

# **Responses to Comments**

on the

**Draft Environmental Analysis**

**Prepared for the**

**Proposed Amendments  
to the California Cap  
on Greenhouse Gas Emissions  
and Market-Based Compliance  
Mechanisms Regulations**

**California Air Resources Board  
1001 I Street  
Sacramento, California, 95814**

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**to be considered at the**

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## **PREFACE**

The California Air Resources Board (CARB or Board) released a Draft Environmental Analysis (Draft EA) for the Proposed Amendments to the California Cap on Greenhouse Gas Emissions and Market-Based Compliance Mechanisms Regulation (Proposed Project) on September 4, 2018, for a 45-day public review and comment period that concluded October 22, 2018. During the public comment period for the Proposed Project, a total of 73 comment letters were submitted electronically on or before October 22, 2018 to the comment docket set up for the Proposed Project and its appendices, including the Draft EA, and nine additional comment letters were received late after the close of the comment period. One additional comment letter was received at the November 15, 2018 Board meeting.. Revisions to the Proposed Project were released for a 15-Day comment period starting on November 16, 2018 and closing on November 30, 2018 during which time 29 additional comment letters were received. Out of the 112 total comments received, eight comment letters were determined to include comments raising significant environmental issues related to the Draft EA and requiring a written response under CARB's certified regulatory program and the California Environmental Quality Act (CEQA).

CARB staff made modifications to the Draft EA to create the Final EA. To facilitate identifying modifications to the document, modified text is presented in the Final EA with ~~strike-through~~ for deletions and underline for additions. None of the modifications alter any of the types of foreseeable compliance responses evaluated or conclusions reached in the Draft EA, introduce new significant effects on the environment, or provide new information of substantial importance relative to the EA. As a result, these revisions do not require recirculation of the draft document pursuant to the CEQA Guidelines, California Code of Regulations, Title 14, Section 15088.5, before consideration by the Board.

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## 1. INTRODUCTION

The California Air Resources Board (CARB or Board) released a Draft Environmental Analysis (Draft EA) for the Proposed Amendments to the California Cap on Greenhouse Gas Emissions and Market-Based Compliance Mechanisms Regulation (Proposed Project) on September 4, 2018, for a 45-day public review and comment period that concluded October 22, 2018. CARB received numerous comment letters through the comment docket opened for the Proposed Project (including the Draft EA) during that time.

All of the comment letters are available for viewing on the comment docket at: <https://www.arb.ca.gov/lispub/comm/bccommlog.php?listname=ct2018>. Pursuant to CARB's certified regulatory program, staff carefully reviewed all the comment letters received to determine which ones raised significant environmental issues related to the Draft EA requiring a written response.

This document presents those comments and CARB staff's written responses for the Board to consider for approval prior to taking final action on the Proposed Project. Although this document includes written responses only to those comments related to the Draft EA, all of the public comments were considered by staff and provided to the Board members for their consideration. The full comment letters are included in Attachment A. For reference purposes, this document includes a summary of each comment followed by the written response. Attachments and appendices to these comment letters can be found at the link to the docket provided above.

Following consideration of the comments received on the Draft EA and during the preparation of the responses to those comments, CARB revised the Draft EA to prepare the Final EA released December 3, 2018.

### 1.1. Requirements for Responses to Comments

These written responses to public comments on the Draft EA are prepared in accordance with CARB's certified regulatory program to comply with the California Environmental Quality Act (CEQA). CARB's certified regulations state:

*California Code of Regulations, title 17, Section 60007. Response to Environmental Assessment*

*(a) If comments are received during the evaluation process which raise significant environmental issues associated with the proposed action, the staff shall summarize and respond to the comments either orally or in a supplemental written report. Prior to taking final action on any proposal for which significant environmental issues have been raised, the decision maker shall approve a written response to each such issue.*

Public Resources Code (PRC) Section 21091 also provides guidance on reviewing and responding to public comments in compliance with CEQA. While this section refers to

environmental impact reports, proposed negative declarations, and mitigated negative declarations, rather than an EA, it contains useful guidance for preparing a thorough and meaningful response to comments.

PRC Section 21091, subdivision (d) states:

*(1) The lead agency shall consider comments it receives if those comments are received within the public review period.*

*(2) (A) With respect to the consideration of comments received, the lead agency shall evaluate any comments on environmental issues that are received from persons who have reviewed the draft and shall prepare a written response pursuant to subparagraph (B). The lead agency may also respond to comments that are received after the close of the public review period.*

*(B) The written response shall describe the disposition of each significant environmental issue that is raised by commenters. The responses shall be prepared consistent with section 15088 of Title 14 of the California Code of Regulations.*

California Code of Regulations, title 14, Section 15088 (CEQA Guidelines) also includes useful information and guidance for preparing a thorough and meaningful response to comments. It states, in relevant part, that specific comments and suggestions about the environmental analysis that are at variance from the lead agency's position must be addressed in detail with reasons why specific comments and suggestions were not accepted. Responses must reflect a good faith, reasoned analysis of the comments.

California Code of Regulations, title 14, Section 15088 (a – c) states:

*(a) The lead agency shall evaluate comments on environmental issues received from persons who reviewed the draft EIR and shall prepare a written response. The Lead Agency shall respond to comments received during the noticed comment period and any extensions and may respond to late comments.*

*(b) The lead agency shall provide a written proposed response to a public agency on comments made by that public agency at least 10 days prior to certifying an environmental impact report.*

*(c) The written response shall describe the disposition of significant environmental issues raised (e.g., revisions to the proposed project to mitigate anticipated impacts or objections). In particular, the major environmental issues raised when the Lead Agency's position is at variance with recommendations and objections raised in the comments must be addressed in detail giving reasons why specific comments and suggestions were not accepted. There must be good faith, reasoned analysis in response. Conclusory statements unsupported by factual information will not suffice.*

## **1.2. Comments Requiring Substantive Responses**

CARB is required to prepare written responses only to those comments that raise “significant environmental issues” associated with the proposed action, as outlined in California Code of Regulations, title 17, Section 60007(a). A total of 73 comment letters were submitted electronically on or before October 22, 2018 to the comment docket set up for the Proposed Project, and nine additional comment letters were submitted late, after the close of the comment period. One additional comment letter was received at the November 15, 2018 Board meeting. Revisions to the Proposed Project were released for a 15-Day comment period starting on November 16, 2018 and closing on November 30, 2018 during which time 29 additional comment letters were received. Out of the 112 total comments received, eight comment letters were determined to include comments raising environmental issues related to the Draft EA and requiring a written response under CARB’s certified regulatory program and CEQA. CARB staff was conservative and inclusive in determining which comments warranted a written response and even included comments that did not mention the analysis included in the Draft EA but that did raise an issue related to potential adverse impacts related to the Proposed Project.

Public comments on the Proposed Project submitted prior to the Board’s second hearing are available on CARB’s website at: <https://www.arb.ca.gov/lispub/comm/bccommlog.php?listname=ct2018>. Comments on the Draft EA were considered by staff and provided to the Board members for their consideration.

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## 2. RESPONSES TO COMMENTS

The comment letters responded to in this document were coded by the order in which they were received. Table 2-1 provides the list of comment letters that contain substantive environmental comments. Responses to these comments are provided below. Comment letters, bracketed to indicate individual comments, are provided in Attachment A.

<b>Comment Number</b>	<b>Date</b>	<b>Name</b>	<b>Affiliation</b>
16	October 22, 2018	Karen Nelson	N/A
17	October 22, 2018	Cathy Helgerson	N/A
18	October 22, 2018	Todd Weber	N/A
25	October 22, 2018	Rhea Hernandez	N/A
26	October 22, 2018	Maya Golden-Krasner	Center for Biological Diversity
30	October 22, 2018	Erin Grizard	Bloom Energy
43	October 22, 2018	Dallas Burtraw	Independent Emissions Market Advisory Committee
68	October 22, 2018	Warren MacGillivray	Panoche Energy Center

Notes: N/A=not applicable

CARB staff received numerous letters which contained comments pertaining to Assembly Bill 398 (AB 398; Chapter 135, Statutes of 2017) direction on offset credits and “direct environmental benefits in the state” amendments under the Proposed Project. These comment letters are listed in Table 2-2. These comments do not raise specific environmental concerns and therefore do not address the adequacy, accuracy, or completeness of the Draft EA, and no changes to the Draft EA are required in response to these comments. Although no response is required under CEQA to these comments. In the interest of transparency and completeness, Master Response 1, below, provides a response to these comments.

<b>Comment Number</b>	<b>Date</b>	<b>Name</b>	<b>Affiliation</b>
2	October 15, 2018	Tanya DeRivi et al.	Southern California Public Powers Authority
3	October 16, 2018	Jon Costantino	Verified Emission Reduction Association
5	October 16, 2018	Clare Breidenich	Western Power Trading Forum
7	This comment is a duplicate of Comment Letter 3		
11	October 19, 2018	Sean Carney	Finite Carbon
14	October 22, 2018	Susan Wood	Dentons US LLP

Cap-and-Trade Regulation Amendments  
Response to Comments

Responses to Comments

21	October 22, 2018	Marcie Milner	Shell Energy
22	October 22, 2018	Amy Vanderwarker	California Environmental Justice Alliance
23	October 22, 2018	Justin Andrews	Lhoist
27	October 22, 2018	Dan Lashof	Nextgen California
34	October 22, 2018	Katie Sullivan	International Emissions Trading Association
36	October 22, 2018	Tim Carmichael	San Diego Gas & Electric Company
38	October 22, 2018	Barbara Haya et al.	University of California, Berkeley
39	October 22, 2018	Adam Smith	California Joint Utility Group
40	October 22, 2018	Tiffany Roberts	Western States Petroleum Association
41	This comment is a duplicate of Comment Letter 40		
42	October 22, 2018	Tiffany Roberts	Western States Petroleum Association
45	October 22, 2018	Erica Morehouse and Katelyn Roedner Sutter	Environmental Defense Fund
46	October 22, 2018	Emily Warms	New Forests
48	October 22, 2018	Thomas P. O'Rourke, Sr. et al.	California Forest Carbon Coalition
49	October 22, 2018	Denise A. Grab et al.	Institute for Policy Integrity
50	October 22, 2018	Gerald D. Secundy	California Council for Environmental and Economic Balance
53	October 22, 2018	Rock Zierman	California Independent Petroleum Association
55	October 22, 2018	Sterling M. Griffin	Quality Carbon Registry
58	October 22, 2018	John Larrea	California Food Producers
60	October 22, 2018	Arjun Patney	American Carbon Registry
61	October 22, 2018	Kevin Townsend	Bluesource
63	October 22, 2018	Fariya Ali	Pacific Gas and Electric
64	October 22, 2018	Barbara Haya	University of California, Berkeley
66	October 22, 2018	William W. Westerfield and Timothy Tutt	Sacramento Municipal Utility District
73	October 22, 2018	Danny Cullenward	Near Zero
74	October 24, 2018 (Late)	Tim Carmichael	SoCalGas

79	November 6, 2018 (Late)	Nicholas van Aelstyn	Indigenous Peoples Reducing Emissions
H-1	This comment is a duplicate of Comment Letter 79		
F-4	November 30, 2018	Jeffrey Fort	Denton US LLP
F-6	November 30, 2018	Sterling Griffin	Quality Carbon Registry
F-9	November 30, 2018	Keith Adamo	Air Products and Chemical, Inc.
F-11	November 30, 2018	Heather Karlstad	Shell Energy North America L.P.
F-18	November 30, 2018	Arjun Patney	American Carbon Registry
F-27	November 30, 2018	Nicholas van Aelstyn	Indigenous Peoples Reducing Emissions

Some comment letters also addressed the Draft EA’s alternatives analysis. Master Response 2, below, provides a response to these comments. These comments are addressed through a master response in order to provide a comprehensive explanation regarding CARB’s consideration of these comments.

**Master Response 1**

**Comment:** Several comment letters were received which included comments pertaining to the “Direct Environmental Benefits” (DEBs) requirement. AB 398 directs the California Air Resources Board (CARB) to adopt amendments as part of the Proposed Project to establish criteria such that at least half of an entity’s offset usage limit may only be met with offsets that provide DEBs. Master Response 1 serves as a response to these comments, which do not raise any substantial environmental comments to the Draft Environmental Analysis (Draft EA).

**Response:**

Page 23 of the Draft EA (Chapter 2, “Project Description”) includes a description of the DEBs requirement under the Proposed Project. The Draft EA specifies that AB 398 imposes lower quantitative usage limits for the percentage of an entity’s compliance obligation that can be met using offset credits post-2020. Additionally, AB 398 specifies that “no more than one-half [of offset credits used for compliance] may be sourced from projects that do not provide direct environmental benefits in the state.” Section 38562(c)(2)(E)(i)(II)(ii) of AB 398 specifies that “direct environmental benefits in the state are the reduction or avoidance of emissions of any air pollutant in the state or the reduction or avoidance of any pollutant that could have an adverse impact on waters of the state.”

Contrary to comments received on the Proposed Project that such offsets would not produce measurable environmental benefits to air and water pollution, CARB has provided an assessment of each protocol (see pp. 51-54 of the Staff Report: Initial Statement of Reasons (ISOR)) that may be used to determine whether a protocol

results in the reduction or avoidance of air pollution or other pollutants that could have an adverse impact on waters of the state, beyond reductions or avoided emissions of GHGs that are credited pursuant to the applicable protocol. This assessment would also apply to projects located outside of the state if a project can provide evidence, based on specified categories of documentation, that supports the determination that DEBs would occur within California (California Code of Regulations title 17, Section 95989).

As stated in the Draft EA, the “environmental analyses conducted when adopting the Compliance Offset Protocols” (including protocols that would produce DEBs) would continue to apply following the adoption of the Proposed Project. As noted in the Draft EA, compliance responses from projects providing DEBs would remain substantially similar to those already seen today. Covered entities would still have the same options for compliance in deciding to purchase offsets (on a reduced basis), decrease their own emissions, or purchase allowances, or a combination of these responses. The same types of offset projects are also expected to be developed, under the existing offset protocols. At this point, it is not possible to opine as to how the DEBs requirement may change the geographic distribution of offset projects developed under the existing protocols, or which existing protocol(s) those offset projects would be developed under. In addition, the process set forth by the Proposed Project for determining whether an offset project located outside the state will qualify for DEBS has yet to be implemented, and it is therefore unclear what specific impact or financial incentives the DEBS requirement will have on projects located inside or outside of the state.

