ENVIRONMENTAL PROTECTION

AIR QUALITY, ENERGY, AND SUSTAINABILITY

DIVISION OF AIR QUALITY

Air Pollution Control

Control and Prohibition of Carbon Dioxide Emissions

Proposed Amendments: N.J.A.C. 7:27-1.4, 1.36, 8.14, 8.18, 22.16, and 22.28; and 7:27A-3.2, 3.5, and 3.10

Proposed New Rules: N.J.A.C. 7:27F

Authorized By: Shawn M. LaTourette, Commissioner, Department of Environmental Protection.

Authority: N.J.S.A. 13:1B-3(e), 13:1D-9, and 26:2C-1 et seq., particularly 26:2C-37 et seq.

Calendar Reference: See Summary below for explanation of exception to calendar requirement.

DEP Docket Number: 07-21-11.

Proposal Number: PRN 2021-117.

A **public hearing** concerning this notice of proposal will be held on February 1, 2022, at 9:00 A.M. The hearing will be conducted virtually through the Department of Environmental Protection's (Department) video conferencing software, Microsoft Teams. A link to the virtual

public hearing and telephone call-in option will be provided on the Department's website at https://www.nj.gov/dep/rules/notices.html.

Submit comments by close of business on March 6, 2022, electronically at www.nj.gov/dep/rules/comments. Each comment should be identified by the applicable N.J.A.C. citation, with the commenter's name and affiliation following the comment.

The Department encourages electronic submittal of comments. In the alternative, comments may be submitted on paper to:

Alice A. Previte, Esq.

Attention: DEP Docket No. **07-21-11**

Office of Legal Affairs

New Jersey Department of Environmental Protection

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If you are interested in providing oral testimony or submitting written comments at the virtual public hearing, please email the Department at heidi.jones@dep.nj.gov, no later than

5:00 P.M. on Friday, January 28, 2022, with your contact information (name, organization, telephone number, and email address). You must provide a valid email address so the Department can send you an email confirming receipt of your interest to testify orally at the hearing and provide you with a separate option for a telephone call-in line if you do not have access to a computer that can connect to Microsoft Teams. Please note that the hearing will be recorded. It is requested (but not required) that anyone providing oral testimony at the public hearing provide a copy of any prepared remarks to the Department through email.

The proposed new rules and amendments will become operative 60 days after their adoption (see N.J.S.A. 26:2C-8). This notice of proposal may be viewed or downloaded from the Department's website at www.nj.gov/dep/rules.

The agency proposal follows:

Summary

As the Department has provided a 90-day comment period on this notice of proposal, this notice is excepted from the rulemaking calendar requirement pursuant to N.J.A.C. 1:30-3.3(a)5.

The Department is proposing new rules and amendments as part of a comprehensive strategy to implement relevant provisions of the Global Warming Response Act (GWRA), N.J.S.A. 26:2C-37 et seq. The GWRA requires New Jersey to reduce greenhouse gas emissions and short-lived climate pollutants. Specifically, greenhouse gas emissions must be reduced to 80 percent less than the 2006 level of Statewide greenhouse gas emissions by 2050 (80x50

goal). As part of an overall strategy to meet the 80x50 goal, Governor Murphy issued Executive Order No. 100 (2020) (EO No. 100), which directs the Commissioner of the Department to, among other things, reform and modernize the Department's air and land use regulations to mitigate the effects of climate change. In response to EO No. 100, Commissioner McCabe issued Administrative Order 2020-01 (2020) (AO No. 1) https://www.nj.gov/dep/njpact/, which directs the Department to propose rules that reduce emissions of carbon dioxide (CO_2) and short-lived climate pollutants, as well as identify the rules and programs that should be updated to better respond to the challenges presented by climate change. Accordingly, the Department will propose multiple sets of rules, including rule proposals from the Division of Air Quality that are intended to reduce CO_2 and short-lived climate pollutants from the transportation, electric generation, and commercial and industrial sectors. Through this rulemaking, the Department proposes to reduce emissions of CO_2 from: (1) fossil fuel-fired electric generating units (EGUs) through the application of emission limits; (2) commercial and industrial fossil fuel-fired boilers based upon additional permit requirements; and (3) No. 4 and No. 6 fuel oil by banning their sale and use.

The Department held stakeholder meetings on February 25, 2020, and September 3, 2020, to discuss this proposed rulemaking. The public information meeting materials are available on the Department's website at https://www.nj.gov/dep/njpact/. The portions of this Summary that follows are organized by topic; consequently, some provisions of the new rules, such as the definitions, are discussed in several places in the Summary.

Global Warming Response Act, Executive Orders No. 28 and 100, 2019 Energy Master Plan, and 2050 Report

In 2007, New Jersey's Legislature passed the GWRA, which recognized that climate change, primarily caused by emissions of heat-trapping greenhouse gases, poses a threat to the Earth's ecosystems and environment. See N.J.S.A. 26:2C-38. Additionally, the Legislature recognized that reducing emissions of greenhouse gases was not only possible, but necessary to prevent further detrimental impacts on human, animal, and plant life. *Id*. A dozen years later, the Legislature amended the GWRA to acknowledge the role that short-lived climate pollutants play in climate change and to require the State to develop programs to reduce emissions of both greenhouse gases and short-lived climate pollutants through a comprehensive strategy. See P.L. 2019, c. 197. The GWRA's two long-term goals are to reduce greenhouse gas emissions to the 1990 level of Statewide greenhouse gas emissions by 2020 (2020 goal), and to achieve the 80x50 goal.

The State achieved the GWRA's 2020 goal for a reduction in emissions to 1990 levels principally through ongoing efforts to reduce emissions in the electric generation sector. See New Jersey Department of Environmental Protection, *Environmental Trends, Greenhouse Gas Emissions Chapter*, September 2020, p. 2, https://www.nj.gov/ dep/dsr/trends/ghg.pdf. Reaching the 80x50 goal, however, will require "substantial reductions in [greenhouse gas] emissions in [all sectors, but especially in] the transportation, residential and commercial, and electric generation sectors." New Jersey Department of Environmental Protection, *New Jersey's Global Warming Response Act 80x50 Report*, October 15, 2020, Executive Summary, p. vii,

https://www.nj.gov/dep/climatechange/docs/nj-gwra-80x50-report-2020.pdf (2050 Report). "In 2006, net emissions totaled 120.6 [million metric tons (MMT)] CO_2e, setting the 80x50 net emission goal at 24.1 MMT CO_2e by 2050." *Id*. at p. v. "[Carbon dioxide equivalent (CO_2e)] is a term for describing different greenhouse gases in a common unit. For any quantity and type of greenhouse gas, CO_2e signifies the amount of carbon dioxide (CO_2) which would have the equivalent global warming impact, based on their relative global warming potential (GWP)." 2050 Report, p. v, Fn 1. In 2018, New Jersey's Statewide emissions were estimated to be 97.0 MMT CO_2e. *Id*. Thus, New Jersey must reduce its annual emissions by roughly 73MMT CO_2e by 2050. Given the breadth of emission reductions required, meeting the 80x50 goal will require planning and collaboration over time and across economic sectors, levels of government, and through public-private ventures. See 2050 Report, Executive Summary; See also *2019 Energy Master Plan: Pathway to 2050*, Executive Summary, https://nj.gov/emp/docs/pdf/2020_NJBPU_EMP.pdf (2019 EMP).

Recognizing the need for a comprehensive strategy, Governor Murphy directed multiple State agencies to develop or update reports and implement policies to mitigate climate change and strengthen resilience. Pursuant to Executive Order No. 28, the New Jersey Energy Master Plan (EMP) was updated for 2019. The updated 2019 EMP included extensive modeling that resulted in the identification of seven overarching strategies the State should pursue in order to meet the 80x50 goal of the GWRA, as well as the goal of 100 percent clean energy by 2050 set forth in the 2019 EMP. See 2019 EMP. On October 15, 2020, the Department released the 2050 Report. The 2050 Report builds on the 2019 EMP by analyzing New Jersey's emissions

reductions to date, evaluating plans presently in place for further reducing emissions, and presenting a set of strategies across seven emission sectors for policymakers to consider in formulating legislation, regulations, policies, and programs to ensure that New Jersey achieves the 80x50 goal. See 2050 Report, Executive Summary, p. v.

Both the 2019 EMP and the 2050 Report highlight the fact that reaching the 80x50 goal and the goal of achieving 100 percent clean energy by 2050 will require transformation in all economic sectors through the collaboration and planning of multiple State agencies, as well as the private sector, over the next three decades. See 2050 Report, Introduction, and Executive Summary; and 2019 EMP, Executive Summary and Conclusion, p. 231. Thus, the strategies and recommendations of the 2019 EMP and 2050 Report are intended to build on one another over time and across sectors.

For example, as New Jersey moves toward the increased electrification of buildings and transportation, it must consider multiple factors, including, but not limited to, the added demand for electric supply; the sources of electricity generated in New Jersey and for use in New Jersey through the regional transmission organization, known as PJM: emerging technologies; and the costs associated with technologies and infrastructure. Because each of these factors is variable, reporting and modeling must be updated periodically. For this reason, the Board of Public Utilities and the Department, in collaboration with other State agencies, will regularly update the strategies and recommendations in the 2019 EMP and the 2050 Report to consider: the State's progress in reducing emissions; current modeling; emerging pathways and technologies: and a reassessment of priorities. See 2050 Report, Introduction, p. 3; 2019 EMP,

Executive Summary, p. 18. Until then, these proposed rules are one of the initial steps New Jersey will take toward meeting the 80x50 goal.

Chapter 27F, Control and Prohibition of Carbon Dioxide Emissions

N.J.A.C. 7:27-1, General Provisions, and N.J.A.C. 7:27F-1, General Provisions

Governor Murphy's EO No. 100 directed the Commissioner of the Department to "[e]stablish criteria that shall govern and reduce emissions of carbon dioxide." As set forth at proposed N.J.A.C. 7:27F-1.1, Purpose and scope, this proposed new chapter is part of the State's comprehensive strategy to meet the 80x50 goal.

The Department's proposed rules establish criteria for the reduction of CO_2 emissions from EGUs, commercial and industrial boilers, and two types of fuels. Consistent with the strategies and recommendations of the 2019 EMP and 2050 Report, this rulemaking is not meant to be viewed as the definitive action by the Department to ensure the State meets the 80x50 goal. Rather, this rulemaking is an initial step developed in response to current modeling and technology. The criteria in the proposed new rules at N.J.A.C. 7:27F may require reexamination when the State updates the modeling for the EMP, when the Department updates the recommendations in the 2050 Report, or when the Department conducts its periodic evaluation of its rules prior to their readoption.

The addition of proposed new N.J.A.C. 7:27F does not relieve a person from any other legal obligations, including those at N.J.A.C. 7:27, Air Pollution Control, and other air rules. The

Department's proposed amendments at N.J.A.C. 7:27 incorporate the proposed CO_2 limits and additional requirements at N.J.A.C. 7:27F into permits issued pursuant to N.J.A.C. 7:27. For this reason, the Department proposes to amend N.J.A.C. 7:27-1.36 to remove the language indicating that CO_2 emissions (actual or potential) are not a basis for, among other things, a requirement to include emission information in a permit application, a permit limitation, or a fee in a permit.

In 2005, the Department amended the definition of "distillates of air" at N.J.A.C. 7:27-8.1, 17.1, 19.1, and 21.1 in order to classify CO_2 as an air contaminant, thereby placing the regulated community on notice that the Department would take future regulatory actions pertaining to CO_2. See 36 N.J.R. 4607(a); 37 N.J.R. 4415(a). Consistent with the 2005 amendments, the Department proposes to define the terms "air contaminant" and "distillates of air" at existing N.J.A.C. 7:27-1 and new N.J.A.C. 7:27F-1.3, Definitions, so that it is clear that CO_2 is not included in the definition of "distillate of air." The effect of deleting N.J.A.C. 7:27-1.36(b) and defining "distillate of air" is to classify CO_2 as an "air contaminant," which is subject to Department regulation. The Department's inclusion of these definitions in the general provisions of both chapters will ensure that CO_2 is treated consistently as an air contaminant throughout both chapters. The definitions at proposed new N.J.A.C. 7:27F-1.3 are common throughout the chapter, or are used in more than one proposed subchapter. Definitions that are unique to a subchapter are defined in that subchapter. The Department will discuss the proposed terms and definitions within the summaries of individual subchapters below.

Though separate from N.J.A.C. 7:27, Air Pollution Control, the general provisions at proposed new N.J.A.C. 7:27F are modeled after, or refer to, the provisions at N.J.A.C. 7:27. Specifically, proposed N.J.A.C. 7:27F-1.4, Confidentiality, refers to the procedures at N.J.A.C. 7:27-1.6 through 1.30, which govern protection of confidential information submitted to the Department. Proposed N.J.A.C. 7:27F-1.5, Right to enter, is the same as existing N.J.A.C. 7:27-1.31, Right to enter, and sets forth the scope of the Department's authority to enter and inspect facilities subject to N.J.A.C. 7:27F. The Department proposes N.J.A.C. 7:27F-1.2, Liberal construction, and 1.6, Severability, which are comparable to existing N.J.A.C. 7:27-1.38 and 1.37, respectively. Proposed N.J.A.C. 7:27F-1.7, Civil administrative penalties and requests for administrative hearings, indicates that penalties for violations of the chapter, as well as the administrative procedure for requesting an adjudicatory hearing, are set forth at proposed amended N.J.A.C. 7:27A, Air Administrative Procedures and Penalties.

Finally, N.J.A.C. 7:27F-1.8, Incorporation by reference, is a general provision indicating that whenever the Department incorporates by reference a code, regulation, or a standard or requirement that originated outside of the Department (that is, a provision within the Code of Federal Regulations or a specification within the ASTM), the incorporation is prospective, unless the language of the incorporation states otherwise. Thus, as a general rule, all incorporations by reference within this chapter should be read to include all supplements or amendments, and to include all notes, comments, appendices, diagrams, tables, forms, figures, publications, and cross-references.

N.J.A.C. 7:27F-2, Carbon Dioxide Emission Reductions from Electric Generating Units

Overview

As noted above, the 2050 Report observed that it will be important to reduce greenhouse gas emissions in all sectors, but particularly in the transportation, residential and commercial, and electric generation sectors in order to meet the 80x50 goal. New Jersey already has one of the lowest-carbon electric generation sectors in the U.S., because "a large portion of its electric generation is comprised of carbon free nuclear energy and efficient combined cycle natural gas plants"; nevertheless, the electric generation sector is still the third largest contributor to the State's total CO_2e emissions. 2050 Report, pp. xiii and 11. Of the total CO_2e emissions from the electric generation sector, natural gas-fired electric generating units (EGUs) contribute 83 percent of these emissions, while coal-fired units account for 11 percent.

One of the goals of the 2019 EMP is to achieve 100 percent clean energy by 2050, which will require the State to reduce emissions from the electric generation sector to net zero by 2050 (net zero). The 2050 Report also stated that meeting the State's clean energy goals will require electric generation to fully decarbonize and drop to 0 MMT CO_2e by 2050. 2050 Report, p. xiii. At the same time, the 2019 EMP explains that a measured approach, consistent with current technological and practical limits of supply/demand, will maintain grid reliability and avoid leakage. Thus, as the Department and other State agencies work together to implement comprehensive policies and regulations to transition the State's electric generation sector to

net zero, variables, such as the availability of renewable electric generation in New Jersey and the PJM region, storage capacity, and increased or decreased electricity demand must be considered. Though the Department anticipates that the first large-scale offshore wind projects will be brought online in New Jersey and other PJM states as early as 2025, and that battery technology will continue to develop, the Department also recognizes that these essential components of a net zero electric generation sector are goals that are expected to be realized at future dates. Moreover, the rules in this rulemaking concerning boiler permits, as well as separately proposed rules, will add demand to the State's existing infrastructure by encouraging electrification in other sectors, including transportation and buildings.

Accordingly, proposed N.J.A.C. 7:27F-2, Carbon Dioxide Emission Limits for Fossil Fuel-Fired Electric Generating Units, seeks to achieve reductions of CO_2 emissions from fossil fuel-fired EGUs by requiring those EGUs to meet output-based emission limits for CO_2 that become more stringent over time. "An output-based format gives a clear measure of the emission impact of producing an energy product, such as electricity or steam. As an example, the most common output-based measure for electricity generation is lb/MWh generated. When emissions are expressed in these units, all sources can be directly compared, and determining the actual tons of emissions for a given level of energy generation is straightforward… [In short, o]utput-based standards make comparing emissions between technologies easier." Output-Based Regulations: A Handbook for Air Regulators, U.S. Environmental Protection Agency Combined Heat and Power Partnership, p. 3-7, August 2014, https://www.epa.gov/sites/production/files/2015-07/documents/output-

based regulations a handbook for air regulators.pdf. The Department believes that the proposed rules are an important first regulatory step toward decarbonizing the State's electric generation sector in line with the 2019 EMP and the 2050 Report.

In 2020, there were 94 fossil fuel-fired EGUs equal to, or greater than, 25 MWe at 33 different facilities operating in the State. EGUs in the State are generally classified as simple cycle combustion turbines, combined cycle units, combined heat and power units, and steam generating units. A combined cycle unit is an EGU that uses a stationary combustion turbine from which the heat from the turbine exhaust gases is recovered by a heat recovery steam generating unit to generate electricity. Because of this heat recovery, combined cycles are more efficient than simple cycle combustion turbines, which do not recover heat from their exhaust gases. An integrated gasification combined cycle (IGCC) is a type of combined cycle facility. A combined heat and power (CHP) unit, which is also known as cogeneration, is an EGU that uses a steam generating unit or stationary combustion turbine to simultaneously produce both electric and useful thermal output from the same primary energy source. A steam generating unit uses a device, such as a furnace or boiler to combust fuel and produce steam that provides electricity or useful thermal output. The Department proposes to define "electric generating unit" or "EGU" at N.J.A.C. 7:27F-2.1, Definitions, as "a combustion or steam generating source used for generating electricity that delivers all or part of its power to the electric power distribution grid for commercial sale." The proposed definition of an EGU is broad enough to include simple cycle combustion turbines, combined cycle units, combined heat and power units, and steam generating units, all of which presently operate in the State.

The Department proposes to define the terms "combined cycle unit," "combined heat and power unit," "steam generating unit," "stationary combustion turbine," "heat recovery steam generating unit" or "HRSG," "integrated gasification combined cycle," "IGCC" or "IGCC facility," and "useful thermal output," at N.J.A.C. 7:27F-2.1, Definitions, consistent with the definitions of those terms as used in the Federal new source performance standards (NSPS) at 40 CFR 60.5580. The Department proposes to define the term "simple cycle combustion turbine" consistent with the definition of the same term as used at N.J.A.C. 7-27-19.1.

Given that the proposed rules are intended to reduce CO_2 emissions from EGUs that burn fossil fuels, the Department proposes to define "fossil fuel-fired," at N.J.A.C. 7:27F-1.3, Definitions, to specify that the rules apply only to electric generating units that "combust fossil fuel, alone or in combination with any other fuel, where the fossil fuel combusted comprises, or is projected to comprise, more than 50 percent of the annual heat input on a BTU basis during any year." The Department proposes to define "fossil fuel," at N.J.A.C. 7:27F-1.3, Definitions, to mean "natural gas, petroleum, coal, and any form of solid, liquid, or gaseous fuel derived from such material for the purpose of creating useful heat." The proposed definition of "natural gas" excludes certain gases, including landfill gas and digester gas. Further, the Department proposes to define the terms "CO_2," "coal," and "petroleum" based upon their generally accepted meanings as used in environmental science.

Due to the need for stability as the State transitions to fully decarbonized electric generation, the Department's proposed emission limits do not require an immediate reduction of CO_2 emissions from all fossil fuel-fired EGUs to net zero. Rather, the Department's proposed rules

would require a new fossil fuel-fired EGU to meet the most stringent CO_2 emission limits currently achievable, while phasing in increasingly stringent CO_2 emission limits imposed on existing fossil fuel-fired EGUs. The definitions reflect this two-tiered approach by creating a classification of either an "existing EGU" or a "new EGU" for purposes of determining the applicable emission limit at N.J.A.C. 7:27F-2.5. As defined at proposed N.J.A.C. 7:27F-2.1, an "existing electric generating unit" or "existing EGU" is "a fossil fuel-fired EGU that commenced construction before the operative date of the rule and provides more than 10 percent of its annual gross electric output to the electric grid," while a "new electric generating unit" or "new EGU" is defined as "a fossil fuel-fired EGU that commenced construction or was reconstructed after the operative date of the rule and provides more than 10 percent of its annual gross electric output to the electric grid." The Department proposes to define the terms "construct" or "construction," and "reconstruct" or "reconstruction," to have the same meaning as those terms as defined at N.J.A.C. 7:27-8.1 and 22.1, as applicable. The term "commence construction" or "commenced construction" is proposed to mean "that an owner or operator has undertaken a continuous program of construction or that an owner or operator has entered into a contractual obligation to undertake and complete, within a reasonable time, a continuous program of construction." Consistent with the Federal Prevention of Significant Deterioration (PSD) program, 40 CFR 52.21(b)(9) and (r)(2), construction is no longer continuous if construction is discontinued for longer than 18 months.

Proposed N.J.A.C. 7:27F-2 applies to new and existing EGUs. Based on the proposed definitions of "new EGU" and "existing EGU," the proposed subchapter does not apply to an EGU that

provides only distributed electricity generation or otherwise provides less than 10 percent of its annual gross electric output to the grid. The Department proposes this applicability threshold, which is consistent with the CO_2 Budget Trading Program rules, N.J.A.C. 7:27C, because the proposed CO_2 emission limits for EGUs in this rulemaking are intended to reduce carbon pollution from electric generating units that provide electricity to the grid. In addition, proposed N.J.A.C. 7:27F-2.2, Scope and applicability, provides that only an existing or a new fossil fuel-fired EGU with a nameplate capacity equal to or greater than 25 megawatt electric (MWe) is required to comply with the numeric CO_2 emissions limits set forth at N.J.A.C. 7:27F-2.5. The proposed 25 MWe threshold is consistent with other State and Federal regulatory programs, including the CO_2 Budget Trading Program and the Federal Acid Rain Program. The Department proposes to define the terms "MWe" and "nameplate capacity," at N.J.A.C. 7:27F-1.3 and 7:27F-2.1, respectively, as those terms are defined in the CO_2 Budget Trading Program at N.J.A.C. 7:27C-1.21.

N.J.A.C. 7:27F-2.5, Emission limits (applicable to existing EGUs)

To begin the transition to net zero, proposed N.J.A.C. 7:27F-2.5, Emission limits, requires that all existing EGUs with a nameplate capacity equal to or greater than 25 MWe comply with an output-based emission limit for CO_2, in the form of an emission rate expressed as pounds (lb) of CO_2/megawatt hour (MWh) per gross energy output. The Department proposes to define the terms "output-based emission limit," "lb," "KWh," and "MWh" at N.J.A.C. 7:27F-1.3, Definitions, and 2.1, Definitions, consistent with their generally accepted meanings as used in engineering principles and environmental science. The Department proposes to define the terms "gross

energy output," "gross electric output," and "net electric output," at N.J.A.C. 7:27F-2.1, Definitions, consistent with the Federal NSPS definitions at 40 CFR 60.5580.

After considering the age, emission rates, and usage of the EGUs currently operating in the State, along with the projected generation needs set forth in the 2019 EMP, the Department proposes three emission limit tiers for existing EGUs and three associated compliance deadlines. For the first tier, on or before January 1, 2024, existing EGUs must meet an emission limit of 1,700 lb CO_2/MWh gross energy output. For the second tier, on or before January 1, 2027, the applicable limit ratchets down to 1,300 lb CO_2/MWh gross energy output. For the third tier, on or before January 1, 2035, existing EGUs must meet a more stringent limit of 1,000 lb CO_2/MWh gross energy output. The Department anticipates that the compliance deadlines will provide sufficient lead time for owners and operators of affected EGUs, as well as the general electric generation sector, including regulators, to plan accordingly. The rationale for each of these emission limit tiers is discussed below.

First tier

The Department proposes to require existing EGUs to meet an emission limit of 1,700 lb CO_2/MWh on or before the first compliance deadline of January 1, 2024. Based on the Department's analysis, there are 12 EGUs in New Jersey that emit over 1,700 lb/MWh of CO_2, including three coal-fired EGUs, seven simple cycle turbines fired by natural gas and No. 2 fuel oil, one simple cycle turbine fired by natural gas, and one simple cycle turbine fired by No. 2 fuel oil. Eight of the nine turbines are over 40 years old. The ninth turbine is over 20 years old.

Based on 2018 data, these units provided less than three percent of New Jersey's net electric generation but emitted seven percent of the total CO_2 emissions from the State's electric generating units.

Given the proposed emission limit and the ages of these EGUs, the owners of these units may choose to shut down on or before January 1, 2024. However, if a unit operated mostly on fuel oil instead of natural gas, the owner might choose to modify its operation to rely less on fuel oil and more on natural gas, which could allow the EGU to meet the proposed emission limit and continue to operate.

The Department acknowledges that fossil fuel-fired electric generation in the State will continue to be needed until clean energy sources come online and clean energy technology advances to meet anticipated electric demand. As depicted in the EMP, with the electrification of buildings and transportation, the EMP predicts more than doubling electricity demand. The EMP modeling indicates that in-State dispatchable generation will be required to meet the State's energy demand. The EMP modeling further indicates that this generation will continue to be met, in part by fossil fuels, transitioning to renewable biofuels in the mid-2040s.

The Department also considered the possibility of "leakage," which is when electric generation dispatch shifts from an in-State to an out-of-State source due to costs imposed by in-State regulatory requirements. New Jersey is a part of the PJM electricity market (also referred to as the "PJM grid"). If leakage occurs, other operating EGUs in the PJM grid make up the in-State electric generation that is lost because an in-State source ceases to operate. Depending on the

CO_2 emission rate of these "other" power plants in the PJM grid, this shift in electric generation could result in higher or lower regional emissions.

To determine the potential impact if all of the electric generation lost from units shut down in New Jersey is made up by power from EGUs in other states in the PJM grid, the Department utilized PJM's "annual emission report with data on both marginal and average emissions rates from electric generators in the PJM footprint." See PJM, 2015-2019 CO_2, SO_2 and NO_x Emission Rates (April 9, 2020), at https://www.pjm.com/~/media/library/reports-notices/special-reports/2019/2019-emissions-report.ashx. PJM provides this report "[t]o support the efforts of regulators, stakeholders and other interested parties as they work toward achieving environmental goals." *Id*. In its report, PJM provides annual CO_2 on-peak marginal emission rates, off-peak marginal emission rates, and PJM system average rates.

