

## TITLE 17. CALIFORNIA AIR RESOURCES BOARD

### NOTICE OF PUBLIC HEARING TO CONSIDER PROPOSED AMENDMENTS TO THE REGULATION FOR REDUCING SULFUR HEXAFLUORIDE EMISSIONS FROM GAS INSULATED SWITCHGEAR

The California Air Resources Board (CARB or Board) will conduct a public hearing at the date and time noted below to consider the proposed amendments to the Regulation for Reducing Sulfur Hexafluoride Emissions from Gas Insulated Switchgear (SF<sub>6</sub> Regulation or Regulation).

DATE: September 24, 2020

TIME: 12:00 P.M.

Please see the Public Agenda which will be posted ten days before the September 24, 2020, Board Meeting for any appropriate direction regarding a possible remote-only Board Meeting. If the meeting is to be held in person, it will be held at the California Air Resources Board, Byron Sher Auditorium, 1001 I Street, Sacramento, California 95814.

This item will be considered at a meeting of the Board, which will commence at 12:00 p.m., September 24, 2020, and may continue at 8:30 a.m., on September 25, 2020. Please consult the agenda for the hearing, which will be available at least ten days before September 24, 2020, to determine the day on which this item will be considered.

#### **WRITTEN COMMENT PERIOD AND SUBMITTAL OF COMMENTS**

Interested members of the public may present comments orally or in writing at the hearing and may provide comments by postal mail or by electronic submittal before the hearing. The public comment period for this regulatory action will begin on July 24, 2020. Written comments not physically submitted at the hearing must be submitted on or after July 24, 2020 and received **no later than September 22, 2020**. CARB requests that when possible, written and email statements be filed at least 10 days before the hearing to give CARB staff and Board members additional time to consider each comment. The Board also encourages members of the public to bring to the attention of staff in advance of the hearing any suggestions for modification of the proposed regulatory action. Comments submitted in advance of the hearing must be addressed to one of the following:

Postal mail: Clerks' Office, California Air Resources Board  
1001 I Street, Sacramento, California 95814

Electronic submittal: <http://www.arb.ca.gov/lispub/comm/bclist.php>

Please note that under the California Public Records Act (Gov. Code, § 6250 et seq.), your written and oral comments, attachments, and associated contact information (e.g., your address, phone, email, etc.) become part of the public record and can be released to the public upon request.

Additionally, the Board requests but does not require that persons who submit written comments to the Board reference the title of the proposal in their comments to facilitate review.

## **AUTHORITY AND REFERENCE**

This regulatory action is proposed under the authority granted in California Health and Safety Code, sections 38510, 38560, 38580, 39600, 39601, 41510, 41511 and 41513. This action is proposed to implement, interpret, and make specific sections 38560, 38580, 39600, 39601, 41510, 41511 and 41513.

## **INFORMATIVE DIGEST OF PROPOSED ACTION AND POLICY STATEMENT OVERVIEW (GOV. CODE, § 11346.5, subd. (a)(3))**

**Sections Affected:** Proposed amendment to California Code of Regulations, title 17, sections 95350, 95351, 95352, 95353, 95354, 95355, 95356, 95357, 95358, and 95359. Proposed adoption of California Code of Regulation, title 17, sections 95354.1, 95357.1 and 95359.1.

## **Documents Incorporated by Reference (Cal. Code Regs., tit. 1, § 20, subd. (c)(3)):**

United States Environmental Protection Agency. 2014. Mandatory Reporting of Greenhouse Gases; Final Rule. Title 40 Code of Federal Regulations, Part 98, Subpart A, Table A-1. December 11, 2014. <https://www.govinfo.gov/content/pkg/FR-2014-12-11/pdf/2014-28444.pdf>, Section 95351(a).

## **Background and Effect of the Proposed Regulatory Action:**

CARB staff is proposing amendments to the Regulation for Reducing Sulfur Hexafluoride Emissions from Gas Insulated Switchgear (Regulation, title 17, California Code of Regulations, sections 95350 et. seq.). The Regulation was originally enacted as an early action measure pursuant to the California Global Warming Solutions Act of 2006 (Assembly Bill 32 or AB 32; Chapter 488, Statutes of 2006) to reduce SF<sub>6</sub> emissions from the electricity sector's transmission and distribution system. AB 32 established an initial goal for California to reduce statewide greenhouse gas (GHG) emissions to 1990 levels by 2020 and to maintain and continue GHG emissions reductions beyond 2020. The current Regulation requires owners of gas-insulated switchgear (GIS) to report the following annually: SF<sub>6</sub> emissions, an inventory of their GIS that use SF<sub>6</sub> as an insulating gas, information related to containers that store SF<sub>6</sub> gas, and transfers of SF<sub>6</sub> into or out of GIS. The proposed amendments would also change the term "GIS" to "gas-insulated equipment" (GIE) to clarify that more devices

beyond switchgear are covered by the Regulation. This terminology change would not affect the types of devices covered under the Regulation, and the term GIE will be used throughout this document.

SF<sub>6</sub> is an extremely powerful and long-lived GHG. The 100-year global warming potential (GWP) of SF<sub>6</sub>, which indicates its heat-absorbing ability relative to that of carbon dioxide (CO<sub>2</sub>) over a 100-year period, is 22,800, making it the most potent of the six main GHGs. Because of its extremely high GWP, small reductions in SF<sub>6</sub> emissions can have a large impact on reducing GHG emissions, which are the main drivers of climate change. The current Regulation requires reductions of SF<sub>6</sub> emissions from GIS over time, setting an annual emission rate limit that each GIE owner may not exceed. The maximum allowable emission rate started at ten percent in 2011, and has decreased one percent per year since then. In the absence of proposed changes to the Regulation, in 2020, the limit would reach one percent and would remain at that level going forward. Data reported under the Regulation show that statewide SF<sub>6</sub> capacity is growing by one to five percent per year, and projections provided by GIE owners indicate that this trend will continue into the future. Because, under the current Regulation, the emissions limit would remain equivalent to one percent of annual capacity, as capacity grows, so too would expected emissions.