### **Master Response 2:**

**Comment:** Several commenters stated that the Draft EA fails to adequately assess all reasonably foreseeable compliance responses and therefore underestimates the environmental impacts of the Proposed Project.

### **Response:**

In Section 2.0, “Project Description,” the Draft EA provides an overview of the project objectives, concepts of the Proposed Project, and outlines the potential compliance responses that could occur because of implementation of the recommended actions. As described in the fifth paragraph on page 6 of the Draft EA, “[t]he level of detail of impact analysis is necessarily and appropriately general because the Proposed Project is programmatic.” As an analogy for this Draft EA (which in this case has been prepared under CARB’s Certified Regulatory Program), a Program EIR is an EIR which may be prepared on a series of actions that can be characterized as one large project and are related, including projects related in connection with the issuance of regulations for a continuing program. (Cal. Code Regs., tit. 14, § 15168(a).) As discussed in the EA, CARB considers both the development of its regulation, and the compliance responses resulting therefrom, to be within the scope of the “project”. As such, the EA analysis is conducted at a high level, without knowing precisely where, what type, and to what extent individual project-level activities will occur in response to the regulation.

The reasonably foreseeable compliance responses are analyzed in a programmatic manner for several reasons: (1) any individual action or activity would be carried out under the same program; (2) the reasonably foreseeable compliance response would result in generally similar environmental effects that can be mitigated in similar ways (California Code of Regulations title 14, Section 15168 (a)(4)); and (3) while the types of foreseeable compliance responses can be reasonably predicted, the specific location, design, and setting of the potential actions are unknown at this time. The law is clear that CEQA does not require agencies to engage in speculation when analyzing the environmental effects of their decisions. CEQA provides that an indirect impact should only be considered if it is a reasonably foreseeable impact caused by the project. (Cal. Code Regs., tit. 14, § 15064(d)(3).) An environmental impact that is speculative is not reasonably foreseeable. (*Id.*) Attempting to predict decisions by entities regarding the specific location and design of actions taken in response to implementation of the Proposed Project is speculative given the influence of other business and market considerations in those decisions. Consequently, the Draft EA takes a reasonably conservative approach in its post-mitigation significance conclusions (i.e., tending to overstate the risk that feasible mitigation may not be implemented by the agency with authority to do so, or may not be sufficient) and discloses, for compliance purposes with CEQA, that potentially significant environmental impacts may be unavoidable, where appropriate. Specific actions undertaken to implement the Proposed Project would undergo project-level environmental review and compliance processes as required at the time they are proposed (pages 13 through 14 of the Draft EA).

The degree of specificity required in a CEQA document corresponds to the degree of specificity inherent in the underlying activity it evaluates. The environmental analysis for broad programs cannot be as detailed as for specific projects. (California Code of Regulations title 14, Section 15146.) For example, the assessment of a construction project would naturally be more detailed than for the adoption of a plan because the construction effects can be predicted with a greater degree of accuracy. (California Code of Regulations title 14, Section 15146, subd. (a).) The level of detail in the Draft EA reflects that the project is a broad statewide action framework. Consequently, the analysis does not provide the level of detail that would be provided in subsequent environmental documents prepared for specific activities in response to the Proposed Project. (California Code of Regulations title 14, Section 15152.) The Draft EA provides a good-faith effort to evaluate programmatically the potential for significant adverse impacts associated with implementation of the Proposed Project based on what is known at this time.

Comment Letter 16 October 20, 2018	Karen Nelson
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**16-1:** The commenter asserts California's Cap-and-Trade program largely ignores environmental justice issues and requests that the Proposed Project also include stronger local caps on concentrations of toxins and particulates from fossil fuel combustion.

**Response:** The commenter does not raise any specific environmental impacts from the Proposed Project. A CEQA analysis must identify and focus on the “significant environmental effects” of the proposed project. (Pub. Resources Code § 21100(b)(1); 14 CCR § 15126(a), 15143.) A significant effect on the environment is defined as “a substantial, or potentially substantial, adverse change in the environment.” (Pub. Resources Code § 21068 [italics added].) By contrast, an action that simply foregoes some hypothetical benefits, as opposed to causing an increase above the environmental baseline, is not a CEQA impact because it does nothing to adversely change the existing environmental conditions that form the baseline. Because the Proposed Project would not authorize any new emissions increases, and does not substantially depart from California's existing Cap-and-Trade Program framework (which is already in place), it is not expected to result in any localized emissions increases. However, since CARB lacks adequate data to conclusively determine that no such increases could occur from the Cap-and-Trade Program more generally, CARB conservatively disclosed a potentially significant impact from such increases in the Draft EA.

With respect to the strength of local caps on concentrations of toxins and particulates of fossil fuel combustion, while the Cap-and-Trade Program involves a statewide cap and not “local” caps, the statewide cap is designed to become more stringent over time. Further, the comment calls for stronger local caps on concentrations of toxins and particulates from fossil fuel combustion. The Cap-and-Trade Program does not regulate these air pollutants. These air pollutants are regulated through stationary source permits and mobile source vehicle standards and other prescriptive regulations. As stated in the ISOR (pp. 172-174), local air districts, rather than CARB, have direct authority to regulate criteria pollutant and toxic emissions from stationary sources. Therefore, local caps on toxic air contaminants and particulate matter from stationary sources would not be a legally feasible alternative. Nevertheless, for many decades, the State has implemented many policies and programs to address and reduce criteria and toxic air pollutants. As a result of these efforts, significant progress has been made in reducing diesel particulate matter (PM) and many other hazardous air pollutants. For example, and based on the most current CEPAM inventory (2016 SIP inventory tool V. 1.05), statewide NOx emissions have been reduced by 26 percent between 2012 and 2017, and diesel PM has been reduced by 50 percent over the same period.

As discussed on page 20 of the Draft EA, the Proposed Project lists the primary objectives of the Cap-and-Trade Program overall that would result in a reduction in emissions of toxic air contaminants (TACs) and particulates from fossil fuel combustion as well as combat environmental justice issues related to stationary sources subject to the Cap-and-Trade Regulation. Project objectives that would reduce emissions and provide environmental justice benefits include:

3. avoid disproportionate impacts,
7. consider a broad range of public health benefits,
8. achieve real emission reductions,
14. consider emissions impacts,
15. prevent increases in other emissions,
16. maximize co-benefits,
19. reduce fossil fuel use, and
22. ensure emissions reductions.

Additionally, AB 617 includes several aspects to further California's climate programs while protecting the state's disadvantaged communities. For example, AB 617 authorizes and directs CARB to take several actions to improve data reporting from facilities, air quality monitoring, and pollution reduction planning for communities affected by a high cumulative exposure burden.

Finally, CEQA Guidelines Section 15131(a) explains that "economic or social effects of a project shall not be treated as significant effects to the environment." As such, the Draft EA focuses only on physical effects on the environment. In terms of air quality impacts, page 43 of the Draft EA explains that the "measures that reduce GHG emissions are expected to provide co-benefits in terms of reductions of criteria air pollutants and toxic air contaminants." This beneficial effect to air quality was also identified in the previous 2016 Cap-and-Trade EA. Nonetheless, the Draft EA evaluates the potential for adverse air quality impacts to occur and concludes that effects to air quality would be potentially significant as described in the 2016 Cap-and-Trade EA. See Master Response 2 for a discussion of CARB's conservative approach to impacts analysis, and Response to Comment 43-2, regarding consideration of potential environmental justice concerns. No changes to the Draft EA are required in response to this comment.

Comment Letter 17 October 21, 2018	Cathy Helgerson
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**17-1:** The commenter appears to request that the Bay Area Air Quality Management District (BAAQMD), under CARB, “address the Cap-[and]-trade situation” as well as the “state working together” to close the “Lehigh Southwest Cement and Quarry” and the “Steven Creek Quarry,” which, the commenter asserts, contribute to pollution.

**Response:** A CEQA analysis must identify and focus on the “significant environmental effects” of the proposed project. (Pub. Resources Code § 21100(b)(1); 14 CCR § 15126(a), 15143.) A significant effect on the environment is defined as “a substantial, or potentially substantial, adverse change in the environment.” (Pub. Resources Code § 21068 [italics added].) By contrast, an action that simply foregoes some hypothetical benefits, as opposed to causing an increase above the environmental baseline, is not a CEQA impact because it does nothing to adversely change the existing environmental conditions that form the baseline. Nevertheless, CARB provides the following response.

The Proposed Project is an undertaking by CARB and not by BAAQMD. It is not clear to CARB how the commenter thinks BAAQMD and CARB should address the Cap-and-Trade Program. Therefore, CARB cannot provide a more-specific response to this comment.

By referencing the “Lehigh Southwest Cement and Quarry,” it is assumed the commenter is referencing the Permanente Quarry, which is operated by the Lehigh Southwest Cement Company. By referencing the “Steven Creek Quarry,” it is assumed the commenter is referencing the Stevens Creek Quarry, which is operated by Stevens Creek Quarry, Inc.

It is unclear whether the commenter is suggesting that closure of both quarries should be part of the Proposed Project or should be addressed at the same time as CARB undertakes the Proposed Project. It should be noted that CARB does not directly regulate activities at either quarry.<sup>1</sup> However, the Permanente Quarry supports the Lehigh Cement Plant, which is identified as a covered entity (i.e., cement production) and subject to the Cap-and-Trade Program.<sup>2</sup> Air pollution, including fugitive dust and odors, is generally regulated by the BAAQMD for the Permanente Quarry and Stevens Creek Quarry. Furthermore, while implementation of the Proposed Project would be

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<sup>1</sup> See <https://www.sccgov.org/sites/dpd/Programs/SMARA/Pages/StevensCreek.aspx> (accessed November 6, 2018) and

<https://www.sccgov.org/sites/dpd/Programs/SMARA/PermanenteQuarry/Pages/PermanenteMain.aspx> (accessed November 6, 2018) for a list of permitting agencies for these facilities.

<sup>2</sup> See <https://www.arb.ca.gov/cc/capandtrade/guidance/chapter2.pdf> (accessed November 6, 2018) for a summary of covered entities under the Cap-and-Trade Program. See also CITSS Registrant Report, September 28, 2018, which identifies Lehigh Southwest Cement Company as a covered entity, available at <https://www.arb.ca.gov/cc/capandtrade/citssregistrants9.28.18.pdf> (accessed November 28, 2018).

expected to generate co-benefits to local and regional air quality within the vicinity of stationary sources subject to the Proposed Project, the primary objective of the Proposed Project is to reduce statewide GHG emissions from stationary sources. This comment therefore does not address the adequacy, accuracy, or completeness of the Draft EA, and no changes to the Draft EA are required in response to this comment.

Comment Letter 18 October 21, 2018	Todd Weber
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**18-1:** This comment is a duplicate of Comment 16-1.

**Response:** Please see response to Comment 16-1.

Comment Letter 25 October 22, 2018	Rhea Hernandez
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**25-1:** This comment is a duplicate of 16-1.

**Response:** Please see response to Comment 16-1.

Comment Letter 26 October 22, 2018	Maya Golden-Krasner Center for Biological Diversity
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**26-1:** The comment asserts that EA alternatives should include an alternative that sunsets surplus credits and reduces 2018-2020 assistance factors for refineries.

**Response:** With regard to the suggested alternative and project design changes, as explained in more detail on page 93 of the Draft EA, while CARB, by virtue of its certified program, is exempt from Chapters 3 and 4 of CEQA and corresponding sections of the CEQA Guidelines (Cal. Code Regs., tit. 14, § 15000 et. seq.), the Guidelines nevertheless provide useful information for preparation of a thorough and meaningful alternatives analysis. The Guidelines specify that “[a]n EIR need not consider every conceivable alternative to a project. Rather, it must consider a reasonable range of potentially feasible alternatives that will foster informed decision making and public participation.” (Cal. Code Regs., tit. 14, § 15126.6(a).) An EIR need not consider multiple variations of alternatives, nor must it consider alternatives to components of the project; rather, it should focus on alternatives to the project as a whole. (See Cal. Code Regs., tit. 14, § 15126.6(a).)

With regard to the comments proposing sunsets to surplus allowances, the allowance caps are set to help the state achieve its statutory mandates. CARB notes that the 2016 Edition of the Greenhouse Gas Inventory demonstrates the state has achieved emissions below the 1990 level 4 years earlier than mandated by AB 32. Having emissions below the allowance caps and reducing emissions to meet statutory mandates is a desirable outcome. AB 398 contains a specific provision directing CARB, in adopting a post-2020 Cap-and-Trade Program, to *evaluate and address concerns related to overallocation in the state board’s determination of the number of available allowances for years 2021 to 2030, inclusive, as appropriate.* (Health & Safety Code § 38562(c)(2)(D).)

In response to the direction in AB 398, staff focused on whether the allowance budgets (caps) established from 2021 through 2030 need to be adjusted to account for any unused allowances from 2013 through 2020. Concerns have been raised about the possibility that the potential pool of unused allowances hinder the ability of the post-2020 period of the Cap-and-Trade Program (Program) to deliver the necessary greenhouse gas (GHG) emission reductions needed to achieve the 2030 target established by Senate Bill (SB) 32 (Chapter 250, Statutes of 2016). Based on the current best available data, CARB determined that while there may be unused allowances in the early years of the Program, the design features of the Program and the established declining caps reinforce a steadily increasing carbon price signal through the next decade. This analysis can be found in Appendix D to the ISOR (Appendix D. AB 398: Evaluation of Allowance Budgets 2021 through 2030).

Further, sunsetting any existing unused allowances or removing allowances from the post-2020 caps would increase allowance prices and prices will increase higher and sooner than would occur under the proposed amendments to the Regulation. While this could potentially result in additional GHG emissions reductions beyond those needed to achieve the statutory targets, this would increase the potential for leakage and result in a less cost-effective Program. It could also accelerate and intensify, rather than reduce or avoid, impacts identified in the Draft EA. As such, it does not meet a fundamental requirement in order to be a viable CEQA alternative.