To estimate the rate of CO_2 emissions from the PJM sources that would have to make up for the electric generation provided by an EGU in New Jersey that shuts down as a result of the Department's proposed CO_2 emission limit, the Department looked at the annual marginal on-peak CO_2 emission rate for 2015 through 2019, provided by PJM. The Department utilized the marginal rate due to the way power is dispatched in the PJM electricity market. The electric dispatch that would fill the demand left by an EGU that has ceased operation in New Jersey would be the next most economically competitive unit that is able to serve the electric demand in the local area, which is the next most economic or "marginal" unit. The Department looked at the marginal on-peak (vs. off-peak) rate because the existing EGUs that operate above the proposed emission rate are units that operate during peak hours. Therefore, the marginal on-

peak rate most closely reflects the CO_2 emissions from the source in the PJM electricity market that would most likely fill the demand left by an EGU that has ceased operation in New Jersey.

The Department then assumed that the five-year trend from 2015 through 2019 would continue through 2027 to project the CO_2 emissions rate in 2024 and 2027 (the second tier, discussed below). Although the Department made this assumption for purposes of its emissions calculations, the future expansion of renewable generation (in-State and out-of-State) could lower the overall carbon intensity of the PJM electric market and result in a lower marginal rate. The Department's rough projection calculated a 1,132 lb/MWh PJM CO_2 marginal rate in 2024, which is lower than the proposed 1,700 lb/MWh CO_2 emission limit that existing EGUs in New Jersey would need to meet by January 1, 2024. Therefore, even if some or all of the electricity generation lost in New Jersey from shut down units is made up by out-of-State PJM sources, the Department expects a net CO_2 emission reduction benefit.

Second tier

Pursuant to proposed N.J.A.C. 7:27F-2.5, existing EGUs must comply with the second, more stringent emission limit of 1,300 lb/MWh of CO_2 on or before January 1, 2027. As of the date of publication of this notice of proposal, all combined cycle EGUs (except for four units built in the 1970s) and some simple cycle EGUs in the State emit CO_2 at a rate less than 1,300 lb/MWh. The Department evaluated all of the EGUs with a nameplate capacity greater than or equal to 25MWe operating in the State at the time of publication of this notice of proposal and determined that there are 14 units emitting CO_2 at a rate less than 1,700 but over 1,300

lb/MWh. These units are all at least 20 years old and have low usage, accounting for less than one percent of the power generated in the State in 2018. The Department's proposed 1,300 lb/MWh limit requires less efficient EGUs to meet an emission rate that is achieved by more efficient units in the State.

As discussed above, if the owners of these units decide to shut them down, rather than possibly adjusting operation to meet the applicable limit after January 1, 2027, some or all of that electricity demand may be made up by out-of-State EGUs in the PJM grid. Thus, the Department, again, estimated the rate of CO_2 emissions from the PJM sources that could make up for electric generation provided by one or more existing EGUs in New Jersey that shut down as a result of the Department's proposed second tier CO_2 emission limit. Looking at the 2015 through 2019 annual marginal on-peak CO_2 emissions rate trend, the Department roughly projects a PJM CO_2 marginal emission rate of 1,051 lb/MWh in 2027, which is lower than the January 1, 2027, proposed emission rate of 1,300 lb/MWh CO_2 for in-State existing EGUs. Therefore, the Department anticipates a net emission reduction benefit if in-State units exceeding the 1,300 lb/MWh limit shut down and other EGUs in PJM make up that electricity demand.

Third tier

The last proposed emission limit for New Jersey's existing EGUs is 1,000 lb/MWh, based on the emission rate currently achieved by more efficient EGUs in the State. As explained below, existing EGUs with best available control technology in the State achieve emission rates

less than 1,000 lb CO_2/MWh. Therefore, the Department proposes to require all existing EGUs to meet a 1,000 lb CO_2/MWh emission rate on or before January 1, 2035.

As of the date of publication of this notice of proposal, there are 40 EGUs that operate in the State and emit CO_2 at a rate greater than 1,000 lb/MWh and less than 1,300 lb/MWh. These units account for approximately nine percent of the power produced in the State and approximately 10 percent of the CO_2 emissions from the electric generation sector. Again, looking at the 2015 through 2019 annual marginal on-peak CO_2 emission rate trend, the Department roughly projects a PJM CO_2 marginal emission rate of 834 lb/MWh in 2035, which is lower than the proposed emission rate of 1,000 lb/MWh by January 1, 2035.

The 2050 Report lays out the State's annual generation goals by year, consistent with the 2019 EMP. See 2050 Report, p.69, Table 3.4. The collective capacity of existing New Jersey EGUs that emit less than 1,000 lb CO_2/MWh is approximately 6,700 MW, which is sufficient to cover the projected fossil fuel generation need if the other annual generation goals are met by 2035. Therefore, the Department believes that the proposed third tier is consistent with the pathways laid out in the 80x50 report.

Extension of time for compliance

For the reasons explained above, the Department proposes a three-tiered regulatory program to reduce CO_2 emissions from existing EGUs consistent with the 80x50 goal, as well as the electricity capacity, generation expectations, and projections included in the 2019 EMP. Nonetheless, the Department recognizes the uncertainties of electricity demand and

generation and the importance of electric grid reliability. Accordingly, the Department proposes to allow affected existing EGUs to apply for an extension of compliance, if the EGU must continue to operate to ensure electric grid reliability. Proposed N.J.A.C. 7:27F-2.5 sets forth the circumstances under which the Department will grant an extension of the compliance deadline(s).

The Department will grant an extension of any of the three compliance deadlines if an owner or operator of an existing EGU requests an extension based on an order from the New Jersey Board of Public Utilities (BPU) that mandates continued operation of the unit, or if the EGU is designated as a "Reliability Must Run unit" or an "RMR unit" by PJM or the New York Independent System Operator (NYISO), which would require the unit to continue to operate to maintain reliable operation of the interstate electric transmission system, pursuant to a duly-approved PJM tariff or a service agreement approved by the Federal Energy Regulatory Commission (FERC). The Department proposes to define "RMR" and "RMR unit" consistent with how these terms are defined by PJM. The Department also recognizes that an EGU might have entered into a power purchase agreement that gives the purchaser of energy from the EGU rights to the EGU's electric energy output. In any of these situations, if the owner or operator verifies the order or agreement, as applicable, the Department will grant the extension for the term of the order or agreement, as applicable. Proposed N.J.A.C. 7:27F-2.5(f)3 and (g) further specify that the Department will grant an extension of an applicable compliance date based on a power purchase agreement only for the agreement's initial term.

The proposed extension is not available if the initial term of the power purchase agreement is extended beyond its original expiration or termination date.

Additionally, if the BPU notifies the Department in writing that a general extension is necessary to ensure reliability of the State's electric transmission or distribution system, the Department will extend the applicable compliance date for the term specified in the BPU's order and publish notice on the Department's website within five business days of receipt of the notice. The Department proposes to define the acronyms "BPU," "PJM," "NYISO," and "FERC," at N.J.A.C. 7:27F-1.3, Definitions, to clearly identify the responsible government agencies. Further, the Department proposes to define "power purchase agreement," at N.J.A.C. 7:27F-2.1, as an agreement that was executed prior to January 1, 2002, is for a duration of more than 15 years from its effective date and provides that the counterpart to the agreement that purchases energy from the facility has rights to the electric energy output of the facility. This definition is consistent with the type of power purchase agreement described at existing N.J.A.C. 7:27C-5.5(b).

Emission limits when applying for a permit modification for an existing EGU

An owner or operator that seeks to modify its existing EGU after the operative date of the new rules must propose and comply with a case-specific output-based emission limit for CO_2, as further explained below in the section, Emission limits (for EGUs at an EGU facility), N.J.A.C. 7:27F-2.5. Though this limit will be determined based on case-specific information, the Department's proposed rules provide that the limit cannot exceed the three emission limits for

existing EGUs by the compliance deadlines set forth above. The Department proposes to define "modify" or "modification," at N.J.A.C. 7:27F-1.3, consistent with the definition of the same term at N.J.A.C. 7:27-22.1.

N.J.A.C. 7:27F-2.5, Emission limits for new EGUs

Proposed N.J.A.C. 7:27F-2.5(b) requires an owner or operator of a new EGU with a nameplate capacity equal to or greater than 25 MWe to meet an emission rate of 860 lb CO_2/MWh. The Department proposes this emission limit based on its analysis of best available control technology for natural gas combined cycle units in the State that are subject to the Federal Prevention of Significant Deterioration (PSD) program. The Department also reviewed data from natural gas combined cycle units constructed in the State after 2010. These units have reported CO_2 emission rates that are generally below 860 lb/MWh. The Department proposes a limit of 860 lb/MWh to provide new EGUs a slight compliance margin when considering what the most efficient EGUs actually achieve.

As with existing EGUs, a new EGU that is modified after the operative date of the new rules must comply with a case-specific output-based emission limit for CO_2, as explained in greater detail below, but cannot exceed the specific emission limit of 860 lb CO_2/MWh for new EGUs at proposed N.J.A.C. 7:27F-2.5(b).

N.J.A.C. 7:27F-2.5, Emission limits for EGUs at an EGU facility

The requirements explained above pertain to EGUs with a nameplate capacity equal to or greater than 25 MWe. The Department does not propose emission limits for smaller existing EGUs. However, proposed N.J.A.C. 7:27F-2.5, Emission limits for EGUs at an EGU facility, requires new units with a nameplate capacity less than 25 MWe to comply with a case-specific output-based emission limit for CO_2 if the unit is located at a facility that has more than one EGU, and the aggregate capacity of those units is equal to or greater than 25 MWe. The Department proposes to consider the aggregate capacity of an EGU facility to avoid the potential situation where a facility seeks to construct one or multiple EGUs, each just below the capacity applicability threshold for the larger EGUs, to avoid compliance with a CO_2 emission limit. The Department believes a case-specific limit is appropriate to ensure the EGU meets a limit that reflects the greatest emission reduction that is technologically feasible based on current air pollution control technology. The Department proposes to define "EGU facility" at N.J.A.C. 7:27F-2.1 as a facility with one or more new and/or existing fossil fuel-fired EGUs where the aggregate nameplate capacity of all of the EGUs at the facility is equal to or greater than 25 MWe. The Department proposes to define "facility" at N.J.A.C. 7:27F-1.3 consistent with the definition of the term "facility" as set forth at N.J.A.C. 7:27-8.1, Permits and certificates for minor facilities and N.J.A.C. 7:27-22.1, Operating permits, as applicable.

To determine if a new EGU that is less than 25 MWe (sometimes referred to as a "smaller EGU") must comply with proposed N.J.A.C. 7:27F-2, the owner or operator of the facility must calculate the capacity of all existing EGUs plus the capacity of the new EGU(s) at the EGU facility. If the aggregate capacity is equal to or greater than 25 MWe, the new unit is

subject to proposed new N.J.A.C. 7:27F-2. If the EGU facility has an existing, individual EGU that is equal to or greater than 25 MWe and proposes to build a new, smaller EGU, the existing EGU is subject to the proposed three-tiered emission limits applicable to existing EGUs, and the new EGU is subject to the proposed case-specific emission limit at proposed N.J.A.C. 7:27F-2.5. As another example, if an owner proposes a new facility with multiple new EGUs, each below the 25 MWe threshold but collectively equal to or greater than the 25 MWe threshold, all of the new units are subject to the case-specific emissions limit. If the collective capacity is less than 25 MWe, none of the new EGUs is required to comply.

Proposed N.J.A.C. 7:27F-2.4 requires an owner or operator of a smaller new EGU to propose a case-specific emission limit that meets the requirements at proposed N.J.A.C. 7:27F-2.5 and to submit all necessary supporting information as part of its application for an initial or modified permit, if the new EGU is proposed to be part of an existing facility. Proposed N.J.A.C. 7:27F-2.5 identifies the factors the Department will use to determine the case-specific CO_2 emission limit applicable to a smaller EGU at an EGU facility. The case-specific output-based emission limit for CO_2 must be based on air pollution control technology, pollution prevention methods, and process modifications or substitutions that will provide the greatest emission reductions that are technologically and economically feasible. The case-specific emission limit must not have greater than 50 percent of the heat input be derived from solid fossil fuel or oil, unless the CO_2 emission rate associated with that input meets the 860 lb CO_2/MWh emission limit. Finally, the limit must include the CO_2 emissions from the gasifier. The term “gasifier” is defined at proposed N.J.A.C. 7:27F-2.1.

N.J.A.C. 7:27F-2.6 and 2.7, Monitoring, compliance demonstration, recordkeeping, and reporting requirements

Proposed N.J.A.C. 7:27F-2.6, Monitoring, compliance demonstration, and recordkeeping procedures, sets forth the monitoring, compliance demonstration, and recordkeeping requirements for an owner and operator of a new or existing EGU subject to the CO_2 emission limits. For consistency with Federal requirements, proposed N.J.A.C. 7:27F-2.6 incorporates by reference applicable sections of the Federal NSPS program monitoring, compliance demonstration, and recordkeeping provisions established at 40 CFR 60.5535, 60.5540, and 60.5560. The Department intends that when an applicable provision of the CFR is incorporated by reference, the incorporation includes all notes, comments, appendices, diagrams, tables, forms, figures, publications, and cross-references associated with that provision. For instance, 40 CFR 60.5535 contains multiple cross-references to other provisions at 40 CFR Part 60, as well as numerous cross-references to the emission monitoring provisions at 40 CFR Part 75.

Most, if not all, EGUs in the State that will be subject to proposed N.J.A.C. 7:27F-2 are already required to comply with the emission monitoring provisions at 40 CFR Part 75, and several newer EGUs are already required to comply with the monitoring, compliance demonstration, and recordkeeping provisions established at 40 CFR 60.5535, 60.5540, and 60.5560. Accordingly, the Department's proposed incorporation by reference of the specified provisions of the CFR ensure consistency with Federal requirements and reduce additional compliance burdens on regulated entities. The Department proposes to define "CFR" as the United States Code of Federal Regulations and "EPA" as United States Environmental Protection

Agency at N.J.A.C. 7:27F-1.3. Further, the Department proposes to define the terms "standard ambient temperature and pressure" or "SATP," "standard conditions," and "valid data" at N.J.A.C. 7:27F-2.1, which are pertinent to the monitoring requirements, consistent with the definitions of those terms at 40 CFR 60.5580.

Because the CO_2 emission limits proposed at N.J.A.C. 7:27F-2 are output-based emission limits, the applicable NSPS program requirements must be adhered to in a manner consistent with the purpose of monitoring and recording output-based CO_2 emissions and determining compliance with an output-based emission limit. The monitoring and compliance demonstration requirements at 40 CFR 60.5535 and 60.5540 specify that compliance with the emissions rate limits is determined on a 12-operating-month rolling average basis, updated after each new operating month. For each 12-operating-month compliance period, quality-assured data from the certified monitoring systems must be used together with the gross output over that period of time to calculate the average CO2 emissions rate. The CO_2 Budget Trading Program Rules at N.J.A.C. 7:27C-8.1 similarly require CO_2 budget units and sources to comply with the Federal monitoring requirements. Therefore, the Department expects little added burden for existing EGUs, all of which are subject to the CO_2 Budget Trading Program rules, to comply with the monitoring requirements of proposed new N.J.A.C. 7:27F-2.6.

Proposed N.J.A.C. 7:27F-2.6 imposes deadlines for an owner or operator of an EGU to meet the monitoring requirements. An owner or operator that commences commercial operation before six months before the effective date of the new rule must comply with the monitoring requirements on and after the operative date of the new rule. An owner or operator that

commences commercial operation on or after six months before the effective date of the new rule must comply with the monitoring requirements on and after the later of the following dates: six months after the operative date of the new rules or 180 calendar days after the date on which the EGU commences commercial operation.

The Department proposes to incorporate by reference the recordkeeping requirements at 40 CFR 60.5560, which cross-reference certain recordkeeping requirements that are set forth at 40 CFR Part 75, subpart F. For example, EGUs using a continuous emission monitoring system must keep records of the data elements, including hourly CO2 concentration, stack gas flow rate, stack gas moisture content (if needed), unit operating time, and gross electric generation. The Department's proposed new rules also require EGU owners or operators to keep records of the calculations performed, including those calculations to determine the total CO2 mass emissions and gross output for each operating month, the average CO2 mass emission rate (kg/MWh), and the percentage of valid CO2 mass emission rates in each compliance period.

As proposed at N.J.A.C. 7:27F-2.7, Reporting, the owner or operator of an affected EGU must comply with the reporting requirements at N.J.A.C. 7:27-8 and 22, as applicable, as well as with the reporting requirements in its preconstruction or operating permits. Finally, the Department's proposed new rules require the owner or operator to submit any additional reports requested by the Department, in accordance with N.J.A.C. 7:27-22.19.

N.J.A.C. 7:27-22.16 and 22.28 and N.J.A.C. 7:27F-2.3 and 2.4, Requirements to incorporate emission limit and other requirements into operating permit

The Department proposes to amend the operating permit rules at N.J.A.C. 7:27-22.16 to add new subsection (q) to require that operating permits contain all applicable requirements at proposed chapter N.J.A.C. 7:27F, as well as sufficient monitoring, recordkeeping, and reporting requirements to ensure compliance. Moreover, pursuant to the proposed general provisions at N.J.A.C. 7:27F-2.3, the owner or operator must submit any supplementary information the Department requires as part of the permit application review process and must operate the EGU in accordance with its permit, including the requirements for monitoring, compliance demonstration, recordkeeping, and reporting. Pursuant to proposed N.J.A.C. 7:27F-2.4, the owner or operator of an existing EGU subject to proposed N.J.A.C. 7:27F-2 shall submit a complete application for a modification or renewal of its permit to incorporate the applicable emission limit and other requirements. The owner or operator of a new EGU must include, in its permit application, the facility name and assigned ORIS or facility code, each EGU at the facility, and the monitoring, compliance demonstration, and recordkeeping requirements. See proposed N.J.A.C. 7:27F-2.4. The Department proposes to define "ORIS code" and "facility code," at N.J.A.C. 7:27F-2.1, consistent with the definitions of those terms at N.J.A.C. 7:27C-1.2.

The Department proposes to amend N.J.A.C. 7:27-22.28 to add new subsection (c), which sets the deadlines by which an owner or operator of a facility subject to N.J.A.C. 7:27F-2 must submit an application to incorporate the requirements of this subchapter into its permit. For a new EGU that was issued a permit before the operative date of the new rules and that must comply with proposed N.J.A.C. 7:27F-2.5(b) or (c), the owner or operator must apply no later than 12 months after the operative date of this rule. For an existing EGU that is required

to comply with proposed N.J.A.C. 7:27F-2.5(c), the owner or operator must apply no later than 12 months after the operative date of this rulemaking or as part of its application for a renewal permit, whichever is later. Finally, for an existing EGU that is required to comply with proposed N.J.A.C. 7:27F-2.5(d), the owner or operator must apply no later than 12 months prior to the applicable compliance date at proposed N.J.A.C. 7:27F-2.5(d)1, 2, or 3 or as part of its application for a renewal permit, whichever is earlier.

To assess compliance, the Department proposes to use the emissions measurements recorded and reported by the affected EGU. As stated at proposed N.J.A.C. 7:27F-2.3, the Department will use a 12-operating month rolling average basis, calculated by dividing the annual total of CO_2 emissions over the relevant 12-month period by the annual gross electric and/or the mechanical output plus the useful thermal output (output-based limit) over the same 12-month period. The Department proposes to define the term "mechanical output," at N.J.A.C. 7:27F-2.1, as "the useful mechanical energy that is not used to operate the affected EGU(s), generate electricity, generate thermal energy, or enhance the performance of the affected EGU." The Department proposes to define the term "operating month," at N.J.A.C. 7:27F-2.1, as "a calendar month during which any fuel is combusted in the affected EGU at any time."

N.J.A.C. 7:27F-1.3 and 2.1, Miscellaneous, general definitions

The Department proposes other definitions, many of which match those at N.J.A.C. 7:27. Specifically, the Department proposes to define "install" or "installation," "process unit,"

"renewal," "source emission testing," "source operation" or "source," "stack or chimney," and "use" at N.J.A.C. 7:27F-2.1, to have the same meaning as those terms are defined at N.J.A.C. 7:27-8.1 or 22.1, as applicable. Likewise, the Department proposes to define "insignificant source," "operating certificate," or "certificate," "operating permit," "permittee," "permit revision," "person," "preconstruction permit," and "significant source" at N.J.A.C. 7:27F-1.3, to have the same meaning as they do at N.J.A.C. 7:27-8.1 or 22.1, as applicable. Finally, the Department proposes to define, at N.J.A.C. 7:27F-1.3, the term "ISO" to mean the International Organization for Standardization and the term "ISO conditions" to mean 288 Kelvin, or 15° C, 60 percent relative humidity, and 101.3 kilopascals pressure.

N.J.A.C. 7:27F-3, Carbon Dioxide Emission Reductions from Fuels

The Department proposes new N.J.A.C. 7:27F and amendments to the Air Pollution Control Rules at N.J.A.C. 7:27 to reduce emissions of CO_2 as one of several initial steps being taken as part of a comprehensive strategy to mitigate the impacts of climate change by reaching the 80x50 goal. It is well-established that the combustion of fossil fuels in stationary sources leads to the emission of greenhouse gases, including the most prevalent greenhouse gas, CO_2. Further, it is well-established that "[d]ifferent fuels emit different amounts of [CO_2] in relation to the energy they produce when burned." https://www.eia.gov/tools/faqs/faq.php?id=73&t=11. The amount of CO_2 emitted by a particular fuel type by activity is frequently expressed as an emissions factor. "An

emissions factor is a representative value that attempts to relate the quantity of a pollutant released to the atmosphere with an activity associated with the release of that pollutant." https://www.epa.gov/air-emissions-factors-and-quantification/basic-information-air-emissions-factors-and-quantification#About Emissions Factors. Accordingly, proposed N.J.A.C. 7:27F-3, Carbon Dioxide Emission Reductions from Fuels, seeks to achieve emission reductions from fossil fuel oils that emit the greatest quantity of CO_2 when burned.

For purposes of proposed N.J.A.C. 7:27F-3, the Department proposes to define "fuel oil" at N.J.A.C. 7:27F-3.1 as "a liquid or liquefiable petroleum product derived directly or indirectly from crude oil, which is produced, manufactured, used, or sold for the generation of heat or power." Additionally, the Department proposes to define "No. 4 fuel oil" and "No. 6 fuel oil," since these fuels have two of the highest CO_2 emissions factors among all fuel oils. See 40 CFR Subpart 98, Table C-1. The definitions for these two fuels are taken directly from the glossary of terms on the U.S. Energy Information Administration's (US EIA) website at https://www.eia.gov/tools/glossary/. Specifically, "No. 4 fuel oil" is defined as "a distillate fuel oil made by blending distillate fuel oil and residual fuel oil stocks. It conforms with ASTM Specification D 396 or Federal Specification VV-F-815C and is used extensively in industrial plants and in commercial burner installations that are not equipped with preheating facilities. It also includes No. 4 diesel fuel used for low- and medium-speed diesel engines and conforms to ASTM Specification D 975." And "No. 6 fuel oil" is defined as "fuel oil that includes Bunker C fuel oil and is used for the production of electric power, space heating, vessel bunkering, and various industrial purposes."

Though both of these fuel oils were used in industrial applications historically, the use of these fuels has dramatically decreased over the last four decades. See U.S. EIA, New Jersey Residual Fuel Oil Sales/Deliveries to Commercial Consumers, https://www.eia.gov/dnav/pet/hist/LeafHandler.ashx?n=PET&s=KPRVCSSNJ1&f=A and New Jersey Sales of Residual Fuel Oil by End Use, https://www.eia.gov/dnav/pet/pet_cons_821rsd_dcu_SNJ_a.htm. According to 2018 data from the US EIA, there were no reported sales of commercial No. 4 fuel oil in New Jersey and only 75 thousand gallons of No. 6 fuel oil (also known as commercial residual oil) were sold in the State that year. See US EIA, New Jersey Distillate Fuel Oil and Kerosene Sales by End Use, 25 Feb. 2020, www.eia.gov/dnav/pet/pet_cons_821use_dcu_SNJ_a.htm. Further, the Department has analyzed its permit data and determined that as of the date of publication of this notice of proposal, there are fewer than 100 permits that list No. 4 or other heavy fuel oils in their permits as either a primary source of energy or as an alternative fuel. After further inquiry, the Department determined that despite the information set forth on the permit, most of the identified facilities have already upgraded their equipment to have the capacity to burn fuels that emit less carbon, such as No. 2 fuel oil or natural gas.

Given the high amount of CO_2 that No. 4 and No. 6 fuel oils emit when burned, as well as the widespread availability of alternative fuels with a lower CO_2 emissions factor, proposed N.J.A.C. 7:27F-3.2 bans the storage, offering for sale, sale, delivery, and exchange in trade, for use in New Jersey, of No. 4 and No. 6 fuel oils on or after the operative date of this rulemaking. However, the proposed rules include a grace period to allow facilities that stored No. 4 or No. 6

fuel oils prior to the operative date of this rulemaking to use, sell, or otherwise dispose of that fuel oil within two years after the operative date of this rulemaking. Based on the available sales data from the EIA and the limited number of sources listing this type of fuel oil in their permits, the Department anticipates that any No. 4 or No. 6 fuel oil in storage at the time of the operative date of the this rulemaking will be minimal. Further, the Department estimates that the combustion of this negligible amount of fuel over a two-year period will be less environmentally harmful than allowing longer-term storage (which could lead to degradation or leakage of the fuel oil) or transport out-of-State (which may be more carbon intense than the actual combustion). Proposed N.J.A.C. 7:27F-3.3 provides the only exemption to the ban, which is for ocean-going vessels. This exemption is necessary to ensure that the Department's rules are not preempted by the Clean Air Act (CAA), 42 U.S.C. §§ 7401 et seq.