The Legislature reaffirmed California's commitment to take further action against climate change by adopting Senate Bill (SB) 32 (Chapter 250, Statutes of 2016), which further directs the State to reduce its GHG emissions to at least 40 percent below the 1990 level by 2030. In 2019, CARB initiated a process to explore achievable paths toward carbon neutrality and is working to implement direction provided in Board Resolution 17-46 to evaluate and explore opportunities to achieve additional significant cuts in GHG emissions from all sources.

Considerable progress has been made in the past decade to develop non-SF<sub>6</sub> GIE; across the voltage spectrum, manufacturers now either offer market-ready non-SF<sub>6</sub> GIE or have development plans in the foreseeable future. Despite this progress, inventory data reported under the Regulation show that SF<sub>6</sub> capacity in the State has been growing, meaning that non-SF<sub>6</sub> technologies have not yet been widely adopted, and staff projects that SF<sub>6</sub> capacity will continue growing well into the future. This indicates that a regulatory change is necessary to drive the transition away from the use of SF<sub>6</sub> in GIE.

In response to California's aggressive climate goals and the increasing availability of technology that does not use SF<sub>6</sub>, CARB staff is proposing to amend the Regulation to clarify regulatory coverage, expand the scope to include other GHGs beyond SF<sub>6</sub>, drive GHG emissions reductions, accelerate the transition to technologies that do not use SF<sub>6</sub>, improve the ability of equipment owners with relatively small amounts of SF<sub>6</sub> to comply with the Regulation, specify reporting and accounting procedures to increase reporting accuracy and facilitate tracking of GHGs covered under the proposed Regulation, and improve CARB staff's ability to verify reported data.

Due to the expansion in the Regulation's scope to include other GHGs beyond SF<sub>6</sub>, and the terminology change from GIS to GIE, CARB staff is proposing to change the name of the Regulation to the "Regulation for Reducing Greenhouse Gas Emissions from Gas Insulated Equipment." If enacted, the amendments will go into effect following the schedule described in the Proposed Regulation Order. Some changes will become effective the day the Regulation is finalized and will impact each GIE owner's data year<sup>1</sup> 2020 annual report (due June 1, 2021). Other changes that require new data to be collected will become effective January 1, 2021, or after.

CARB may also consider other changes to the sections affected, as listed on page two of this notice, during the course of this rulemaking process.

### **Objectives and Benefits of the Proposed Regulatory Action:**

The proposed Regulation would establish a timeline for phasing out acquisition of SF<sub>6</sub> GIE in California that would take effect in stages between 2025 and 2033. The proposed amendments would reduce total GHG emissions from GIE, improve the ability of small GIE owners to comply, improve accuracy in reported emissions, and improve CARB staff's ability to verify reported data. The proposed Regulation has been developed with the help of a robust informal public process, which included three publicly noticed workshops and one publicly noticed working group meeting from November 2017 through August 2019. The proposed amendments would:

- Expand the scope of the Regulation to cover emissions of all insulating gases with a global warming potential (GWP) greater than one, and clarify terminology related to which GIE are covered by the Regulation;
- Establish a timeline for phasing out acquisition of SF<sub>6</sub> GIE in California and create an incentive to encourage GIE owners to acquire non-SF<sub>6</sub> GIE prior to the phase-out;
- Establish a process through which GIE owners could be granted a phase-out exemption to allow them to acquire SF<sub>6</sub> GIE after the phase-out, but only when certain conditions are met;
- Establish alternative emissions limits for small-capacity GIE owners to improve their ability to comply with the Regulation, assign each GIE owner an emissions limit in metric tons of CO<sub>2</sub> equivalent (MTCO<sub>2e</sub>) (as opposed to the current SF<sub>6</sub>-specific emission rate limit), and establish methods to minimize the growth of the emissions limit over time; and
- Revise reporting requirements to improve reporting accuracy, clarify requirements, close gaps in accounting for SF<sub>6</sub> and other covered insulated gases, and improve CARB staff's ability to verify reported data.

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<sup>1</sup> "Data year" means the calendar year for which a GIE owner must submit an annual GHG emissions data report.

Staff analyzed the impacts of the amendments, in particular the installation of non-SF<sub>6</sub> GIE due to the phase-out, through 2036, the year after which all requirements in the proposed Regulation would come into effect. Absent the proposed amendments, staff estimates that SF<sub>6</sub> emissions in 2036 would be 364,000 MTCO<sub>2e</sub>, a significant increase relative to estimated emissions of 286,000 MTCO<sub>2e</sub> in 2024, the year before the phase-out begins. By contrast, the proposed Regulation will reduce the 2036 emissions level to be approximately 283,000 MTCO<sub>2e</sub>. Cumulative emissions reductions for the period 2020 to 2036 will be approximately 391,000 MTCO<sub>2e</sub>. Because GIE lasts approximately 40 years, though, emissions reductions from non-SF<sub>6</sub> GIE acquired between 2025 and 2036 will continue through 2075, resulting in cumulative emissions reductions of approximately 3,143,000 MTCO<sub>2e</sub>.

Each of these proposed changes to the Regulation are explained here in further detail.