At the outset, staff notes that the purpose of an alternatives analysis is to reduce or avoid one or more potentially significant environmental impacts. It remains unclear how commenter's suggestions would reduce or avoid any potentially significant impact identified in the Draft EA.

With regard to the comment to reduce allowance allocation to refineries from 2018 through 2020, AB 32 and AB 398 require that we minimize leakage. Allocation to industry is to mitigate against leakage—which would be the relocation of emissions, along with associated jobs and production outside of the State in response to the Cap-and-Trade Program. Assistance factors are one of several factors used in allocation to industry for leakage prevention. With AB 398 setting the assistance factors at 100 percent from 2021 through 2025, with data that shows we remain on track to achieve the 2020 target early, and the much deeper reductions needed in the next decade, CARB staff believes a smooth allocation path between 2017 and 2021 is the most conservative path to protect against emissions leakage, enable earlier investments in onsite equipment upgrades, and allow for economic growth. Like the other alternative suggested above, this suggestion could also accelerate and intensify, rather than reduce or avoid, impacts identified in the Draft EA. As such, it does not meet a fundamental requirement in order to be a viable CEQA alternative.

Importantly, a 100 percent assistance factor does not mean entities get all the allowances they need to comply with the Program—they still need to reduce onsite or seek out additional allowances. By 2030, entities will receive about half of the allowances they receive today as the allocation continues to drop each year at the same rate as the overall caps in the Program. Between 2021 and 2030, the cap decline rate is almost double what it is today.

For background, when the Program was initially designed, assistance factors were set at 100 percent and were proposed to drop each compliance period as there was an expectation for carbon pricing or carbon regulations to phase-in in other regions. Today, we have not seen the expansive use of carbon pricing or GHG regulation we expected to see, consequently the leakage risk has not changed very much since the beginning of this Program. Moving forward, we are hopeful actions under the Paris Agreement will change this and as other regions address GHGs, our industry and their competitors in other regions will face similar requirements.

**26-2:** The comment states that the EA should assess the impacts of surplus credits and the 2018-2020 assistance factors for refineries. The comment recommends that the alternatives analysis in the EA include an assessment of the potential reductions achieved if a 75% (and lower) Industry Assistance Factor were applied to petroleum refining for the 2018-2020 period, with respect to the emissions from that sector over that period and subsequently through 2030. The comment additionally recommends assessment of the impacts of sunsetting allowances banked before 2020, with implications for new, on-site reductions post-2020.

**Response:** Please see response to CT 26-1.

With respect to the commenter's recommendation of assessing lower assistance factors for the 2018-2020 timeframe, and whether that impacts emissions reductions, CARB notes that the EA specifically addressed this issue noting that the amendments to the assistance factors in this time period do not change the stringency or effectiveness of the current Program provisions, as the cap on emissions would be maintained at the same level. Moreover, CARB is directed by AB 398 to set assistance factors to 100 percent from 2021 through 2030. As setting different assistance factors for that time period is legally infeasible, CARB is not required to further analyze such an alternative. Finally, such an alternative may not as effectively meet project objectives relating to cost effectiveness, and it is not clear that it would reduce or avoid any identified significant impact.

Comment Letter 30 October 22, 2018	Erin Grizard Bloom Energy
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**30-1:** The commenter asserts that implementation of the Proposed Project would ultimately increase GHG emissions and criteria air pollutants as customers choose dirtier grid electricity backed up by diesel generators rather than installing fuel cell technologies.

**Response:** The commenter does not provide evidence that customers elect to use diesel generators in lieu of cleaner grid electricity or fuel cells as a result of the existing compliance obligations under the Cap-and-Trade Program. The proposed project would not result in the conversion from any existing less emissions-intensive means of power generation to diesel generators; rather, commenter points to potential foregone benefits, which do not constitute CEQA impacts. Pages 43 through 46 of the Draft EA evaluate the potential increase in criteria air pollutants as a result of the Proposed Project. Short-term emissions of criteria pollutants and ozone precursors could occur from upgrading equipment, switching to lower intensity carbon fuels, and construction of new or modified facilities. Long-term operational air pollutant emissions would decrease statewide, although individual offset projects (e.g., Mine Methane Capture) and regulated facilities could potentially see minor operational changes, based on a variety of factors that influence such business decisions. These increases in emissions would not be attributable to an increase in the use of diesel generators as a direct result of implementation of the Proposed Project. As such, the Draft EA takes the conservative approach in its post-mitigation significance conclusion and discloses, for CEQA compliance purposes, that air quality impacts would be potentially significant and unavoidable. With the recent passage of SB 100, eligible renewables are going to comprise at least 60 percent of the electricity by 2030 while the State plans for 100 percent renewables on the grid by 2045. Additionally, SB 350 requires a doubling of energy savings by 2030, reducing demand for electricity within the State. Both pieces of legislation will result in less demand for electricity and whatever needs exist will be met through increasingly renewable grid power. Fuel cells that utilize natural gas do not have the same combustion air pollutant emissions as diesel generators, but can still contribute to GHGs through the utilization of fossil natural gas. Since the Cap-and-Trade Program places a compliance obligation on fossil fuels such as fossil natural gas and diesel and with an increasingly decarbonized grid, it is not expected that criteria pollutant emissions will increase in response to the Program. Therefore, no changes to the Draft EA are required in response to this comment.

See also Response to Comment 30-2.

**30-2:** The commenter asserts that CARB amended the Cap-and-Trade Regulation to remove fuel cells as an “emissions source without a compliance obligation” but continued to afford similar treatment to combustion combined heat and power (CHP) technologies. The commenter argues that this has led customers to perceive fuel cells as having a higher carbon intensity than they actually do, which unintentionally leads to customers favoring diesel generators and/or less efficient cogeneration technologies.

**Response:** Please see response to 30-1.

Staff's understanding is that the commenter would like to be able to state a fuel cell, regardless of fuel type, is exempt from the Program for marketing purposes. All fossil natural gas emissions resulting from end-use in the State are regulated by the Cap-and-Trade Program. That includes both emissions from CHP and fuel cells. Fuel cells were exempt from the Program entirely for the first 5 years of implementation and only associated with a compliance obligation beginning in 2018. This aligned the policy in the Program with the 2017 Scoping Plan<sup>3</sup> which calls for a reduction in use of fossil natural gas and substitution with renewable gas where all fossil natural gas cannot be phased out. In limited situations, a handful of facilities that were early movers with CHP were afforded an exemption from the Program if it was the presence of the CHP that triggered the facility to be above the Program threshold. Even here, the GHG emissions associated with the fossil natural gas are regulated upstream with the utility. The perception concern is misplaced as the Program treats all fuels the same regardless of technology.

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<sup>3</sup> See [https://www.arb.ca.gov/cc/scopingplan/scoping\\_plan\\_2017.pdf](https://www.arb.ca.gov/cc/scopingplan/scoping_plan_2017.pdf) (accessed December 3, 2018).

Comment Letter 43 October 22, 2018	Dallas Burtraw et al. Independent Emissions Market Advisory Committee
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**43-1:** The commenter recommends that CARB evaluate alternative methods to reduce emissions in the transportation sector if the state cannot implement its tailpipe and ZEV standards.

**Response:** This comment is beyond the scope of the Proposed Project, which involves modifications to the existing Cap-and-Trade Regulation. The Proposed Project does not modify existing tailpipe and ZEV standards. The commenter also does not indicate what type of alternative methods it is suggesting, or how those alternative methods would reduce or avoid any significant impact identified in connection with the Proposed Project. Therefore, no further response is necessary. However, staff provides the following response for informational purposes.

The comment highlights the current uncertainty related to Federal support for CARB to implement measures to achieve reductions in criteria and GHG air pollutant emissions in the transportation sector. The 2017 Scoping Plan anticipated the potential for this very situation and states that any delays in Federal support or action would require the State to evaluate how to achieve the same level of emissions reductions within the same sector. The tailpipe and ZEV standards are separate from this Proposed Project. Therefore, no changes to the Draft EA are required in response to this comment

**43-2:** The commenter states that local and regional air pollution poses significant environmental and health risks, and these local pollution problems should be addressed as vigorously as global climate change. The commenter recommends that CARB continue to monitor and analyze the distribution of emissions impacts associated with California’s GHG emissions trading program on disadvantaged communities. The comment also speaks to the need for the state to also support efforts to address air quality concerns in marginalized communities across the state through additional policies like AB 617.

**Response:** The comment does not discuss the Draft EA or indicate additional environmental impacts beyond those analyzed in the Draft EA. Although no further response is required under CEQA to this comment, CARB staff, in the interest of transparency and completeness, provides the following information.

The comment discusses concerns raised prior to this Cap-and- Trade rulemaking proceedings by environmental justice advocates and encourages CARB to take actions to engage and address long-standing air quality concerns in disadvantaged communities. The Commenter does not explain how this rulemaking would have the potential to cause any new significant impacts not previously analyzed.

The comment notes that environmental justice advocates are concerned that implementation of the Cap-and-Trade Program will lead to adverse air quality impacts in

disadvantaged communities. For more information on the potential for localized emissions increases and on efforts by CARB and other agencies to ensure such increases do not occur, see Master Response 1: Response to Comments Raising Environmental Justice Concerns, from the Response to Comments on the Draft Environmental Analysis for the Proposed Amendments to the California Cap on Greenhouse Gas Emissions and Market-Based Compliance Mechanisms Regulation And California's Compliance Plan for the Federal Clean Power Plan (July 17, 2017),<sup>4</sup> at pages 2-10 through 2-23. That response is summarized below, and is hereby incorporated by reference.

As noted in the Initial Statement of Reasons (pp. 176-179), as a result of the efforts on addressing air quality, actions of CARB, local air districts, and federal air pollution control programs have made substantial progress towards improving the air quality in California. However, some communities, largely low-income and composed of people of color, continue to experience higher exposures than others because of the cumulative impacts of air pollution from multiple sources located in these communities. It is important to note that the Cap-and-Trade Program is just one of many programs that address air emissions in California, and CARB is just one of several organizations responsible for administering these policies. Following are examples of additional efforts in the State to reduce air emissions, as led by CARB and other organizations.

To date, at least half of the monies collected from the sale of Cap-and-Trade Program allowances at the quarterly auctions have been allocated for programs that benefit disadvantaged communities. These investments yield GHG and air pollutant co-benefits. The list below includes some of the programs being funded by the Cap-and-Trade Program auction monies that are benefitting disadvantaged communities:

- Low-Income Weatherization Program/Renewable Energy
- Urban forestry
- Zero and near-zero emission passenger vehicle rebates
- Heavy duty hybrid/ZEV trucks and buses
- Pilot programs (car sharing financing, etc.) in disadvantaged communities
- Intermodal affordable housing
- Transit-oriented development

Additionally, newly-enacted AB 617 (Chapter 136, Statutes of 2017) directs and authorizes CARB to take several actions to improve data reporting from facilities, air quality monitoring, and pollution reduction planning for communities affected by a high cumulative exposure burden. With regard to reporting, it requires CARB to develop a uniform statewide annual reporting system of criteria pollutants and toxic air contaminants for certain categories of stationary sources. As for monitoring, it required CARB to prepare a monitoring plan by October 1, 2018 to identify the highest priority

locations around the state to deploy community air monitoring systems. By July 1, 2019, any district containing a high priority location would need to deploy a community air monitoring system for that location or locations. The districts would also have authority to require nearby facilities to deploy a fence-line monitoring system under certain conditions. These efforts will help better understand the complex emissions interrelations between the Cap-and-Trade Program and air district criteria and toxics programs. Finally, with regard to planning, AB 617 also requires CARB to prepare, in consultation with numerous stakeholders (including environmental justice organizations), a statewide strategy to reduce emissions of toxic air contaminants and criteria air pollutants in communities affected by a high cumulative exposure burden. This strategy was required to be prepared by October 1, 2018. The Board approved AB 617 program requirements and community selection at the September 2018 Board hearing.

**43-3:** The commenter states that additional data collection and analysis is needed to protect against leakage and resource shuffling, beyond generally noting a concern with emissions leakage and resource shuffling.

**Response:** The commenter does not raise any environmental issues pertaining to the EA. No further response is necessary; however staff is providing some additional information for transparency and completeness.

Please see Response to Comment 26-1, above, regarding CARB's approach to addressing leakage. Further, AB 398 requires a report to the legislature by the end of 2025 on the risk posed to leakage by the Program. As such, staff will be undertaking a focused effort to define metrics for tracking leakage in the industrial sectors. This effort will include a public stakeholder process. In regards to resource shuffling and leakage in the electricity sector, the Program prohibits resource shuffling and requires detailed reporting and third-party verification of the reported GHG emissions data. Staff also reviews external data to reconcile reported data with other sources of data as part of the quality assurance checks. This diligent approach to evaluating for and adjusting the Program for concerns around potential resource shuffling and leakage is evident in the three years CARB has been coordinating with the California Independent System Operator on the Energy Imbalance Market.

**43-4:** The commenter recommends that CARB evaluate alternative methods to reduce emissions in the transportation sector if the state cannot implement its tailpipe and ZEV standards. The commenter specifies possible alternative methods for CARB to evaluate.

**Response:** Please see Response to Comment 43-1, above.

**43-5:** The comment highlights the need to monitor impacts of GHG emissions regulations on local air quality. It also references AB 197 and AB 617 providing an opportunity for the agency and state to demonstrate the priorities of local air quality coupled with climate and the prevention or mitigation of unintended consequences. The

comment also indicates that there can be no assumption these policies will sufficiently address environmental justice issues.

**Response:** This comment pertains to ongoing monitoring for potential unintended air quality issues related to the implementation of climate programs and does not raise concerns with the Draft EA. Although no further response is required under CEQA to this comment, CARB staff, in the interest of transparency and completeness, provides the following information.