N.J.A.C. 7:27F-4, Carbon Dioxide Emission Reductions from Boilers

Overview

As noted above, the 2050 Report observed that it will be important to reduce greenhouse gas emissions in all sectors, but particularly in the transportation, residential and commercial, and electric generation sectors in order to meet the 80x50 goal. "Space heating, water heating, appliances, and industrial use account for 28 percent of New Jersey's greenhouse gas emissions, including 15.2 MMT of CO_2e in the residential sector, 9.4 MMT of CO_2e in the commercial sector, and 7.2 MMT of CO_2e in the industrial sector. Buildings are also

responsible for a combined 62% of the state's total end-use energy consumption, including similar energy consumption in commercial buildings (26%) and residential buildings (25%), followed by the industrial sector (12%)." 2019 EMP, p. 157. Thus, the 2019 EMP sets forth a long-term strategy to electrify the buildings sector. See 2019 EMP, pp. 157 to 172. Proposed N.J.A.C. 7:27F-4, Carbon Dioxide Emission Reductions from Boilers, seeks to achieve reductions of CO_2 emissions directly from boilers used in the commercial and industrial sector.

At the time of publication of this notice of proposal, the Department's rules at N.J.A.C. 7:27-8, which pertain to permit requirements for commercial fuel burning equipment located at minor facilities and major facilities without an operating permit, classify a boiler with a maximum gross heat input under one million British Thermal Units per hour (MMBTU/hr) as an "insignificant source." Compare N.J.A.C. 7:27-8.1 with 8.2(a) and (c). Pursuant to N.J.A.C. 7:27-8, Permits and certificates for minor facilities (and major facilities without an operating permit), insignificant sources are not required to obtain a certificate or permit. See N.J.A.C. 7:27-8.2(a). Though some facilities voluntarily elect to obtain a permit for an insignificant source pursuant to N.J.A.C. 7:27-8, the Department does not require a permit. Accordingly, the Department cannot determine the total number of fossil fuel-fired boilers with a maximum gross heat input under one MMBTU/hr located at minor facilities or major facilities without an operating permit based on the existing permit data.

Similarly, the Department's rules at N.J.A.C. 7:27-22, setting requirements for commercial fuel burning equipment located at facilities with an operating permit, also classify a boiler with a maximum gross heat input under one MMBTU/hr as an "insignificant source

operation." See N.J.A.C. 7:27-22.1, compare the definitions of significant source operation, paragraph 11 with the definition of insignificant source operation, paragraph 1. Pursuant to N.J.A.C. 7:27-22, Operating Permits, an owner or operator of a facility that applies for an operating permit is required to list all source operations, including any insignificant source operation(s), in its permit application. See N.J.A.C. 7:27-22.6(d). Though some information must be listed on the permit, the Department does not require the same type or amount of information to be reported for an insignificant source operation as it does for a significant source operation located at a facility with an operating permit. For this reason, based upon the existing permit data, the Department is unable to ascertain an accurate count of the fossil fuel-fired boilers that are classified in operating permits as insignificant source operations.

In contrast, a boiler with a maximum gross heat input equal to or greater than one MMBTU/hr requires a permit pursuant to N.J.A.C. 7:27-8 and is classified as a significant source operation pursuant to N.J.A.C. 7:27-22. Therefore, the Department's permit data pertaining to fossil fuel-fired boilers with a maximum gross heat input equal to or greater than one MMBTU/hr is comprehensive. Based upon the available permit data for 2020, the Department identified approximately 10,678 permits (issued pursuant to N.J.A.C. 7:27-8 and 22) for fossil fuel-fired boilers with a maximum gross heat input equal to or greater than one MMBTU/hr. And of these 10,678 fossil fuel-fired boilers, the Department identified approximately 8,421 as having a maximum gross heat input rating equal to or greater than one MMBTU/hr and less than five MMBTU/hr.

Using the permit data for the 8,421 fossil fuel-fired boilers with a maximum gross heat input rating equal to or greater than one MMBTU/hr and less than five MMBTU/hr, the Department sorted by the standard industrial classification (SIC) codes listed on the permits. Based on the SIC codes, the Department estimates that approximately 32 percent of the boilers with a maximum gross heat input rating equal to or greater than one MMBTU/hr and less than five MMBTU/hr are located in kindergarten through 12th-grade schools, approximately 16 percent are located in apartment buildings, approximately six percent are located in colleges and universities, approximately four percent are located in military facilities, approximately three percent are located in municipal buildings, and the remaining 39 percent are located at a mix of manufacturing, retail, and other non-government establishments.

Estimating the total emissions from the approximately 8,421 permitted fossil fuel-fired boilers that have a maximum gross heat input rating equal to or greater than one MMBTU/hr and less than five MMBTU/hr is challenging because the Department does not currently track the actual emissions of all of these boilers. Hypothetically, a single fossil fuel-fired boiler could run 24 hours a day for 365 days per year, which equates to 8,760 hours per year of operation. Using the average gross heating value of natural gas of 1,020 British thermal units per standard cubic foot (BTU/scf), a boiler with a maximum gross heat input rating of one MMBTU/hr would potentially use 8,590,000 standard cubic feet per year of natural gas. By inputting this value into the EPA's greenhouse gas calculator (https://www.epa.gov/energy/greenhouse-gas-equivalencies-calculator), the Department calculates that this hypothetical natural gas-fired boiler running year-round would have a CO_2e potential to emit of approximately 520 ton/yr

(1,040,000 lb/yr) for every one MMBTU/hr of heat input. Note that the EPA greenhouse gas calculator results for Mscf of natural gas "represents the CO_2 equivalency of CO_2 released for natural gas burned as a fuel, not natural gas released to the atmosphere. Direct methane emissions released to the atmosphere (without burning) are about 25 times more powerful than CO_2 in terms of their warming effect on the atmosphere." https://www.epa.gov/energy/greenhouse-gas-equivalencies-calculator.

The Department recognizes that most boilers do not run all day, every day of the year. Accordingly, a more plausible scenario to estimate the actual emissions from the 8,421 permitted fossil fuel-fired boilers that have a maximum gross heat input rating equal to or greater than one MMBTU/hr and less than five MMBTU/hr would be to assume that actual boiler operations are 25 percent of the total potential (2,190 hours per year of operation equating to 2,147 Mscf/yr of natural gas usage). Pursuant to this scenario, and using the EPA's greenhouse gas calculator, a natural gas-fired boiler would have CO_2e emissions of 130 ton/yr (260,000 lb/yr) for every one MMBTU/hr of heat input. For example, one natural gas-fired boiler with a maximum gross heat input rating of three MMBTU/hr operating at 2,190 hours per year would use a total of 6,444 Mscf of natural gas and have CO_2e emissions of 390 tons (780,000 pounds).

In contrast, a "fossil fuel free heating mechanism," such as an electric boiler, does not emit CO_2 or any other criteria pollutant from the device no matter how many hours the fossil fuel free heating mechanism operates. The Department proposes to define the term "fossil fuel free heating mechanism," at N.J.A.C. 7:27F-4.1, Definitions, as "any device that does not

combust a fossil fuel to produce hot water or steam and does not cause the emission of an air contaminant at the site of the device."

Given the impacts of climate change, the large number of known fossil fuel-fired boilers with a maximum gross heat input rating of equal to or greater than one MMBTU/hr and less than five MMBTU/hr, and the significant difference in the emissions from a fossil fuel-fired boiler versus a fossil fuel free heating mechanism, the Department proposes this rulemaking as an initial step toward electrifying commercial and industrial buildings, consistent with the State's comprehensive strategy to lower greenhouse gas emissions to meet the 80x50 goal.

To begin the transition from fossil fuel-fired boilers to technology that does not emit CO_2, the proposed rulemaking places an additional permit requirement on a facility that is seeking a permit for a new fossil fuel-fired boiler with a maximum gross heat input rating equal to or greater than one MMBTU/hr and less than five MMBTU/hr. Specifically, a facility seeking a permit for a fossil fuel-fired boiler subject to the new rules must demonstrate that a fossil fuel free heating mechanism is either technically infeasible; or infeasible at the facility because any interruption in boiler operations caused by an electrical outage could jeopardize public health, life, or safety.

The Department has determined that the most commonly available fossil fuel free heating mechanism for the production of hot water and steam is an electric boiler. Further, electric boiler models capable of functioning in the same capacity as fossil fuel-fired boilers with a maximum gross heat input rating of less than five MMBTU/hr are currently available for

purchase and installation from vendors in New Jersey. The Department anticipates that the number of available models of electric boilers will continue to increase as demand grows.

As noted previously, one of the goals of the 2019 EMP is to reach 100 percent carbon-neutral electricity generation (net zero) by 2050. Hence, the State is working to increase renewable and clean sources of electricity in New Jersey concurrent with its work to electrify the transportation and building sectors. For purposes of the emission reductions estimate, which are described more fully in the Environmental Impact statement, the Department relied solely on the direct CO_2 emission reductions expected to be achieved by using a device that no longer combusts fossil fuels. The Department acknowledges that in the near-term, some of the electricity used to power an electric boiler will come from EGUs that combust fossil fuels, which will result in an increase of indirect emissions of CO_2. Thus, the full impact of the direct emission reductions will not be achieved until the electric grid reaches the net zero goal.

The portion of the rules related to reducing boiler emissions utilize a number of defined terms. Specifically, the Department proposes to define "facility" at N.J.A.C. 7:27F-1.3 as that term is defined at N.J.A.C. 7:27-8.1 or 22.1, as applicable. The Department proposes to define the terms "BTU," "CO_2," "fossil fuel," "fossil fuel-fired," "hr," "insignificant source," "MMBTU," "natural gas," and "significant source," at N.J.A.C. 7:27F-1.3, Definitions, because these terms are used in more than one subchapter of proposed N.J.A.C. 7:27F. The terms "BTU," "CO_2," "hr," "fossil fuel," "fossil-fuel-fired," "MMBTU," and "natural gas" have been defined consistent with their generally accepted meanings as used in engineering principles and environmental science. The Department proposes defining "insignificant source" and "significant source" as

those terms have been defined at N.J.A.C. 7:27-8.1 or 22.1, as applicable. Additionally, the Department proposes to define "maximum gross heat input" at N.J.A.C. 7:27F-4.1, as "the maximum amount of fuel a combustion source is able to combust in a given period as stated by the manufacturer of the combustion source."

N.J.A.C. 7:27-8.8, 8.14, 8.18, and 22.16 and N.J.A.C. 7:27F-4.2 and 4.4, Additional requirement necessary to permit a fossil fuel-fired boiler with a maximum gross heat input rating equal to or greater than one MMBTU/hr and less than five MMBTU/hr

Pursuant to the proposed amendments at N.J.A.C. 7:27-8.14, 8.18, and 22.16, as well as proposed new N.J.A.C. 7:27F-4.2, Applicability, and 4.4, Additional requirement necessary to permit a fossil fuel-fired boiler with a maximum gross heat input rating equal to or greater than one MMBTU/hr and less than five MMBTU/hr, on or after January 1, 2025, the Department will not issue a permit for a fossil fuel-fired boiler with a maximum gross heat input rating equal to or greater than one MMBTU/hr and less than five MMBTU/hr, unless the owner or operator has met the additional requirement at proposed N.J.A.C. 7:27F-4.4. Specifically, an application for a permit or permit revision submitted pursuant to N.J.A.C. 7:27-8 or 22, must demonstrate that a fossil fuel free heating mechanism is technically infeasible, based on physical, chemical, or engineering principles; or is infeasible because interruption in boiler operations caused by an electrical outage could jeopardize public health, life, or safety. For example, pursuant to proposed N.J.A.C. 7:27F-4.4(a)1, the Department would approve a permit for a fossil fuel-fired

boiler with a maximum gross heat input rating equal to or greater than one MMBTU/hr and less than five MMBTU/hr, if the facility's application demonstrates that infrastructure constraints would make installation of a fossil fuel free heating mechanism infeasible. Or, pursuant to proposed N.J.A.C. 7:27F-4.4(a)2, the Department would approve a permit for a fossil fuel-fired boiler with a maximum gross heat input rating equal to or greater than one MMBTU/hr and less than five MMBTU/hr, if the facility's application demonstrates jeopardy to public health and safety, such as a loss of power due to a general electrical outage at a hospital that administering life-saving measures dependent on the boiler.

Under the existing rules, general permits and general operating permits are pre-approved permits that do not require technical reviews. Because proposed new N.J.A.C. 7:27F-4.4 requires a case-by-case review on or after January 1, 2025, the Department notes that certain general permits and general operating permits will be affected, including general permit GP-017A (Boiler(s) and/or Heater(s) Each Less Than 5 MMBTU/hr), and general operating permit, GOP-007 (Boiler or Heater Greater than or equal to 1 MMBTU/hr and less than 5 MMBTU/hr). These permits will no longer be available for the installation of new boilers after January 1, 2025. To be clear, renewals of GP-017A and GOP-007 for existing operational sources will not be affected by the proposed rules. In other words, proposed N.J.A.C. 7:27F-4.4 does not require replacement of existing boilers that are still functional. The intent of proposed N.J.A.C. 7:27F-4.4 is to ensure that a fossil fuel-fired boiler is used in new construction or replaces an existing fossil fuel-fired boiler that must be replaced due to, for example,

mechanical failure, only when a fossil fuel free heating mechanism is infeasible, as described above.

As noted above, pursuant to N.J.A.C. 7:27-8, Permits and certificates for minor facilities (and major facilities without an operating permit), a fossil fuel-fired boiler located at a minor facility that has a maximum gross heat input of less than one MMBTU/hr is an insignificant source because it does not meet the significant source applicability threshold of one million MMBTU/hr or greater as set forth at N.J.A.C. 7:27-8.2(c)(1). Similarly, pursuant to N.J.A.C. 7:27-22, Operating permits, a fossil fuel-fired boiler located at a major facility that has a maximum gross heat input of less than one MMBTU/hr is an insignificant source operation because it does not meet the significant source operation applicability threshold of one million MMBTU/hr or greater, as defined at N.J.A.C. 7:27-22.1. A boiler of that size would be listed in an operating permit only as an insignificant source operation. The Department has determined that based upon the current categorization of fossil fuel-fired boilers with a maximum gross heat input of less than one MMBTU/hr as insignificant for purposes of permitting pursuant to N.J.A.C. 7:27-8 and 22, the proposed additional permit requirement at N.J.A.C. 7:27F-4.4 will not apply to fossil fuel-fired boilers with a maximum gross heat input less than one MMBTU/hr.

Based on the available permit data concerning boiler applications over the previous five years, the Department has determined that it receives 268 applications per year, on average, for new (or replacement) boilers with a maximum gross heat input rating equal to or greater than one MMBTU/hr and less than five MMBTU/hr, with an average maximum gross heat input of 2.15 MMBTU/hr. Assuming 250 fewer fossil fuel-fired boilers that would have run at 25

percent operating capacity are installed annually pursuant to proposed N.J.A.C. 7:27F-4.4, the Department estimates the proposed rulemaking would prevent 70,780.5 tons/yr (141,561,000 lb/yr) of direct CO_2e emissions per year (though this number would only be fully realized when the electric grid has transitioned to net-zero). Another benefit of installing a fossil fuel free heating mechanism is that the facility would not be required to apply for or maintain an air permit since a fossil fuel free heating mechanism would not qualify as a source, pursuant to N.J.A.C. 7:27-8 or 22.

While the Department's research indicates that electric boilers are the most common non-fossil-fuel-fired-technology currently available on the market, stakeholder feedback indicated that other technology, such as hydrogen fuel, could be viable in the future. Accordingly, the Department's proposed rules do not attempt to specify the types of fossil fuel free heating mechanisms that qualify as non-fossil-fuel-fired-technology. Instead, the Department's proposed rules define the type of equipment that will be subject to the additional permit requirement as a result of its emissions. The term "boiler" is not defined at N.J.A.C. 7:27-8 or 22. Therefore, the Department proposes to define the term at N.J.A.C. 7:27F-4.1, Definitions, as "fuel burning equipment used to produce hot water or steam," consistent with language in the Department's general permits and general operating permits. Likewise, the Department proposes to define "equipment" at N.J.A.C. 7:27F-4.1, as "any device capable of causing the emission of an air contaminant either directly or indirectly to the outdoor atmosphere, and any stack or chimney, conduit, flue, duct, vent, or similar device connected or

attached to, or serving the equipment." This definition is almost identical to the definition of the same term at N.J.A.C. 7:27-8.1 and 22.1.

The Department proposes to define a number of terms that are used at proposed N.J.A.C. 7:27F-4.3 to match their use at N.J.A.C. 7:27-8 and 22, since the new provisions concern equipment that is subject to permits pursuant to those two subchapters. The proposed definitions of the terms "operating permit," "permittee," "permit revision," "person," and "preconstruction permit," at N.J.A.C. 7:27F-1.3, have the same meanings as those terms at N.J.A.C. 7:27-8.1 and 22.1, as applicable. The Department has proposed to define the term "permit," at N.J.A.C. 7:27F-4.1, Definitions, as "preconstruction permit, operating certificate, operating permit, general permit, or general operating permit" in order to have a comprehensive reference to all of the types of permits at N.J.A.C. 7:27-8 and 22. In addition, the Department proposes to define the term "potential to emit," at N.J.A.C. 7:27F-4.1, based upon its generally accepted meanings as used in engineering principles. The term "person" is defined at N.J.A.C. 7:27F-1.3, because it appears in the proposed definition of "permittee," as well as other subchapters at proposed N.J.A.C. 7:27F. The Department proposes to define the term "person" broadly to ensure the proposed rules clearly apply not only to individuals, but also to all forms of private and public entities.

N.J.A.C. 7:27F-4.11, Affirmative defense in case of emergency

Pursuant to proposed N.J.A.C. 7:27F-4.11, Affirmative defense in case of emergency, a facility may assert an affirmative defense if, due to an emergency, the owner or operator

replaces a fossil fuel-fired boiler with a fossil fuel-fired boiler with a maximum gross heat input rating equal to or greater than one and less than five MMBTU/hr before receiving an approved permit from the Department. The affirmative defense, which is available on or after January 1, 2025, is subject to review and approval by the Department. Pursuant to the proposed rules, this affirmative defense may be asserted only if the installation was required by an emergency; the installation of a fossil fuel free heating mechanism would have been infeasible pursuant to N.J.A.C. 7:27F-4.4(a)2; and the facility submits a permit application asserting the affirmative defense no later than 30 days after the installation. The Department proposes to define "emergency," at N.J.A.C. 7:27F-4.1, as "any situation that arises from sudden and reasonably unforeseeable events beyond the control of an owner or operator of a facility, such as an unforeseen system capacity shortage caused by an act of God, that requires immediate corrective action to prevent system collapse or to restore normal operations at the facility."

N.J.A.C. 7:27F-4.2, 4.3, and 4.5 through 4.10, Boiler Fleet Report Requirements

Reporting

Pursuant to proposed N.J.A.C. 7:27F-4.3, General provisions, and 4.5, Procedure for submitting a boiler fleet report, an owner or operator of a boiler fleet that includes at least one fossil fuel-fired boiler with a maximum gross heat input rating that is less than five MMBTU/hr will be required to submit a boiler fleet report, which will include information related to the number of boilers within the fleet and annual emissions. The Department proposes to define a

"boiler fleet" as "a facility with 10 or more fossil fuel-fired boilers," at least one of which must have a maximum gross heat input of equal to or greater than one MMBTU/hr." If a facility has 10 boilers, all of which have a maximum gross heat input of less than one MMBTU/hr, it does not meet the definition of a boiler fleet.

However, even if a facility meets the definition of a boiler fleet, it will not be subject to the reporting requirements, unless it also meets the criteria at proposed N.J.A.C. 7:27F-4.2(b)2, which only apply if there is at least one fossil fuel-fired boiler with a maximum gross heat input rating that is less than five MMBTU/hr. In other words, a facility that has 10 or more boilers, all of which are above the maximum gross heat input threshold, are not subject to the boiler fleet report requirements at proposed N.J.A.C. 7:27F-4.5 through 4.9.

The Department proposes to collect data submitted in the boiler fleet reports for two main reasons. First, facilities required to submit a boiler fleet report will have to carefully examine their existing equipment and emissions, and in doing so, may determine that there are certain steps that can be taken to maximize the efficiency of their fleet, resulting in lower emissions. Other State agencies, like the Board of Public Utilities, have programs available to assist with energy audits and to determine whether the entity qualifies for incentives to reduce energy use. Second, the Department anticipates that the data collected may inform future rulemaking efforts to reduce greenhouse gas emissions from facilities with multiple sources.

The Department estimates that in 2020, there were close to 4,000 unique facilities that maintained permits for boilers pursuant to N.J.A.C. 7:27-8 or 22. Of those facilities, in 2020,

108 met the proposed criteria for submission of a boiler fleet report because those facilities had 10 fossil fuel-fired boilers, at least one of the boilers had a maximum gross heat input equal to or greater than one MMBTU/hr, and at least one of the boilers was identified in the facility permit as having a maximum gross heat input that is less than five MMBTU/hr.

Timing of submitting a boiler fleet report

Pursuant to proposed N.J.A.C. 7:27F-4.5, Procedure for submitting a boiler fleet report, the first boiler fleet report will be due on April 15, 2024, assuming that in calendar year 2023, the facility meets the definition of a boiler fleet and the criteria at proposed N.J.A.C. 7:27F-4.2(b)2. In short, the submittal year for a boiler fleet is the calendar year immediately following the reporting year. The Department proposes to define the terms "submittal year" and "reporting year," at N.J.A.C. 7:27F-4.1, Definitions, to clarify when the data is to be collected (reporting year) and when that data is to be submitted (submittal year). As proposed, the first reporting year is calendar year 2023, but only for those facilities that meet the definition of a boiler fleet and the applicability criteria at N.J.A.C. 7:27F-4.2(b)2 in that reporting year. For facilities that do not meet the definition of a boiler fleet and the criteria at proposed N.J.A.C. 7:27F-4.2(b)2 in calendar year 2023, but do meet those requirements in a subsequent year, the reporting year and submittal year apply in the same fashion. Specifically, the boiler fleet report will always be submitted on April 15th of the submittal year, but the data itself will be based upon information from the reporting year, which is the immediately preceding calendar year. Boiler fleet reports must be submitted on forms that will be provided by the Department.

Contents of a boiler fleet report

The requirements at proposed N.J.A.C. 7:27F-4.6, Contents of a boiler fleet report, can be divided into two principal categories. First, the boiler fleet report must include information concerning every fossil fuel-fired boiler located at the facility. The information, which includes but is not limited to fuel type, function, potential to emit, and actual annual emissions in tons per year, must be provided for each boiler at the facility. To avoid confusion, proposed N.J.A.C. 7:27F-4.7, Methods to be used for quantifying actual emissions, clarifies the methods to be used by referring to N.J.A.C. 7:27-21.6, a provision at N.J.A.C. 7:27-21, Emission Statements. Facilities with operating permits should be familiar with the methods set forth in this subchapter. And those facilities unfamiliar with the Emission Statements subchapter at N.J.A.C. 7:27 will have ample time to review the methods prior to the first reporting year of 2023. The second proposed category of information to be included in the boiler fleet report is administrative in nature. This information includes the facility name, facility ID number, the reporting year, as well as a requirement for a certification pursuant to N.J.A.C. 7:27-1.39, which will ensure that the responsible official certifies to the truth of the information being submitted.

Extension of time, determination of non-applicability, and recordkeeping

If a facility is unable to meet the submission deadline, proposed N.J.A.C. 7:27F-4.8, Request for extension of the time to submit a boiler fleet report, sets forth the requirements for a facility to request an extension of time. The proposed rule replicates the language at

N.J.A.C. 7:27-21.9 concerning requests for an extension to submit an emission statement, with some differences for context. The proposed rule refers to boiler fleet reports, rather than emission statements. Otherwise, the requirements for an extension request for a boiler fleet report, which include timing, extreme hardship, and facility identification information, are identical to a request for an extension to submit an emission statement.

Likewise, proposed N.J.A.C. 7:27F-4.9, Determination of non-applicability, mirrors the language of the emission statement rules at N.J.A.C. 7:27-21.10, Determination of non-applicability. Again, the language was modified to account for the differences between boiler fleet reports and emission statements; however, the basic requirements for the determination remain the same. These include the criteria necessary to make a request for a non-applicability determination, the facility-identifying information to be included in the request for determination of non-applicability, where to send the request, the preferred timing of the request if the facility is to receive a determination prior to the April 15th submission date, assurances that the facility has no plans to modify the facility in the foreseeable future in a manner that would impact the non-applicability determination, the principal that a non-applicability determination does not exempt a facility from future applicability if circumstances change, and a statement acknowledging that the Department's failure to respond to a request by a date certain does not exempt the facility from the requirement to timely submit a boiler fleet report.

Pursuant to proposed N.J.A.C. 7:27F-4.10, Recordkeeping, a facility must maintain all relevant records for five years and make those records available to the Department upon

request. This requirement is comparable to the recordkeeping requirements at N.J.A.C. 7:27-21 pertaining to emission statements.

N.J.A.C. 7:27A-3.10, Civil Administrative Penalties for Violations of N.J.A.C. 7:27-8 and 22 and 7:27F

The Department proposes new civil administrative penalties for violations of the requirements of N.J.A.C. 7:27F, Control and Prohibition of Carbon Dioxide Emissions. Existing N.J.A.C. 7:27A-3.5 authorizes the Department to impose a civil administrative penalty for a violation of the Air Pollution Control Act (Act) or any rule promulgated, or administrative order, operating certificate, registration requirement, or permit issued pursuant to the Act, even if the violation is not otherwise included at N.J.A.C. 7:27A. The addition of references to N.J.A.C. 7:27F at N.J.A.C. 7:27A-3.2 and 3.5 make it clear that the Department may also assess a civil administrative penalty for a violation of N.J.A.C. 7:27F, even if the violation is not included at proposed N.J.A.C. 7:27A.

Existing N.J.A.C. 7:27A-3.5(g) and (h) address the calculation of penalties for certain violations of requirements at N.J.A.C. 7:27-8 and 22, related to continuous monitoring systems. These same systems are used to comply with the requirements at proposed N.J.A.C. 7:27F-2.6(e). Accordingly, the proposed amendments at N.J.A.C. 7:27A-3.5(g) and (h) apply the existing penalty calculation provisions to violations at proposed N.J.A.C. 7:27F-2.6(e).