### ***Expanding Scope and Clarifying Coverage of the Regulation***

The purpose of the proposed Regulation is to further reduce emissions by phasing out SF<sub>6</sub> use so that GIE owners will transition to use of non-SF<sub>6</sub> GIE, some of which may utilize GHGs other than SF<sub>6</sub> that have substantially lower GWPs than SF<sub>6</sub>. The introduction of insulating gases that contain a GHG other than SF<sub>6</sub> necessitates expanding the scope of the Regulation to include GHGs with a GWP greater than one. Staff proposes only to require the reporting and regulatory coverage of insulating gases with a GWP greater than one because the amount of GHGs with GWPs less than or equal to one that would be used in GIE would have a relatively small potential impact to global warming (in MTCO<sub>2e</sub>). This is because the volume of insulating gas with a GWP less than or equal to one contained in GIE through the State is anticipated to be very low. If all SF<sub>6</sub> in active, non-hermetically sealed GIE in California at present were converted to CO<sub>2</sub>, the amount of CO<sub>2</sub> in GIE statewide would be about 1,000 MTCO<sub>2e</sub>. Annual CO<sub>2</sub> emissions in this case would be roughly ten metric tons (assuming a one-percent leak rate as required by the Regulation), which is roughly equivalent to the emissions from driving two passenger vehicles for a year.<sup>2</sup>

Throughout the proposed Regulation and this document, the term “SF<sub>6</sub>” was in many places replaced with “insulating gas with a GWP greater than one” or “covered insulating gas,” except in cases where specific references to SF<sub>6</sub> are still needed. Coverage of these alternative gases in the Regulation ensures continued tracking of GHGs from the operation of GIE in the state. It also facilitates recognition of the transition from SF<sub>6</sub> GIE to non-SF<sub>6</sub> GIE.

### ***SF<sub>6</sub> Phase-Out and Early Action Credit***

In Table 1 and Table 2 of the proposed Regulation, CARB staff proposes a schedule for the phase-out of the acquisition of new SF<sub>6</sub> GIE. The phase-out dates differ according

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<sup>2</sup> U.S. EPA Greenhouse Gas Equivalencies Calculator: <https://www.epa.gov/energy/greenhouse-gas-equivalencies-calculator>. Last accessed November 20, 2019.

to voltage capacity, short-circuit current rating, and configuration (i.e., above or below ground). Non-SF<sub>6</sub> GIE either do not contain a GHG or use insulating gas with a significantly lower GWP than SF<sub>6</sub>, so the transition from SF<sub>6</sub> GIE to non-SF<sub>6</sub> GIE will have the benefit of reducing GHG emissions. In developing the phase-out schedule, CARB staff consulted with more than ten manufacturers currently developing non-SF<sub>6</sub> GIE to learn when their products are expected to be commercially available. Additionally, based on stakeholder comments about the amount of time their organizations generally require to ensure that new products are safe, reliable, and deployable, CARB staff included a three-year period between expected commercial availability and proposed phase-out dates.

Because the phase-out dates would not begin until 2024, and certain types of non-SF<sub>6</sub> GIE are available now, the proposed regulatory amendments also include an early action credit. The early action credit would encourage GIE owners to place 72.5 kV or greater non-SF<sub>6</sub> circuit breakers into active service prior to the applicable phase-out date for those devices, which should lead to additional reductions in GHG emissions. The proposed credit is roughly equivalent to the amount of SF<sub>6</sub> in a comparable SF<sub>6</sub> circuit breaker.

### ***SF<sub>6</sub> Phase-Out Exemption Process***

As described above, CARB staff developed the phase-out schedule after discussing non-SF<sub>6</sub> GIE availability dates with over ten manufacturers for over a year. CARB staff, however, recognizes that, in some specific cases, GIE owners may need to install SF<sub>6</sub> GIE after the corresponding phase-out date.

Therefore, the proposed Regulation adds a new exemption process that allows GIE owners to acquire SF<sub>6</sub> GIE after the applicable phase-out date under the following conditions: when the GIE owner submits, and CARB approves, an SF<sub>6</sub> phase-out exemption request; when the SF<sub>6</sub> GIE device was present in the State for a prior data year; when the SF<sub>6</sub> GIE device was purchased prior to the applicable phase-out date (provided the SF<sub>6</sub> GIE device enters California no later than 24 months after the purchase date); or when the SF<sub>6</sub> GIE device is a replacement provided by the manufacturer under the terms of the manufacturer's warranty.

To obtain a phase-out exemption, the GIE owner must submit a phase-out exemption request to CARB that would explain and justify the need for the exemption. If the request is approved, the GIE owner could acquire the SF<sub>6</sub> GIE described in the request and install the SF<sub>6</sub> GIE in the location(s) described in the exemption request.

### ***Revisions to the Emission Rate Limit***

The proposed Regulation contains revisions that would change the allowed emissions levels for GIE owners with smaller capacities of SF<sub>6</sub> and other covered insulating gases. As explained below, this change will enable small-capacity GIE owners to comply with the Regulation. Further, the proposed Regulation transitions the basis for evaluating

emissions compliance from an emission rate limit to an emissions limit measured in MTCO<sub>2e</sub>. The emissions limit will be structured to support the phase-out of SF<sub>6</sub>, incentivize adoption of non-SF<sub>6</sub> GIE, and ensure continued emissions reductions despite the anticipated growth of GIE capacity in this sector.

a. Transition to an Annual Emissions Limit

The proposed Regulation includes a new method for GIE owners to calculate their emissions limit in terms of MTCO<sub>2e</sub> rather than percent of average system capacity. From 2020<sup>3</sup> through 2024, GIE owners with average system capacities of 10,000 MTCO<sub>2e</sub> or greater will have an emissions limit equivalent to one percent of average system capacity (considering all insulating gases with a GWP greater than one), maintaining equivalency with the current Regulation.

The proposed Regulation increases the emissions limits for the smallest GIE owners. CARB staff's goal for the proposed Regulation was to set emission limits such that GIE owners of all sizes would be held to stringent but reasonable limits on emissions. Given the difficulty in achieving a one-percent emission rate for GIE owners with average system capacities below 10,000 MTCO<sub>2e</sub>, and the fact that these owners make up less than two percent of statewide SF<sub>6</sub> capacity, staff proposes a threshold of 10,000 MTCO<sub>2e</sub>, below which the emissions limit would be set at the equivalent of two percent of average system capacity from 2020 to 2034, or 50 MTCO<sub>2e</sub>, whichever is greater.