While the relationship between GHGs and local air pollutants is complex, we continue to take steps to improve the data and evaluate this issue. Staff recognizes there are data gaps with using the existing criteria and toxics data to evaluate trends in GHGs and local air pollutants. As part of implementing AB 197 and 617, ARB staff will be bringing a regulation to the Board in December 2018 that would result in enhanced and consistent reporting of criteria and toxics data. In efforts to allow for tracking air pollutant trends at a more granular level, staff also added census tract layers into the Integrated Emissions Visualization Tool. With this new feature, a user can select a census tract in their community and have instant access to the CalEnviroScreen scores, a list of the facilities in the census tract, their individual and aggregated emissions, and charts that allow the analysis and comparison of the greenhouse gas, criteria and toxic pollutants emission trends. The ability to see trends at a single facility is already part of the existing Integrated Emissions Visualization Tool.

**43-6:** The comment raises concern over the definition of what constitutes a “Direct Environmental Impact”.

**Response:** Please see Master Response 1.

**43-7:** The comment raises concerns about the appropriateness of CARB’s implementation of AB 197, specifically that implementation of the Cap-and-Trade Program to reduce GHG emissions could diminish the priority to address localized criteria pollutants from industrial sources.

**Response:** This comment does not raise concerns with the Draft EA. Although no further response is required under CEQA to this comment, in the interest of transparency and completeness, please see Response to Comment 43-2, above, for more information.

Comment Letter 68	Warren MacGillivray
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October 22, 2018	Panoche Energy Center
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**68-1:** The comment expresses concern that without a price on carbon, adverse environmental impacts to the San Joaquin Valley could occur. The comment states that impacts would include increased localized air pollution in disadvantaged communities and increased usage of limited groundwater supply.

**Response:** The commenter does not raise any specific environmental impacts from the Proposed Project. A CEQA analysis must identify and focus on the “significant environmental effects” of the proposed project. (Pub. Resources Code § 21100(b)(1); 14 CCR § 15126(a), 15143.) A significant effect on the environment is defined as “a substantial, or potentially substantial, adverse change in the environment.” (Pub. Resources Code § 21068 [italics added].) Because the Proposed Project would not authorize any new emissions increases, and does not substantially depart from California’s existing Cap-and-Trade Program framework (which is already in place), it is not expected to result in any emissions increases. Nevertheless, for informational purposes, CARB provides the following response.

Pages 43 through 45 of the Draft EA evaluate the potential beneficial and adverse air quality effects related to the Proposed Project. As described in that discussion, the Proposed Project could result in potentially significant and unavoidable impacts related to air quality. Please see responses to Comments 30-1 for additional information related to the Draft EA’s evaluation of increased emissions of air pollutants as a result of the Proposed Project. See also Response to Comment 16-1.

Pages 55 through 57 of the Draft EA discuss the potential adverse hydrology and water quality impacts related to implementation of the Proposed Project including impacts to groundwater. It may be that the air quality and groundwater impacts identified in the Draft EA would manifest in the San Joaquin Valley; however, there is inherent uncertainty surrounding the location, severity, and magnitude of impacts related to the reasonably foreseeable compliance responses to the Proposed Project. The Draft EA takes a programmatic perspective when identifying potentially significant environmental impacts and provides a high-level analysis of the physical effects of reasonably foreseeable compliance responses. As such, geographically-specific hydrology and water quality impacts cannot be adequately evaluated due to the uncertainty of the location and character of future projects constructed and operated under the Proposed Project. See Master Response 2 for additional information regarding the programmatic analysis performed for the Draft EA. Therefore, no changes to the Draft EA were made in response to this comment.

**68-2:** The comment expresses concern that without a price on carbon, impacts to electricity markets could occur. These impacts include dispatch of a power plant in an uneconomical fashion, misuse of peaker plants, and setting reference prices based on incomplete inputs. The commenter insists that there are negative economic impacts when utility companies are not subject to the same carbon price which could lead to secondary impacts related to the uneconomic dispatch of a state power plant, misuse of

a peaker plant built to supplement the Renewable Portfolio Standard (RPS), and lack of inclusion of GHG-related costs. The commenter identifies economic impacts as a result of the exclusion of a set carbon price.

**Response:** The commenter does not raise any specific environmental impacts from the Proposed Project. A CEQA analysis must identify and focus on the “significant environmental effects” of the proposed project. (Pub. Resources Code § 21100(b)(1); 14 CCR § 15126(a), 15143.) A significant effect on the environment is defined as “a substantial, or potentially substantial, adverse change in the environment.” (Pub. Resources Code § 21068 [italics added].) Because the Proposed Project would not authorize any new emissions increases, and does not substantially depart from California’s existing Cap-and-Trade Program framework (which is already in place), it is not expected to result in any emissions increases. Nevertheless, for informational purposes, CARB provides the following response.

Pursuant to CEQA Guidelines § 15131(a), “[e]conomic or social effects of a project shall not be treated as significant effects on the environment.... The intermediate economic or social changes need not be analyzed in any detail greater than necessary to trace the chain of cause and effect. The focus of the analysis shall be on the physical changes.” The commenter does not discuss what physical environmental impacts could occur from this economic effect. As such, no changes to the Draft EA are required in response to this comment.

In general, there have been periods of increased natural gas power generation due to variability in annual rainfall and decreased availability of hydropower. More recently, regions of the State were impacted by unhealthy air quality due to wildfires, which resulted in public health agencies directing residents to use their air conditioning systems to help filter the air inside buildings. These factors have resulted in power generation needs in response to factors that have not been the historical norm. But, these factors would not impact a single plant, but rather the dispatch system as a whole. Further, the Cap-and-Trade Program does not set any single carbon price for the market. While it is accurate that the Program has an auction floor price, that may, or may not, be the actual carbon price used in establishing third-party agreements that consider a carbon price or in secondary market agreements. Therefore, no changes to the Draft EA were made in response to this comment.

**68-3:** The comment expresses concern that without a price on carbon, natural gas usage could increase causing operational pressures on infrastructure.

**Response:** Please see response 68-2.

The commenter does not elaborate on what “operational pressures” would be placed on infrastructure or explain how those pressure would increase natural gas usage. Therefore, no changes to the Draft EA were made in response to this comment.

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**ATTACHMENT A**  
**COMMENT LETTERS**

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16

**From:** Karen Nelson  
**To:** [Gray, Jason@ARB](mailto:Gray.Jason@ARB)  
**Subject:** CA Cap and Trade Is NOT working to successfully reduce emissions: WE NEED AMENDMENTS TO THE C&T program  
**Date:** Saturday, October 20, 2018 12:24:29 PM

**CAUTION:** This email originated from outside of the organization. Do not click links or open attachments unless you recognize the sender and know the content is safe.

**Re: Proposed Amendments to the California Cap On Greenhouse Gas Emissions and Market-Based Compliance Mechanisms Regulation**

Date: October 20, 2018

In order to meet our state's greenhouse gas emissions goals, it is essential that the California Air Resources Board (CARB) drastically reduce the emissions cap used in California's cap and trade (C&T) program. As has been reported by independent analyses, the annual caps through the year 2030 are actually higher than current projected emissions.<sup>1,2,3</sup> This means that the cap and trade program will likely end up having no effect on state emissions at all.

In other words, assuming that the C&T program didn't exist, emissions from the covered sectors would already be lower than the proposed caps leading up to 2030. It's as if a law stated that you were allowed to pollute 100 units next year, even though your best analysis predicts that you weren't going to pollute more than 90 units to begin with. Such a law would have no effect on behavior. The correct remedy would be to set the allowed pollution rate to something like 80 units—otherwise you would simply continue to pollute at 90 units annually.

Though the first C&T priority must be for CARB to reduce emissions caps, we also urge state lawmakers to add *additional restrictions* to this program. The changes made to C&T in 2017 (bill AB 398) were disappointing, not only because of weak procedures for choosing caps, but because the bill did not address significant pathologies in California C&T.

We urge the state legislature to address the following two flaws. First, the goal of any carbon dioxide emissions program must be to eliminate all emissions as quickly as possible, not to simply reduce it by 20 or 30 percent. Unlike sulfates and particulates from coal plants, additional carbon dioxide stays in the atmosphere for millennia. Humanity soon needs to see virtually zero emissions, meaning that the only viable strategy is to use price signals to put pressure on CO<sub>2</sub>-emitting *technology*. We demand that the C&T program be *limited* to trading credits between technologies that actually emit GHGs—industry, electricity, transportation, and buildings. This would cause emitters to make improvements to technology that reduce emissions, whereas the current program does not.

Second, environmental justice has been largely ignored in California's C&T policy. We request that there be stronger *local* caps on concentrations of toxins and particulates from fossil fuel combustion.

I 16-1

We are residents of California, aware of our unparalleled role on the front lines of the climate war. There is no other American state that has a size, reputation, regulatory reach, and innovation ecosystem that can counteract the federal government's abhorrent climate policies.

We *have a CRITICAL responsibility* to get the policies right. We request that (a) CARB drastically lowers emissions caps and that (b) the state legislature creates new C&T laws to address the severe inadequacies enumerated above. This is about more than just emissions from the Golden State itself — the rest of the world relies on us to set a new gold standard for climate policies, which we can begin to do by fixing the serious flaws in current policy.

Thanks for registering this comment

Karen Nelson, Chair of the Santa Clara County, CA chapter of The Climate Reality Project

**Karen Nelson, CEO**



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17

**From:** Cathy Helgerson  
**To:** Gray, Jason@ARB; Senator Beall  
**Subject:** Cap-and-trade  
**Date:** Sunday, October 21, 2018 7:53:40 AM

**CAUTION:** This email originated from outside of the organization. Do not click links or open attachments unless you recognize the sender and know the content is safe.

My name is Cathy Helgerson and I live in Cupertino California the Cap-and-trade system is not a benefit to the public especially in my case with the Lehigh Southwest Cement and Quarry and the Stevens Creek quarry at my door who continue to pollute.

The real issue is that Cap-and-trade is just that a trading system with credits traded at state-sanctioned auctions and on secondary markets this only benefits the polluter/companies not the public. The question is here how do the states set the limits for the polluters? It is stated in the background information I received on this matter that some companies have not yet needed to use up the allowances to stay within state emissions limits and probably won't have to in the next couple of years, according to some analysts, who estimate there are hundreds of millions of unused credits in the system.

The result they say is a glut of credits that could allow businesses to keep polluting past state limits in later years after the overall cap becomes more restrictive. Unless the oversupply is addressed, experts say, polluters will have no incentive to cut emissions to required levels by 2030; instead, industries could continue polluting and use banked allowance to offset their emissions and technically keep them under the cap.

Further, there is no cap on local toxins affecting the communities where the polluters reside. This is a critical missing piece of this cap and trade bill and needs to be changed to protect citizens living in these geographic areas.

I would like to mention my take on all this the way I see it if a company sells their credits because they wish to make money or where given to many, to begin with by the state representatives who decide by some crude method that the amount of credits fits that company need it is too late to save the public from harm. The company such as the Lehigh Southwest Cement and Quarry buy credits at state-sanctioned auctions and on secondary markets are allowed to emit more pollution and the public suffers serious harm and even death. Trading one companies credits for whatever reason is wrong it does not benefit the public who now must endure more pollution from the company that buys the credits Lehigh, for example, can buy more credits they are over their limit. Why set limits on pollution if there is a way to just buy more credits from the state the system is flawed in so many ways and I have never understood how this system was even allowed.

The Lehigh Southwest Cement and Quarry or now called the Lehigh Hansen Cement and Quarry is an abomination has been so for over 90 years and counting they are running out of limestone to mine their cement and will soon very soon need to apply for a permit to mine another pit that will destroy 30 thousand trees and 600 acres this should never be allowed. If they are allowed to by more credits to increase this pollution allowance limit the people here in Silicon Valley and the SF Bay area will continue to suffer it seems there will be no end to this poison, pollution, and destruction.

The Bay Area Air Quality Management District over the Silicon Valley under the Air

↓ 17.1

Resource Board needs to address this Cap-in-trade situation along with the state working together to shut down the Lehigh Southwest Cement and Quarry and the Steven Creek Quarry that have been polluting the public the Air, Water and Soil are highly polluted and the permit given out to these polluters only allows them to pollute. The levels of pollution are set high by the state and the EPA and so it really looks as if they are setting them high in order to allow the polluter to pollute and keep operating. It also seems that the polluter is always under these set levels and is allowed to pollute. The cumulative effect of the pollution to the public is not even taken into consideration there is no testing of the amount of pollution the public has endured and my question is why have the agencies and especially the State and Federal Health agencies not conducted tests on humans to see what is causing all of the health problems such as cancer and death. The EPA moves very slowly to set limits for each pollutant and because of that we the public continue to suffer.

↑  
17-1  
Cont.

I truly believe that the Cap-and-trade system should be abolished never to be heard from again and that each polluter company should have strong very strong limits set on their emissions and that the Bay Area Air Quality Management District should start to impose stronger regulations on the 400 hundred companies in the Silicon Valley that they say are polluting. There are they say 2,000 thousand companies that are polluters but it seems they can only handle 400 hundred at this time. I have asked them and the Air Resource Board to start their strong new regulations on these companies that include the Lehigh Southwest Cement and Quarry and the Steven Creek Quarry so far nothing is happening and so I have gone to the Air Resource Board to get some answers.

I hope that our representatives will take this matter very seriously and help to stop the pollution of our homes.

Thanks  
Cathy Helgerson  
408-253-0490

18

**From:** Todd Weber  
**To:** [Gray, Jason@ARB](mailto:Gray.Jason@ARB)  
**Cc:** [Todd A. Weber](mailto:Todd.A.Weber)  
**Subject:** WRITTEN COMMENT TO CALIFORNIA AIR RESOURCES BOARD  
**Date:** Sunday, October 21, 2018 8:03:33 PM

**CAUTION:** This email originated from outside of the organization. Do not click links or open attachments unless you recognize the sender and know the content is safe.

## Re: Proposed Amendments to the California Cap On Greenhouse Gas Emissions and Market-Based

### Compliance Mechanisms Regulation

In order to meet our state's greenhouse gas emissions goals, it is essential that the California Air Resources Board (CARB) drastically reduce the emissions cap used in California's cap and trade (C&T) program. As has been reported by independent analyses, the annual caps through the year 2030 are actually higher than current projected emissions.<sup>1,2,3</sup> This means that the cap and trade program will likely end up having no effect on state emissions at all.