The Department proposes to codify the penalties for violations of N.J.A.C. 7:27F at N.J.A.C. 7:27A-3.10(w) and reserve N.J.A.C. 7:27A-3.10(v), which the Department anticipates will contain penalties for proposed new N.J.A.C. 7:27E (the subject of a separate rulemaking). The proposed penalties at N.J.A.C. 7:27A-3.10(w) are consistent with existing penalties at N.J.A.C. 7:27A-3.10(m) for similar violations of other Department rules. For example, the Department determined that the sale of a banned fuel by a supplier at proposed N.J.A.C. 7:27F-3.2 is similar to the sale of a banned fuel by a supplier pursuant to N.J.A.C. 7:27-9.2(a); therefore, the penalty provisions for violations of the requirements are consistent.

Under the Grace Period Law, N.J.S.A. 13:1D-125 through 133, a person responsible for a minor violation is afforded a period of time by the Department to correct the violation in order to avoid being subject to a penalty. Based upon the criteria set forth at N.J.S.A. 13:1D-129, the Department has determined which of the proposed penalties at N.J.A.C. 7:27A-3.10(w) are minor, and, thus, subject to a grace period, and which are non-minor, and, thus, not subject to a grace period. Generally, the Department has determined that those violations that do not result in emissions (and, therefore, pose minimal risk to the public health, safety, and the environment) and do not materially and substantially undermine or impair the goals of the regulatory program are classified as “minor.” Under the existing rules, a minor violation can be ineligible for a grace period if the conditions at N.J.A.C. 7:27A-3.10(s) are not met.

Environmental impact

The Department anticipates that the proposed rules will have a positive environmental impact. By establishing CO_2 emission limits for fossil fuel-fired EGUs, precluding the use of certain highly carbon intense fuels, and introducing additional requirements for the permitting of certain fossil fuel-fired boilers, the proposed rules will reduce emissions of CO_2, NO_x, sulfur dioxide (SO_2), and particulate matter (PM), and hazardous air pollutants. It is important to reduce CO_2 from EGUs and move toward decarbonizing the electric generation and building sectors if New Jersey is going to meet the 80x50 goal. Thus, the proposed rules will serve as one of a number of significant initial steps toward mitigating the adverse environmental effects and impacts of climate change.

Rule Impacts on Climate

As explained above, CO_2 is one of the main contributors to climate change. Reducing emissions of CO_2 will mitigate the environmental effects and impacts of climate change. The effects and impacts of climate change on the environment were carefully researched and published in the Department's *2020 New Jersey Scientific Report on Climate Change*. See New Jersey Department of Environmental Protection. 2020. *New Jersey Scientific Report on Climate Change*, Version 1.0 (Eds. R. Hill, M.M. Rutkowski, L.A. Lester, H. Genievich, N.A. Procopio) Trenton, NJ 184 pp. (2020 Report on Climate Change). While the science behind climate change is largely tied to the environment, the effects of climate change on the environment have a multitude of social costs, economic expenditures, and environmental damages. Because the social, environmental, and economic impacts of the proposed rules and amendments are inextricably related, the impact statements of this rulemaking contain multiple cross-

references. While the substantive findings of the 2020 Report on Climate Change are discussed extensively in the Social Impact statement below, the Department has highlighted only a few of the environmental impacts of climate change here to avoid repetition:

- Increased air pollution, particularly in densely populated urban areas. See 2020 Report on Climate Change, p. x.
- Stress on the quantity of New Jersey's water supply, in addition to water quality impairments. See *id*. at p. x.
- Blueberries and cranberries may be unable to adapt to changes in the environment, reducing their productivity and making them unsuitable crops for New Jersey. See *id*. p. xi-xii.
- Loss of animal and plant habitat, including, but not limited to, rare native plant species, vulnerable bird species (for example, the American Goldfinch, New Jersey's State bird), and commercially valuable marine life (for example, summer flounder). See *id*. at p. xii-xv.

N.J.A.C. 7:27F-2, Carbon Dioxide Emission Reductions from Electric Generating Units

The Department estimated the potential net avoided CO_2 emissions to be approximately 2,548,210 tons per year starting in 2035, when the proposed rule is fully implemented, if existing EGUs operating over the proposed CO_2 emission rates shut down by the respective compliance deadlines. As explained below, to estimate these emission reductions the

Department started with the total avoided CO_2 emissions at each compliance date and then subtracted the CO_2 emissions that would result from make-up power.

To estimate the avoided net CO_2 emissions from existing EGUs if proposed N.J.A.C. 7:27F-2 is implemented, the Department utilized 2018 data from EPA's Clean Air Markets Division (CAMD) database. CAMD "runs programs that reduce air pollution from power plants to address several environmental problems including acid rain, ozone and particle pollution, and interstate transport of air pollution." See https://www.epa.gov/airmarkets. Using the 2018 CAMD data, the Department calculated the CO_2 emission rate for each existing EGU that operated in the State and reported data to the EPA. The Department then assumed that any existing EGU that operated above the applicable CO_2 emission limits of 1,700, 1,300, and 1,000 lb/MWh (referred to as the "affected EGUs") would shut down by the applicable compliance date. Using this data and assumption, the Department calculated the mass CO_2 emissions from the affected EGUs to estimate the total avoided CO_2 emissions at each compliance date at proposed N.J.A.C. 7:27F-2.5.

The Department then assumed that boilers would be needed to generate steam for the industrial facilities currently being served by the three coal units, which were assumed to shut down by the first compliance date. The Department additionally assumed that in 2024 and 2027, electricity would need to be provided by other fossil fuel-fired EGUs in the PJM grid to make up the electricity no longer provided by the affected EGUs. The Department made this assumption because the 2019 EMP contemplates the continued need for electricity generated by fossil fuel-fired power plants through these years to meet the State's electricity demands.

For its calculation, the Department further assumed the EGUs would operate as they did in 2018.

To calculate the CO_2 emissions from this "make-up" power, the Department utilized PJM's annual emission report for 2015-2019. See PJM, 2015-2019 CO_2, SO_2 and NO_x Emission Rates (April 9, 2020), at https://www.pjm.com/~/media/library/reports-notices/special-reports/2019/2019-emissions-report.ashx. As explained in the Summary above, the Department used the annual marginal on-peak CO_2 emissions rate from 2015-2019 and assumed the five-year trend during those years remained the same through 2027, in order to project the PJM CO_2 marginal rate out to 2027 to determine the potential CO_2 emissions that could result from power generated elsewhere in the PJM grid.

Based on these assumptions, the Department calculated a net emission reduction of approximately 519,169 tons of CO_2 in 2024 and an additional net 41,719 tons reduction of CO_2 in 2027. If all of the existing EGUs operating over 1,000 lb/MWh shut down by January 1, 2035, 1,987,322 tons of avoided CO_2 emissions could be realized. The estimated total potential avoided CO_2 emissions is approximately 2,548,210 tons per year. The Department did not estimate potential net emissions reductions in 2035 because there are too many variables and uncertainties about the electric generation makeup and demand in the region at this future date. Nevertheless, if PJM resources are called upon to meet the State's capacity needs, then based on the projected PJM marginal rate, the State would still realize a net avoided CO_2 emissions benefit.

Proposed N.J.A.C. 7:27F-2 is also expected to reduce emissions of methane, a highly warming gas and short-lived climate pollutant that has more heat-trapping potential than carbon dioxide on a pound for pound basis. See 80x50 Report, p. 112. The estimated potential reductions are explained below.

N.J.A.C. 7:27F-3, Carbon Dioxide Emission Reductions from Fuels

The Department anticipates that the ban on the use in New Jersey, as well as the ban on the storage, offering for sale, sale, delivery, or exchange of No. 4 and No. 6 fuel oils for use in New Jersey will have an estimated maximum net reduction of 101 tons of CO_2 emissions per year beginning in calendar year 2025, when the two-year grace period at proposed N.J.A.C. 7:27F-3 will no longer be applicable. At that time, the net reduction calculation by the Department is based on the assumption that the 75,000 gallons of No. 6 fuel oil, which EIA sales data indicated were sold in New Jersey in 2018, are replaced with natural gas for combustion.

N.J.A.C. 7:27F-4, Carbon Dioxide Emission Reductions from Fossil Fuel-Fired Boilers

As explained in the Summary above, proposed N.J.A.C. 7:27F-4.4 places an additional requirement on a facility that is seeking a permit for a new fossil fuel-fired boiler with a maximum gross heat input rating between one and five MMBTU/hr (for new construction or to replace a fossil fuel-fired boiler that has failed).

The Department receives an average of 268 applications per year for new fossil fuel-fired boilers with a maximum gross heat input rating between one and five MMBTU/hr. Assuming that, pursuant to proposed N.J.A.C. 7:27F-4.4, 250 fewer fossil fuel-fired boilers with an average

maximum gross heat input of 2.15 MMBTU/hr that would have run at 25 percent operating capacity were installed annually, the Department estimates the proposed rules will prevent the equivalent of 70,780.5 tons/yr (141,561,000 lb/yr) of direct CO_2e emissions.

While a fossil fuel free heating mechanism does not emit CO_2 directly at the source, the Department acknowledges that any fossil fuel-fired sources used to generate the electricity that is used to power an electric boiler will result in indirect emissions of CO_2. Hence, the full impact of the direct CO_2e emission reductions from a fossil fuel free heating mechanism that replaces a fossil fuel-fired boiler will not be achieved until the electricity grid reaches carbon-neutrality (net zero). As noted above, the State is working toward a carbon neutral electricity grid simultaneous with its efforts to electrify the transportation and building sectors. Until the electricity grid reaches the net zero CO_2 goal, any estimate of the indirect emissions attributable to a fossil fuel free heating mechanism during the interim period will vary based upon many factors, including, but not limited to, the mix of electricity generation sources in the grid (that is, nuclear, coal, natural gas, other renewable) in a given year and the percent contribution to overall electric generation in New Jersey from each type of source. Thus, unlike the analysis done for the proposed rule provisions concerning the net CO_2 emission reductions from EGUs and fuels, the Department determined that there were too many variables to estimate the net emissions (direct emissions minus indirect emissions) from a fossil fuel free heating mechanism installed prior to the State reaching its goal of a carbon-neutral electricity grid. Accordingly, the CO_2 emission reductions have been calculated based upon the direct CO_2 emission reductions and assuming a carbon-neutral electricity grid.

Rule Impacts on Other Pollutants

The Department expects these proposed rules to not only mitigate the impacts of climate change, but also to reduce the negative effects of other air pollutants, such as NO_x, SO_2, PM, volatile organic compound (VOC), methane, and hazardous air pollutants (HAPs).

Ground-level ozone

Both NO_x and VOC are ozone precursors. As discussed more fully in the Social Impact statement, ground-level ozone (also referred to herein as ozone) harms human health. Within the environment, "[t]he welfare effects of ozone can be observed across a variety of scales, i.e., subcellular, cellular, leaf, whole plant, population and ecosystem." See USEPA, Greenhouse Gas Emissions and Fuel Efficiency Standards for Medium- and Heavy-Duty Engines and Vehicles—Phase 2, Regulatory Impact Analysis, August 2016 (USEPA 2016 RIA), pp. 6-25, https://nepis.epa.gov/Exe/ZyPDF.cgi/P100P7NS.PDF?Dockey=P100P7NS.PDF. Plant-level effects, when widespread, can cause "broad changes in ecosystems, such as productivity, carbon storage, water cycling, nutrient cycling, and community composition." *Id*. Ozone damage to sensitive species includes visible injury to leaves and impaired photosynthesis, which is the process by which the plant makes carbohydrates, its source of energy and food. *Id*. By interfering with the ability of plants to produce and store food, ozone can lead to reduced crop and forest yields, including timber production, and overall plant productivity and growth. *Id.* Ground-level ozone makes plants more susceptible to harsh weather, disease, insects, and

other pollutants. It also damages the foliage of trees and other plants, sometimes marring the landscape of cities, national parks and forests, and recreation areas. *Id.* at 6-25.

NO_x, SO_2, methane, and PM

In addition to its role as an ozone precursor, NO_x can cause rainfall to become highly acidic, damaging leaves and plant structures during rain events. See NJDEP, Health and Environmental Effects of Ground-Level Ozone, https://www.nj.gov/dep/cleanairnj/health.html. Similarly, SO_2 harms the environment by damaging foliage and decreasing plant and tree growth. SO_2 also contribute to acid rain, which can injury sensitive ecosystems. See EPA, Sulfur Dioxide Basics, https://www.epa.gov/so2-pollution/sulfur-dioxide-basics.

NO_x as well as methane, CO, and SO_2 also contribute to the formation of PM and $PM_{2.5}$, either through condensation or complex reactions with other compounds in the atmosphere. See 2050 Report, pp. 61-62. $PM_{2.5}$ includes all particulate matter having an aerodynamic diameter less than or equal to a nominal 2.5 microns, including condensable particulate matter. As more fully discussed in the Social Impact statement, $PM_{2.5}$ has been linked to public health risks. Particles generally also cause harm the environment when they settle on ground or water. Particulate matter can acidify lakes and streams, change the nutrient balance in coastal waters and large river basins, deplete nutrients in soil, damage farm crops and sensitive forests, affect ecosystem diversity, and contribute to acid rain effects. Fine PM also is the main cause of reduced visibility, or haze. See EPA, Health and Environmental Effects of Particulate Matter

(PM), https://www.epa.gov/pm-pollution/health-and-environmental-effects-particulate-matter-pm.

Hazardous air pollutants

Hazardous air pollutants, or air toxics, are "pollutants that are known or suspected to cause cancer or other serious health effects, such as reproductive effects or birth defects, or adverse environmental effects." See EPA, What are Hazardous Air Pollutants, https://www.epa.gov/haps/what-are-hazardous-air-pollutants. As defined, exposure to hazardous air pollutants may increase an individual's chance of getting cancer or experiencing such serious health effects as immune system damage and neurological, reproductive, developmental, and respiratory problems. Air toxics deposited onto soils or surface waters can be taken up by plants, ingested by animals, and magnify through the food chain. Air toxics can also cause animal health problems. See EPA, Health and Environmental Effects of Hazardous Air Pollutants, https://www.epa.gov/haps/health-and-environmental-effects-hazardous-air-pollutants.

N.J.A.C. 7:27F-2, Carbon Dioxide Emission Reductions from Electric Generating Units

The Department estimated the Statewide reductions of criteria and hazardous air pollutants, as a result of the implementation of proposed N.J.A.C. 7:27F-2, as shown in the table below. In calculating these co-benefits of proposed N.J.A.C. 7:27F-2, unlike the CO_2 emissions calculations, the Department did not subtract the emissions of criteria and hazardous air pollutants that would result from make-up power elsewhere in the PJM grid to estimate net

reduction. The difference in calculation is because the primary impact of many of the criteria and hazardous air pollutants on air quality is at a local level, compared with the global nature of CO_2 emissions.

To calculate the potential reductions, the Department utilized data in the affected facilities' 2018 emission statements provided to the Department. The numbers reflect the estimated emission reductions if the affected facilities determine to cease operations, rather than modify their facilities to meet the applicable limits at proposed N.J.A.C. 7:27F-2. In 2024 (compared with 2027 and 2035), the Department projects the largest reductions in NO_x (1,024 tons per year) and SO_2 (1,238 tons per year), primarily due to the three remaining coal-fired EGUs that are still operating above the first tier proposed limit of 1,700 lb/MWh. Carbon monoxide will also decrease by 578 tons per year. Additionally, the Department expects total HAP emissions to be reduced by 4,672 pounds per year in 2024. In 2027, HAP emission reductions are estimated to be 11,214 pounds per year, and in 2035, reductions are potentially 23,994 pounds per year.

Criteria pollutants (tons per year)			
	2024	2027	2035
CO	578	50	234
NO_x**	1,024	89	473

PM_{10}	58	19	90
$PM_{2.5}$	51	19	89
SO_2	1,238	3	10
VOC**	15	4	44
Methane	81	51	92
** ozone precursors			
Hazardous air pollutants (pounds per year)			
	2024	2027	2035
Acetaldehyde	360	1,486	2,208
Acrolein	9	291	329
Benzene	124	525	696
Chromium compounds	42	86	13
Formaldehyde	447	7,553	19,163
Hydrogen chloride	2,990		
Manganese compounds	359	1,034	1,280
Methylene chloride (Dichloromethane)	181		

Nickel compounds	59	62	58
Polycyclic organic matter	22	111	175
Total HAPs	**4,672**	**11,214**	**23,994**

N.J.A.C. 7:27F-3, Carbon Dioxide Emission Reductions from Fuels

If the 75,000 gallons of No. 6 oil estimated to be sold in New Jersey in 2018 were replaced with natural gas, the Department estimates net reduction benefits of 1.3 tons/year NO_x, 2.9 tons/year SO_2, and 0.218 metric tons/year PM.

N.J.A.C. 7:27F-4, Carbon Dioxide Emission Reductions from Fossil Fuel-Fired Boilers

To estimate the reductions in emissions of other pollutants upon implementation of proposed N.J.A.C. 7:27-4.4, Additional requirement necessary to permit a fossil fuel-fired boiler with a maximum gross heat input rating between one and five MMBTU/hr, the Department used the same assumptions (that is, number of fossil-fuel boilers, average maximum gross heat input, average operating capacity) that were employed to estimate the CO_2 emission reductions. Based upon these assumptions, the reductions in emissions of other pollutants are estimated as follows: 4.03 tons/yr (8,060 lb/yr) of PM, 2.69 tons/yr (5,380 lb/yr) of VOC, 57.78 tons/yr (115,560 lb/yr) of NO_x, and 48.38 tons/yr (86,760 lb/yr) of CO.

Social Impact

The Department anticipates that the proposed rules will have a positive social impact in New Jersey. The proposed rules are among the initial steps the Department is taking to mitigate the impacts of climate change by reducing the greenhouse gas emissions that are driving climate change. In addition to reducing greenhouse gas emissions, the proposed rules are expected to have an ancillary positive social impact by reducing co-pollutants that have an adverse impact on air quality and human health. For purposes of the Social Impact statement, the detailed calculations and total emission reductions of CO_2 and other pollutants are as discussed in the Environmental Impact statement above. Likewise, the monetized value of the CO_2 emission reductions is as discussed in the Economic Impact statement below.

Climate Change

The recently released *2020 New Jersey Scientific Report on Climate Change* is the Department's first effort to compile scientific material in a comprehensive report detailing both the effects and the impacts of climate change. See 2020 Report on Climate Change. While the report examines climate change at the global and regional level, its purpose is to explain the current and anticipated effects and impacts in New Jersey. See *id*. at 3. In fact, one of the report's findings is that New Jersey is uniquely vulnerable to climate change due to multiple factors, including its coastal location, population density, and geography. See *id.*, Executive Summary.

The 2020 Report on Climate Change devoted more than 100 pages to an enumeration of both the effects and the impacts of climate change, which are inextricably linked. Rather than

recite the more than 100 pages of the 2020 Report on Climate Change detailing the effects and impacts of climate change, which serves as the foundation for the Department's Social, Environmental, and Agricultural Industry impact statements, the Department offers a number of highlights below.

Causes of Climate Change

CO_2 and other naturally occurring greenhouse gases trap heat; thus, these gases absorb some of the sun's solar energy, keeping the Earth's atmosphere warmer than if those gases were not present. See 2020 Report on Climate Change, pp. 3-5, and 14. Without this warming effect, the Earth would be uninhabitable. *Ibid*. Based on studies of ice cores from Antarctica, scientists have determined that concentrations of CO_2 in the Earth's atmosphere were fairly stable for 800,000 years. *Id*. at pp. 14-15. Around the time of the Industrial Revolution, however, the level of CO_2 in the atmosphere began to steadily increase as a result of human activities. *Id.* Concentrations of CO_2 in the Earth's atmosphere have gone from a steady rate of around 300 parts per million (ppm) to over 400 ppm. Due to the warming effect of CO_2 and other greenhouse gases, this increase in concentration has increased, and will continue to increase global temperatures, resulting in climate change. See *id*. at 15. Climate scientists worldwide agree that the substantial increase in heat-trapping greenhouse gases in the Earth's atmosphere from fossil fuel production and combustion, as well as land degradation are the principal causes of climate change. See *id*., p. vi. And though CO_2 is the most abundant greenhouse gas, scientists have recently begun to study the role of other short-lived climate pollutants/forcers, such as hydrofluorocarbons, methane, and black carbon. See *id*. at 25-26. It

is now understood within the scientific community that while these pollutants and forcers tend to have shorter atmospheric lives, they also have much higher warming potentials making them significant contributors to climate change. *Ibid*.

Below are some of the current and anticipated effects of climate change.

Effects of Climate Change

Climate change resulting from the increase in greenhouse gases and other highly warming climate pollutants and forcers effects temperature, precipitation, sea-level rise, and ocean acidification. See 2020 Report on Climate Change, p. 28.

The documented increased temperatures driven by climate change will have many impacts, chief among them "more intense heat waves and less intense cold waves." 2020 Report on Climate Change, p. 34. "Temperature increases are felt more strongly in New Jersey because of the high urbanization of the State, which results in large expanses of asphalt and concrete instead of forests, fields, and other open spaces that can provide cooling effects." *Id*. at viii. Increased temperatures also contribute to increased water vapor in the Earth's atmosphere and the warming of oceans. See *id*. at 36. Though these are not the only factors influencing precipitation patterns, they enhance the conditions for more frequent extreme precipitation events. See *id.* at 36-42. In New Jersey, the effect may increase flooding or drought conditions, depending on the season and/or local geography. *Ibid*.

Warming ocean temperatures and the melting of glaciers and polar ice sheets also contribute to sea-level rise. Indeed, for many reasons, sea-level rise within New Jersey's coastal

areas is increasing at a higher rate than it is globally. See *id*. at 44. As the seas rise, so too will the number of days New Jersey experiences tidal flooding. See *id*. at 44-46. Increased levels of CO_2 in the Earth's atmosphere also mean increased levels of CO_2 in the oceans. See *Id*. at 49. As "CO_2 dissolves in seawater, …. a chain reaction [begins] leading to more acidic conditions" known as ocean acidification. *Id*. at 49. This change in the ocean's pH affects the availability of certain minerals, and by extension, the marine species that rely on the existing pH balance for survival. See *id*. at 49-55.

In short, climate change affects the environment in a variety of ways. As discussed throughout, the effects of climate change on the environment have a multitude of social costs, economic expenditures, and environmental damages. Below are a few of the impacts that are predicted to occur under the low-, moderate-, and high-emissions scenarios set forth in the 2020 Report on Climate Change.

Impacts of Climate Change

Air Quality

The EPA sets national ambient air quality standards (NAAQS) for six criteria pollutants. One of these health-based standards is for ground level ozone. New Jersey is classified as nonattainment for the ozone standard, which means the level of ozone measured at designated monitors around the State exceeds the Federal standards. See 2020 Report on Climate Change, p. 61. "The primary climate change impacts on ozone formation are expected to result from changes to meteorological conditions, often referred to as the ozone-climate penalty." *Id*. at 62.

The ozone-climate penalty refers to a phenomenon in which the level of ozone precursors in the atmosphere may remain stable or even decrease, but warming temperatures offset those improvements such that ozone formation remains unchanged. Thus, the work New Jersey has done, and continues to do, to reduce ozone precursors may be less effective at reducing ground-level ozone as temperatures continue to rise due to greenhouse gas emissions, like CO_2, and short-lived climate pollutants, like black carbon. See *id*. at pp. 61-62 and 25-26.

Increased concentrations of ground level ozone have been linked to a number of health impacts, including, but not limited to, eye irritation, aggravated asthma and other respiratory distress, and premature death. See *id*. at 63-64. Additionally, there is some evidence that these health impacts may be elevated when higher ozone levels are combined with other climate-related impacts, such as the higher temperatures that occur during heat waves. See *id*. at 66. This is particularly significant for New Jersey's urban areas where high temperatures are often accompanied by high levels of other local air pollutants. See *id*. at 66.

Climate change impacts air quality in other ways. The increased heat waves and drought caused by climate change can lead to greater wildfire risk. See 2020 Science Report on Climate Change at p. 67. The particulate matter and other pollutants from wildfires that burn in New Jersey and those that burn in upwind states can negatively impact New Jersey's air quality. See *id*. at 66-67. Climate change also increases exposure to other aeroallergens such as pollen (longer growing season), dust particles (droughts and dust storms), and mold (severe weather events). *Id*. at 68-69.

In short, climate change will result in increased respiratory and cardiovascular health problems, particularly among vulnerable populations, such as the very young, very old, and those suffering from asthma or allergic illness. See *id*. at 61-69.

Water Resources

The effects of climate change (temperature, precipitation, sea-level rise) may impact water quality and supply in New Jersey. See 2020 Report on Climate Change, p. 71. For instance, increasing temperatures translate into longer growing seasons, which leads to higher water demand. Added water use for agriculture could put stress on New Jersey's groundwater resources and diminish the supply. See *id*. at 71-73. The quality of groundwater sources in New Jersey may also suffer adverse impacts as increased periods of precipitation can lead to contamination of groundwater supplies. Similarly, sea-level rise can lead to saltwater intrusion of coastal groundwater supplies causing increased levels of salinity. See *id*. at 73-75. Water quality concerns extend beyond groundwater supplies. New Jersey's surface water resources may also be threatened by rising air and water temperatures, increased extreme weather events, and sea-level rise, all of which could result in increased salinity, which existing water treatment plants are not designed to handle. See *id*. at 75.

In sum, climate change may result in a reduction in the amount of water necessary to meet the State's needs and require more extensive resources to treat the remaining water supply.

Agriculture

The effects of climate change, particularly precipitation levels, changes in temperature, and the concentration of CO_2 in the atmosphere, will impact crop and animal farming. See 2020 Report on Climate Change, p. 81. As discussed in greater detail in the Agriculture Industry Impact statement, insects, weeds, and pathogens are expected to thrive in warmer, wetter weather, which is in stark contrast to the decrease in productivity anticipated for the many New Jersey crops and livestock that may lack the ability to adapt to the environmental effects of climate change. See *id*. at 81-83. On the whole, climate change is anticipated to have a negative impact on New Jersey's agricultural industry as it may diminish the variety of crops and livestock that are cultivated in New Jersey for sale and consumption both locally and regionally.