While allowing these GIE owners to have higher GHG emissions limits than allowed under the current Regulation may seem to run contrary to the goal of reducing GHG emissions, setting an emissions limit that is too low for these GIE owners to comply with is an ineffective way to reduce GHG emissions. Setting a realistic target could help incentivize small-capacity GIE owners to reduce their emissions, where possible, to ensure compliance, which should be achievable under the revised limits.

b. Establishing a Baseline to Incentivize Adoption of Non-SF<sub>6</sub> GIE and Emissions Limit Stepdown

Because smaller capacities of SF<sub>6</sub> and other covered insulating gases can make compliance with the emissions limit more challenging, staff was concerned that establishing an emissions limit that is equivalent to one or two percent of active, non-hermetically sealed system capacity could actually disincentivize the replacement of SF<sub>6</sub> GIE with non-SF<sub>6</sub> GIE. That is, GIE owners may keep and operate their SF<sub>6</sub> GIE longer to maintain a higher capacity level. To address this issue, the proposed Regulation includes a baseline approach which would "fix" average system capacity (that is, the GIE owner's capacity against which emissions compliance is assessed) at a point in time, after which any reduction in actual SF<sub>6</sub> capacity would not result in a commensurate reduction in average system capacity.

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<sup>3</sup> For data year 2020 only, the emissions limit considers SF<sub>6</sub> only. See the discussion in section III of this ISOR, Rationale for Section 95353(b)(1).

An emissions limit with a fixed baseline would incentivize a GIE owner to replace SF<sub>6</sub> GIE with non-SF<sub>6</sub> GIE after the baseline is set because the implementation of non-SF<sub>6</sub> GIE would decrease the actual amount of SF<sub>6</sub> in their system, which would reduce the risk of SF<sub>6</sub> emissions, without any corresponding decrease in average system capacity used to evaluate regulatory compliance. This transition from SF<sub>6</sub> GIE to non-SF<sub>6</sub> GIE should result in additional reductions in GHG emissions.

Because average system capacity will not decrease when SF<sub>6</sub> GIE are replaced with non-SF<sub>6</sub> GIE, the equivalent allowed emission rate will effectively grow over time, making it easier to comply with the Regulation. To ensure that the Regulation remains equally ambitious over time, CARB staff proposes that, in 2035, each GIE owner's emissions limit will be reduced by five percent, and remain at that level going forward, to maintain an effective emission rate limit near one or two percent.

### ***Changes to Required Procedures and Reported Elements***

Finally, the proposed Regulation contains revisions that would change reporting requirements to improve reporting accuracy, clarify requirements, close gaps in accounting for SF<sub>6</sub> and other covered insulated gases, and improve CARB staff's ability to verify reported data.

### ***Benefits of Proposed Amendments***

In total, the staff proposal achieves the following outcomes:

- Establishes an SF<sub>6</sub> phase-out schedule with unique dates for nine GIE categories, based on GIE voltage capacity, short-circuit current rating, and whether the GIE would be used above or below ground. The schedule is consistent with expected non-SF<sub>6</sub> product availability from at least two manufacturers in each of those categories and the phase-out dates are set to be three years after this availability. These factors are responsive to stakeholder feedback that non-SF<sub>6</sub> GIE must be available from more than one manufacturer and that GIE owners need approximately three years to familiarize themselves with the new GIE in advance of the phase-out dates. For non-SF<sub>6</sub> GIE that are available today, CARB staff set the earliest phase-out date to be 2025 to accommodate the three- to five-year capital planning cycle that GIE owners indicated they undertake.
- Includes an SF<sub>6</sub> phase-out exemption request process that offers GIE owners flexibility to acquire SF<sub>6</sub> GIE after the phase-out when non-SF<sub>6</sub> GIE are unavailable from at least two suppliers, and when available non-SF<sub>6</sub> GIE either cannot meet the size requirements, cannot be used due to incompatibility with existing infrastructure, or are not suitable based on safety or reliability requirements. In response to stakeholder feedback, the exemption request process allows for expedited approvals in the wake of a catastrophic failure affecting the GIE owner's SF<sub>6</sub> or non-SF<sub>6</sub> GIE, shortening the review period to 14 days instead of the standard 75 days when a catastrophic failure has occurred.



- In recognition of stakeholder feedback and the fact that non-SF<sub>6</sub> GIE are available for some applications today, GIE owners that install qualifying non-SF<sub>6</sub> GIE in advance of the applicable phase-out date will receive an early action credit that can be added to the GIE owner's baseline starting in 2025. By being early adopters of non-SF<sub>6</sub> GIE, GIE owners will gain more experience with them, smoothing the transition to non-SF<sub>6</sub> GIE more broadly.
- Establishes emissions limits that all GIE owners can meet, regardless of their average system capacity. The emissions limits for GIE owners with average system capacity of less than 10,000 MTCO<sub>2e</sub> will have an emissions limit equivalent to two-percent of their average system capacity, rather than having to meet the one-percent limit specified in the current Regulation. GIE owners of this size have demonstrated the difficulties they face in achieving a one-percent emission rate on an annual basis, and this adjustment allows them to maintain their 2019 allowed emission rate.
- Promotes accurate accounting of GHG emissions from GIE throughout the State by expanding the current Regulation to cover additional GHGs expected to be used as insulating gases in GIE in the coming years. The GWP of some emerging insulating gases is less than one. As a result of stakeholder feedback and the relatively small potential impact to global warming (in MTCO<sub>2e</sub>) of GIE equipment using GHGs with GWPs less than or equal to one, staff proposes only to require the reporting and regulatory coverage of insulating gases with a GWP greater than one. Other revisions to the reporting requirements will improve CARB staff's ability to verify the reported values.