In other words, assuming that the C&T program didn't exist, emissions from the covered sectors would already be lower than the proposed caps leading up to 2030. It's as if a law stated that you were allowed to pollute 100 units next year, even though your best analysis predicts that you weren't going to pollute more than 90 units to begin with. Such a law would have no effect on behavior. The correct remedy would be to set the allowed pollution rate to something like 80 units—otherwise you would simply continue to pollute at 90 units annually.

Though the first C&T priority must be for CARB to reduce emissions caps, we also urge state lawmakers to add *additional restrictions* to this program. The changes made to C&T in 2017 (bill AB 398) were disappointing, not only because of weak procedures for choosing caps, but because the bill did not address significant pathologies in California C&T.

We urge the state legislature to address the following two flaws. First, the goal of any carbon dioxide emissions program must be to eliminate all emissions as quickly as possible, not to simply reduce it by 20 or 30 percent. Unlike sulfates and particulates from coal plants, additional carbon dioxide stays in the atmosphere for millennia. Therefore humanity soon needs to see virtually zero emissions, meaning that the only viable strategy is to use price signals to put pressure on CO<sub>2</sub>-emitting *technology*. We demand that the C&T program be *limited* to trading credits between technologies that actually emit GHGs—industry, electricity, transportation, and buildings. This would cause emitters to make improvements to technology that reduce emissions, whereas the current program does not.

Second, environmental justice has been largely ignored in California's C&T policy. We request that there be stronger *local* caps on concentrations of toxins and particulates from fossil fuel combustion.

I 18-1

We are residents of California, aware of our unparalleled role on the front lines of the climate war. There is no other American state that has a size, reputation, regulatory reach, and innovation ecosystem that can counteract the federal government's abhorrent climate policies.

Therefore *we have a unique responsibility* to get the policies right. We request that (a) CARB drastically lowers emissions caps and that (b) the state legislature creates new C&T laws to address the severe inadequacies enumerated above. This is about more than just emissions from the Golden State itself—the rest of the world relies on us to set a new gold standard for climate policies, which we can begin to do by fixing the serious flaws in current policy.

Todd Weber  
1134 Blewett Ave.  
San Jose, CA 95125

25

**From:** Rhea Hernandez  
**To:** Gray, Jason@ARB  
**Subject:** Proposed Amendments to the California Cap On Greenhouse Gas Emissions and Market-Based Compliance Mechanisms Regulation  
**Date:** Monday, October 22, 2018 11:39:55 AM

**CAUTION:** This email originated from outside of the organization. Do not click links or open attachments unless you recognize the sender and know the content is safe.

Dear Jason Gray,

In order to meet our state's greenhouse gas emissions goals, it is essential that the California Air Resources Board (CARB) drastically reduce the emissions cap used in California's cap and trade (C&T) program. As has been reported by independent analyses, the annual caps through the year 2030 are actually higher than current projected emissions.<sup>1,2,3</sup> This means that the cap and trade program will likely end up having no effect on state emissions at all. Assuming that the C&T program didn't exist, emissions from the covered sectors would already be lower than the proposed caps leading up to 2030.

Though the first C&T priority must be for CARB to reduce emissions caps, we also urge state lawmakers to add *additional restrictions* to this program. The changes made to C&T in 2017 (bill AB 398) were disappointing, not only because of weak procedures for choosing caps, but because the bill did not address significant pathologies in California C&T.

I urge the state legislature to address the following two flaws. First, the goal of any carbon dioxide emissions program must be to eliminate all emissions as quickly as possible, not to simply reduce it by 20 or 30 percent. Unlike sulfates and particulates from coal plants, additional carbon dioxide stays in the atmosphere for millennia. Therefore humanity soon needs to see virtually zero emissions, meaning that the only viable strategy is to use price signals to put pressure on CO<sub>2</sub>-emitting *technology*. The C&T program be *limited* to trading credits between technologies that actually emit GHGs—industry, electricity, transportation, and buildings. This would cause emitters to make improvements to technology that reduce emissions, whereas the current program does not.

Second, environmental justice has been largely ignored in California's C&T policy. I request that there be stronger local caps on concentrations of toxins and particulates from fossil fuel combustion.

As a resident of California, aware of our unparalleled role on the front lines of the climate war. There is no other American state that has a size, reputation, regulatory reach, and innovation ecosystem that can counteract the federal government's abhorrent climate policies.

Therefore *we have a unique responsibility* to get the policies right. I request that (a) CARB drastically lowers emissions caps and that (b) the state legislature creates new C&T laws to address the severe inadequacies enumerated above. This is about more than just emissions from the Golden State itself—the rest of the world relies on us to set a new gold standard for climate policies, which we can begin to do by fixing the serious flaws in current policy.

Thank you for your consideration and attention to this critical issue.

25-1

Rhea Hernandez  
Concerned Californian Voter



*Submitted via online portal at:*

[https://www.arb.ca.gov/lispub/comm/besubform.php?listname=ct2018&comm\\_period=A](https://www.arb.ca.gov/lispub/comm/besubform.php?listname=ct2018&comm_period=A)

October 22, 2018

Jason Gray  
Cap-and-Trade Program, Branch Chief  
California Air Resources Board  
Sacramento, CA

**Re: 2018 Proposed Amendments to California's Cap on Greenhouse Gas Emissions and Market-Based Compliance Mechanisms Regulation**

Dear Mr. Gray:

These comments are submitted on behalf of the Center for Biological Diversity ("Center") regarding the California Air Resources Board's ("CARB") Proposed Amendments to the California Cap on Greenhouse Gas Emissions and Market-Based Compliance Mechanisms Regulation ("proposal" or "proposed amendments"). The Center is a non-profit organization with more than one million members and online activists, including over 150,000 members and supporters in California. The Center's mission is to ensure the preservation, protection and restoration of biodiversity, native species, ecosystems, public lands and waters and public health. In furtherance of these goals, the Center's Climate Law Institute seeks to reduce U.S. greenhouse gas emissions and other air pollution to protect biological diversity, the environment, and human health and welfare. Specific objectives include securing protections for species threatened by global warming, ensuring compliance with applicable law in order to reduce greenhouse gas emissions and other air pollution, and educating and mobilizing the public on global warming and air quality issues.

The need for steep reductions in greenhouse gas emissions in order to avoid the worst impacts of climate change is becoming clearer every year, and indicates that California and the world must use all available options to reduce greenhouse gas emissions in the near term. In this context, the cap-and-trade program is frustrating, as that market mechanism tends to postpone potentially greater reductions in favor of smaller and less expensive options in the near term, and can divert attention and resources from other urgently needed and cost-effective GHG reduction activities.

A recent 2018 report from the Intergovernmental Panel on Climate Change (IPCC) highlights the necessity of limiting warming to 1.5°C, rather than the Paris Agreement's 2°C, to

avoid catastrophic impacts to people and life on Earth.<sup>1</sup> According to the IPCC's analysis, the damages that would occur at 2°C warming compared with 1.5°C include more deadly heatwaves, drought and flooding; 10 centimeters of additional sea level rise within this century, exposing 10 million more people to flooding; a greater risk of triggering the collapse of the Greenland and Antarctic ice sheets with resulting multi-meter sea level rise; dramatically increased species extinction risk, including a doubling of the number of vertebrate and plant species losing more than half their range, and the virtual elimination of coral reefs; 1.5 to 2.5 million more square kilometers of thawing permafrost area with the associated release of methane, a potent greenhouse gas; a tenfold increase in the probability of ice-free Arctic summers; a higher risk of heat-related and ozone-related deaths and the increased spread of mosquito-borne diseases such as malaria and dengue fever; reduced yields and lower nutritional value of staple crops like corn, rice, and wheat; a doubling of the number of people exposed to climate-change induced increases in water stress; and up to several hundred million more people exposed to climate-related risks and susceptible to poverty by 2050.<sup>2</sup>

In order to avoid these catastrophic consequences, the 2018 IPCC report provided a revised carbon budget for a 66 percent probability of limiting warming to 1.5°C, estimated at 420 GtCO<sub>2</sub> and 570 GtCO<sub>2</sub> depending on the temperature dataset used, from January 2018 onwards.<sup>3</sup> At the current emissions rate of 42 GtCO<sub>2</sub> per year, this carbon budget would be expended in just *10 to 14 years*, underscoring the urgent need for immediate, transformative global action to transition from fossil fuel use to clean energy.<sup>4</sup> Simply put, we are out of time to make the significant and systemic changes needed to avert disaster.

However, given that ARB has chosen to place a great emphasis on cap-and-trade as a mechanism for achieving California's greenhouse gas reduction goals, it is very important that the program be as ambitious and well designed as possible. It is in that context that we offer these comments.

This letter largely—though not entirely—collates the Center's previous comments, while addressing any changes in the current draft. In short,

1. CARB should sunset surplus credits banked through 2020, as those excess credits, if they are allowed to carry forward after 2020, will substantially reduce the amount of reductions achieved in the 2020-2030 period.
2. The use of offsets for 2024 and 2025 emissions should be capped at 4% to be consistent with the intent of AB 398.
3. The current definition of "direct environmental benefits in the state" ("DEBS") is an improvement over previous iterations; however, determining whether a project qualifies

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<sup>1</sup> IPCC [Intergovernmental Panel on Climate Change], Global Warming of 1.5°C, 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 (October 6, 2018), <http://www.ipcc.ch/report/sr15/>.

<sup>2</sup> *Id.* at Summary for Policymakers.

<sup>3</sup> IPCC [Intergovernmental Panel on Climate Change], Global Warming of 1.5°C, 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 (October 6, 2018), <http://www.ipcc.ch/report/sr15/>.

<sup>4</sup> *Id.*

should include a public process, and the criteria should include a way to prioritize a project's benefit to the state's tribal and disadvantaged communities.

4. CARB should include potential reductions and associated benefits in its analysis of 2018-2020 Industry Assistance Factors, rather than focusing solely on costs to polluters, and lower the Industry Assistance Factors, in particular, for refineries.
5. The Environmental Analysis ("EA") alternatives analysis should include an alternative that sunsets surplus credits and reduces 2018-2020 assistance factors for refineries.

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**1. Allowances banked through 2020 should sunset after 2020 in order to avoid postponing or precluding new, on-site reductions in the 2021-2030 period.**

AB 398 directs CARB to address concerns regarding overallocation of allowances.<sup>5</sup> California's cap-and-trade program is projected to generate between 190 and 300 million surplus allowances through 2020,<sup>6</sup> with each allowance representing a ton of CO<sub>2</sub>-equivalent GHG emissions. Since the cap-and-trade program went into effect in 2013, emissions from facilities subject to the cap have consistently been lower than the projected business-as-usual baseline, which has allowed covered polluters to acquire excess allowances at relatively low prices, as well as free allowances, that they have been able to trade and bank for future use.

At the same time, the price of offset credits has also stayed low, in part because the price of offset credits is dictated largely by the price of allowances, which have been readily available at low prices. This has allowed for the purchase of offset credits at low prices to use at a later date when the price of allowances may rise, and contributes to the current surplus of credits.

The expected surplus of allowances by 2020 is potentially greater than the 294 MMT in reductions that ARB estimates must come from cap-and-trade between 2021 and 2030. As a result, the reductions required under cap-and-trade through 2030 could feasibly be met in large part with the excess carbon credits leftover from the pre-2020 period, if those credits are allowed to carry forward for use in 2020-2030.

If GHG emissions have been lower than business-as-usual projections as a result of general economic factors and larger market forces (i.e., non-carbon market) or because the business-as-usual projection is too high for any reason, and cannot be attributed to climate policies, then the excess allowances are not the result of real reductions in the covered sectors. In that case, surplus allowances that are the accident of larger market trends would be treated the same as reductions attributed to climate policies, and would undermine future real reductions.

It is critical to determine the extent to which the existing surplus of allowances and credits can serve to postpone new, on-site reductions in the years after 2020. If there is a significant probability that the surplus of banked allowances will postpone new, on-site reductions, then the cap-and-trade regulation should contain options for retiring and/or devaluing pre-2021 allowances in private accounts after 2020.

<sup>5</sup> Health & Safety Code § 38562(c)(2)(D),

<sup>6</sup> Busch, Chris, Recalibrating California's Cap-and-Trade Program to Account for Oversupply: An original quantitative analysis and policy recommendations (March 2017), p. 16 [https://energyinnovation.org/wp-content/uploads/2017/04/RecalibratingCA\\_Cap-Trade\\_2017.pdf](https://energyinnovation.org/wp-content/uploads/2017/04/RecalibratingCA_Cap-Trade_2017.pdf) (accessed 10/19/18).

**2. The use of offsets for 2024 and 2025 emissions should be capped at 4% to be consistent with the intent of AB 398.**

AB 398 establishes an offset usage limit of 4% for 2021-2025, and 6% for 2026-2030, and ARB proposes limits of 4% for the compliance obligations due in 2024 and 2025 and 6% for the compliance obligations due in 2026.

However, in the first years of each compliance period, covered entities are required to surrender obligations for only 30% of their emissions in each year, with the remainder due in at the end of the three-year compliance period.<sup>7</sup> Thus, the 4% limit would apply to only 30% of the 2024 emissions and 30% of the 2025 emissions, and the remaining 70% of emissions in each of those years would be subject to the higher 6% limit.

The distinction between when emissions are emitted, and the deadline by which compliance obligations covering those emissions must be surrendered to ARB should not be construed to weaken the offset usage limit for 2024 and 2025.

AB 398 states that: “(I) From January 1, 2021, to December 31, 2025, inclusive, a total of 4 percent of a covered entity’s compliance obligation may be met by surrendering offset credits... (II) From January 1, 2026, to December 31, 2030, inclusive, a total of 6 percent of a covered entity’s compliance obligation may be met by surrendering offset credits....”

Covered entities have a compliance obligation for all of their covered emissions in 2024 and 2025, even if the regulation allows them flexibility to postpone surrendering those obligations until 2026. That is, the “compliance obligation” is the emissions they cover, not the timing of when the compliance instruments are surrendered. As defined in the regulation, “Compliance Obligation” means the quantity of verified reported emissions or assigned emissions for which an entity must submit compliance instruments to ARB.”<sup>8</sup>

The 4% offset limit applies to *all* covered emissions emitted during the years 2021-2025.