Forests, Wetlands, and Carbon Sequestration

The effects of climate change, including precipitation levels, changes in temperature, and the concentration of CO_2 in the Earth's atmosphere, have already begun to impact ecosystems in New Jersey's forests and wetlands. See 2020 Report on Climate Change, pp. 85-113. Warmer temperatures mean that some pest species will grow faster, travel farther, and live well into warmer winters, all the while putting pressure on tree species unprepared for the onslaught. See *id*. at 90-91. In New Jersey, the pine beetle is a prime example of this phenomenon. See *id*. at 91. Warmer temperatures have allowed this pest to increase its

numbers and range, creating conditions ripe for "massive mortality events covering tens of thousands of acres of New Jersey's pine forests." *Id*. at 91. Likewise, warmer temperatures and the potential for prolonged periods of drought may affect the composition of the tree species in New Jersey's forests. These conditions favor species that are more tolerant of drought and sandy soils, while existing hardwood trees will become stressed. See *id*. at 85-90. Moreover, "[i]ncreases in temperature, and the hot, dry periods that result, may intensify the danger of wildfires by drying out vegetation and soil" in New Jersey forests. *Id*. at 93.

Some of New Jersey's freshwater wetlands are under threat because of climate change impacts, such as changes in precipitation, sea-level rise, and increased temperatures. See 2020 Report on Climate Change, p. 95-98. Tidal wetlands in New Jersey face similar threats to their existing ecosystems. See *id*. at 98-108. Sea-level rise contributes to the erosion of existing tidal wetlands and an increase in marsh migration. Increased frequency, severity, and duration of precipitation events will also contribute to the erosion of some tidal wetlands. See *id*. at 104-107. The erosion and diminishing of New Jersey's freshwater and tidal wetlands will result in the loss of plant and animal habitats, loss of natural flood control resources and depletion of the State's natural buffers that help to protect coastal communities from storms. See *id*. at pp. 95 and 99.

New Jersey's forests and wetlands serve as carbon sinks. See 2020 Report on Climate Change, p. 111. Specifically, these resources work as natural carbon capture systems, removing CO_2 from the atmosphere and helping New Jersey lower its net emissions. See *ibid*. As explained above, the loss of forests and wetlands due to climate change will hinder New

Jersey's ability to offset carbon emissions through these carbon sinks. In the case of forests destroyed by pests such as the pine beetle or by wildfires, forests could become net carbon emitters. See *id.* at 112.

In sum, climate change will have a negative impact on the State's plant and animal life, reducing habitats and diminishing the quality of recreational and cultural endeavors available within the State.

Impact of the proposed rules

Though the proposed rules, standing alone, will not eradicate climate change, they are important steps in a larger strategy intended to mitigate its effects and impacts. Efforts to mitigate the effects and impacts of climate change will require long-term commitments across all levels of government and sectors of the economy to increase the State's overall resilience while simultaneously facilitating climate pollutant reductions. In addition to achieving the estimated emission reductions set forth in the Environmental Impact statement above, the rules will also assist in setting expectations as we begin to decarbonize electric generation in New Jersey.

Further, and as detailed in the Environmental Impact statement above, the Department expects the rules to continue to improve air quality in the State by reducing emissions of other air pollutants, including NO_x, SO_2, PM, VOC, CO, methane, and hazardous air pollutants. The Department anticipates that these emission reductions will result in positive social impacts on

human health, such as fewer instances of premature mortality, fewer hospital and emergency room visits, and fewer lost days of work.

The effects of air pollutants, such as SO_2, NO_x, CO, and PM, on public health have been widely and extensively studied by the EPA and others. For instance, elevated levels of NO_x cause damage to the mechanisms that protect the human respiratory tract and can increase a person's susceptibility to, and the severity of, respiratory infections, and asthma. Long-term exposure to high levels of NO_x can cause chronic lung disease. Other health effects from exposure to NO_x, include shortness of breath and chest pains. Further, long-term exposure to low concentrations of nitrogen dioxide (NO_2), a component of NO_x, also causes adverse health effects, including lung irritation and aggravates lung diseases, such as asthma. See USEPA, Greenhouse Gas Emissions and Fuel Efficiency Standards for Medium- and Heavy-Duty Engines and Vehicles—Phase 2, Regulatory Impact Analysis (August 2016), pp. 6-6 to 6-7, at https://nepis.epa.gov/Exe/ZyPDF.cgi/P100P7NS.PDF?Dockey=P100P7NS.PDF. Exposure to SO_2–which is also a PM precursor–also can harm the human respiratory system. See https://www.epa.gov/so2-pollution/sulfur-dioxide-basics.

$PM_{2.5}$ has significant health impacts due to its ability to penetrate deeply into the lungs. See EPA, Health and Environmental Effects of Particulate Matter (PM), https://www.epa.gov/pm-pollution/health-and-environmental-effects-particulate-matter-pm. Exposure to $PM_{2.5}$ has been linked to premature mortality, lung cancer, cardiovascular effects and disease, nervous system effects, and respiratory effects, including changes in lung function; decrements in lung function growth; increased respiratory symptoms, such as coughing,

difficulty breathing, and irritation of the airways; respiratory infection; and aggravated asthma. See 85 FR 82,684, 82,695 to 82,703 (Dec. 18, 2020). The benefits of reducing NO_x and PM emissions include reduced incidence of premature mortality and morbidity from exposure to both $PM_{2.5}$ and ozone. See USEPA, Integrated Science Assessment for Oxides of Nitrogen – Health Criteria, EPA/600/R-08/071, July 2008, http://ofmpub.epa.gov/eims/eimscomm.getfile?p_download_id=475020; and USEPA, Integrated Science Assessment (ISA) for Particulate Matter, EPA/600/R-08/139F, December 2009, http://ofmpub.epa.gov/eims/eimscomm.getfile?p_download_id=494959. Other recognized health impacts include reduced incidence of morbidity from exposure to NO_x. See National Research Council. 2002. Estimating the Public Health Benefits of Proposed Air Pollution Regulations. Washington, DC: The National Academies Press. https://doi.org/10.17226/10511; Driscoll, C.T, Buonocore, J., Reid, S., Fakhraei, H, and Lambert, K.F. 2014. Co-benefits of Carbon Standards Part 1: Air Pollution Changes under Different 111d Options for Existing Power Plants. Syracuse University, Syracuse, NY and Harvard University, Cambridge, MA. A report of the Science Policy Exchange. 34 pp.

Carbon monoxide also has adverse health effects. In the blood, CO forms carboxyhemoglobin, which inhibits oxygen intake and causes acute effects. At low concentrations, CO causes fatigue in healthy people and chest pain in individuals with heart disease. At higher concentrations, CO can reduce brain function, impair vision and coordination, and cause headaches, dizziness, confusion, and nausea. At very high

concentrations, CO can be fatal. See EPA, Carbon Monoxide's Impact on Indoor Air Quality, https://www.epa.gov/indoor-air-quality-iaq/carbon-monoxides-impact-indoor-air-quality.

The health effects of hazardous air pollutants are summarized in the Environmental Impact statement.

Economic Impact

The Department proposes this rulemaking to reduce CO_2 emissions from fossil fuel-fired EGUs, certain fossil fuels, and certain commercial and industrial boilers. The Department acknowledges that some entities will incur costs to comply with the proposed rules. However, as discussed in the Social and Environmental Impact statements, climate change impacts are significant and far-reaching. Additionally, the co-benefit reductions of SO_2, NO_x, VOC, methane, PM, and hazardous air pollutants will benefit New Jersey and its residents by reducing the number of premature deaths, minimizing risk of lowered productive work hours and lost work days, lessening the number of health care visits, and reducing health care and hospitalization costs. When considering the social cost of carbon (SC-CO_2), as well as the health and the environmental benefits of reducing other pollutants, the Department has determined that the State will achieve a net positive economic impact as further discussed below.

Monetized value of CO_2 emission reductions

As discussed in the Social and Environmental Impact statements, among the significant direct and indirect environmental effects and impacts the State will experience due to climate change are "increases in temperature, variability in precipitation, frequency and intensity of storms, sea-level rise, ocean acidification, and the associated impacts to ecological systems, natural resources, human health, and the economy." 2020 Report on Climate Change, p. vi.

The economic costs of greenhouse gas emissions can be expressed using the social cost of carbon (SC-CO_2). "The SC-CO_2 is the monetized damages associated with an incremental increase in carbon emissions in a given year." Interagency Working Group on Social Cost of Greenhouse Gases, United States Government, *Technical Support Document: Technical Update of the Social Cost of Carbon for Regulatory Impact Analysis Under Executive Order 12866*, August 2016 (2016 IWG TSD Update), p.3, https://www.epa.gov/sites/production/files/2016-12/documents/sc_co2_tsd_august_2016.pdf. "The SC-CO_2 is intended to provide a comprehensive measure of the net damages—that is, the monetized value of the net impacts—from global climate change that result from an additional ton of CO_2." National Academies of Sciences, Engineering, and Medicine 2017. *Valuing Climate Damages: Updating Estimation of the Social Cost of Carbon Dioxide.* Washington, DC: The National Academies Press (2017 NAS Report), p.5, https://doi.org/10.17226/24651. The damages include "changes in net agricultural productivity, human health, property damages from increased flood risk, and the value of ecosystem services due to climate change." 2016 IWG TSD Update, p.3. As the SC-CO_2 provides a dollar valuation of the damages caused by one ton of carbon pollution, the SC-CO_2 can also be

used to represent the monetary benefit of reducing carbon emissions by providing an estimate of the avoided cost of future damages.

In 2018, the new Jersey's Legislature determined as part of its findings relative to nuclear energy that "[t]he social cost of carbon, as calculated by the U.S. Interagency Working Group on the Social Cost of Carbon in its August 2016 Technical Update, is an accepted measure of the cost of carbon emissions." N.J.S.A. 48:3-87.3(b)(8). Likewise, the 2019 Energy Master Plan (EMP) and the Department's 2018 rulemaking CO_2 Budget Trading Program rules notice of proposal used the U.S. Interagency Working Group on Social Cost of Greenhouse Gases (IWG) supported SC-CO_2 values to consider the avoided social costs of actions taken to reduce greenhouse gas emissions. Considering all of these factors, the Department has determined that the techniques used to estimate the 2016 IWG SC-CO_2 values are based on the most current science and, therefore, are appropriate when estimating the monetary benefits of avoided greenhouse gas emissions.

The Department further notes that the Intergovernmental Panel on Climate Change (IPCC) has stated that the 2016 IWG SC-CO_2 estimates are likely underestimated due to the omission of significant impacts that cannot be accurately monetized, including important physical, ecological, and economic impacts. See IPCC, 2018: Global Warming of 1.5 degrees Celcius. An IPCC Special Report on the impacts of global warming of 1.5°C above pre-industrial levels and related global greenhouse gas emission pathways, in the context of strengthening the global response to the threat of climate change, sustainable development, and efforts to eradicate poverty [Masson-Delmotte, V., P. Zhai, H.-O. Pörtner, D. Roberts, J. Skea, P.R. Shukla, A. Pirani,

W. Moufouma-Okia, C. Péan, R. Pidcock, S. Connors, J.B.R. Matthews, Y. Chen, X. Zhou, M.I. Gomis, E. Lonnoy, T. Maycock, M. Tignor, and T. Waterfield (eds.)]. In Press (2018 IPCC Special Report), p.150-51, https://www.ipcc.ch/site/assets/uploads/sites/2/2019/06/SR15_Full_Report_High_Res. pdf.

As noted in the 2016 IWG TSD Update cited above, the models used by the IWG did "not include all of the important physical, ecological, and economic impacts of climate change recognized in the climate change literature" at that time, and that in the IWG's judgement "these limitations suggest that the SC-CO_2 estimates are likely conservative." *Id*. at 20-21. While the Department understands there is uncertainty regarding the precise potential future impacts of climate change, the Department agrees with the IPCC and the IWG's own guidance. Therefore, the monetary benefits set forth below are believed to be conservative, and the avoided greenhouse gas emissions achieved through this rulemaking will likely result in greater economic benefits.

The SC-CO_2 "for a given year is an estimate, in dollars, of the present discounted value of the future damage caused by a 1-metric ton increase in CO_2 emissions into the atmosphere in that year, or equivalently, the benefits of reducing CO_2 emissions by the same amount in that year." 2017 NAS Report, p.5. The SC-CO_2 is year specific and is highly sensitive to the discount rate used to discount the value of the damages in the future due to CO_2 emissions. The SC-CO_2 increases over time as social-ecological systems become more stressed from the aggregate impacts of climate change and future emissions cause incrementally larger damages. Table 1

below shows the increase of SC-CO_2 values over time for each discount rate used by the Department.

Table 1: Social Cost of CO_2, 2025-2050 (in 2018 dollars per metric ton of CO_2)

Year	5% Average	3% Average	2.5% Average
2025	17	56	83
2030	19	61	89
2035	22	67	95
2040	26	73	102
2045	28	78	108
2050	32	84	115

(Values derived from the 2016 IWG TSD Update)

According to the 2016 IWG TSD Update, "the range of discount rates reflects both uncertainty and, at least in part, different policy or value judgements." *Id*. at 19. When modeling the economic impact of climate change, a higher discount rate decreases the value today of future environmental damages. The Department's SC-CO_2 estimates are calculated using the 2.5, three, and five percent discount rates determined by IWG to "reflect reasonable judgments under both descriptive and prescriptive approaches." Interagency Working Group on Social Cost of Carbon, United States Government, *Technical Support Document: Social Cost of Carbon for Regulatory Impact Analysis Under Executive Order 12866*, February 2010 (2010 IWG TSD), p.23, https://www.epa.gov/sites/production/files/2016-12/documents/scc_tsd_2010.pdf.

Following IWG recommendations, the Department's estimates of avoided SC-CO_2 benefits are presented as a range of values using the 2.5, three, and five percent discount rates. See 2016 IWG TSD Update. Additionally, the Department expresses all monetary values in 2018 dollars to estimate the economic impacts of the proposed rules to be consistent with other rulemaking to reduce climate pollution. Further, the Department estimates the cumulative SC-CO_2 benefits by using the compliance date for each of the subchapters as the beginning year through 2035, when the rules are expected to be fully implemented. However, the Department notes that as reducing carbon in the atmosphere has long-lasting impacts, the benefits of carbon reduction will carry on past 2035.

The Department calculated annual climate benefits by first identifying the annual emission reductions through that year. In cases where pollution-causing equipment is no longer expected to be in use, the Department carried the resultant emissions reductions through to the next year. For example, a piece of equipment replaced on January 1, 2024, will not produce CO_2 in 2024. It will also not produce CO_2 in 2025, 2026, etc. Therefore, the total annual emissions reductions for 2026 includes the avoided emissions for all equipment no longer in use from 2024, 2025, and 2026. Then the Department multiplied the total annual emissions reductions for each year by the SC-CO_2 values provided by the IWG for that year to find a monetary value for that year. The Department repeated this process for each year through 2035. Finally, the Department totaled the annual monetary benefits to provide a cumulative value of avoided SC-CO_2. The Department provided this cumulative total SC-CO_2 value in nominal 2018 dollars in each subsection below

N.J.A.C. 7:27F-2, Carbon Dioxide Emission Reductions from Electric Generating Units

Proposed N.J.A.C. 7:27F-2.5(d) for existing fossil fuel-fired EGUs sets three CO_2 emission limits with three compliance dates, the earliest being January 1, 2024. Therefore, the Department calculated the avoided SC-CO_2 beginning in 2024, when the first phase of reductions is anticipated to be realized. The Department then added the emission reductions expected on January 1, 2027, and on January 1, 2035. In calculating SC-CO_2 values, the Department assumed all reductions associated with each phase will occur in the expected year for that phase.

The corresponding cumulative total benefits from avoided SC-CO_2 from 2024 through 2035 are estimated as $154 million (five percent discount rate), $485 million (three percent discount rate), and $699 million (2.5 percent discount rate).

N.J.A.C. 7:27F-3, Carbon Dioxide Emission Reductions from Fuels

The Department calculated the total benefits from avoided SC-CO_2 from banning No. 4 and No. 6 fuel oils beginning in 2025, when the two-year grace period at proposed N.J.A.C. 7:27F-3 will no longer be applicable. The cumulative total benefits from avoided SC-CO_2 associated with proposed N.J.A.C. 7:27F-3 from 2025 through 2035 are estimated as $20,000 (five percent discount rate), $61,000 (three percent discount rate), and $90,000 (2.5 percent discount rate).

N.J.A.C. 7:27F-4, Carbon Dioxide Emission Reductions from Fossil Fuel-Fired Boilers

In order to estimate the avoided SC-CO_2 benefits based on the Department's rulemaking to place an additional requirement on the future installation of certain fossil fuel-fired boilers, the Department assumes that approximately 250 fewer fossil fuel-fired boilers will be installed per year beginning in the year 2025.

As noted above, the full benefits of the proposed rulemaking will not be realized until the State reaches its goal of a carbon-neutral electricity grid. For simplicity, the Department estimated the avoided SC-CO2 benefits using three potential scenarios. In each scenario, the Department has chosen a different year to represent a potential timeframe in which the electricity grid is assumed to reach full carbon-neutrality. The values in this section likely understate the benefits of boiler replacement, as one would expect partial avoided SC-CO2 benefits as the State works to reach its goal of a carbon-neutral grid.

The first benefit scenario assumes that the grid reaches carbon-neutrality in 2035. Under this scenario, the cumulative total benefits from avoided SC-CO_2 resulting from implementation of proposed N.J.A.C. 7:27F-4 from 2025 through 2050 are estimated as $552 million (five percent discount rate), $1,455 million (three percent discount rate), and $2,030 million (2.5 percent discount rate).

The second benefit scenario assumes that the grid reaches carbon-neutrality in 2040. Under this scenario, the corresponding cumulative total benefits from avoided SC-CO_2 resulting from implementation of proposed N.J.A.C. 7:27F-4 from 2025 through 2050 are estimated as $524

million (five percent discount rate), $1,165 million (three percent discount rate), and $1,621 million (2.5 percent discount rate).

The third benefit scenario assumes that the grid reaches carbon-neutrality in 2050. Under this third scenario, the corresponding total benefits from avoided SC-CO_2 resulting from implementation of proposed N.J.A.C. 7:27F-4 from 2025 through 2050 are estimated as $53 million (five percent discount rate), $140 million (three percent discount rate), and $193 million (2.5 percent discount rate).

Summary of Costs

N.J.A.C. 7:27F-2, Carbon Dioxide Emission Reductions from Electric Generating Units

The CO_2 emission limit the Department proposes for new EGUs with a nameplate capacity equal to or greater than 25 MWe reflects the achievable emission rate based on best available control technology. Combined cycle units constructed in the State since 2010 meet the proposed limit applicable to new EGUs. Therefore, the Department does not expect the owner or operator of a new fossil fuel-fired EGU with a nameplate capacity equal to or greater than 25 MWe to incur additional costs to comply with the proposed CO_2 emission limit of 860 lb/MWh.

Smaller new EGUs at an EGU facility are subject to a case-specific emission limit. The owner or operator must propose a limit and demonstrate that the proposed limit is based on air pollution control technology, pollution prevention methods, and process modifications or substitutions

that will provide the greatest reductions technologically and economically feasible. The limit also shall not have greater than 50 percent of the heat input be derived from solid fossil fuel or oil unless the CO_2 emission rate is equal to the limit for new EGUs. The owner or operator of a new EGU at an EGU facility could incur some additional costs to prepare the information required to support its proposed emission limit. However, the Department expects this cost to be relatively minor because the owner or operator would already have to prepare documents to support its permit application.

There will be some financial costs for regulated entities if an owner or operator chooses to modify or retire an existing EGU that is subject to but cannot meet the three tiers of CO_2 emission limits at proposed N.J.A.C. 7:27F-2.5(d), which includes three emission limits with three compliance deadlines: on or before January 1, 2024, existing EGUs must meet an emission limit of 1,700 lb CO_2/MWh gross energy output; on or before January 1, 2027, the applicable limit ratchets down to 1,300 lb CO_2/MWh gross energy output; on or before January 1, 2035, all existing EGUs must meet a more stringent limit of 1,000 lb CO_2/MWh gross energy output.

In 2020, there were 93 fossil fuel-fired EGUs with a nameplate capacity equal to or greater than 25 MWe at 32 different facilities operating in the State. Based on 2018 CAMD data, there were 12 units at seven facilities that emit CO_2 at a rate higher than 1,700 lb/MWh. There were 14 units at six facilities with EGUs that emit CO_2 between 1,300 lb/MWh and 1,700 lb/MWh. Finally, there were 40 units at 13 facilities that emit CO_2 at a rate lower than 1,300 lb/MWh and higher than 1,000 lb/Mwh. The EGUs that emit CO_2 at a rate higher than 1,000

lb/MWh are owned by 11 different entities. Therefore, the Department expects that these 11 owners/operators will incur some cost to comply with the proposed rules or will shut down the affected EGU.

The costs of compliance will vary. The Department anticipates that some facilities will make a business decision to shut down because an EGU will no longer be an economically viable asset given the cost to meet an emission limit that continues to ratchet down. To the extent that existing units shut down and are not replaced, there may be economic impacts at the State and local level. For an operating EGU, a shutdown may mean the loss of anywhere from zero to 50 jobs as the EGU winds down its operations. At the State and local government level, the Department anticipates that the shutdown of a facility may result in some loss of tax revenue, which the Department is not in a position to estimate. Additionally, the Department would lose emission fees that are collected to cover the Department's permit program expenses.

The Department cannot predict with certainty which units will shut down or when. The owner and operator of an affected EGU will make a business decision, based on a number of factors, likely including, but not limited to, the age of the unit or facility, how often the unit is called upon to provide electricity to the grid, where the unit appears in the dispatch order, electricity supply and demand, location, capacity contracts, power purchase agreements, and operating costs, as well as the cost needed to meet the new emission limits. For the 12 units currently operating above the 1,700lb/MWh, the Department anticipates that the cost to meet the final 1,000 lb/MWh CO_2 emission limit in 2035 would result in a business decision to shut

the unit down at some point. However, proposed N.J.A.C. 7:27F-2 allows the owner or operator of an affected EGU to apply for and obtain an extension of a compliance date if the owner/operator verifies it has a power purchase agreement with an initial term that ends after the compliance date. The owner/operator may also apply for, and obtain, an extension to keep operating an EGU if the unit is designated as a "reliability must-run" unit or if an order is issued by the BPU.

For the other 54 units that will likely be impacted by the 1,300 lb/MWh and 1,000 lb/MWh CO_2 emission limits, the Department's review of the data indicates that several are operating within range of the emission limits and may need to make only operational changes, such as fuel switching, to lower overall emissions to come into compliance with the 2027 or 2035 proposed CO_2 emission limits. In that case, the costs of compliance would be minimal. For other facilities, the cost of compliance could be significant, but would vary considerably based on the size of the unit and other technical factors, and the owner/operator's decision whether to reconstruct or replace the unit with a more efficient unit that can achieve the new limits or shut the unit down without replacing it. The cost of a fossil fuel-fired EGU that would meet the CO_2 emission limit of a new EGU is estimated to be in the range of $873,000 per MW to $1.3 million per MW. See PJM Cost of New Entry, April 19, 2018, at https://www.pjm.com/~/media/committees-groups/committees/mic/20180425-special/20180425-pjm-2018-cost-of-new-entry-study.ashx, and United States Energy Information Administration, Cost and Performance Characteristics of New Generating Technologies, Annual Energy Outlook 2020, January 2020, at

https://www.eia.gov/outlooks/aeo/assumptions/pdf/table_8.2.pdf. Given that at least 40 of the 66 EGUs covered by the proposed rules will not be required to meet new limits until 2035, these facility owners/operators will have more than 10 years to plan for these changes and make a sound business decision considering the costs of compliance for each of these units.

In addition to the compliance costs necessary to meet the CO_2 emission limits, some EGU owners/operators may incur some additional cost to comply with the monitoring, recordkeeping, and reporting requirements. All owners/operators of an EGU subject to proposed N.J.A.C. 7:27F-2 will be required to incorporate these requirements into their operating permit to assure compliance with the applicable CO_2 emission limit. The owners and operators of each EGU must install and certify monitoring systems and collect, record, quality-assure, and report data. The Department anticipates that a facility will spend less than $50,000 to set up a monitoring and data acquisition system if there is no existing system. However, the Department has determined that most EGUs subject to N.J.A.C. 7:27F-2 already have systems installed to monitor SO_2 and NO_x emissions, as well as CO_2 emissions because they are subject to the CO_2 Budget Trading Program rules. Therefore, only minor modifications to their existing systems will be necessary.

Finally, the Department anticipates that the proposed rules will have some impact on the Department, given the staff hours that will be needed for administration and compliance with the proposed CO_2 emission limits.

N.J.A.C. 7:27F-3, Carbon Dioxide Emission Reductions from Fuels

As explained in the summary of proposed N.J.A.C. 7:27F-3, the sale and use of Nos. 4 and 6 fuel oil in the State has dramatically decreased over the past four decades. The Department does not anticipate any significant capital costs for upgrading any equipment to use a less carbon-intensive fuel source, since very few facilities maintain the ability to use heavy fuel oils and most of these facilities have already upgraded their equipment to use No. 2 fuel oil or natural gas. In the atypical case in which a facility will need to make upgrades, capital costs are estimated to be between $347.00 to $470.00 per horsepower (Miscellaneous Industrial Costs, https://www.michigan.gov/documents/Vol2-36UIP12MiscellaneousIndustrialCosts_121081_7.pdf). However, these initial costs would be offset by the savings from lower operating costs associated with more efficient No. 2 fuel oil or natural gas over the long-term, as well as the lower cost of natural gas. Therefore, the Department does not expect facilities to be negatively affected economically by this ban.

N.J.A.C. 7:27F-4, Carbon Dioxide Emission Reductions from Fossil Fuel-Fired Boilers

As explained in the Summary, proposed N.J.A.C. 7:27F-4 places an additional requirement on a facility that is seeking a permit for a new fossil fuel-fired boiler with a maximum gross heat input rating equal to or greater than one MMBTU/hr and less than five MMBTU/hr. As noted in the Summary, electric boiler models capable of functioning in the same capacity as fossil fuel-fired boilers with a maximum gross heat input rating of less than five MMBTU/hr, are currently available for purchase and installation from vendors in New

Jersey. For a facility installing a new boiler (not replacing an existing boiler that has experienced mechanical failure) pursuant to proposed N.J.A.C. 7:27F-4.4, the Department estimates that the costs to install an electric boiler may be significantly less expensive than a commensurate fossil fuel-fired boiler. Specifically, the infrastructure costs are generally lower for an electric boiler because an electric boiler can be installed at the point of use. Thus, unlike a fossil fuel-fired boiler, an electric boiler will not necessarily require a designated boiler room, flue, fuel lines, ventilation, or long steam lines.