### **Comparable Federal Regulations:**

In 2017, ten of the GIE owners subject to the Regulation also filed an emissions report to United States Environmental Protection Agency (U.S. EPA) under 40 CFR Part 98 (Greenhouse Gas Reporting Program or GHGRP) Subpart DD.<sup>4</sup> U.S. EPA's GHGRP requires reporting of GHG emissions data and other relevant information from GIE owners whose aggregate nameplate capacity of non-hermetically sealed GIE exceed 17,820 pounds of SF<sub>6</sub> or perfluorinated compounds.<sup>5</sup> U.S. EPA states that these data can be used by businesses and others to track and compare facilities' GHG emissions and identify opportunities to reduce pollution, minimize wasted energy, and save money.<sup>6</sup> U.S. EPA's GHGRP does not require that emissions be reduced; it only requires that they be reported. This stands in contrast to CARB's Regulation, which was enacted as an early action measure under AB 32 for the purpose of achieving GHG emissions reductions. As such, more granular data are required to be reported under CARB's Regulation, which requires that all GIE owners in California report emissions and ensure that they do not exceed the applicable emissions limit.

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<sup>4</sup> U.S. EPA Greenhouse Gas Reporting Program data, accessed through FLIGHT: <https://go.usa.gov/xpX98>.

<sup>5</sup> Subpart DD, Greenhouse Gas Reporting Program - Electric Transmission and Distribution Equipment Use: [https://www.epa.gov/sites/production/files/2018-02/documents/dd\\_infosheet\\_2018.pdf](https://www.epa.gov/sites/production/files/2018-02/documents/dd_infosheet_2018.pdf)

<sup>6</sup> Greenhouse Gas Reporting Program (GHGRP): <https://www.epa.gov/ghgreporting/learn-about-greenhouse-gas-reporting-program-ghgrp>

U.S. EPA's GHGRP is not a comparable federal regulation because it has a high reporting threshold and lacks any emissions limit. CARB's Regulation is needed to support mandated GHG emissions reductions, as set by SB 32, and follow the direction provided in Board Resolution 17-46 to evaluate and explore opportunities to achieve additional significant cuts in GHG emissions from all sources.

**An Evaluation of Inconsistency or Incompatibility with Existing State Regulations (Gov. Code, § 11346.5, subd. (a)(3)(D)):**

During the process of developing the proposed regulatory action, CARB conducted a search of any similar regulations on this topic and concluded the proposed regulation is neither inconsistent nor incompatible with existing State regulations.

**DISCLOSURE REGARDING THE PROPOSED REGULATION**

**Fiscal Impact/Local Mandate Determination Regarding the Proposed Action (Gov. Code, § 11346.5, subds. (a)(5)&(6)):**

The determinations of the Board's Executive Officer concerning the costs or savings incurred by public agencies and private persons and businesses in reasonable compliance with the proposed regulatory action are presented below.

Under Government Code sections 11346.5, subdivision (a)(5) and 11346.5, subdivision (a)(6), the Executive Officer has determined that the proposed regulatory action would create costs or savings to any State agency, would not create costs or savings in federal funding to the State, would not create costs or mandate to any local agency or school district, whether or not reimbursable by the State under Government Code, title 2, division 4, part 7 (commencing with section 17500), or other nondiscretionary cost or savings to State or local agencies.

***Cost to any Local Agency or School District Requiring Reimbursement under section 17500 et seq.:***

The proposed regulatory action would not impose a mandate on local agencies, and the costs to local agencies would not be reimbursable by the State because the proposed Regulation does not mandate local agencies to provide a service to the public. Further, the requirements are of general applicability because they apply to all GIE owners regardless of whether the owners are local agencies or private businesses.

Because some regulatory provisions begin in 2020, all mentions of cumulative cost will cover the entire analysis period (2020–2036). However, since there are no incremental costs or cost savings between 2020 and 2024, all average costs and cost savings discussed below are averages over the 12-year period (2025–2036) with non-zero costs.

Because the phase-out requirement will not be implemented until 2025, there will be no

costs to local government in the fiscal year that the proposed Regulation will be effective (2020–2021) and the two subsequent fiscal years. However, there will be costs and cost savings to 49 local agencies that are mainly publicly owned utilities across California. Local government agencies would incur the higher capital cost for non-SF<sub>6</sub> GIE upfront but would benefit from maintenance and reporting cost savings in subsequent years. Staff estimated the cumulative cost to local government to be \$37 million over the period 2020–2036, or approximately \$3.1 million per year on average over the 12 years with non-zero costs. There is also a cumulative cost savings of \$17 million over the period of 2020–2036, or approximately \$1.4 million per year on average over the 12 years with non-zero costs. The tax revenue to local governments from 2025 through 2036 totals to \$10.5 million with an average of \$875,000 per year during the 12 years of non-zero costs.

The proposed Regulation would not impose a mandate on any school district.

*Cost or Savings for State Agencies:*

Because the phase-out requirement will not be implemented until 2025, there will be no cost to State government in the fiscal year that the proposed Regulation will be effective (2020–2021) and the two subsequent fiscal years. However, there will be costs and cost savings to ten State government agencies across California. All ten State government agencies considered in this analysis are public universities. Staff estimates the cumulative cost to State government to be \$2.1 million over the period 2020–2036, or approximately \$176,000 per year on average over the 12 years with non-zero costs. There is also a cumulative cost savings of \$1.7 million over the period 2020–2036, or approximately \$138,000 per year on average over the 12 years with non-zero costs. The sales tax revenue to State government from 2025 through 2036 totals to ~\$8.8 million with an average of \$737,000 per year during the 12 years of non-zero costs.

The implementation and enforcement of the proposed Regulation would not have an impact on staff resources at CARB. The workload will be absorbed by current staff using similar processes.

*Other Non-Discretionary Costs or Savings on Local Agencies:*

No additional costs or savings to local agencies beyond those addressed above under “Cost to any Local Agency or School District Requiring Reimbursement under section 17500 et seq.” are expected.

*Cost or Savings in Federal Funding to the State:*

No costs or savings in federal funding are anticipated.

**Housing Costs (Gov. Code, § 11346.5, subd. (a)(12)):**

The Executive Officer has also made the initial determination that the proposed regulatory action will not have a significant effect on housing costs.