**3. DEBS should include public input in determining whether individual projects meet the qualifications, and the process should prioritize projects with benefits to the state’s tribal and disadvantaged communities.**

The Center appreciates that the current definition of DEBS no longer includes benefits or avoidance of pollutants into any watershed that flows into California, and that CARB has removed the significantly problematic suggested provision that “[i]f [the] project is located adjacent to a water body that flows within or into California, no further information” on that project’s impacts or benefits would be needed.<sup>9</sup>

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<sup>7</sup> Proposed Cap-and-Trade Amendments, Initial Statement of Reasons, Sept. 4, 2018 (“ISOR”), p. 50, available at: <https://www.arb.ca.gov/regact/2018/capandtrade18/ct18isor.pdf>.

<sup>8</sup> 17 C.C.R. § 95802.

<sup>9</sup> See Maya Golden-Krasner, Center for Biological Diversity, Additional comments to the 2018 amendments to California’s GHG Cap-and-Trade regulation and the June 21, 2018 workshop (July 20, 2018), available at <https://www.arb.ca.gov/lists/com-attach/38-ct-6-21-18-wkshp-ws-ADFRb1MNVTYKOWBf.pdf>.

Because the current process for determining whether a project provides DEBS is a case-by-case determination, however, it is critical that the process include an opportunity for public participation. In particular, members of the public who live near projects, or are affected by projects attempting to use out-of-state offsets should have an opportunity to provide comment on potential adverse impacts. In addition, public comment would allow area experts to review, evaluate, and comment on the data and other information provided by the applicant (or provide any other relevant information).

Additionally, the Center proposes that project applicants be required to submit any information as to whether the project benefits disadvantaged and/or tribal communities and that CARB prioritize such projects in its decisionmaking. Notably, a recent study (“Cushing Study”) found that rather than investing in green projects within the state, an astounding seventy-five percent of offset credits went towards projects outside of California.<sup>10</sup> Meanwhile, the Study found, from 2011-2015, disadvantaged communities within California experienced *increases in both GHG emissions and co-pollutant emissions* from regulated facilities disproportionately located in their neighborhoods.<sup>11</sup> Incentivizing out-of-state projects while actively harming California’s disadvantaged communities undermines the intent of AB 398.<sup>12</sup>

The intent of AB 398 to benefit disadvantaged communities is evident from the plain language of Health and Safety Code section 38591.1(a) (AB 398), which directs ARB to create a task force to create guidance for new offset protocols for a “market-based compliance mechanism for the purposes of *increasing offset projects with direct environmental benefits in the state while prioritizing disadvantaged communities, Native American or tribal lands, and rural and agricultural regions.*” (Emphasis added.) It is clear from this language—one of only two places in the statute that “DEBS” is used—that any DEBS criteria must recognize and incorporate that the direct benefits should be not only within the boundaries of the state but also prioritize disadvantaged communities.

This reading is also consistent with the statutory scheme of California’s climate regulation. As noted in the Senate Committee on Environmental Quality (“SCEQ”) report for AB 398, AB 32 specified that prior to the inclusion of any market-based compliance mechanism in the regulations, ARB was required to (1) “consider the potential for direct, indirect, and cumulative emission impacts from these mechanisms, including localized impacts in communities that are already adversely impacted by air pollution,” (2) “design any market-based compliance mechanism to prevent any increase in the emissions of toxic air contaminants or criteria air pollutants,” and (3) “maximize additional environmental and economic benefits for California, as appropriate.” Moreover, AB 197 (Garcia, 2016) directed ARB to consider social costs and prioritize direct emission reductions at large stationary, mobile, and other sources in order to protect disadvantaged communities.<sup>13</sup>

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<sup>10</sup> Cushing, Lara et al., “Carbon trading, co-pollutants, and environmental equity: Evidence from California’s cap-and-trade program (2011–2015),” *PLoS Med* 15(7) (July 10, 2018) (“Cushing, Carbon Trading”), available at <http://journals.plos.org/plosmedicine/article?id=10.1371/journal.pmed.1002604>.

<sup>11</sup> Cushing, Carbon Trading.

<sup>12</sup> Note that the Office of the Senate Floor Analyses stated its understanding that, of the offset credits allowed, AB 398 “[r]equires 50% of all offsets to be *in* California.” See Senate Floor Analysis for AB 398, p. 5 (emphasis added).

<sup>13</sup> Health and Safety Code § 38562.5.

Moreover, to the extent CARB or others have raised dormant Commerce Clause concerns regarding the DEBS requirement, the clearer and more direct the environmental benefits are to California communities, the less likely a dormant Commerce Clause claim would survive in court.<sup>14</sup> “The guiding principle in determining whether a state regulation discriminates against interstate or foreign commerce is whether either the purpose or the effect of the regulation is economic protectionism.”<sup>15</sup> Here, the purpose of requiring in-state benefits from offset credits is clearly protecting California’s communities from pollution-related harm, not economic protectionism. Indeed, the Cushing Study clearly supports the need for such regulation. The more the DEBS criteria focus on scientific- and health-based criteria and the benefits to local communities, the better the regulation will be able to withstand any dormant Commerce Clause challenges.

**4. CARB should include potential reductions and associated benefits in its analysis of 2018-2020 Industry Assistance Factors, rather than focusing solely on costs to polluters, and lower the Industry Assistance Factors, in particular, for refineries.**

CARB proposes to maintain Industry Assistance Factors of 100% for all industries through 2020, given that AB 398 mandates 100% Industry Assistance Factors beginning in 2021. CARB submits that this will facilitate a smooth transition to a post-2020 regulatory structure, and that it protects against emissions leakage, enables earlier investments in onsite equipment upgrades, allows for economic growth, and will not increase compliance costs to polluters over that period.<sup>16</sup> CARB also indicates that lower Industry Assistance Factors would not be necessary to achieve the reductions currently expected from those sectors over the 2018-2020 period. However, CARB still failed to assess the implications for increased reductions and associated benefits.

We urge CARB to analyze the potential for lower Industry Assistance Factors for the 2018-2020 period to increase real reductions and associated benefits during that period and in the years after 2020. For example, a lower Industry Assistance Factor would raise the cost of emissions in the refinery sector for the next two years, providing an incentive for on-site reductions over that period, including equipment upgrades that would continue to provide real reductions in GHG emissions and co-pollutants on an ongoing basis after 2020. We recommend that the Industry Assistance Factors decline for the 2018-2020 period.

We single out refineries here because AB 398 prohibits CARB from adopting any GHG regulation other than cap-and-trade for petroleum refineries and oil and gas production facilities through 2030. In addition, AB 398 prohibits local air districts through 2030 from “adopting or implementing an emission reduction rule for carbon dioxide from stationary sources that are also subject to a specified market-based compliance mechanism.” Thus, refineries present a special

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<sup>14</sup> See e.g., *Rocky Mtn. Farmers Union v. Corey*, 730 F.3d 1070, 1087-88 (9<sup>th</sup> Cir. 2013) [upholding California’s Low Carbon Fuel Standard against dormant Commerce Clause claims] [“Absent discrimination, we will uphold the law ‘unless the burden imposed on [interstate] commerce is clearly excessive in relation to the putative local benefits.’ *Pike v. Bruce Church, Inc.*, 397 U.S. [137,] 142.”].

<sup>15</sup> *Pacific Northwest Venison Producers v. Smitch*, 20 F.3d 1008 (9<sup>th</sup> Cir. 1994); accord, *Rocky Mountain*, 730 F.3d at 1087.

<sup>16</sup> ISOR, p. 62.

situation in which options for inducing GHG emission reductions are extremely limited, making it necessary to optimize the reductions achieved through cap-and-trade.

A lower Industry Assistance Factor would raise the cost of emissions in the refinery sector for the next two years, providing an incentive for on-site reductions over that period, including equipment upgrades that would continue to provide real reductions in GHG emissions and co-pollutants on an ongoing basis after 2020.

**5. The environmental review alternatives analysis should assess the impacts of surplus credits and the 2018-2020 assistance factors for refineries.**

In previous comments, the Center recommend that the alternatives analysis in the EA include an assessment of the potential reductions achieved if a 75% (and lower) Industry Assistance Factor were applied to petroleum refining for the 2018-2020 period, with respect to the emissions from that sector over that period and subsequently through 2030. The Center also recommend that the EA include an alternatives assessment of the impacts of sunsetting allowances banked before 2020, with its implications for new, on-site reductions in the years after 2020.

The alternatives analysis provided in the draft EA for the proposed amendments contains neither of these alternatives, even though they would feasibly attain most of the objectives; nor did the EA explain why it was not analyzing them. On the other hand, the EA includes clearly infeasible alternatives, such as an alternative that would exclude DEBS requirements (Alternative 6), even though it obviously fails to comply with the requirements of AB 398. The Center recommends that the EA analyze a scenario in which surplus credits are retired and CARB provides lower 2018-2020 assistance factors for refineries—an alternative clearly more feasible than several of the ones it did analyze.

Thank you for your consideration of these comments. Please contact me if you have any questions.

Sincerely,



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Deputy Director | Senior Attorney  
Climate Law Institute *at the*  
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# Bloomenergy

October 22, 2018

Clerk of the Board  
California Air Resources Board  
1001 "I" Street  
Sacramento, CA 95814

Dear Mr. Corey,

Bloom Energy<sup>1</sup> provides the following comments in response to the September 4, 2018 Proposed Amendments to the California Cap on Greenhouse Gas Emissions and Market Based Compliance Mechanisms Regulation ("Cap-and-Trade"). For the past 26 months, Bloom Energy has worked with the ARB to address the direct cap-and-trade compliance obligation imposed on fuel cells. Fuel cells reduce greenhouse gas emissions and improve criteria air pollutants compared to the grid and compared to multiple other electricity generating technologies. However, the ARB regulations assign a compliance obligation to emissions from a fuel cell but treat less efficient combustion technologies as emissions without a compliance obligation. This regulatory treatment has the unintended consequence of increasing GHG emissions and criteria air pollutants, as ARB regulations are leading some customers to choose dirtier grid electricity backed up by diesel generators, or less-efficient combustion cogeneration technologies, instead of installing fuel cell technologies. Additionally, since this direct cap-and-trade compliance obligation will prevent some fuel cell projects from proceeding, it will reduce the fuel cell industry's capacity to make investments to address the immense challenges that currently stand in the way of increasing the use of biogas for electricity generation. Deploying biogas in fuel cells results in even greater greenhouse gas emissions reductions.

30-1

This situation pushes a zero-net carbon future further out into the future. These comments reiterate a proposal that Bloom provided in the pre-rulemaking phase of this proceeding. Bloom's proposal would help enable both GHG emissions reductions and criteria pollutant reductions through the deployment of fuel cells. The formula proposed herein mirrors the but-for-CHP exemption and would ensure that customers are not penalized by choosing to switch to fuel cells. These changes are within scope of the present rulemaking and we urge the ARB to adopt them expeditiously to advance the mission of the Cap-and-Trade: to reduce the greenhouse gas emissions that cause climate change.

## Background

In the original Cap-and-Trade rulemaking, the ARB included fuel cells as an emission source without a Cap-and-Trade compliance obligation (i.e., Section 95852.2). The significance of including fuel cells in Section 95852.2 and the letter the Executive Director sent to Bloom Energy

<sup>1</sup>Bloom Energy develops on-site distributed generation using innovative fuel cell energy technology that utilizes natural gas or biogas. Our unique on-site power generation systems utilize an innovative new fuel cell energy technology with roots in NASA's Mars program. Derived from a common sand-like powder, and leveraging breakthrough advances in materials science, our technology is able to produce clean, reliable, affordable energy, practically anywhere, from a wide range of renewable energy sources or traditional fuels. Our Energy Servers<sup>®</sup> are among the most efficient energy generators on the planet; providing for significantly reduced electricity costs and dramatically reduced greenhouse gas emissions. By generating power on-site, where it is consumed, Bloom Energy offers increased electrical reliability and improved energy security, providing a clear path to energy independence.

dated May 23, 2013 (Attached below) confirming the treatment of fuel cells offered a clear demarcation that fuel cells are GHG reducing with co-benefits that afford them unique treatment in recognition of these important attributes.

In 2016, the ARB amended the Cap-and-Trade Regulation to remove fuel cells as an “emissions source without a compliance obligation” but continued to afford similar treatment to combustion CHP technologies. This change has been problematic, as it dissuades potential customers from procuring fuel cells as a low-carbon intensity (CI) alternative to grid electricity with virtually no criteria pollutants. By having a direct cap-and-trade compliance obligation, some customers do not perceive fuel cells as a low-CI alternative. Moreover, the prospect of having a direct compliance obligation (as opposed to simply paying GHG costs imbedded in gas rates), has led to concerns of new administrative burdens and regulatory risks for potential fuel cell owners and operators—leading customers to choose dirtier diesel generators and/or less-efficient cogeneration technologies.

30-2

The number of fuel cell facilities subject to a direct cap-and-trade compliance obligation is relatively small (based on Bloom’s estimates, less than 100,000 MT/year). However, the impact on the fuel cell industry’s ability to market its systems is significant. Additionally, since this direct cap-and-trade compliance obligation will prevent some fuel cell projects from proceeding, it will reduce the fuel cell industry’s capacity to make investments to address the challenges that currently stand in the way of operating fuel cells using biogas. Deploying biogas in fuel cells results in even greater greenhouse gas emissions reductions. This situation pushes a zero-net carbon future further out.

#### Proposed Solution

To address these concerns and to prevent ARB from inadvertently encouraging California entities from picking dirtier technologies, Bloom proposed in comments on June 21, 2018 that the ARB should mirror the logic of the but-for-CHP exemption in the fuel cell context. The but-for-CHP exemption allows facility operators to avoid a direct cap-and-trade compliance obligation through a “but-for-CHP” formula. The CHP formula subtracts emissions attributable to thermal energy from the total emissions of the CHP facility. If the resulting emissions are less than 25,000 MT, the facility is exempt from a direct cap-and-trade compliance obligation. Facilities qualifying for this provision are still subject to paying for cap-and-trade costs through their gas purchases from the utility. As noted in the Final Statement of Reasons for the 2013-14 Cap-and-Trade Rulemaking, the CHP exemption ensures that facilities that currently have cogeneration systems are not disadvantaged compared to similar facilities that produce their own thermal energy with boilers and purchase electricity from the grid.”<sup>2</sup> Natural gas fuel cells have a much lower CI than the current CI for grid electricity, and the ARB could account for this fact through a similar limited-exemption calculation applicable to natural gas fuel cells.