For boilers between one and five MMBtu/hr, the Department estimates a range for installation costs, only, of between $5,000 and $12,000 for an electric boiler and between $8,000 and $30,000 for a natural gas-fired boiler, which means a potential savings of between $3,000. and $18,000 for an electric boiler. The Department based this estimate on the price ranges set forth in the EIA data from their "Updated Buildings Sector Appliance and Equipment Costs and Efficiencies" report (https://www.eia.gov/analysis/studies/buildings/equipcosts/pdf/full.pdf), as well as information gathered from New Jersey-based vendors. In this case, the installation costs include all the costs for the installation, such as shipping and labor. Using the same resources (EIA and vendor data), the Department has also estimated a range for the cost of the new boiler unit itself. Depending on the size of the unit, the cost of a new electric boiler may be between $5,000 and $20,000; whereas, the cost of a new natural gas-fired boiler may be between $5,000 and $25,000. In other words, the equipment costs are on par, but the costs associated with a new electric boiler, including the installation, may be significantly lower than a fossil fuel-

fired boiler. Thus, the Department anticipates that proposed N.J.A.C. 7:27F-4.4, as it applies to the installation of a new boiler, will result in a cost savings on installation and equipment.

The Department acknowledges that a facility that is replacing an existing fossil fuel-fired boiler with an electric boiler pursuant to proposed N.J.A.C. 7:27F-4.4 will not realize the savings associated with the installation of a new electric boiler, because that facility would likely have the infrastructure necessary for a replacement fossil fuel-fired boiler (designated boiler room, flue, fuel lines, ventilation, or long steam lines) in place already. The Department estimates the replacement cost of a fossil fuel-fired boiler with an electric boiler to be between $10,000 and $32,000 per boiler.

Based on a comparison of the 2018 average retail electricity costs versus the 2018 commercial rate for natural gas, the Department estimates that the operational costs for an electric boiler may be between 4.2 and 4.9 percent higher.

Though operational costs are estimated to be higher based upon a comparison of electric and natural gas prices, there are several variables that may benefit a facility subject to N.J.A.C. 7:27F-4.4. As noted in the Summary, the Department anticipates that in 2025, the increased demand for electric boilers will lead to greater competition and lower prices. Similarly, given the 2025 compliance date, an owner or operator of a single boiler that may be on the verge of replacement and subject to N.J.A.C. 7:27F-4.4, will have time to plan ahead. The Department expects that for some facilities, this rulemaking will provide the impetus to closely examine their energy usage and their equipment through a formal or informal energy

audit. For instance, a facility may determine that current fossil fuel-fired equipment is too large and inefficient for the job; thus, replacement with a correctly sized boiler could offset the costs of replacement. Alternatively, a facility may determine that the increased costs for an electric boiler can be offset by other energy saving measures, such as replacement of fluorescent lights with LED technology. As noted in the Summary, State agencies, like the Board of Public Utilities, have programs available to assist with energy audits and to determine whether the entity qualifies for incentives to implement energy efficiency measures, which may offset the costs of replacement.

In addition to the costs necessary to comply with N.J.A.C. 7:27F-4.4, owners and operators of boiler fleets will bear an additional cost to comply with the monitoring, recordkeeping, and reporting requirements. As described in detail in the Regulatory Flexibility Analysis, the Department acknowledges that facilities that include a boiler fleet will need to allocate time for personnel to compile and submit the information required by the proposed boiler fleet reporting requirements. The Department estimates that businesses are likely to complete the initial boiler fleet report within 15 to 20 hours, whereas subsequent annual reports should require only a few hours of personnel time.

Finally, the Department anticipates that the proposed rules will impact State agencies, given the staff hours that will be needed for administration and compliance with the new rules. The Department will need to review the boiler fleet reports annually, as well as a greater number of case-specific permit applications. Moreover, the Department anticipates that

incentive programs administered by other State agencies, such as the clean energy program administered by the BPU, will see an increase in inquiries and applications.

Federal Standards Analysis

N.J.S.A. 52:14B-1 et seq., requires State agencies that adopt, readopt, or amend State rules that exceed any Federal standards or requirements to include in the rulemaking document a Federal standards analysis.

N.J.A.C. 7:27F-2, Carbon Dioxide Emission Reductions from Electric Generating Units

The Department has performed a comparison of the proposed rules at N.J.A.C. 7:27F-2, Carbon Dioxide Emission Reductions from Electric Generating Units, to Federal regulations at 40 CFR Parts 51 and 52, prevention of significant deterioration (PSD), and 40 CFR Part 60, Subpart TTTT, new source performance standards (NSPS), which apply to fossil fuel-fired electric generating units. Based upon the Department's review, the Department has determined there are no comparable Federal standards for existing EGUs. The proposed rules pertaining to new EGUs greater than 25 MWe are comparable to the Federal PSD standards and the Federal NSPS, except for the proposed emission rate, which is more stringent than the Federal NSPS. The Department's analysis is below.

New source performance standards

In 2015, the EPA issued final NSPS for new and reconstructed fossil fuel-fired EGUs greater than 25 MW that commenced construction or reconstruction activities after January 8, 2014. 80 FR 64,510 (Oct. 23, 2015). In establishing the NSPS for fossil fuel-fired EGUs, the EPA distinguished among stationary combustion turbines, steam generating units, and IGCC units. The NSPS for a new steam generating or IGCC unit is 1,400 lb/MWh. The NSPS for a reconstructed steam generating or IGCC unit is 1,800 lb/MWh or 2,000 lb/MWh, depending on the maximum amount of heat input the unit can combust on a steady state basis.

The Federal NSPS established different emission limits for stationary combustion turbines based on fuel (natural gas or multi-fuel). The NSPS further distinguished between "base load" and "non-base load" natural gas-fired stationary combustion turbines. The EPA "use[d] the term base load natural gas-fired units to refer to stationary combustion turbines that (1) burn over 90 percent natural gas; and (2) sell electricity in excess of their design efficiency (not to exceed 50 percent) multiplied by their potential electric output." 80 FR at 64,601. For base load natural gas-fired units, the EPA established a NSPS for CO_2 of 1,000 lb/MWh (an output-based limit), calculated on a 12-operating-month rolling average basis. *Ibid*. For non-base load natural gas-fired units, the EPA established a NSPS for CO_2 of 120 lb CO_2/MMBtu (an input-based limit), calculated on a 12-operating-month rolling average basis. *Ibid*. For multi-fuel-fired units, the EPA established a NSPS for CO_2 of 120 to 160 lb CO_2/MMBtu (an input-based limit), calculated on a 12-operating-month rolling average basis.

In contrast to the EPA's approach, the Department proposes to require any new EGU, regardless of type or fuel, that has a nameplate capacity equal to or greater than 25 MWe and

provides more than 10 percent of its annual gross electric output to the electric grid to comply with an output-based CO_2 emission limit of 860 lb/MWh. As explained in the Summary, a new EGU includes a fossil fuel-fired EGU that commenced construction or was reconstructed on or after the operative date of the proposed rulemaking.

The Department's proposed CO_2 emission limit for new EGUs is more stringent than the NSPS. However, no new steam generating unit has been built in the State since the early 1990s and the Department has not received an application for a permit to construct a new IGCC unit in the State since 2011. As for natural gas-fired stationary combustion turbines, the purpose of proposed N.J.A.C. 7:27F-2 is to require that all new fossil fuel-fired EGUs meet emission limits based on the CO_2 emissions achieved by the most efficient EGUs operating in the State. In New Jersey, the most efficient EGUs are natural gas-fired stationary combustion turbines that are combined cycle units. Because combined cycle fossil fuel-fired EGUs constructed in the State since 2010 operate at emission rates less than 860 lb/MWh, the Department does not believe that requiring a new EGU to meet this proposed limit, rather than the output or input based limits of 1,000 lb/MWh and 120 to 160 lb CO_2/MMBtu, will result in any added costs. Though there may be added initial costs to construct or reconstruct a more efficient unit, those costs are made up in more efficient operations.

To the extent there are added costs, the Department believes that the costs are justified. As explained in the Summary, the proposed rules are intended to be a first step in a comprehensive plan to lower greenhouse gas emissions in the State in order to meet the 80x50 goal. The 2019 EMP and the 2050 Report recognize that the State must take a measured

approach to reduce greenhouse gas emissions from the electric generating sector to net zero by 2050, given the variables of renewable electric generation availability, storage capacity, and expected increased electric demand as the State electrifies other sectors, such as the transportation and building sectors. Thus, the proposed rules are a necessary initial step toward decarbonizing the electric generating sector by requiring new EGUs to meet stringent CO_2 emission limits and existing EGUs to meet CO_2 emission limits that become increasingly stringent in three phases.

In proposing this rulemaking, the Department has balanced the need to mitigate the impacts of climate change on health and the environment against any economic impacts of the rules. The Department has determined that the proposed rules are achievable under current technology and are cost-effective. The Department has determined that the proposed emission limit for new EGUs, even though more stringent than the Federal NSPS, is essential to begin the process of decarbonizing the electric generating sector as the State strives to achieve the 80x50 goal to protect the environment and the public health.

In sum, the Department anticipates the benefits of the proposed rules and amendments to be an increase in the quality of life and protection of human health and the environment. The primary environmental benefit will be a reduction in the emission of CO_2, the most prevalent greenhouse gas. The Department believes that the proposed rules are necessary for the State to transition to a clean energy economy, so that the State can meet the 80x50 goal and prevent further detrimental impacts on human, animal, and plant life. See N.J.S.A. 26:2C-38.

N.J.A.C. 7:27F-3, Carbon Dioxide Emission Reductions from Fuels

Proposed N.J.A.C. 7:27F-3 bans the storage, offering for sale, sale, delivery, or exchange of No. 4 and No. 6 fuel oils for use in the State upon the operative date of the proposed rulemaking. However, the proposed rulemaking includes a grace period to allow facilities that stored No. 4 or No. 6 fuel oils prior to the operative date of the rulemaking to dispose of that fuel oil by using what remains in storage within two years after the operative date of the proposed rulemaking. Further, to ensure compliance with the Clean Air Act, the proposed rules exempt marine vessels from the ban. Because there are no comparable rules or Federal standards, no further analysis is required.

N.J.A.C. 7:27F-4, Carbon Dioxide Emission Reductions from Fossil Fuel-Fired Boilers

Proposed N.J.A.C. 7:27F-4 establishes an additional requirement for fossil fuel-fired boiler permits with a maximum gross heat input rating of greater than or equal to one MMBTU/hr and less than five MMBTU/hr. Proposed N.J.A.C. 7:27F-4 also establishes new reporting requirements for the owners and operators of a facility with a boiler fleet that includes a boiler with a maximum gross heat input rating less than five MMBTU/hr. The Department has determined that there are no comparable rules or Federal standards. Therefore, no further analysis is required.

Jobs Impact

The Department anticipates that the proposed rulemaking may have a small impact on job retention in the State. As provided below, the Department anticipates that proposed new N.J.A.C. 7:27F-2, Carbon Dioxide Emission Reductions from Electric Generating Units, will result in minimal overall job losses. The Department does not anticipate that the remaining proposed rules will have an impact on job creation or retention in the State.

Proposed new N.J.A.C. 7:27F-2, Carbon Dioxide Emission Reductions from Electric Generating Units, which requires existing EGUs to meet specific emission limits by the three-tiered compliance deadlines could result in EGUs shutting down, with potential associated job loss at those facilities. The potentially affected EGUs are located at 25 different facilities, which collectively reported a total of 645 employees. The range of employee numbers reported by each facility is between 0 and 65. Some facilities have EGUs that operate at different emission rates, meaning individual EGUs at the facility will be affected at different times through the overall compliance time period (between 2024 and 2035), or only partially affected through 2035 because the facility includes an EGU that operates at an emission rate lower than 1,000 lb/MWh.

Though some job loss is a possibility due to the shutdown of a unit, these facilities frequently operate multiple units and/or have other operations on site, which may not be directly related to the operation of the EGUs. Thus, the Department does not anticipate all of the employees at a given facility would lose their employment. For some facilities, the shutdown of a unit may result in the shifting of employees to other operations. Moreover, the Department expects technology to continue to advance, which could result in some facilities choosing to modify

their operations rather than shut down. For these reasons, the Department is unable to estimate the number of jobs that would be affected by the proposed rules.

Agricultural Industry Impact

The Department anticipates that the proposed rulemaking will have a positive impact on the agricultural industry in New Jersey by reducing emissions of CO_2 and, therefore, reducing atmospheric concentrations of the gases that are driving climate change. The 2020 New Jersey Scientific Report on Climate Change included a section outlining the existing and anticipated impacts of climate change on the agricultural industry in New Jersey. See 2020 Report on Climate Change, pp. 81-83. The report broadly defines "agriculture" to include crops, livestock, and nursery plants. *Id*. at p. 81. Though many factors can affect agriculture, the report focuses on the alterations in temperature, CO_2 concentrations, and availability of water that are attributable to climate change. See 2020 Report, p. 81. These alterations include:

- Increased temperatures, which can:
    - negatively impact the flavor and visual appeal of crops.
    - result in conditions that are no longer suitable for specialty crops, such as cranberries and blueberries.
    - result in a larger number of insects, whose lifespans are elongated.

- lead to an increased use of pesticides, which may cause other adverse environmental impacts.
- negatively impact livestock production (such as milk production).

- Increases in the concentration of CO_2, which can:
  - lead to increases in weeds competing for crop resources.
  - lead to an increase in the amount and frequency of herbicide use, which may cause other adverse environmental impacts.

- Changes in water availability, which can:
  - Lead to longer dry periods, increasing the need for irrigation and increasing the cost of production.

See 2020 Report on Climate Change, pp. 81-83. In other words, climate change is expected to have major impacts on the growth and productivity of New Jersey crops and livestock due to an increase in dry spells, heat waves, and sustained droughts. "Crop yields are expected to decrease [and become] stressed due to agricultural pests and weeds as winter temperatures continue to rise. All of this will increase pressure on farms, which will likely result in an increased use of herbicide and pesticide use." 2020 Report on Climate Change, p. 83. For this reason, the proposed rulemaking should have a positive impact on agriculture in this State by reducing the extent of significant losses attributable to climate change.

Regulatory Flexibility Analysis

As required by the New Jersey Regulatory Flexibility Act, N.J.S.A. 52:14B-16 et seq., the Department has evaluated the reporting, recordkeeping, and other compliance requirements that the proposed rulemaking would impose upon small businesses. The Regulatory Flexibility Act defines the term "small business" as "any business which is a resident in this State, independently owned and operated and not dominant in its field, and which employs fewer than 100 full-time employees." Based on this definition, the Department anticipates that only proposed new N.J.A.C. 7:27F-3 and 4, and related amendments to the Air Pollution Control rules at N.J.A.C. 7:27, affect small businesses. The substantive requirements and their corresponding costs are as discussed in the Summary and Economic Impact statement above.

N.J.A.C. 7:27F-3, Carbon Dioxide Emission Reductions from Fuels

As noted above, the Department anticipates that very few (if any) entities will incur the capital costs for upgrading equipment to combust a less carbon intensive fuel source. Further, those costs are nominal, particularly given the long-term savings in efficiency expected to be achieved by the less carbon intense replacement fuel options. Accordingly, the Department has evaluated proposed N.J.A.C. 7:27F-3 and determined that any nominal additional compliance requirements imposed on small businesses subject to the proposed subchapter is offset by the State's need to mitigate the impacts of climate change. For this reason, the Department has not provided an exception or accommodation for small businesses.

N.J.A.C. 7:27F-4, Carbon Dioxide Emission Reductions from Fossil Fuel-Fired Boilers

Additional requirement necessary to permit a fossil fuel-fired boiler with a maximum gross heat input rating equal to or greater than one MMBTU/hr and less than five MMBTU/hr

Proposed N.J.A.C. 7:27F-4.4 sets forth an additional requirement to obtain a permit if a business seeks to install a new fossil fuel-fired boiler with a maximum gross heat input rating equal to or greater than one MMBTU/hr and less than five MMBTU/hr in new construction or to replace an existing fossil fuel-fired boiler. However, no permit would be required if the small business installs a fossil fuel free heating mechanism as defined in the proposed rules. At the present time, the most commonly available fossil fuel free heating mechanism is an electric boiler. As set forth in the Summary above, the Department has determined that electric boiler models capable of functioning in the same capacity as fossil fuel-fired boilers with a maximum gross heat input rating of less than five MMBTU/hr are available for purchase and installation from vendors in New Jersey. A fossil fuel free heating mechanism, unlike a fossil fuel-fired boiler, would not require a permit because it emits no air pollutants. For this reason, a small business that requires a boiler for new construction or to replace an existing fossil fuel-fired boiler could avoid the reporting, recordkeeping, and other compliance requirements associated with proposed N.J.A.C. 7:27F-4.4 by installing an electric boiler.

The Department anticipates that a small percentage of the total number of entities requiring a new boiler will find that installation of an electric boiler is infeasible. For these

entities, which may include some small businesses, there will be a minor increase in reporting and recordkeeping. Specifically, a business applying for a permit for a fossil fuel-fired boiler with a maximum gross heat input rating of between one and five MMBTU/hr will be required to submit, as part of its permit application, a demonstration that the installation of an electric boiler or other non-fossil-fuel-fired technology at the facility is not feasible. Other than this addition to the permit application procedure, there will be no additional reporting and recordkeeping requirements. For a business that can demonstrate the infeasibility of a fossil fuel free heating mechanism, there would be no additional cost of compliance. Accordingly, the Department has evaluated proposed N.J.A.C. 7:27F-4.4 and determined that the additional compliance requirements imposed on a small number of small businesses is offset by the State's need to mitigate the impacts of climate change. For this reason, the Department proposes no exception or accommodation for small businesses.

Boiler fleet report

Pursuant to proposed N.J.A.C. 7:27F-4.2, 4.5 and 4.6, owners and operators of a boiler fleet will be required to submit a boiler fleet report to the Department, which will include information related to the number of boilers at the facility, identifying information pertaining to each boiler, and information concerning the emissions from those boilers. To qualify as a boiler fleet, the facility must have a minimum of 10 fossil fuel-fired boilers, at least one of which has a maximum gross heat input equal to or greater than one MMBTU/hr. Further, to be subject to

the boiler fleet reporting requirements, at least one of the facility's fossil fuel-fired boilers must have a maximum gross heat input less than five MMBTU/hr. Given the number of boilers involved, the Department anticipates that a minority of businesses subject to the boiler fleet reporting requirements will employ fewer than 100 full-time employees.

For those small businesses subject to the proposed requirements, the Department expects that the business has existing personnel familiar with the boilers located in the facility, as well as records related to those boilers, including fuel usage. While the Department acknowledges that those businesses will need to allocate time for personnel to compile and submit the information required by the proposed boiler fleet reporting requirements, the Department estimates that those businesses are likely to complete the first boiler fleet report within 15 to 20 hours, as the report would include the use of the EPA's greenhouse gas calculator to report actual CO_2e emissions. The time necessary to complete the boiler fleet report in subsequent years will take only a few hours, as most of the information gathered for the initial report (that is, boiler identification) will not change. The Department expects the reporting process to require limited effort at minimal cost for the regulated entity. Moreover, and as discussed above, gathering this information may alert the business to potential long-term savings should it choose to conduct an energy audit and/or pursue available incentives for energy improvements. The information that the Department collects is necessary as the State implements a comprehensive strategy to meet the 80x50 goal. Accordingly, the proposed rulemaking does not provide an exception or accommodation for small businesses.

Housing Affordability Impact Analysis

In accordance with N.J.S.A. 52:14B-4, the Department has evaluated the proposed rulemaking to determine their impact, if any, on the affordability of housing. The proposed rulemaking establishes: (1) CO_2 emission limits for fossil fuel-fired EGUs; (2) a ban on the sale and use of certain fuels; and (3) additional requirements for the permitting of certain fossil fuel-fired boilers. Given the limited applicability of the proposed rulemaking, it neither imposes requirements, nor confers direct benefits onto homeowners, builders, or other providers of housing, and the Department has determined that the proposed rulemaking is unlikely to impact housing affordability or the average costs of housing in the State. While it is possible that the proposed rulemaking may have some indirect impact on the types of boilers that could be installed in large housing complexes, such as apartments, the impact would be too negligible to affect the overall cost of housing in the State.

Smart Growth Development Impact Analysis

In accordance with N.J.S.A. 52:14B-4, the Department has evaluated the proposed rulemaking to determine its impact, if any, on housing production in Planning Areas 1 or 2, or within designated centers, under the State Development and Redevelopment Plan. The proposed rulemaking establishes: (1) CO_2 emission limits for fossil fuel-fired EGUs; (2) a ban on the sale and use of certain fuels; and (3) additional requirements for the permitting of certain fossil fuel-fired boilers. The proposed rulemaking does not impact land use development of any

kind including that of residential housing. While it is possible that the proposed rulemaking may have some indirect impact on the types of boilers that could be installed in large housing complexes, such as apartments, the impact would be too negligible to affect the overall cost of housing in the State. Therefore, the rules are unlikely to evoke a change in housing production in Planning Areas 1 or 2, or within designated centers, under the State Development and Redevelopment Plan.

Racial and Ethnic Community Criminal Justice and Public Safety Impact

In accordance with N.J.S.A. 52:14B-4(a)(2) and 2C:48B-2, the Department has evaluated this rulemaking and determined that it will not have an impact on pretrial detention, sentencing, probation, or parole policies concerning adults and juveniles in the State. Accordingly, no further analysis is required.

Full text of the proposal follows (additions indicated in boldface **thus**; deletions indicated in brackets [thus]):

CHAPTER 27

AIR POLLUTION CONTROL

SUBCHAPTER 1. GENERAL PROVISIONS

7:27-1.4 Definitions

The following words and terms, when used in this chapter, have the following meanings, unless the context clearly indicates otherwise.

"Air contaminant" means any substance, other than water or distillates of air, present in the atmosphere as solid particles, liquid particles, vapors, or gases.

…

"Distillates of air" means helium (He), nitrogen (N_2), oxygen (O_2), neon (Ne), argon (Ar), krypton (Kr), and xenon (Xe).

…

7:27-1.36 Applicability

[(a)] Compliance with any subchapter of this chapter shall not relieve any person of the obligation to comply with all other applicable provisions of this chapter.

[(b) A facility's actual emissions of carbon dioxide (CO_2) or potential emissions of CO_2, or an item of equipment's actual emissions of CO_2 or potential emissions of CO_2, or actual emissions

of CO_2 or potential emissions of CO_2 from an item of control apparatus, is not a basis for any of the following under this chapter:

1. A requirement to include in a permit application information about CO_2 emissions;

2. A requirement to obtain a permit under N.J.A.C. 7:27-8 or -22;

3. A limitation on CO_2 emissions in a permit;

4. A requirement for state-of-the-art analysis with respect to the control of CO_2 emissions;

5. A fee;

6. A facility being considered a "major facility";

7. An item of equipment or a source operation being considered a "significant source"; or

8. The applicability of any other requirement under this chapter, other than the requirements of N.J.A.C. 7:27-21.]

SUBCHAPTER 8. PERMITS AND CERTIFICATES FOR MINOR FACILITIES (AND MAJOR FACILITIES WITHOUT AN OPERATING PERMIT)

7:27-8.14 Denials

(a) The Department shall deny an application if anything proposed in the application would result in:

1. – 7. (No change.)

8. A violation of an administrative order; [or]

9. A violation of a State or Federal standard or requirement[.]**; or**

10. A violation of a provision at N.J.A.C. 7:27F, Control and Prohibition of Carbon Dioxide Emissions.

(b) – (d) (No change.)

7:27-8.18 Permit revisions

(a) The following actions require prior approval from the Department through a permit revision:

1. – 5. (No change.)

6. Except as allowed at N.J.A.C. 7:27-8.21(b)6, the replacement of an entire permitted significant source with a replacement source. For the purposes of this section, replacement means that the replacement source will take the place of the replaced source in the manufacturing process, and the replaced source will be permanently shut down; [or]

7. Construction or installation of a new significant source (including a control apparatus), if there are existing, permitted sources onsite, and the new source could, [under] **pursuant to** N.J.A.C. 7:27-8.4(h), be combined on one permit application with the existing permitted sources. If the new source could not be combined under one permit with existing permitted sources [under] **pursuant to** N.J.A.C. 7:27-8.4(h), installation of the new source would require a new permit of its own[.]**; or**

8. Construction or installation of a fossil fuel-fired boiler pursuant to the relevant provisions at N.J.A.C. 7:27F, Control and Prohibition of Carbon Dioxide Emissions.

(b) (No change.)

SUBCHAPTER 22. OPERATING PERMITS

7:27-22.16 Operating permit contents

(a)-(p) (No change.)

(q) [(Reserved)] **The operating permit shall contain all applicable requirements at N.J.A.C. 7:27F, Control and Prohibition of Carbon Dioxide Emissions. The operating permit shall contain sufficient monitoring, recordkeeping, and reporting requirements necessary to ensure compliance with all applicable requirements at N.J.A.C. 7:27F.**

(r) – (t) (No change.)

7:27-22.28 Incorporation of CO_2 Budget Trading Program **and CO_2 emission limit** requirements

(a)-(b) (No change.)

(c) The owner or operator of a facility subject to N.J.A.C. 7:27F-2 shall apply to incorporate the CO_2 emission limit and other requirements at N.J.A.C. 7:27F-2, as applicable, into

the operating permit pursuant to N.J.A.C. 7:27-22.3(u), 22.5, and 22.9, by the following deadlines:

1. For a new electric generating unit, as defined at N.J.A.C. 7:27F-2.1, that was issued a permit before (the operative date of this amendment) and that is required to comply with the emission limits at N.J.A.C. 7:27F-2.5(b) or (c), no later than 12 months after (the operative date of this amendment); and

2. For an existing electric generating unit, as defined at N.J.A.C. 7:27F-2.1, that is required to comply with the emission limit at N.J.A.C. 7:27F-2.5(d), no later than 12 months prior to the applicable compliance date set forth at N.J.A.C. 7:27F-2.5(d)1, 2, and 3, or as part of its application for a renewal permit, whichever is earlier.