**Significant Statewide Adverse Economic Impact Directly Affecting Business, Including Ability to Compete (Gov. Code, §§ 11346.3, subd. (a), 11346.5, subd. (a)(7), 11346.5, subd. (a)(8)):**

The Executive Officer has made an initial determination that the proposed regulatory action would not have a significant statewide adverse economic impact directly affecting businesses, including the ability of California businesses to compete with businesses in other states, or on representative private persons.

**Results of The Economic Impact Analysis/Assessment (Gov. Code, § 11346.5, subd. (a)(10)):**

**NON-MAJOR REGULATION: Statement of the Results of the Economic Impact Assessment (EIA):**

(A) The creation or elimination of jobs within the State of California.

The operation and maintenance requirements of alternative-gas GIE are designed to be similar to those for conventional SF<sub>6</sub> GIE. Technicians familiar with handling SF<sub>6</sub> GIE may need to receive additional training to operate and maintain non-SF<sub>6</sub> GIE, and they are expected to be able to perform the job as they have with SF<sub>6</sub> GIE. Therefore, staff does not expect there to be a significant increase or decrease in jobs due to workers' ability to perform the job. However, vacuum GIE are expected to require significantly less maintenance. Staff expects a decrease in jobs related to maintenance crews at sites that use vacuum technology, though it is anticipated that this decrease will be relatively small.

(B) The creation of new business or the elimination of existing businesses within the State of California.

Because all existing GIE manufacturers are located outside of California, the proposed Regulation is not expected to result in considerable business creation or elimination in California.

Non-SF<sub>6</sub> GIE are generally more expensive upfront than SF<sub>6</sub> GIE; however, the cost savings from less maintenance and reporting are expected to compensate for the higher purchase cost and potentially lower the lifetime ownership cost. Most of the GIE owners in the State are electric power generation, transmission, and distribution and large industrial companies. CARB staff expects that these entities will be able to cover the higher upfront cost with little financial impact, especially when they can anticipate cost savings over the long term.

(C) The expansion of businesses currently doing business within the State of California.

No significant impacts to the expansion of businesses due to the proposed Regulation are anticipated. While the proposed Regulation is intended to increase demand for non-SF<sub>6</sub> GIE, this will be in place of SF<sub>6</sub> GIE that would have been acquired in the absence of the proposed Regulation. The proposed Regulation is therefore not expected to drive an overall increase in demand for GIE and expansion of businesses for GIE owners. There may be some expansion of business to manufacturers of non-SF<sub>6</sub> GIE, but all currently known GIE manufacturers are located outside of California.

(D) The benefits of the regulation to the health and welfare of California residents, worker safety, and the state's environment.

Benefits such as reduced GHG emissions and reduced operating costs could result from implementation of non-SF<sub>6</sub> GIE. The proposed Regulation is expected to reduce approximately 38,000 pounds of SF<sub>6</sub>, or 391,000 MTCO<sub>2e</sub> of GHG emissions during the analysis years 2020–2036. Because GIE lasts approximately 40 years, emissions reductions from non-SF<sub>6</sub> GIE acquired between 2025 and 2036 will continue through 2075, resulting in cumulative emissions reductions of approximately 3,143,000 MTCO<sub>2e</sub>. Because GHGs are global pollutants, both California's residents and the world's population would benefit from the reduction in these emissions and the associated mitigation of global climate change. Therefore, these amendments may also directly improve the health and welfare of California residents, worker safety, and the State's environment.

Effect on Jobs/Businesses:

The Executive Officer has determined that the proposed regulatory action would have minimal impact on the creation or elimination of jobs within the State of California, the creation of new businesses or elimination of existing businesses within the State of California, or the expansion of businesses currently doing business within the State of California. A detailed assessment of the economic impacts of the proposed regulatory action can be found in the Economic Impact Analysis in the Initial Statement of Reasons (ISOR).

Benefits of the Proposed Regulation:

The objective of the proposed regulatory action is to reduce GHG emissions, improve the ability of small GIE owners to comply, improve accuracy in reported emissions, and improve CARB staff's ability to verify reported data.

A summary of these benefits is provided; please refer to "Objectives and Benefits" under the Informative Digest of Proposed Action and Policy Statement Overview Pursuant to Government Code 11346.5(a)(3) discussion that starts on page three.

**Business Report (Gov. Code, §§ 11346.5, subd. (a)(11); 11346.3, subd. (d)):**

In accordance with Government Code sections 11346.5, subdivisions (a)(11) and 11346.3, subdivision (d), the Executive Officer finds the reporting requirements of the proposed regulatory action which apply to businesses are necessary for the health, safety, and welfare of the people of the State of California.

**Cost Impacts on Representative Private Persons or Businesses (Gov. Code, § 11346.5, subd. (a)(9)):**

In developing this regulatory proposal, CARB staff evaluated the potential economic impacts on representative private persons or businesses. The proposed regulatory action would impose additional costs to private businesses acquiring non-SF<sub>6</sub> GIE instead of SF<sub>6</sub> GIE or filing for an SF<sub>6</sub> phase-out exemption. Some of these costs are expected to be offset by savings in the long run due to lower maintenance costs and exemption from reporting requirements for some non-SF<sub>6</sub> GIE.

CARB is not aware of any cost impacts that a representative private person would necessarily incur in reasonable compliance with the proposed action.

**Effect on Small Business (Cal. Code Regs., tit. 1, § 4, subs. (a) and (b)):**

The Executive Officer has also determined under California Code of Regulations, title 1, section 4, that the proposed regulatory action would affect small businesses. However, there are significant maintenance cost savings that will offset some of the costs to small businesses.

**Consideration of Alternatives (Gov. Code, § 11346.5, subd. (a)(13)):**

Before taking final action on the proposed regulatory action, the Board must determine that no reasonable alternative considered by the Board, or that has otherwise been identified and brought to the attention of the Board, would be more effective in carrying out the purpose for which the action is proposed, would be as effective and less burdensome to affected private persons than the proposed action, or would be more cost-effective to affected private persons and equally effective in implementing the statutory policy or other provisions of law.