Under Bloom’s proposal, the ARB would compare natural gas fuel cells to the emissions factor set forth in the California Energy Commission’s Thermal Efficiency Report, which is updated on an annual basis. The ARB would compare a natural gas fuel cell’s emissions rate (on a MWh basis) to the CEC thermal efficiency rate. The “delta” between the two emissions rates would be the amount of emissions avoided by the customer in choosing to switch to a fuel cell system. The ARB would subtract this “delta” from the total facility emissions of the fuel cell. If the resulting emissions are less than 25,000 MT, the fuel cell operator would be permitted to pay for its share of cap-and-

<sup>2</sup> See 2014 FSOR at p. 195, available at: <https://www.arb.ca.gov/regact/2013/capandtrade13/ctfsor.pdf>

trade costs indirectly through the natural gas utility. This proposal is detailed in proposed regulatory amendment text in Attachment A to these comments.

Bloom's Proposal to Address Fuel Cells is within the Scope of the Present Rulemaking

Bloom has engaged collaboratively with ARB staff—sharing data, making presentations, organizing multiple meetings—to find a solution for the past 26 months. We have been willing partners and—for the sake of our business, our customers, California's economy, and climate change—desire to resolve this uncertainty.

The proposals Bloom made in the pre-rulemaking process to provide natural gas fuel cells with a transition to using renewable natural gas can be considered to be within the scope of the 2018 Cap-and-Trade Rulemaking.

The relevant legal provisions governing the scoping requirements for California agency rulemakings are set forth in Cal. Govt. Code Sec. 11346.8(c), which provides:

(c) No state agency may adopt, amend, or repeal a regulation which has been changed from that which was originally made available to the public pursuant to Section 11346.5, unless the change is (1) nonsubstantial or solely grammatical in nature, or (2) *sufficiently related to the original text that the public was adequately placed on notice that the change could result from the originally proposed regulatory action*. If a sufficiently related change is made, the full text of the resulting adoption, amendment, or repeal, with the change clearly indicated, shall be made available to the public for at least 15 days before the agency adopts, amends, or repeals the resulting regulation. Any written comments received regarding the change must be responded to in the final statement of reasons required by Section 11346.9. (emphasis added)

The term sufficiently related was defined by OAL in regulation to mean:

Changes to the original text of a regulation shall be deemed to be “sufficiently related,” as that term is used in Government Code Section 11346.8, if *a reasonable member of the directly affected public could have determined from the notice that these changes to the regulation could have resulted*. (See 1 Cal. ADC Sec. 42, emphasis added)

Bloom's proposal for a calculation that mirrors the but-for-CHP exemption is “sufficiently related” to the scope of the present Cap-and-Trade Rulemaking. These changes to the regulation could have resulted based on at least three separate reasons, each of which justify its inclusion in the 15 day language:

1. The ISOR includes numerous changes to Section 95852 – “emissions categories used to calculate compliance obligations.” This is the section of the Regulation where Bloom’s proposal from the pre-rulemaking docket could be included. To a member of the public, it is clear that the rulemaking has a broad scope and there are numerous changes to the various emissions categories that lead to compliance obligations. The ISOR includes changes to the exemption language, including new provisions for waste-to-energy facilities and CHP. While fuel cells are not explicitly listed in the ISOR changes, a member of the public could reasonably anticipate that fuel cells or other technologies could result given the broad nature of the rulemaking and the specific inclusion of new exemption language for other technologies.

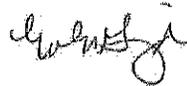
2. The ISOR explicitly contemplates changes to encourage biomass derived fuels and better align the program with the LCFS. By providing a transition to RNG use in fuel cells, Bloom’s fuel cell language shares the same policy goals and is sufficiently related to the changes the ARB is making related to how biofuels are covered in the Cap-and-Trade.

3. The ISOR makes explicit reference to the pre-rulemaking workshops, notes that public comments were received, and goes on to include links in the ISOR to the pre-rulemaking record. The ISOR explicitly references the June 21<sup>st</sup> workshop where Bloom made its proposal. By explicitly referencing the pre-rulemaking record, a member of the public could reasonably anticipate that comments and proposals made in the pre-rulemaking record could become the subject of a 15 day notice.

### Conclusion

We urge you to recognize that imposing direct cap-and-trade compliance obligations on fuel cells can actually lead to increased emissions as customers choose dirtier or less efficient electricity generating technologies that do not prompt a direct cap-and-trade compliance obligation. Thank you again for the opportunity to provide these comments as well as you and your staff’s attention to this important matter.

Sincerely,



Erin Grizard



**Matthew Rodriguez**  
*Secretary for  
Environmental Protection*

# Air Resources Board

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**Mary D. Nichols, Chairman**  
1001 I Street • P.O. Box 2815  
Sacramento, California 95812 • [www.arb.ca.gov](http://www.arb.ca.gov)



**Edmund G. Brown Jr.**  
*Governor*

May 23, 2013

Mr. Josh Richman  
Bloom Energy  
1299 Orleans Drive  
Sunnyvale, California 94089

Dear Mr. Richman:

Thank you for your recent letter to Chairman Nichols requesting confirmation of the requirements for fuel cell operators under the Air Resources Board's (ARB) greenhouse gas (GHG) Cap-and-Trade and Mandatory Reporting Programs.

ARB recognizes the environmental and energy benefits of fuel cell technologies and has elected to exempt these GHG emissions from a compliance obligation under the Cap-and-Trade Program. We specifically refer you to section 95852.2(b)(2) of the Cap-and-Trade Regulation for the exemption. Please note that beginning in 2015, a compliance obligation for natural gas supplied to uncovered entities in California will be assessed on the local distribution company (LDC) supplying the gas. ARB expects that the LDC will pass GHG compliance costs to the end user of the fuel as an incentive to spur efficient technology investment such as that provided by fuel cells.

While there are currently no requirements for reporting CO<sub>2</sub>, CH<sub>4</sub> or N<sub>2</sub>O emissions from fuel cells, pursuant to the Mandatory Reporting Regulation, fuel cell operators are required to report basic information about the generating unit including generating capacity, net and gross power generation, fuel type and fuel consumption, and fuel supplier information. This information is collected to track the increased use of this new technology and to support the ARB's legislatively mandated program to maintain the statewide GHG emissions inventory. The detailed requirements can be found in section 95112(f) of the Mandatory Reporting Regulation.

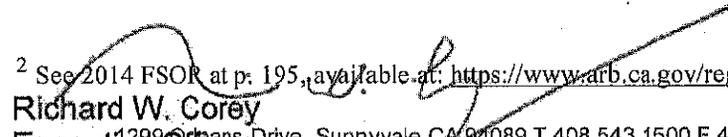
*The energy challenge facing California is real. Every Californian needs to take immediate action to reduce energy consumption. For a list of simple ways you can reduce demand and cut your energy costs, see our website: <http://www.arb.ca.gov>.*

California Environmental Protection Agency

Mr. Josh Richman  
May 23, 2013  
Page 2

We appreciate your continued efforts in helping California reach its greenhouse gas emission reduction goals. For any additional questions related to the Cap-and-Trade Regulation, please contact Mr. Steve Cliff at (916) 322-7194 or [scliff@arb.ca.gov](mailto:scliff@arb.ca.gov). For questions related to the Mandatory Reporting Regulation, please contact Mr. Dave Edwards at (916) 323-4887 or [edwards@arb.ca.gov](mailto:edwards@arb.ca.gov).

Sincerely,

  
<sup>2</sup> See 2014 FSOR at p. 195, available at: <https://www.arb.ca.gov/regact/2013/capandtrade13/ctfsor.pdf>

Richard W. Corey  
Executive Officer

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cc: Mary D. Nichols  
Chairman

Steven Cliff, Chief  
Climate Change Program Evaluation Branch

Dave Edwards, Manager  
Climate Change Reporting Section

## Attachment B

Limited Exemption of Emissions from the Production of Qualified Fuel Cell Output. Emissions from the production of electrical output from a fuel cell installation shall not have a compliance obligation and shall not count toward the inclusion threshold of section 95812(c)(1) if the requirements of this subsection are satisfied.

A facility with a fuel cell unit may apply for a limited emissions exemption if it meets the following condition for the applicable emissions year, and will remain eligible until the year in which the condition is not met, based on annual emissions data reported pursuant to Section 95100 *et seq.*, of the Mandatory Reporting Regulation: The Limited Exemption from the Production of Qualified Fuel Cell Output will apply when the facility's adjusted emissions ( $GHG_{FC\text{ Adjusted}}$ ) using the following formula is less than 25,000 metric tons of CO<sub>2</sub>e:

$$GHG_{FC\text{ Adjusted}} = H_{FC} - GHG_D$$

Where:

“ $GHG_{FC}$ ” is the annual amount of covered emissions for each calendar year, in metric tons of CO<sub>2</sub>e, associated with the production of electric output by a fuel cell installation.

“ $GHG_D$ ” is the difference between annual covered emissions for each calendar year, in metric tons of CO<sub>2</sub>e, associated with the production of electric output by a fuel cell installation and the production of electric output by an alternative natural gas power plant;

Where:

$$GHG_D = GHG_{Alt} - GHG_{FC}$$

“ $GHG_{Alt}$ ” is the annual amount of emissions for each calendar year, in metric tons of CO<sub>2</sub>e, associated with the production of electric output by a hypothetical natural gas power plant, which is calculated as follows:

$$GHG_{Alt} = Output_{FC} \times HR_{Alt} \times CO_{2ENG}$$

Where:

“ $Output_{FC}$ ” is equal to the annual electric output of a fuel cell installation;

“ $HR_{Alt}$ ” is the CEC thermal efficiency report “State Average without Cogeneration” heat rate value, which is updated annually. For 2018, the State Average without Cogeneration heat rate value is 7,761 btu/kWh;

“ $CO_{2ENG}$ ” is the GHG emissions content per unit of natural gas of 117 lbs/mmBtu





# 2018 ANNUAL REPORT OF THE INDEPENDENT EMISSIONS MARKET ADVISORY COMMITTEE

October 22, 2018

**Dallas Burtraw**, Committee Chair, Darius Gaskins Senior Fellow - Resources for the Future

**Ann Carlson**, Committee Vice Chair, Shirley Shapiro Professor of Environmental Law, Faculty Co-Director - Emmett Institute on Climate Change and the Environment, University of California, Los Angeles School of Law

**Danny Cullenward**, Policy Director - Near Zero, Research Associate - Carnegie Institution for Science, Lecturer - Stanford Law School

**Quentin Foster**, Director, California Climate - Environmental Defense Fund

**Meredith Fowlie**, Class of 1935 Distinguished Chair in Energy - University of California, Berkeley, Department of Agricultural & Resource Economics

**Observer:** Ross Brown, Principal Fiscal and Policy Analyst - Legislative Analyst's Office, California

**Convener:** California Environmental Protection Agency – Secretary J. Matthew Rodriguez, Deputy Secretary Ashley Conrad-Saydah, Bill Dean, Rebecca Favila, Michelle Sinclair, Deputy Secretary and Legal Counsel Chris Tiedemann, Sheryl Watson

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## Executive Summary:

The enclosed document is the first annual report of the Independent Emissions Market Advisory Committee (IEMAC or Committee). Through the passage of Assembly Bill (AB) 398 in 2017, the California Legislature and Governor Edmund G. Brown, Jr. directed the development of the Committee within the California Environmental Protection Agency (CalEPA). The provisions specific to the Committee are set forth in the Health and Safety Code, Section 38591.2. They require the IEMAC to meet at least annually and provide an annual report exploring the environmental and economic performance of the State's cap-and-trade program and other relevant environmental programs to the California Air Resources Board (CARB) and the Joint Legislative Committee on Climate Change.

The IEMAC met twice at CalEPA in 2018, forming six subcommittees consisting of two Committee members each to complete the annual report. The enclosed document is a compilation of sub-committee chapters on overlapping policies, environmental justice, leakage, offsets, managing allowance supply, and price ceilings.

The IEMAC recommends that CARB perform additional analysis or collect additional information to cast light on potential problem areas identified by the subcommittees. In some cases, this information may exist and we welcome direction to that information; in other cases, there may be opportunities to improve existing information or to develop new analysis. In some cases, the IEMAC suggests revisions to the draft cap-and-trade regulations CARB issued on September 4, 2018.

## **Chapter 1: Introduction**

**Authors: Dallas Burtraw and Ann Carlson**

The California carbon dioxide emissions cap-and-trade program is the best designed emissions trading program in the world and has contributed to the state achieving its 2020 goals four years ahead of schedule. In 2017, the California Legislature and Governor Edmund G. Brown, Jr. directed the development of the Independent Emissions Market Advisory Committee (IEMAC or Committee) through the passage of Assembly Bill (AB) 398. The provisions specific to the Committee are set forth in the Health and Safety Code, Section 38591.2.

The statute established the IEMAC within the California Environmental Protection Agency (CalEPA) through January 1, 2031. IEMAC members include at least five experts on emissions trading market design appointed by the Governor (three members), the Senate Committee on Rules (one member), and the Speaker of the Assembly (one member). Membership also includes a representative from the Legislative Analyst's Office.

Committee members must all possess academic, nonprofit, or other relevant backgrounds and lack financial conflicts of interest with entities subject to the cap-and-trade regulations adopted by the California Air Resources Board (CARB). The statute requires at least one annual public meeting and a report to both CARB and the Joint Legislative Committee on Climate Change Policies on the environmental and economic performance of the cap-and-trade regulation and other relevant climate policies<sup>1</sup>.

### **A. Summary of the Committee Research and Recommendations**

The role of the IEMAC as outlined by AB 398 is to report annually on the environmental and economic performance of the state's carbon pricing regulation and other relevant climate policies. This report presents six reviews, conducted in subcommittees consisting of two Committee members, of issue areas that affect the performance of California's cap-and-trade program and other relevant climate policies. The reviews cover overlapping policies, environmental justice, leakage, offsets, managing allowance supply, and price ceilings. In this summary, we highlight several recommendations to CARB about data collection, reporting and analysis that the committees believe would help ensure the integrity of California's emissions reduction efforts and help inform regulatory choices. In some of the subcommittee reports we also comment on CARB's proposed regulations for the cap-and-trade market. We first offer several overarching comments focused on big design issues facing CARB in shaping the cap-and-trade market post-2020 and in evaluating the state's efforts to date.

