APPENDIX A

STAFF REPORT: INITIAL STATEMENT OF REASONS

Proposed Fuel Cell Net Energy Metering Greenhouse Gas Emission Standards Regulation

Proposed Regulation Order

State of California

AIR RESOURCES BOARD

Release Date: October 22, 2019

Fuel Cell Net Energy Metering Greenhouse Gas Emission Standards Regulation

Subchapter 10. Climate Change
Article 4. Regulations to Achieve Greenhouse Gas Emission Reductions

Adopt new subarticle 5.2. Fuel Cell Net Energy Metering Greenhouse Gas Emission Standards, sections 95408, 95409, 95410, 95411, and 95412, California Code of Regulations, to read as follows:

(Note: The entire text set forth below is new language in "normal type" proposed to be added to the California Code of Regulations.)

Subarticle 5.2. Fuel Cell Net Energy Metering Greenhouse Gas Emission Standards

§ 95408. Purpose

The purpose of this regulation is to establish a schedule of annual greenhouse gas emissions reduction standards for an eligible fuel cell electrical generation resource as required by section 2827.10 of the Public Utilities Code.

Note: Authority cited: Sections 39600 and 39601, Health and Safety Code, and section 2827.10, Public Utilities Code. Reference: Section 2827.10, Public Utilities Code.

§ 95409. Applicability

The provisions of this Article apply to fuel cell electrical generation resources that participate in fuel cell net energy metering under section 2827.10 of the Public Utilities Code.

Note: Authority cited: Sections 39600 and 39601, Health and Safety Code, and section 2827.10, Public Utilities Code. Reference: Section 2827.10, Public Utilities Code.

§ 95410. Definitions and Acronyms

(a) For the purposes of this Article, the following definitions apply.

(1) **"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 about 39.2 degrees Fahrenheit.

(2) **"Carbon dioxide" or "CO_2"** means the most common of the six primary greenhouse gases, consisting on a molecular level of a single carbon atom and two oxygen atoms.

(3) **"Carbon dioxide equivalent" or "CO_2e"** means the number of metric tons of CO_2 emissions with the same global warming potential as one metric ton of another greenhouse gas when calculated using the individual global warming potentials as specified in the "global warming potential" definition of this Article.

(4) **"Global warming potential" or "GWP"** means the ratio of the time-integrated radiative forcing from the instantaneous release of one kilogram of a trace substance relative to that of one kilogram of a reference gas (i.e., CO_2). For 2011 through 2020 data years, the GWP values used for emissions estimation and reporting are as specified in Table A-1 to Subpart A of Title 40, Code of Federal Regulations Part 98 as published to the Federal Register on October 30, 2009, which is hereby incorporated by reference. For data years 2021 and onward, the GWP values are as specified in the Table A-1 to Subpart A of Title 40 Code of Federal Regulations Part 98 as published to the Federal Register on December 11, 2014, which is hereby incorporated by reference.

(5) **"Greenhouse gas" or "GHG"** means carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), sulfur hexafluoride (SF_6), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and other fluorinated greenhouse gases.

(6) **"Megawatt-hour" or "MWh"** means the electrical energy unit of measure equal to one million watts of power supplied to, or taken from, an electric circuit steadily for one hour.

Note: Authority cited: Sections 39600 and 39601, Health and Safety Code, and section 2827.10, Public Utilities Code. Reference: Section 2827.10, Public Utilities Code.

§ 95411. Greenhouse Gas Emission Standards

For purposes of section 2827.10 of the Public Utilities Code, the average annual greenhouse gas emission standards for an eligible fuel cell electrical generation resource for years 2017 through 2022 shall be:

Year	Average Annual GHG Emission Standards (kg CO_2e/MWh)
2017	409

2018	399
2019	389
2020	379
2021	370
2022	360

Note: Authority cited: Sections 39600 and 39601, Health and Safety Code, and section 2827.10, Public Utilities Code. Reference: Section 2827.10, Public Utilities Code.