CHAPTER 27A

AIR ADMINISTRATIVE PROCEDURES AND PENALTIES

SUBCHAPTER 3. CIVIL ADMINISTRATIVE PENALTIES AND REQUESTS FOR ADJUDICATORY HEARINGS

7:27A-3.2 Definitions

The following words and terms, when used in this subchapter, have the following meanings, unless the context clearly indicates otherwise. Unless otherwise specified below, all words and terms are as defined [in] **at** N.J.S.A. 26:2C-2 and N.J.A.C. 7:27**,** [and] 27C**, and 27F**.

…

7:27A-3.5 Civil administrative penalty determination—general

(a) - (c) (No change.)

(d) The Department may assess a civil administrative penalty for a violation of any provision of N.J.A.C. 7:27**,** [or] 27C**, or 27F** for which no penalty amount is specified [under] **pursuant to** N.J.A.C. 7:27A-3.6 through 3.11. The Department shall base the amount of such a penalty assessment upon the following factors:

1. – 2. (No change.)

(e) – (f) (No change.)

(g) For violations of N.J.A.C. 7:27-8.3(e) or 22.3(c) or (e)**;** [or] 7:27C-8.1(k), (l), or (n)**; or 7:27F-2.6(e)**, indicated by a continuous monitoring system, the Department shall calculate penalties in accordance with N.J.A.C. 7:27A-3.10(n)1 and may, in its discretion for purposes of determining the statutory maximum penalty for an offense, treat an offense as a first offense for civil administrative penalty determination purposes, at the beginning of each calendar

quarter.

(h) For violations of N.J.A.C. 7:27-8.3(e) or 22.3(d) or (e)**;** [or] 7:27C 8.1(k), (m), or (n)**; or 7:27F-2.6(e)**, when a continuous monitoring system operates out of control or is out of service, the Department shall calculate penalties in accordance with N.J.A.C. 7:27A-3.10(n)2 and may, in its discretion, treat an offense as a first offense for civil administrative penalty determination purposes, if the violator has not committed the same offense in the four consecutive calendar quarters immediately preceding the first day of the calendar quarter during which the pending offense was committed.

7:27A-3.10 Civil administrative penalties for violation of rules adopted pursuant to the Act

(a) - (u) (No change.)

(v) (Reserved.)

(w) The violations at N.J.A.C. 7:27F, whether the violation is minor or non-minor in accordance with (q), (r), (s), and (t) above, and the civil administrative penalty amounts for each violation are as set forth in the following Civil Administrative Penalty Schedule. The numbers of the following subsections correspond to the numbers of the corresponding subchapter at N.J.A.C. 7:27F. The rule summaries provided in the column labelled "Class" for

the requirements set forth in the Civil Administrative Penalty Schedule in this subsection are provided for informational purposes only and have no legal effect.

CIVIL ADMINISTRATIVE PENALTY SCHEDULE

1. The violations of N.J.A.C. 7:27F-1, General Provisions, and the civil administrative penalty amounts for each violation are as set forth in the following table:

Citation	Class	Type of Violation	First Offense	Second Offense	Third Offense	Fourth and Each Subsequent Offense
N.J.A.C. 7:27F-1.5(b)	Right to Enter	NM	$8,000	$16,000	$40,000	$40,000
N.J.A.C. 7:27F-1.5(c)	Fail to Assist Department Inspection	NM	$8,000	$16,000	$40,000	$40,000
N.J.A.C. 7:27F-1.5(d)	Operating Conditions	M	$2,000	$4,000	$10,000	$30,000

2. The violations of N.J.A.C. 7:27F-2, Carbon Dioxide Emission Reductions from Electric Generating Units, and the civil administrative penalty amounts for each violation are as set forth in the following table:

Citation	Class	Type of Violation	First Offense	Second Offense	Third Offense	Fourth and Each Subsequent Offense
N.J.A.C. 7:27F-2.3(a)1	Fail to Submit New, Renewal, or Modification Application	M	$2,000	$4,000	$10,000	$30,000
N.J.A.C. 7:27F-	Fail to Respond Timely	M	$500	$1,000	$2,500	$7,500

2.3(a)2

N.J.A.C. 7:27F-2.3(a)3	**Actual Emission (pound per megawatt hour)**					
Equal or Greater than 25MWe Fossil Fuel-Fired EGU						
Less than 25 percent over allowable		**NM**	**$6,000**	**$12,000**	**$30,000**	**$50,000**
From 25 to 50 percent over allowable		**NM**	**$8,000**	**$16,000**	**$40,000**	**$50,000**
Greater than 50 percent over allowable		**NM**	**$10,000**	**$20,000**	**$50,000**	**$50,000**
N.J.A.C. 7:27F-2.3(a)4	**Compliance demonstration, recordkeeping, and monitoring**	**See N.J.A.C. 7:27F-2.6(c), (d), or (e) for the calculation of civil administrative penalties**				

N.J.A.C. 7:27F-2.3(a)5	**Reporting**	**M**	**$500**	**$1,000**	**$2,500**	**$7,500**
N.J.A.C. 7:27F-2.4(a)	**Fail to Submit Renewal or Modified Permit Application**	**M**	**$2,000**	**$4,000**	**$10,000**	**$30,000**
N.J.A.C. 7:27F-2.4(b) and (c)	**Fail to Submit Application**	**M**	**$2,000**	**$4,000**	**$10,000**	**$30,000**
N.J.A.C. 7:27F-2.5(a) through (d)	**Actual Emission (pound per megawatt hour)**					

Equal or Greater than 25MWe

Fossil Fuel-Fired EGU

Less than 25 percent over allowable		**NM**	**$6,000**	**$12,000**	**$30,000**	**$50,000**
From 25 to 50 percent over allowable		**NM**	**$8,000**	**$16,000**	**$40,000**	**$50,000**
Greater than 50 percent over allowable		**NM**	**$10,000**	**$20,000**	**$50,000**	**$50,000**
N.J.A.C. 7:27F-2.6(c)	**Compliance Demonstration**	**M**	**$2,000**	**$4,000**	**$10,000**	**$30,000**
N.J.A.C. 7:27F-2.6(d)	**Recordkeeping**	**M**	**$500**	**$1,000**	**$2,500**	**$7,500**
N.J.A.C. 7:27F-2.6(e)	**Monitoring System Not Installed, Out of Service Each day**	**NM**	**$500/day**	**$1,000/day**	**$2,500/day**	**$7,500/day**

N.J.A.C. 7:27F-2.7	**Reporting**	**M**	**$500**	**$1,000**	**$2,500**	**$7,500**

3. The violations of N.J.A.C. 7:27F-3, Carbon Dioxide Emission Reductions from Fuels, and the civil administrative penalty amounts for each violation are as set forth in the following table:

Citation	Class	Type of Violation	First Offense	Second Offense	Third Offense	Fourth and Each Subsequent Offense
N.J.A.C. 7:27F-3.2	**Storage/Sale by User**	**NM**	**$500**	**$1,000**	**$2,500**	**$7,500**
	Supplier	**NM**	**$5,000**	**$10,000**	**$25,000**	**$50,000**

4. The violations of N.J.A.C. 7:27F-4, Carbon Dioxide Emission Reductions from Boilers, and the civil administrative penalty amounts for each violation are as set forth in the following table:

Citation	Class	Type of Violation	First Offense	Second Offense	Third Offense	Fourth and Each Subsequent Offense
N.J.A.C. 7:27F-4.3(a)	Failure to Submit Boiler Fleet Report	NM	$2,000	$4,000	$10,000	$30,000
N.J.A.C. 7:27F-4.4(a)	Install Fossil Fuel Boiler without Department approval	NM	$2,000	$4,000	$10,000	$30,000
N.J.A.C. 7:27F-4.5(a)	Failure to Submit Boiler Fleet Report	NM	$2,000	$4,000	$10,000	$30,000
N.J.A.C. 7:27F-	Failure to Submit Boiler Fleet Report	NM	$2,000	$4,000	$10,000	$30,000

4.5(b)

N.J.A.C. 7:27F-4.6(a)	**Omission of Required Information**	**M**	**$500**	**$1,000**	**$2,500**	**$7,500**
N.J.A.C. 7:27F-4.6(b)	**Omission of Required Information**	**M**	**$500**	**$1,000**	**$2,500**	**$7,500**
N.J.A.C. 7:27F-4.6(c)	**Failure to Certify**	**M**	**$2,000**	**$4,000**	**$10,000**	**$30,000**
N.J.A.C. 7:27F-4.9(f)	**Failure to Obtain Department Approval Prior to Discontinuing Submittal**	**M**	**$100**	**$200**	**$500**	**$1,500**

N.J.A.C. 7:27F-4.10(a), (b), or (c)	**Failure to Keep Records**	**M**	**$500**	**$1,000**	**$2,500**	**$7,500**

CHAPTER 27F

CONTROL AND PROHIBITION OF CARBON DIOXIDE EMISSIONS

SUBCHAPTER 1. GENERAL PROVISIONS

7:27F-1.1 Purpose and scope

(a) This chapter establishes the criteria that shall govern and reduce emissions of carbon dioxide from fossil fuel-fired electric generating units, fossil fuel-fired boilers, and fossil fuels.

(b) The criteria governing emission reductions set forth in this chapter are part of a comprehensive strategy to reduce Statewide greenhouse gas emissions by 80 percent below the 2006 level by 2050, as required by the Global Warming Response Act, N.J.S.A. 26:2C-37 et seq.

(c) The Department may determine that the criteria governing the reduction of CO_2 emissions, as set forth in this chapter, should be supplemented and/or amended, as needed.

(d) Compliance with any subchapter of this chapter shall not relieve any person of the obligation to comply with all other statutes, rules, permits, or orders administered or issued by the Department.

7:27F-1.2 Liberal construction

This chapter, being necessary to promote the public health and welfare, and to protect the environment, shall be liberally construed to permit the Department to discharge its statutory functions under the Air Pollution Control Act, N.J.S.A. 26:2C-1 et seq., generally, including the Global Warming Response Act, N.J.S.A. 26:2C-37 et seq.

7:27F-1.3 Definitions

The following words and terms, when used in this chapter, shall have the following meanings, unless the context clearly indicates otherwise:

"Air contaminant" means any substance, other than water or distillates of air, present in the atmosphere as solid particles, liquid particles, vapors, or gases.

"ASTM" means ASTM International, formerly known as the American Society for Testing and Materials, which was formed in 1898. ASTM standards incorporated by reference are available at astm.org.

"BPU" means the New Jersey Board of Public Utilities.

"British thermal unit" or "BTU" means the quantity of heat required to raise the temperature of one pound of water by one degree Fahrenheit, at the temperature at which water has its greatest density (approximately 39 degrees Fahrenheit).

"CFR" means the United States Code of Federal Regulations.

"CO_2" means carbon dioxide.

"Distillates of air" means helium (He), nitrogen (N_2), oxygen (O_2), neon (Ne), argon (Ar), krypton (Kr), and xenon (Xe).

"EPA" means the United States Environmental Protection Agency.

"Facility" shall have the same meaning as the term "facility" as defined at N.J.A.C. 7:27-8.1 or 22.1, as applicable.

"FERC" means the Federal Energy Regulatory Commission.

"Fossil fuel" means natural gas, petroleum, coal, and any form of solid, liquid, or gaseous fuel derived from such material for the purpose of creating useful heat.

"Fossil fuel-fired" means the combustion of fossil fuel, alone, or in combination with any other fuel, where the fossil fuel combusted comprises, or is projected to comprise, more than 50 percent of the annual heat input on a BTU basis during any year.

"Hr" means hour.

"Insignificant source" shall have the same meaning as the term "insignificant source" or "insignificant source operation" as defined at N.J.A.C. 7:27-8.1 or 22.1, as applicable.

"ISO" means International Organization for Standardization, iso.org.

"ISO conditions" means 288 Kelvin, or 15 degrees Celcius, 60 percent relative humidity, and 101.3 kilopascals pressure.

"KWh" means kilowatt hours.

"Lb" means pound.

"Modify" or "modification" shall have the same meaning as the term "modify" or "modification" as defined at N.J.A.C. 7:27-8.1 or 22.1, as applicable.

"MMBTU" means million BTU.

"MW" means megawatt.

"MWe" means megawatt electrical.

"MWh" means megawatt hour.

"Natural gas" means a fluid mixture of hydrocarbons (for example, methane, ethane, or propane), composed of at least 70 percent methane by volume or that has a gross calorific value between 35 and 41 megajoules per dry standard cubic meter (950 and 1,100 BTU per dry standard cubic foot), that maintains a gaseous state under ISO conditions. Natural gas does not include the following gaseous fuels: landfill gas, digester gas, refiner gas, sour gas, blast furnace gas, coal-derived gas, producer gas, coke oven gas, or any gaseous fuels produced in a process which might result in highly variable CO_2 content or heating value.

"New York Independent System Operator" or "NYISO" means the not-for profit corporation, or any successor organization, responsible for operating New York State's bulk electricity grid, administering New York State's competitive wholesale electricity markets, and conducting comprehensive long-term planning for New York State's electric power system serving New York State. NYISO is the Federally designated electric bulk system operator in New York State.

"Operating certificate" or "certificate" shall have the same meaning as the term "operating certificate" or "certificate" as defined at N.J.A.C. 7:27-22.1.

"Operating permit" shall have the same meaning as the term "operating permit" as defined at N.J.A.C. 7:27-22.1.

"Permittee" shall have the same meaning as the term "permittee" as defined at N.J.A.C. 7:27-8.1 or 22.1, as applicable.

"Permit revision" shall have the same meaning as the term "permit revision" as defined at N.J.A.C. 7:27-8.1.

"Person" means an individual, public or private corporation, company, partnership, firm, association, society, joint stock company, international entity, institution, county, municipality, state, interstate body, the United States of America, or any agency, board, commission, employee, agent, officer, or political subdivision of a state, an interstate body, or the United States of America.

"Petroleum" means crude oil or a fuel derived from crude oil, including, but not limited to, distillate and residual oil.

"PJM Interconnection, LLC" or "PJM" means the regional transmission organization, or its successor, that coordinates the movement of wholesale electricity in all or parts of Delaware, Illinois, Indiana, Kentucky, Maryland, Michigan, New Jersey, North Carolina, Ohio, Pennsylvania, Tennessee, Virginia, West Virginia, and the District of Columbia.

"Preconstruction permit" shall have the same meaning as the term "preconstruction permit" as defined at N.J.A.C. 7:27-22.1.

"Significant source" shall have the same meaning as the term "significant source operation" or "significant source" as defined at N.J.A.C. 7:27-8.1 or 22.1, as applicable.

7:27F-1.4 Confidentiality

All information submitted to the Department pursuant to this chapter shall be public information, unless the person submitting the information asserts a confidentiality claim in accordance with the procedures set forth at N.J.A.C. 7:27-1.6 through 1.30 and the Department determines that the information is entitled to confidential treatment. Information submitted electronically cannot be handled confidentially. Therefore, information submitted pursuant to a confidentiality claim must be submitted in paper form only, and the claims of confidentiality must be asserted by clearly marking the information as required pursuant to N.J.A.C. 7:27-1.6.

7:27F-1.5 Right to enter

(a) The Department, and its representatives, shall have the right to enter and inspect, at any time, any facility or building, or portion thereof, including all documents and equipment on the premises, in order to ascertain compliance or noncompliance with this chapter or with any preconstruction permit, certificate, operating permit, order, authorization or other legal document issued pursuant thereto, or to verify any information submitted to the Department. This right is absolute and shall not be conditioned upon any action by the Department, except the presentation of appropriate credentials as requested, and compliance with appropriate safety standards. This right includes, but is not limited to, the right to:

1. Enter upon the premises of the facility;

2. Sketch or photograph any portion of the facility;

3. Enter upon the premises of a facility where records are maintained under the conditions of this chapter or the preconstruction permit, certificate, or operating permit;

4. Review any records that must be kept under the conditions of the preconstruction permit, certificate, or operating permit;

5. Copy or photograph any records that must be kept under the conditions of this chapter or the preconstruction permit, certificate, or operating permit;

6. Inspect any part of the facility, including any equipment (including any equipment used for monitoring and any air pollution control apparatus), practices, or operations, regulated or required under this chapter or the preconstruction permit, certificate, or operating permit;

7. Interview any employee or representative of the owner or operator; and

8. Test or sample any substance or material.

(b) No person shall obstruct, hinder, or delay the Department or its representatives in its exercise of its rights pursuant to (a) above.

(c) An owner or operator of a facility, and any appropriate employee, or representative of any owner or operator, shall, upon request, assist the Department and its representatives in the performance of any inspection. Such assistance shall include, but shall not be limited to, making available sampling equipment and facilities necessary to conduct sampling to determine the nature and quantity of any air contaminant emitted by the facility.

(d) During any sampling or testing conducted by the Department, any equipment, and all components connected to, attached to, or serving the equipment, shall be operated under normal operating conditions, or under conditions set forth in any preconstruction permit, certificate, operating permit, order, or other State or Federal authorization covering the equipment.

7:27F-1.6 Severability

If any section, subsection, provision, clause, or portion of this chapter, or the application thereof to any person, is adjudged unconstitutional or invalid by a court of competent jurisdiction, such judgment shall be confined in its operation to the subchapter, section, subsection, provision, clause, portion, or application directly involved in the controversy in which the judgment was rendered and it shall not affect or impair the remainder of this chapter or the application thereof to other persons.

7:27F-1.7 Civil administrative penalties and requests for administrative hearings

Penalties for violations of the provisions of this chapter and the procedure for requesting an adjudicatory hearing are provided at N.J.A.C. 7:27A, Air Administrative Procedures and Penalties.

7:27F-1.8 Incorporation by reference

Unless specifically stated otherwise in this subchapter, when a provision of a code, rule, or a standard or requirement that originated outside of the Department, is incorporated by reference, the provision is incorporated, as supplemented or amended, and includes all notes, comments, appendices, diagrams, tables, forms, figures, publications, and cross-references. Moreover, any other changes including, without limitation, repeals or stays that affect the meaning or operational status, brought about by either judicial or administrative action and adopted or otherwise noticed by the authority are incorporated by reference.

SUBCHAPTER 2. CARBON DIOXIDE EMISSION REDUCTIONS FROM ELECTRIC GENERATING UNITS

7:27F-2.1 Definitions

The following words and terms, when used in this chapter, shall have the following meanings, unless the context clearly indicates otherwise:

"Coal" means all solid fuels classified as anthracite, bituminous, subbituminous, or lignite by ASTM in ASTM D388-99 (Reapproved 2004, incorporated herein by reference), coal refuse, and petroleum coke. Synthetic fuels derived from coal for the purpose of creating useful heat, including, but not limited to, solvent-refined coal, gasified coal (not meeting the

definition of natural gas), coal-oil mixtures, and coal-water mixtures are included in this definition.

"Combined cycle unit" means an electric generating unit that uses a stationary combustion turbine from which the heat from the turbine exhaust gases is recovered by a heat recovery steam generating unit to generate additional electricity.

"Combined heat and power unit" or "CHP unit" means an electric generating unit that uses a steam generating unit or stationary combustion turbine to simultaneously produce both electric (or mechanical) and useful thermal output from the same primary energy source. A CHP unit is also known as cogeneration.

"Commence commercial operation" or "commenced commercial operation" means, with regard to a unit that serves an EGU, to begin to produce steam, gas, or other heated medium used to generate electricity for sale or use, including test generation.

"Commence construction" or "commenced construction" means that an owner or operator has undertaken a continuous program of construction or that an owner or operator has entered into a contractual obligation to undertake and complete, within a reasonable time, a continuous program of construction. Construction is no longer continuous if construction is discontinued for longer than 18 months.

"Construct" or "construction" shall have the same meaning as the term "construct" or "construction" as defined at N.J.A.C. 7:27-8.1 or 22.1, as applicable.

"Control apparatus" shall have the same meaning as the term "control apparatus" as defined at N.J.A.C. 7:27-22.1.

"EGU facility" means a facility that includes one or more new and/or existing fossil fuel-fired EGU(s) and at which the aggregate nameplate capacity of all of the EGUs at the facility is equal to or greater than 25 MWe.

"Electric generating unit" or "EGU" means a combustion or steam generating source used for generating electricity that delivers all or part of its power to the electric power distribution grid for commercial sale.

"Emissions" means any air contaminant or category of air contaminants discharged, directly or indirectly, into the outdoor atmosphere.

"Emit" means to cause or release emissions.

"Existing electric generating unit" or "existing EGU" means any fossil fuel-fired electric generating unit that commenced construction before (the operative date of this new chapter), and provides more than 10 percent of its annual gross electric output to the electric grid.

"Facility code" means a five-digit code assigned by the Energy Information Agency at the United States Department of Energy to a power plant that is not owned by an electric utility.

"Gasifier" means an emission source that converts a hydrocarbon feedstock into a fuel.

"Gross electric output" means the total amount of electric energy produced by a generating unit and measured at the generating terminal in KWh or MWh. It includes the electricity used in the plant auxiliaries and the transformers.

"Gross energy output" means:

1. For stationary combustion turbines and integrated gasification combined cycle (IGCC) facilities, the gross electric and/or mechanical output from both the EGU (including, but not limited to, output from steam turbine(s), combustion turbines(s), and gas expander(s)) plus 100 percent of the useful thermal output;

2. For steam generating units, the gross electric and/or mechanical output from the affected EGU(s) (including, but not limited to, output from steam turbine(s), combustion turbine(s), and gas expander(s)) minus any electricity used to power the feedwater pumps, plus 100 percent of the useful thermal output; and

3. For combined heat and power facilities where at least 20 percent of the total gross energy output consists of electric and/or mechanical output and 20 percent of the total gross energy output consists of useful thermal output on a 12-operating-month rolling average basis, the gross electric or mechanical output from the affected EGU, including, but not limited to, output from steam turbine(s), combustion turbine(s), and gas expander(s), minus any electricity used to power the feedwater pumps (the electric auxiliary load of boiler feedwater pumps is not applicable to IGCC facilities), that difference divided by 0.95, plus 100 percent of the useful thermal output.

"Heat recovery steam generating unit" or "HRSG" means an EGU in which hot exhaust gases from the combustion turbine engine are routed in order to extract heat from the gases and generate useful output. Heat recovery steam generating units can be used with or without duct burners.

"Install" or "installation" shall have the same meaning as the term "install" or "installation" as defined at N.J.A.C. 7:27-22.1.

"Integrated gasification combined cycle," "IGCC," or "IGCC facility" means a combined cycle facility that is designed to burn fuels containing 50 percent, by heat input, or more solid-derived fuel not meeting the definition of natural gas, plus any integrated equipment that provides electricity or useful thermal output to the affected EGU or auxiliary equipment. No solid fuel is directly burned in the EGU during operation.

"Mechanical output" means the useful mechanical energy that is not used to operate the affected EGU(s), generate electricity, generate thermal energy, or enhance the performance of the affected EGU. Mechanical energy measured in horsepower hour should be converted into MWh by multiplying the number of horsepower hours by 745.7 then dividing by 1,000,000.

"Nameplate capacity" means the maximum electrical output in MWe that an EGU can sustain over a specified period of time, under specific conditions designated by the manufacturer, when not restricted by seasonal or other deratings as measured in accordance with the United States Department of Energy standards.

"Net-electric output" means the gross amount of electricity generation a generator produces, including, but not limited to, output from steam turbine(s), combustion turbine(s), and gas expander(s), as measured at the generator terminals, less the electricity used to operate the plant (that is, auxiliary loads); such uses includes fuel handling equipment, pumps, fans, pollution control equipment, other electricity needs, and transformer losses as measured at the transmission side of the step up transformer (for example, the point of sale).

"New electric generating unit" or "new EGU" means any fossil fuel-fired electric generating unit on which the owner or operator commenced construction or on which reconstruction commenced on or after (the operative date of this new chapter), and provides more than 10 percent of its annual gross electric output to the electric grid.

"Operating month" means a calendar month during which any fuel is combusted in the affected EGU at any time.

"ORIS code" means a number assigned by the Energy Information Agency at the United States Department of Energy to power plants owned by electric utilities.

"Output-based emission limit" is an emission limit that relates emissions to the productive output of the process. An output-based emission limit uses units of measure, such as lb of emissions/MWh generated or lb of emissions/MMBTU of steam generated.

"Power purchase agreement" means an agreement that was executed prior to January 1, 2002, is for a duration of more than 15 years from its effective date, and provides that the

party to the agreement that purchases energy from the facility has rights to the electric energy output of the facility.

"Process unit" shall have the same meaning as the term "process unit" as defined at N.J.A.C. 7:27-22.1.

"Reconstruct" or "reconstruction" shall have the same meaning as the term "reconstruct" or "reconstruction" as defined at N.J.A.C. 7:27-8.1 or 22.1, as applicable.

"Renewal" shall have the same meaning as the term "renewal" as defined at N.J.A.C. 7:27-22.1.

"RMR" means reliability must-run.

"RMR unit" means a unit that is requested by PJM or NYISO to remain operational beyond its announced retirement date, or come back into operation, to maintain reliable operation of the interstate transmission system, pursuant to a duly approved section of a PJM Tariff or a FERC-approved service agreement.

"Simple cycle combustion turbine" shall have the same meaning as the term "simple cycle combustion turbine" as defined at N.J.A.C. 7:27-19.1.

"Source emission testing" shall have the same meaning as the term "source emission testing" as defined at N.J.A.C. 7:27-22.1.

"Source operation" or "source" "shall have the same meaning as the term "source operation" or "source" as defined at N.J.A.C. 7:27-22.1.

"Stack or chimney" shall have the same meaning as the term "stack or chimney" as defined at N.J.A.C. 7:27-22.1.

"Standard ambient temperature and pressure" or "SATP" conditions means 298.15 Kelvin (25 degrees Celsius or 77 degrees Fahrenheit) and 100.0 kilopascals (14.504 psi, 0.987 atm) pressure.

"Standard conditions" means 70 degrees Fahrenheit (21.1 degrees centigrade) and one atmosphere pressure (14.7 pounds per square inch absolute or 760.0 millimeters of mercury).

"Stationary combustion turbine" means all equipment including, but not limited to, the turbine engine, the fuel, air, lubrication and exhaust gas systems, control systems (except emissions control equipment), heat recovery system, fuel compressor, heater, and/or pump, post-combustion emission control technology, and any ancillary components and sub-components comprising any simple cycle stationary combustion turbine, any combined cycle combustion turbine, and any combined heat and power combustion turbine-based system plus any integrated equipment that provides electricity or useful thermal output to the combustion turbine engine, heat recovery system, or auxiliary equipment. Stationary means that the combustion turbine is not self-propelled or intended to be propelled while performing its function. It may, however, be mounted on a vehicle for portability. A stationary combustion turbine that burns any solid fuel directly is considered a steam generating unit.