The Executive Officer analyzed three alternatives to the proposed amendments and determined that none were less burdensome and equally effective in achieving the purposes of the Regulation in a manner than ensures full compliance with the authorizing law.

Retain One-Percent Emission Rate Limit. This alternative would maintain the Regulation's one-percent emission rate limit rather than replacing it with an emissions limit measured in MTCO<sub>2e</sub>. The impact of this alternative would be that SF<sub>6</sub> emissions

from this source would continue to grow with system GIE capacity. The data reported to CARB under the Regulation demonstrate that the amount of SF<sub>6</sub> in active GIE—that is, the GIE capacities used to determine emission rate limits—has grown in the last several years at an annual rate between one and five percent. In meetings with GIE owners during the public process to amend the Regulation, GIE owners have noted that the rate at which SF<sub>6</sub> capacity is expected to grow statewide in the coming years may be greater than the historical rate and, for certain GIE owners, the rate of growth could be significantly greater than for the sector overall. Reasons for the expected increase include replacement of old oil circuit breakers with SF<sub>6</sub> breakers, growth in demand for electricity due to population growth and the State’s goal to increase electrification of vehicles and other infrastructure, and the changing nature of the electric grid to include the growth in renewables.

Because SF<sub>6</sub> capacity is expected to grow after 2020, and the maximum emissions allowed are proportional to SF<sub>6</sub> capacity, under the Regulation, emissions from this source category would be expected to increase after 2020. The one-percent rate limit also fails to encourage adoption of new GIE that do not contain SF<sub>6</sub>, and would not capture GIE devices that use a GHG other than SF<sub>6</sub> as an insulating gas. The non-SF<sub>6</sub> GIE alternatives present an opportunity to reduce GHG emissions from this source category, consistent with the State’s aggressive GHG emissions reduction targets described earlier in this document.

Under this alternative, the goal of accelerating the transition to non-SF<sub>6</sub> technologies and reducing GHG emissions would be more difficult to achieve. With an emission rate limit, any decrease in a GIE owner’s capacity also decreases the amount of SF<sub>6</sub> the GIE owner is allowed to emit on an annual basis. This creates somewhat of a disincentive to replace SF<sub>6</sub> GIE with non-SF<sub>6</sub> GIE. Though this could mean delayed purchases of (currently more expensive) non-SF<sub>6</sub> GIE, or increased maintenance costs from operating older SF<sub>6</sub> GIE devices, these are indirect rather than direct outcomes of this option. Therefore, this alternative could increase SF<sub>6</sub> emissions with neither a cost increase nor decrease. For these reasons, staff has rejected the “Retain One-Percent Emission Rate Limit” alternative.

Do Not Phase out SF<sub>6</sub> GIE. This alternative would consist of removing the phase-out requirements and corresponding SF<sub>6</sub> phase-out exemption process. This alternative would not achieve the goals of accelerating the transition to non-SF<sub>6</sub> technologies and realizing the corresponding GHG emissions reductions. Through conversations with GIE owners and GIE manufacturers as part of the public process, it became clear that non-SF<sub>6</sub> GIE are being developed and these emerging technologies over time have the ability to replace SF<sub>6</sub> GIE in many, if not all, applications. Though some non-SF<sub>6</sub> alternatives are in use today, their adoption is somewhat limited and supply varies by company. As with many emerging or alternative technologies, the cost of non-SF<sub>6</sub> GIE is expected to be higher than SF<sub>6</sub> GIE in the near-term, though over the long-term costs are expected to come down as production volumes increase. GIE owners are also extremely comfortable with their long-standing practice of using SF<sub>6</sub> GIE. These factors could make it difficult for the non-SF<sub>6</sub> to get a foothold without further incentives.

By establishing a phase-out schedule, CARB is establishing a market and driving demand for these products, particularly for the higher-voltage options that are anticipated to be developed at a later point in time. CARB has been told by manufacturers and GIE owners that the proposed SF<sub>6</sub> phase-out would be a key factor driving near-term development work to commercialize additional non-SF<sub>6</sub> GIE. If these technologies are not adopted, it is conceivable that SF<sub>6</sub> use and emissions will continue to grow. Also, with no phase-out of SF<sub>6</sub> GIE, these emerging technologies will likely become commercially available at a later point in time, if they are developed at all, due to lack of demand. This could have impacts both in California and globally, and further GHG emissions reductions from this source category beyond those mandated by the Regulation would be very difficult to achieve without use of these alternative GIE. Implementing this alternative would yield significant cost savings relative to the proposed Regulation, but it would also result in SF<sub>6</sub> emissions growth over time, an option that is untenable from a climate impacts and a policy perspective given California's GHG emissions reduction goals. For these reasons, staff has rejected the "Do Not Phase out SF<sub>6</sub> GIE" alternative.

Do Not Implement Differing Emissions Limits for Small-Capacity GIE Owners. This alternative would keep the emissions limit for small-capacity GIE owners (that is, GIE owners with capacity of less than 10,000MTCO<sub>2e</sub>) at one percent. Small-capacity GIE owners have explained to CARB staff the challenge in complying with a one-percent emission rate limit on an annual basis. GIE owners of this size may have a small number of SF<sub>6</sub> GIE devices. Typically, a pressurized SF<sub>6</sub> GIE device will notify the owner of a drop in pressure (leak) only when the pressure drops below a certain threshold. Because that threshold may be several percent of the device's capacity, by the time the GIE owner is made aware that a leak has occurred, more SF<sub>6</sub> may have been lost than allowable under the one-percent emission rate limit. While leaks are an issue for larger GIE owners as well, because these events occur relatively infrequently for individual GIE devices, larger GIE owners have sufficient capacity to allow for several of these events per year while maintaining an overall emission rate below one percent.