§ 95412. Greenhouse Gas Emission Standards Methodology

(a) Beginning in 2022, and every three years thereafter until 2047, the Executive Officer shall calculate the annual greenhouse gas emission standards for the next three years and publish them on the California Air Resources Board (CARB) website using the process outlined in section 95412(a)(1)-(4). The calculation will be performed on the second Monday of November and published on the CARB website within five business days.

(1) Calculate the standard for the calendar year following the year in which the triennial update is occurring using the following equation:

$$FCNEM_{y+1} = CSC\ ER_{y-1} * \frac{(HR - HR0_{y-1})}{HR}$$

Where:

FCNEM = Fuel cell net energy metering GHG emission standard

$FCNEM_{y+1}$ = FCNEM GHG emission standard for year *y+1* ($kgCO_2e/MWh$)

y = Calendar year in which the update is occurring

CSC ER_{y-1} = CEC GHG emission rate ($kgCO_2e/MWh$) for combined/simple cycle gas power plants for year *y-1,* or the most recent year that data is available

"HR" = Number of hours in a year (8,760 for years with 365 days)

"$HR0_{y-1}$" = Hours the day-ahead market electricity price was at or below zero for year "*y-1*" or the most recent year that day-ahead market electricity price data are available from the California Independent System Operator Department of Market Monitoring Unit, published annually pursuant to the Code of Federal Regulations, title 18, section 35.28(g)(3)

"CSC ER_{y-1}" is calculated as follows:

$$CSC\ ER_{y-1} = CEC\ SA_{y-1} * 0.001 * 53.07$$

Where:

CEC SA_{y-1} = State average natural gas-fired electric generation heat rate value (Btu/kWh), excluding cogeneration plants, for year *y-1,* or the most recent year that data are available from the California Energy Commission pursuant to California Code of Regulations, Title 20, Division 2, Chapter 3, Section 1304(a)

0.001 = Conversion factor Btu/kWh to million Btu (MMBtu)/MWh

53.07 = Conversion factor MMBtu/MWh to $kgCO_2e$/MWh

(2) Calculate the standard for the calendar year two years after the year in which the triennial update is occurring using the following equation:

$$FCNEM_{y+2} = FCNEM_{y+1} * 0.975$$

Where:

FCNEM = Fuel cell net energy metering GHG emission standard

$FCNEM_{y+2}$ = FCNEM GHG emission standard for year *y+2* ($kgCO_2e$/MWh)

y = Calendar year in which the update is occurring

0.975 = Adjustment to reduce annual GHG emission standard by 2.50 percent

(3) Calculate the standard for the calendar year three years after the year in which the triennial update is occurring using the following equation:

$$FCNEM_{y+3} = FCNEM_{y+2} * 0.975$$

Where:

FCNEM = Fuel cell net energy metering GHG emission standard

$FCNEM_{y+3}$ = FCNEM GHG emission standard for year *y+3* ($kgCO_2e$/MWh)

y = Calendar year in which the update is occurring

0.975 = Adjustment to reduce annual GHG emission standard by 2.50 percent

(4) If in any year $FCNEM_{y+1}$, as calculated per section 95412(a)(1), is greater than $FCNEM_y$, $FCNEM_{y+1}$ shall be calculated as follows:

$$FCNEM_{y+1} = FCNEM_y * 0.975$$

Where:

FCNEM = Fuel cell net energy metering GHG emission standard

$FCNEM_{y+1}$ = FCNEM GHG emission standard for year *y+1* ($kgCO_2e/MWh$)

y = Calendar year in which the update is occurring

0.975 = Adjustment to reduce annual GHG emission standard by 2.50 percent

Note: Authority cited: Sections 39600 and 39601, Health and Safety Code, and section 2827.10, Public Utilities Code. Reference: Section 2827.10, Public Utilities Code.