"Steam generating unit" means any furnace, boiler, or other device used for combusting fuel and producing steam, plus any integrated equipment that provides electricity or useful thermal output to the affected EGU(s) or auxiliary equipment. The term does not include nuclear steam generators.

"Use" shall have the same meaning as the term "use" as defined at N.J.A.C. 7:27-22.1.

"Useful thermal output" shall have the same meaning as the term is defined at 40 CFR 60.5580, which is incorporated herein by reference.

"Valid data" shall have the same meaning as the term is defined at 40 CFR 60.5580.

7:27F-2.2 Scope and applicability

(a) This subchapter establishes requirements and procedures concerning the control and prohibition of CO_2 emissions from fossil fuel-fired EGUs and EGU facilities subject to this subchapter.

(b) The provisions of this subchapter shall apply to any owner and operator of an existing fossil fuel-fired EGU with a nameplate capacity equal to or greater than 25 MWe, a new fossil fuel-fired EGU with a nameplate capacity equal to or greater than 25 MWe, and a new fossil fuel-fired EGU with a nameplate capacity less than 25 MWe that is located at an EGU facility.

7:27F-2.3 General provisions

(a) The owner and operator of each fossil fuel-fired electric generating unit subject to this subchapter that is required to have a preconstruction or operating permit pursuant to N.J.A.C. 7:27-8 or 22 shall:

1. Submit to the Department a complete application for a new, renewed, or modified preconstruction or operating permit, in accordance with the requirements and deadlines specified in this subchapter, N.J.A.C. 7:27-8 or 22, as applicable;

2. Submit in a timely manner any supplemental information that the Department determines is necessary to review the application and issue or deny an initial or modified preconstruction or operating permit or operating permit renewal that includes the applicable emissions limitation and other requirements as set forth in this subchapter;

3. Operate the EGU in compliance with the emission limits of this subchapter as incorporated in the permit;

4. Comply with the following requirements of this subchapter:

i. Monitoring;

ii. Compliance demonstration procedure; and

iii. Recordkeeping requirements of this subchapter; and

5. Submit reports as required pursuant to N.J.A.C. 7:27-8 and 22 and the applicable preconstruction or operating permit and as requested by the Department.

(b) The Department will use the emissions measurements recorded and reported in accordance with this subchapter to determine the EGU's compliance with the emission limits set forth at N.J.A.C. 7:27F-2.5.

(c) For purposes of determining compliance with the emission limits set forth in this subchapter, the Department will use a 12-operating-month rolling average basis, calculated by dividing the annual total of CO_2 emissions over the relevant 12-month period by the annual electric and/or the mechanical output plus the useful thermal output (output-based limit) over the same 12-month period.

(d) A renewal or modification of the operating permit or preconstruction permit of an EGU source will not cure a violation of the requirements of this subchapter if that renewal or modification is effective after the violation occurs.

7:27F-2.4 Permits

(a) In order to incorporate the applicable emission limit and other requirements set forth in this subchapter, the owner and operator of an existing EGU subject to this subchapter shall submit a complete application for a modification or renewal of its permit pursuant to N.J.A.C. 7:27-8 or 22, and in conformance with the requirements of this subchapter.

(b) The owner and operator of a new EGU subject to this subchapter shall submit an application for an initial or modified preconstruction or operating permit, as applicable, that shall include the following information, in a format prescribed by the Department:

1. Identification of the facility with the EGU(s) subject to this subchapter, including facility name and the assigned ORIS or facility code, if applicable;

2. Identification of each EGU at the facility; and

3. The monitoring, compliance demonstration, and recordkeeping requirements set forth at N.J.A.C. 7:27F-2.6.

(c) In addition to the requirements at (b) above, an owner or operator of an EGU subject to this subchapter and required to comply with N.J.A.C. 7:27F-2.5(c) shall propose for Department review and approval, a limit that meets the requirements at N.J.A.C. 7:27F-2.5(c)1, 2, and 3 and submit information necessary to support the proposed emission limit.

7:27F-2.5 Emission limits

(a) An owner or operator of an electric generating unit subject to this subchapter shall ensure that the unit complies with the applicable CO_2 emission limit established at (b) through (e) below. Unless otherwise specified, the emission limits apply as of (the operative date of this section).

(b) A new electric generating unit with a nameplate capacity equal to or greater than 25 MWe shall meet an emission rate of 860 pounds of CO_2 per MWh gross energy output.

(c) A new electric generating unit with a nameplate capacity less than 25 MWe that is located at an EGU facility shall meet a case-specific output-based emission limit for CO_2 that shall:

1. Be based on air pollution control technology, pollution prevention methods, and process modifications or substitutions that will provide the greatest emission reductions that are technologically and economically feasible;

2. Not have greater than 50 percent of the heat input be derived from solid fossil fuel or oil, unless the CO_2 emission rate meets the CO_2 emission limit at (b) above; and

3. Include the CO_2 emissions from the gasifier, if the emission source(s) are directly attached to a gasifier.

(d) An existing EGU with a nameplate capacity equal to or greater than 25 MWe shall meet the following emission limits by the specified compliance date:

1. On or before January 1, 2024, an emission rate of 1,700 pounds of CO_2 per MWh gross energy output;

2. On or before January 1, 2027, an emission rate of 1,300 pounds of CO_2 per MWh gross energy output; and

3. On or before January 1, 2035, an emission rate of 1,000 pounds of CO_2 per MWh gross energy output.

(e) An owner or operator of an electric generating unit subject to this subchapter that applies for a modification of its permit after (the operative date of this section), shall comply with (c) above, subject to the following conditions:

1. A new EGU with a nameplate capacity equal to or greater than 25 MWe must not exceed the emission limit required at (b) above; and

2. An existing EGU with a nameplate capacity equal to or greater than 25 MWe that is subject to (d) above must not exceed the emission limit required pursuant to the compliance schedule set forth at (d) above.

(f) The owner or operator of an electric generating unit required to comply with the limits at (d) above may request an extension of the compliance date at (d)1, 2, or 3 for any of the following reasons:

1. The BPU issues an order determining that the unit must continue operating;

2. The EGU is designated as an RMR unit; or

3. The electric generating unit is subject to a power purchase agreement that is in its initial term and in effect as of (the operative date of this section).

(g) An owner or operator of an existing electric generating unit who requests an extension pursuant to (f) above shall submit documentation verifying the basis for which the extension is requested. If the owner or operator provides such verification and, after consultation with the BPU, the Department confirms the EGU meets the applicable condition

at (f) above, the Department will extend the compliance date for the EGU for the term of the order or designation as described at (f)1 or 2 above, or the initial term of the power purchase agreement described at (f)3 above, as applicable.

(h) The Department will issue a general extension of the compliance date(s) at (d) above, if the BPU notifies the Department in writing that an extension is necessary to ensure reliability of the electric transmission or distribution system in the State. The Department will extend the applicable compliance date for the term specified in the BPU notice. The Department will publish notice of the general extension on its website within five business days of receipt of the BPU's notice.

7:27F-2.6 Monitoring, compliance demonstration, and recordkeeping

(a) An owner or operator of an EGU subject to this subchapter shall demonstrate compliance with the applicable emission limits specified at N.J.A.C. 7:27F-2.5 and/or in its permit through compliance with the monitoring, compliance demonstration, and recordkeeping requirements at 40 CFR 60.5535, 60.5540, and 60.5560, as incorporated herein by reference, including all notes, comments, appendices, diagrams, tables, forms, figures, publications, and cross-references. The monitoring, compliance demonstration, and recordkeeping requirements at 40 CFR 60.5535, 60.5540, and 60.5560 shall be adhered to in a manner consistent with the purpose of monitoring and recording for output-based CO_2

emissions and determining compliance with the applicable output-based emission limit set forth at N.J.A.C. 7:27F-2.5.

(b) An owner and operator of an EGU subject to this subchapter shall, in accordance with 40 CFR 60.5535:

1. Install all monitoring systems necessary to monitor CO_2 emissions;

2. Successfully complete all certification test requirements applicable to the monitoring systems installed;

3. Record and quality-assure the data from the monitoring systems required; and

4. Use monitoring procedures pertaining to EGUs with an output-based emission limit for CO_2.

(c) An owner or operator of an EGU subject to this subchapter shall use the compliance demonstration procedures at 40 CFR 60.5540 that pertain to EGUs with an output-based emission limit for CO_2.

(d) An owner or operator of an EGU subject to this subchapter shall comply with the recordkeeping requirements at 40 CFR 60.5560 that pertain to EGUs with an output-based emission limit for CO_2.

(e) An owner or operator of a fossil fuel-fired EGU subject to this subchapter shall meet the monitoring requirements at (b) above and shall record, and quality-assure, the data from the monitoring systems according to the following schedule:

1. For the owner or operator of an affected EGU that commences commercial operation before (six months before the effective date of this section), on and after (the operative date of this section);

2. For the owner or operator of an affected EGU that commences commercial operation on or after (six months before the effective date of this section), on and after the later of the following dates:

i. (Six months after the operative date of this section); or

ii. 180 calendar days after the date on which the EGU commences commercial operation.

7:27F-2.7 Reporting

(a) An owner or operator of a fossil fuel-fired EGU subject to this subchapter shall comply with the reporting requirements at N.J.A.C. 7:27-8 and 22 and the applicable preconstruction or operating permit. In accordance with N.J.A.C. 7:27-8.15 and 22.19, the owner or operator shall, upon the Department's request, submit any record relevant to the operating permit or to the emission of CO_2 from the EGU within 30 days, or within a longer time period if approved, in writing, by the Department.

SUBCHAPTER 3. CARBON DIOXIDE EMISSION REDUCTIONS FROM FUELS

7:27F-3.1 Definitions

The following words and terms, when used in this subchapter, shall have the following meanings unless the context clearly indicates otherwise.

"Fuel oil" means a liquid or liquefiable petroleum product derived directly or indirectly from crude oil, which is produced, manufactured, used, or sold for the generation of heat or power.

"No. 4 fuel oil" means a distillate fuel oil made by blending distillate fuel oil and residual fuel oil stocks. It conforms with ASTM Specification D 396 or Federal Specification VV-F-815C and is used extensively in industrial plants and in commercial burner installations that are not equipped with preheating facilities. It also includes No. 4 diesel fuel used for low- and medium-speed diesel engines and conforms to ASTM Specification D 975.

"No. 6 fuel oil" means fuel oil that includes Bunker C fuel oil and is used for the production of electric power, space heating, vessel bunkering, and various industrial purposes.

7:27F-3.2 Carbon standard for fuels

(a) No person shall store, offer for sale, sell, deliver, or exchange in trade, for use in New Jersey, No. 4 fuel oil or No. 6 fuel oil, on or after (the operative date of this section), except as provided at (c) below.

(b) No person shall use No. 4 fuel oil or No. 6 fuel oil on or after (the operative date of this section), except as provided in at (c) below.

(c) Number 4 fuel oil or No. 6 fuel oil that was stored in New Jersey before (the operative date of this section), may be used, stored, offered for sale, sold, delivered, or exchanged in trade, in New Jersey, for two years after (the operative date of this section).

7:27F-3.3 Exemption

This subchapter shall not apply to fuel oil used by ocean-going vessels.

SUBCHAPTER 4. CARBON DIOXIDE EMISSION REDUCTIONS FROM BOILERS

7:27F-4.1 Definitions

The following words and terms, when used in this subchapter, have the following meanings unless the context clearly indicates otherwise.

"Boiler" means fuel burning equipment used to produce hot water or steam.

"Boiler fleet" means a facility with 10 or more fossil fuel-fired boilers. At least one of the 10 or more fossil fuel-fired boilers must have a maximum gross heat input of equal to or greater than one MMBTU/hr.

"Combustion source" means a source operation or item of equipment that combusts fuel.

"Emergency" means any situation that arises from sudden and reasonably unforeseeable events beyond the control of an owner or operator of a facility, such as an unforeseen system capacity shortage caused by an act of God, that requires immediate corrective action to prevent system collapse or to restore normal operations at the facility.

"Equipment" means any device capable of causing the emission of an air contaminant, either directly or indirectly, to the outdoor atmosphere, and any stack or chimney, conduit, flue, duct, vent, or similar device connected or attached to, or serving the equipment.

"Fossil fuel free heating mechanism" means any device that does not combust a fossil fuel to produce hot water or steam and does not cause the emission of an air contaminant at the site of the device.

"Maximum gross heat input rate" means the maximum amount of fuel a combustion source is able to combust in a given period as stated by the manufacturer of the combustion source. This term is expressed in BTUs per hour, based on the highest BTU value of the fuels combusted.

"Permit" means any preconstruction permit, operating permit, operating certificate, general permit, or general operating permit.

"Potential to emit" or "PTE" means the maximum aggregate capacity of a source operation or of a facility to emit an air contaminant under its physical and operational design. Any physical

or operational limitation on the capacity of a source operation or a facility to emit an air contaminant, including control apparatus, and restrictions on hours of operation or on the type or amount of material combusted, stored, or processed, shall be treated as part of its design if the limitation is enforceable pursuant to the conditions of approval contained in a permit issued by the Department.

"Reporting year" means the temporal period, specifically, a calendar year, during which the emissions of CO_2 that are reported in a boiler fleet report are emitted.

"Submittal year" means the calendar year in which a boiler fleet report is required to be submitted, which is the calendar year immediately after the reporting year.

7:27F-4.2 Applicability

(a) This subchapter establishes requirements and procedures concerning the control and prohibition of CO_2 emissions from certain boilers.

(b) The provisions of this subchapter shall apply to:

1. On or after January 1, 2025, any person who purchases, leases, or installs for use in New Jersey a fossil fuel-fired boiler with a maximum gross heat input rating equal to or greater than one MMBTU/hr and less than five MMBTU/hr; and

2. The owner and operator of a facility with a boiler fleet that includes at least one fossil fuel-fired boiler with a maximum gross heat input rating that is less than five MMBTU/hr.

7:27F-4.3 General provisions

(a) The owner or operator of any facility with a boiler fleet subject to this subchapter pursuant to N.J.A.C. 7:27F-4.2(b)2 shall submit to the Department a boiler fleet report for each reporting year, in accordance with the procedures of this subchapter.

(b) An owner or operator that is required to submit a boiler fleet report pursuant to (a) above, shall submit a boiler fleet report for such facility in each submittal year, unless:

1. By February 1 of the submittal year, the owner or operator submits a claim of non-applicability to the Department pursuant to N.J.A.C. 7:27F-4-9; and

2. By April 1 of the submittal year, the Department approves the claim of non-applicability, in writing.

(c) The owner or operator of any facility with a boiler fleet that is subject to this subchapter pursuant to N.J.A.C. 7:27F-4.2(b)2, is responsible for ensuring compliance with all requirements of this subchapter. An owner or operator who fails to submit a boiler fleet report that is required, under this subchapter, submits a boiler fleet report with incomplete information, fails to replace a fossil fuel-fired boiler with a maximum gross heat input rating that is less than five MMBTU/hr, or otherwise fails to comply with any provision of this subchapter shall be subject to civil penalties, in accordance with N.J.A.C. 7:27A-3 and applicable criminal penalties including, but not limited to, those set forth at N.J.S.A. 26:2C-19(f). If there is more than one person who is an owner or operator of a facility with a boiler

fleet that is subject to this subchapter pursuant to N.J.A.C. 7:27F-4.2(b)2, each such person shall be jointly and severally liable for such civil and criminal penalties.

(d) Compliance with requirements of this subchapter does not relieve any owner or operator of a facility with a boiler fleet that is subject to this subchapter pursuant to N.J.A.C. 7:27F-4.2(b)2 from the responsibility to comply with any other applicable requirements set forth in any Federal or state law, rule, or regulation, or in the conditions of approval of any permit in effect.

7:27F-4.4 Additional requirement necessary to permit a fossil fuel-fired boiler with a maximum gross heat input rating equal to or greater than one MMBTU/hr and less than five MMBTU/hr

(a) On or after January 1, 2025, no person shall cause, or in any way allow, the construction or installation of a fossil fuel-fired boiler with a maximum gross heat input rating equal to or greater than one MMBTU/hr and less than five MMBTU/hr, unless the owner or operator has received approval of an application for a new permit or permit revision/modification submitted pursuant to N.J.A.C. 7:27-8 or 22. The Department shall deny approval, unless the application includes a demonstration that a fossil fuel free heating mechanism, capable of producing the hot water or steam previously supplied by the fossil fuel-fired boiler is:

1. Technically infeasible, based on physical, chemical, or engineering principles. Technical infeasibility may include, but is not limited to, infrastructure constraints that may jeopardize the operations; or

2. Infeasible at the facility because any interruption in boiler operations caused by an electrical outage could jeopardize public health, life, or safety. An example of such a facility is a hospital or first responder facility.

7:27F-4.5 Procedure for submitting a boiler fleet report

(a) The owner or operator of any facility with a boiler fleet that is subject to this subchapter pursuant to N.J.A.C. 7:27F-4.2(b)2 as of (the operative date of this section), shall submit a boiler fleet report to the Department by the following dates:

1. On or before April 15, 2024, for the initial reporting year of 2023; and

2. For each subsequent reporting year in which the facility with a boiler fleet is subject to this subchapter, by April 15 of the submittal year.

(b) The owner or operator of any facility with a boiler fleet that becomes subject to this subchapter pursuant to N.J.A.C. 7:27F-4.2(b)2 after calendar year 2023 shall submit a boiler fleet report on forms provided by the Department by the following dates:

1. On or before April 15 of the submittal year immediately following the first reporting year in which a facility becomes subject to this subchapter; and

2. For each subsequent reporting year in which the facility is subject to this subchapter, by April 15 of the submittal year.

(c) All boiler fleet reports shall be submitted, in writing, to the Department at:

Department of Environmental Protection

Division of Air Quality Air Quality Permitting Program

Bureau of Air Permits

401 East State Street

Mail Code 401-02

PO Box 0420

Trenton, NJ 08625-0420.

7:27F-4.6 Contents of a boiler fleet report

(a) An owner or operator of a facility with a boiler fleet that is subject to this subchapter pursuant to N.J.A.C. 7:27F-4.2(b)2, shall submit a boiler fleet report that includes the following information for each fossil fuel-fired boiler located at the facility:

1. Boiler name/designation;

2. Boiler location description;

3. Function (heat/hot water/steam tracing/other);

4. Whether designated as a significant or insignificant source;

5. Permit Activity number, as applicable (equipment ID/insignificant source ID);

6. Any other numbers or labels that may be used to identify the boiler;

7. Boiler age and installation date;

8. Fossil fuel type;

9. Fuel usage during the reporting (calendar) year;

10. Maximum gross heat input rate in MMBTU/hr;

11. The CO_2 potential to emit (during the reporting year), described in tons per year; and

12. The actual CO_2 emissions (for each boiler located at the facility), described in tons per year, based upon one reporting year of usage, calculated pursuant to N.J.A.C. 7:27F-4.7.

(b) An owner or operator of a facility with a boiler fleet that is subject to this subchapter pursuant to N.J.A.C. 7:27F-4.2(b)2 shall submit a boiler fleet report that includes the following integral information for administrative purposes:

1. Facility name and facility ID number;

2. The reporting year for which the statement is being submitted;

3. A certification, in accordance with the requirements at N.J.A.C. 7:27-1.39; and

4. The date of the signature of certification, and the name, title, mailing address, and telephone number of the responsible official certifying the boiler fleet report.

7:27F-4.7 Methods to be used for quantifying actual emissions

An owner or operator of a facility with a boiler fleet that is subject to this subchapter pursuant to N.J.A.C. 7:27F-4.2(b)2 shall quantify the actual emissions of CO_2 for each boiler listed in the boiler fleet report pursuant to the method specified in the facility's permit, if applicable. If no method is specified in the facility's permit, the actual emissions of CO_2 shall be quantified for use in the boiler fleet report by following the procedures set forth at N.J.A.C. 7:27-21.6.

7:27F-4.8 Request for extension of the time to submit a boiler fleet report

(a) If meeting the due date for the submittal of a boiler fleet report, as set forth at N.J.A.C. 7:27F-4.5, would cause extreme hardship, an owner or operator of a facility with a boiler fleet subject to this subchapter pursuant to N.J.A.C. 7:27F-4.2(b)2 may request an extension.

(b) A request for an extension shall include the following information:

1. The name of the facility; the mailing address of the facility, including its zip code; and its facility ID number, as assigned by the Department;

2. The name and telephone number of the contact person for the extension request, if the contact person is different from the responsible official;

3. The name of the responsible official and the responsible official's telephone number;

4. The reasons and justifications for the inability to submit the boiler fleet report by the due date and the extreme hardship that would be prevented if the Department allows an extension of the due date;

5. The revised date by which the owner or operator commits to submitting the boiler fleet report. This revised date can be no later than one month from the due date; and

6. A certification, signed by the responsible official, in accordance with N.J.A.C. 7:27-1.39.

(c) A request for an extension shall be submitted, in writing, to the address listed at N.J.A.C. 7:27F-4.5(c).

(d) A request to extend the due date must be received by the Department by April 1 of the submittal year. The Department will not consider a request for an extension if the Department receives it after this date.

(e) Within 10 working days after receipt of a request for extension, the Department will respond with its determination as to whether the request for extension is denied or granted and, if granted, the revised date by which the boiler fleet report is due. The Department will grant an extension if the extension is necessary to prevent extreme hardship.

(f) Once an owner or operator has obtained an extension of the due date for the submission of a boiler fleet report pursuant to (a) through (e) above, the Department will not grant any additional extension for that boiler fleet report or any continuance of the initial extension.

7:27F-4.9 Determination of non-applicability

(a) An owner or operator of a facility with a boiler fleet that is subject to this subchapter pursuant to N.J.A.C. 7:27F-4.2(b)2 may request approval from the Department to discontinue submission of an annual boiler fleet report by submitting, in accordance with this section, a claim of non-applicability.

(b) An owner or operator may not submit a claim of non-applicability until the facility can demonstrate that for the immediately preceding full reporting year:

1. The fossil fuel-fired boilers located within the facility did not meet the definition of a boiler fleet because the facility:

i. Had fewer than 10 fossil fuel-fired boilers; or

ii. Had 10 or more fossil fuel-fired boilers, but none of the boilers had a maximum gross heat input of equal to or greater than one MMBTU/hr; or

2. The boiler fleet located within the facility did not meet the criteria at N.J.A.C. 7:27F-4.2(b)2 because the boiler fleet:

i. Did not include at least one fossil fuel-fired boiler with a maximum gross heat input rating less than five MMBTU/hr; or

ii. Included a fossil fuel-fired boiler(s) with a maximum gross heat input rating that is less than five MMBTU/hr, but such fossil fuel-fired boiler(s) was authorized to operate based upon one of the criteria set forth at N.J.A.C. 7:27F-4.4 and as approved by the Department in a permit.

(c) A claim of non-applicability must include the following information:

1. The name of the facility; the mailing address of the facility, including its zip code; and its facility ID number, as assigned by the Department;

2. The name and telephone number of the boiler fleet report contact for the facility, if the contact person is different than the responsible official;

3. The name of the responsible official and the responsible official's telephone number;

4. A demonstration as set forth at (b) above;

5. A statement as to whether the owner or operator of the facility anticipates that conditions at the facility may change in such a manner so that the requirements of this subchapter may again become applicable to the facility in the future and, therefore, the facility may become obligated to recommence submission of boiler fleet reports; and

6. A certification, signed by the responsible official, in accordance with N.J.A.C. 7:27-1.39.

(d) A claim of non-applicability shall be submitted to the address listed at N.J.A.C. 7:27F-4.5(c).

(e) If an administratively complete claim of non-applicability is received between February 2 of the preceding calendar year and February 1 of the current calendar year, the Department will respond by April 1. The Department's response will set forth the Department's determination as to whether the Department concurs that this subchapter no longer applies to the facility. The Department will not approve any claim of non-applicability unless it is satisfied that:

1. The facility has made the demonstration required pursuant to (b) above; and

2. The facility will not in the foreseeable future change in such a manner that the facility would be subject to the reporting requirements of this subchapter.

(f) An owner or operator who has submitted a claim of non-applicability shall continue to submit a boiler fleet report in each submittal year unless the owner or operator has received a response from the Department on or before April 1 of that year, that states that the Department concurs with the claim of non-applicability and approves discontinuance of submission of boiler fleet reports for the facility. Failure of the Department to respond by April 1 to the submission of a claim of non-applicability does not relieve the owner or operator of the responsibility to submit a boiler fleet report, nor does it constitute the Department's concurrence with the claim of non-applicability.

(g) An approval of a claim of non-applicability will not relieve the facility's obligation to submit a boiler fleet report to the Department, if the facility becomes subject to the requirements of this subchapter after the Department issues the approval.

7:27F-4.10 Recordkeeping

(a) For each boiler fleet report submitted to the Department, the owner or operator of the facility shall maintain the following records at the facility for a period of five years from the date each report is due:

1. A copy of each boiler fleet report submitted to the Department;

2. Records indicating how the information submitted in the boiler fleet report was determined, including any calculations, data, measurements, and estimates used; and

3. Each written justification required pursuant to N.J.A.C. 7:27F-4.7 documenting the basis for the selection of the method for quantifying emissions.

(b) Upon the request of the Department, the owner or operator of the facility shall make these records available at the facility for inspection by any representative of the Department during normal business hours.

(c) Upon receipt of a written request from the Department, the owner or operator of the facility shall timely submit a copy of any or all of the records specified at (a) above to the Department by mail or by other means as agreed to by the Department.

7:27F-4.11 Affirmative defense in case of emergency

(a) On or after January 1, 2025, a facility may assert an affirmative defense for installing a fossil fuel-fired boiler to replace an existing fossil fuel-fired boiler; however, the affirmative defense is subject to review and approval by the Department. The affirmative defense shall be available for a violation of a provision or condition of this subchapter only if:

1. The installation of a fossil fuel-fired boiler to replace an existing fossil fuel-fired boiler is required by an emergency, as defined at N.J.A.C. 7:27F-4.1;

2. The facility submits an application for a permit or permit modification pursuant to N.J.A.C. 7:27F-4.4(a)2 no later than 30 days after the installation; and

3. The facility asserts the affirmative defense in its application for a permit or permit modification, by providing evidence that establishes both the emergency situation and the facility's eligibility for a permit pursuant to N.J.A.C. 7:27F-4.4(a)2.