Under the proposed Regulation, CARB staff proposed increasing the allowable emission rate for these small-capacity GIE owners. Under this alternative where the emission rate remains at one percent for all GIE owners, small-capacity GIE owners may be unable to comply on a regular basis. This could result in additional costs to the small-capacity GIE owners due to possible enforcement penalties. This could also result in significant program and enforcement staff time to address emissions exceedances, many of which may be dismissed if deemed beyond the control of the GIE owner. Because of these physical limits, small-capacity GIE owners could incur these additional costs without any corresponding GHG emissions reductions. For these reasons, staff has rejected the "Do Not Implement Differing Emissions Limits for Small-Capacity GIE Owners" alternative.



## **ENVIRONMENTAL ANALYSIS**

When the Regulation for Reducing Sulfur Hexafluoride Emissions from Gas Insulated Switchgear (“Regulation;” Title 17, California Code of Regulations, sections 95350 et. seq.) was proposed in 2010, CARB adopted a no impact environmental analysis (NIEA), which is the equivalent of a negative declaration, under its certified regulatory program (California Code of Regulations, title 17, sections 60000 through 60008) to comply with the requirements of the California Environmental Quality Act (CEQA; Public Resources Code section 21080.5). The NIEA, included as Section V. of the ISOR for that 2010 item, dated January 7, 2010, determined that, based upon available information, no significant adverse environmental impacts should occur as a result of adopting the Regulation. Staff has determined that no additional environmental review is required for the current proposed amendments to the Regulation because there are no changes proposed to the originally approved project that involve new significant environmental effects or a substantial increase in severity of previously identified significant effects than previously identified in the prior 2010 NIEA. The basis for reaching this conclusion is provided in Section VI. of the ISOR report.

## **SPECIAL ACCOMMODATION REQUEST**

Consistent with California Government Code Section 7296.2, special accommodation or language needs may be provided for any of the following:

- An interpreter to be available at the hearing;
- Documents made available in an alternate format or another language; and
- A disability-related reasonable accommodation.

To request these special accommodations or language needs, please contact the Clerk of the Board at (916) 322-5594 or by facsimile at (916) 322-3928 as soon as possible, but no later than 10 business days before the scheduled Board hearing.

TTY/TDD/Speech to Speech users may dial 711 for the California Relay Service.

Consecuente con la sección 7296.2 del Código de Gobierno de California, una acomodación especial o necesidades lingüísticas pueden ser suministradas para cualquiera de los siguientes:

- Un intérprete que esté disponible en la audiencia;
- Documentos disponibles en un formato alternativo u otro idioma; y
- Una acomodación razonable relacionados con una incapacidad.

Para solicitar estas comodidades especiales o necesidades de otro idioma, por favor llame a la oficina del Consejo al (916) 322-5594 o envíe un fax a (916) 322-3928 lo más pronto posible, pero no menos de 10 días de trabajo antes del día programado para la audiencia del Consejo. TTY/TDD/Personas que necesiten este servicio pueden marcar el 711 para el Servicio de Retransmisión de Mensajes de California.

## **AGENCY CONTACT PERSONS**

Inquiries concerning the substance of the proposed regulatory action may be directed to the agency representative Carey Bylin, Manger, Energy Section, at (916) 445-1952 or (designated back-up contact) Mary Jane Coombs, Branch Chief, at (916) 322-7554.

## **AVAILABILITY OF DOCUMENTS**

CARB staff has prepared a Staff Report: Initial Statement of Reasons (ISOR) for the proposed regulatory action, which includes a summary of the economic and environmental impacts of the proposal. The report is entitled: Staff Report: Initial Statement of Reasons for Rulemaking-Proposed Amendments to the Regulation for Reducing Sulfur Hexafluoride Emissions from Gas Insulated Switchgear.

Copies of the ISOR and the full text of the proposed regulatory language, in underline and strikeout format to allow for comparison with the existing regulations, may be accessed on CARB's website listed below, or may be obtained from the Public Information Office, California Air Resources Board, 1001 I Street, Visitors and Environmental Services Center, First Floor, Sacramento, California, 95814, on July 21, 2020. Because of current travel, facility, and staffing restrictions, the California Air Resources Board's offices may have limited public access. Please contact Bradley Bechold, Regulations Coordinator, at [bradley.bechtold@arb.ca.gov](mailto:bradley.bechtold@arb.ca.gov) or (916) 322-6533 if you need physical copies of the documents.

Further, the agency representative to whom nonsubstantive inquiries concerning the proposed administrative action may be directed is Bradley Bechtold, Regulations Coordinator, (916) 322-6533. The Board staff has compiled a record for this rulemaking action, which includes all the information upon which the proposal is based. This material is available for inspection upon request to the contact persons.

## **HEARING PROCEDURES**

The public hearing will be conducted in accordance with the California Administrative Procedure Act, Government Code, title 2, division 3, part 1, chapter 3.5 (commencing with section 11340).

Following the public hearing, the Board may take action to approve for adoption the regulatory language as originally proposed, or with non-substantial or grammatical modifications. The Board may also approve for adoption the proposed regulatory language with other modifications if the text as modified is sufficiently related to the originally proposed text that the public was adequately placed on notice and that the regulatory language as modified could result from the proposed regulatory action. If this occurs, the full regulatory text, with the modifications clearly indicated, will be made available to the public, for written comment, at least 15-days before final adoption.

The public may request a copy of the modified regulatory text from the contact information listed above.

### **FINAL STATEMENT OF REASONS AVAILABILITY**

Upon its completion, the Final Statement of Reasons (FSOR) will be available and copies may be requested from the agency contact persons in this notice, or may be accessed on CARB's website listed below.

### **INTERNET ACCESS**

This notice, the ISOR and all subsequent regulatory documents, including the FSOR, when completed, are available on CARB's website for this rulemaking at <https://ww2.arb.ca.gov/rulemaking/2020/sf6>

CALIFORNIA AIR RESOURCES BOARD



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Richard W. Corey  
Executive Officer

Date: July 7, 2020

*The energy challenge facing California is real. Every Californian needs to take immediate action to reduce energy consumption. For a list of simple ways you can reduce demand and cut your energy costs, see our website at [www.arb.ca.gov](http://www.arb.ca.gov).*