### **B. Program Design**

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<sup>1</sup> Statute also requires CARB to consult with the IEMAC and report to the Legislature in the event of specified cap-and-trade auction outcomes.

We begin with three important principles. First, it is crucial that decarbonization of the state's economy not interfere with California's economic growth and that the state continues the trend of decoupling greenhouse gas (GHG) emissions from economic activity. Ensuring that our climate policies are as cost-effective as possible (consistent with other goals) is important to achieving this outcome. Second, the programs the state has adopted to reduce our GHG emissions – both legislatively and administratively – must be administered in ways that maximize benefits to all Californians, particularly those in disadvantaged and vulnerable communities. And third, the state's programs to reduce emissions must be designed to maximize environmental integrity – to produce real, verifiable emissions reductions that help reduce overall global emissions. As the state's emissions targets ratchet down and the state aims to achieve carbon neutrality by 2045<sup>2</sup>, achieving cost-effective reductions that have environmental integrity and produce benefits to all Californians will become tougher. Our aim in this report is to begin to evaluate areas of carbon market design with these background principles in mind.

Our subcommittee reports are worth reading in their entirety but below we summarize key recommendations offered by the Committee. Most of our recommendations ask CARB to gather – either directly or through independent research – information and analysis that would cast light on potential problem areas identified by the subcommittees. In some cases, this information may exist and we welcome direction to that information; in other cases, there may be opportunities to improve of existing information or new analysis may be necessary. In some cases, we suggest revisions to the draft cap-and-trade regulations CARB issued on September 4, 2018. We appreciate that tradeoffs must be made in assigning scarce resources within California's regulatory agencies. In this light, we try to identify priorities.

### C. IEMAC Summary Recommendations

#### Overlapping Policies

- Identify the potential that overlapping or companion policies may reduce allowance prices and examine remedies if this is a problem.
- Evaluate alternative methods to reduce emissions in the transportation sector if the state cannot implement its tailpipe and ZEV standards.

I 43-1

#### Environmental Justice Implications of California Climate Change Policies

- Local and regional air pollution poses significant environmental and health risks, and these local pollution problems should be addressed as vigorously as global climate change.
- Continue to monitor and analyze the distribution of emissions impacts associated with California's GHG emissions trading program on disadvantaged communities.

43-2

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<sup>2</sup> Executive Order on Carbon Neutrality

- The state should consider the development of out-of-market emissions reduction opportunities in advance of when they might be needed in the program to provide compliance instruments if the price ceiling is triggered. New protocols that might apply can generate global environmental benefits.

#### D. Looking Forward

Before moving to the subcommittee reports, we offer a word on process. This committee had an abbreviated schedule to meet and develop recommendations, and we accelerated the process to provide our first report within the fall 2018 comment window for the proposed amendments to the cap-and-trade program. Going forward, we are committed to improving committee process to enable better engagement with the public and the legislature.

We appreciate the hard work and dedication of the CalEPA Secretary's office and CARB, under the leadership and direction of the Executive Officer, the CARB Board and its Chair. Their work, along with many other state agencies implementing climate policy, has produced emissions reductions that have met the 2020 GHG emissions cap four years early at the same time that California has led the country in economic growth. Our recommendations intend to assist the Board in the next phase of program development and implementation, as we work collectively to ensure that California meets its ambitious climate goals with environmental integrity, with environmental justice, and in a way that continues to contribute to California's economic health.

- More is expected and must be done to further an inclusive and transparent process between the agency, environmental justice advocates, and local communities to foster trust

↑ 43-2  
cont.

#### Emissions Leakage and Resource Shuffling

- Additional data collection and analysis is needed to refine and improve the current approach to calibrating and conferring output-based leakage mitigation compensation. As California's GHG policies increase in stringency and ambition, the efficiency and distributional implications of any miscalibration of these subsidies become more significant.
- GHG reductions in the electricity sector are driving statewide trends. Electricity imports are potentially subject to resource shuffling. CARB should review and update core resource shuffling accounting methods in the current and proposed regulations. A more comprehensive assessment of the extent to which resource shuffling has occurred would be complicated and inevitably imprecise, but would help to target and inform any mitigation actions going forward.

43-3

#### Offsets

- The proposed regulatory text defining "direct environmental benefits" (DEBs) contains an ambiguity that could enable any offset project to claim a DEB on the basis of its greenhouse gas emissions. CARB should foreclose this option.
- Credits issued under the U.S. Forest Projects protocol account for about three-quarters of the offsets market. The subcommittee recommends additional review of this protocol's crediting methods to reflect technical concerns related to leakage, the timing of credited reductions, and the risk of unintentional reversal due to fires and other exogenous causes.

#### Managing Allowance Supply

- Public and private banking of allowances that are not needed in the pre-2021 market period will increase market supply in the post-2020 period, with the total number made available depending on future market prices. To improve transparency and address concerns about the ultimate emissions outcome, CARB should increase its public data reporting and prepare a comprehensive report on allowance supply.
- CARB should consider rule-based adjustments to program design that would adjust the supply of allowances based on observable metrics and in response to any concerns identified in the recommended studies.

#### Price Ceiling Considerations

- The state should develop an independent estimate of the social cost of carbon (SCC) to be included in a justification of the price tiers and price ceiling, accounting for the potential impact on disadvantaged communities from covered sources.
- The focus of program integrity should be placed on the level of emissions reductions achieved, not the amount of revenue the program generates.



## **Chapter 2: Overlapping Policies**

**Authors: Dallas Burtraw and Ann Carlson**

### **A. Context**

California's cap-and-trade program to reduce greenhouse gases is a highly visible piece of the state's portfolio of climate policies. However, it is only one element of the state's program to reduce greenhouse gases to meet its 2030 target. The state has adopted a number of additional policies, including a stringent Renewable Portfolio Standard, land use measures to reduce vehicle miles traveled, a Low Carbon Fuel Standard, and greenhouse gas emissions standards for various categories of vehicles. The 2017 Scoping Plan adopted by the Air Resources Board, in fact, identifies regulatory measures that are designed to achieve a majority of the emissions reductions required by statute. The cap-and-trade program is, nevertheless, an extremely important part of the program. It serves a number of valuable functions. These include

- 1) introducing greater cost effectiveness by making sure that low cost opportunities for emissions reductions are captured;
- 2) ensuring, through the cap, that the overall statutory emissions goals are achieved;
- 3) providing a signal to innovators about the value of low-carbon investments.

### **B. Key considerations**

Though California's suite of regulatory policies is impressive and responsible for a significant portion of GHG emissions, one issue they raise is that these policies may overlap with the cap-and-trade program by targeting the same regulated entity more than once. By adopting overlapping policies, the state may create effects that are not always fully transparent or that can undermine the goals of the policies. For example, overlapping policies may dampen prices in the cap-and-trade market. These price-dampening effects can, in turn, reduce incentives for technological innovation. Overlapping policies also tend to (though not always) mask their cost and may be more expensive per ton reduction of GHGs than a less fettered cap-and-trade program. Overlapping policies can also produce many benefits, some of which we also highlight. Our focus in our subcommittee report is on these policies and their interaction with the allowance market.

### **C. Case studies and public comments**

#### **1. Overlapping policies**

Many policies that overlap with cap and trade are initiated by other agencies in local, state and federal government. Examples of policies that overlap with the cap-and-trade program include:

- 1) The Low Carbon Fuel Standard (LCFS) regulates the full life cycle of transportation fuels. This includes their production, transport, and

combustion. The cap-and-trade program includes petroleum transport fuels and natural gas, though is not based on life cycle emissions but instead only combustion. Compliance for one program can achieve compliance for the other if the compliance for one program reduces the required amount of reduction for the regulated entity under the other program; whether the LCFS or the cap-and-trade program requires the compliance depends on individual circumstances (Controlling Greenhouse Gas Emissions from Transport Fuels: The Performance and Prospect of California's Low Carbon Fuel Standard).

Even though LCFS allowance prices are significantly higher than allowance prices under cap-and-trade, the interactive effects of the program vary depending on factors like the carbon intensity of a particular fuel. As Parson, et al. explain, a fuel like fossil CNG, which has a relatively low carbon intensity, receives credits under the LCFS but must surrender allowances under cap-and-trade. By contrast, some high-intensity fuels achieve their compliance through purchasing LCFS allowances, not through cap-and-trade.

2) The Renewables Portfolio Standard (RPS) requires the state's electric utilities to achieve a set percentage of their energy from defined renewable sources such as wind and solar. The percentage has increased over time, so that by 2030 the state's utilities must achieve 60 percent of their energy from defined renewable sources. The state's utilities (both investor-owned and publicly-owned) are also subject to the cap-and-trade program. The RPS in effect directs the utilities how to achieve the majority of their emissions cuts – by procuring energy from renewable sources and is expected to have additional costs to the state even as it advances the integration of renewable energy technology into the electricity system. If the RPS did not exist, utilities could instead meet their cuts under the cap-and-trade program by choosing how they would comply. Other programs that operate similarly include energy efficiency standards and mandates for the procurement of battery storage. Each of these have their own long-run justifications, but each may introduce additional costs in the short-run compared to cap and trade (though energy efficiency may be cheaper in the short-run).

3) The Zero Emission Vehicle (ZEV) and GHG mobile source standards. Expanded electrification and energy efficiency in transportation will yield reductions over the next decade. Although car manufacturers are not subject to the cap-and-trade program, as described above, fuels are.

## 2. Issues Raised by Interactive Effects of Cap-and-Trade, Complementary Policies

The overlap of the cap-and-trade program with other regulatory measures could be mutually reinforcing or could undermine the incentives or cost effectiveness of each of the approaches. Overlapping and companion policies have many and varied justifications, including importantly the attainment of ancillary environmental benefits and especially environmental improvements in disadvantaged communities. For example, the RPS, with its requirement that utilities procure renewable energy, lowers

air pollutants to the degree that renewable resources displace dirtier energy sources like natural gas. Other justifications include promoting targeted technological change and building infrastructure. For example, the RPS may have helped stimulate technological innovation and driven down procurement costs for renewable projects.

The policies that directly regulate emissions from sources that are also covered by the cap-and-trade program, however, can be expected to put downward pressure on the cap-and-trade allowance price. That is because when policies direct how emissions will be reduced (through, for example, mandating that utilities procure a set amount of renewable energy), there are fewer emissions to be reduced in the cap-and-trade market (even though the lower emissions resulting from the RPS help utilities achieve compliance). A lower price in the market has advantages, such as protecting California industry, but that lower price masks what are in some cases higher costs for these industries if the cost of meeting the RPS, for example, is higher than the cost of cutting emissions through other means. Another disadvantage of a lower allowance price is that it lessens the economic signal from the cap-and-trade program that influences investments by industry, businesses and households and therefore opportunities for technological innovation. As climate goals become increasingly ambitious, most economists advocate for an increasing role for pricing. However, a declining price that results from an abundance of overlapping policies undermines confidence in the market and expectations about a price signal, creating a cycle that requires yet more regulation to achieve long-run emissions reduction goals.

In some cases, it appears that an allowance price that could practically be achieved – even without overlapping policies – would be insufficient to incentivize the necessary emissions reductions in the short run or the investment in infrastructure and innovation that is necessary in the long run. In this case, government regulation may have a special role in coordinating these transformations. This seems especially true in the transportation sector, where allowance prices in cap-and-trade may be insufficient to direct the changes necessary to achieve large emissions cuts in the sector.

California enforces its vehicle mandates under a waiver granted by the US Environmental Protection Agency (EPA). The EPA is currently proposing to revoke California's waiver to issue GHG standards for passenger automobiles and for its ZEV program. The ARB Scoping Plan for 2017 considers the possibility that the federal government will attempt to limit California's authority to issue tailpipe standards. If the federal effort succeeds in either delaying the implementation of the standards or blocking them all together, the Scoping Plan calls for achieving emissions reductions from the same sector. However, it will be a challenge for California to do so if the federal government succeeds in either delaying or forestalling vehicle emissions standards for 2021-2025 altogether. Additionally, under the Clean Air Act, California will need to get federal permission (a waiver) to issue standards for 2025 and beyond. Although California has a strong legal case that it can continue to impose its 2021-2025 standards for passenger automobiles and require compliance with its ZEV program, no legal case is without uncertainty. And transportation is the largest source of GHGs in

the state and the sector showing increases, rather than decreases, in emissions in recent inventories.

### 3. Public Comments

We highlight two comments received by the committee. These comments have not been evaluated by the full committee.

- 1) AB 32 requires the state to account for emissions associated with imported power. In doing so, the state applies a protocol to identify or assign an emissions rate to imported power. Entities that deliver imported power to the California grid are responsible for surrendering emissions allowances commensurate with the embodied emissions of that power. Consequently, relatively low-emitting power may be preferentially directed to the California market. The same power may have created renewable energy credits that are used for compliance in a renewable portfolio program in California or another state. If the California power market is valuing the power because it is clean, then the renewable credits might be double counting that attribute in other programs. Conversely, the renewable credits might be lowering the price of renewable power that is made available to the California energy market. Among suggestions shared with the committee was the idea that renewable power that is imported to California be identified as a zero-emissions import in WREGIS, so that other programs can consider the influence of the overlapping policies.
- 2) One comment suggested that compliance entities report the greenhouse gas emissions reductions that are achieved from overlapping regulatory programs. This reporting protocol may have merit, but it may lead to ambiguous assignment of emissions reductions across programs. We invite ARB to consider the possibility further.

#### D. Recommendations for cap-and-trade regulatory amendments

We do not see opportunities to address overlapping policies in the short-run context. We have suggestions for analysis that could be important to the direction of the program in the long run.

#### E. Recommendations for longer-term implementation

Overlapping policies raise a number of issues that could benefit from additional analysis and consideration.

- 1) Identify the potential that overlapping or companion policies may reduce allowance prices and examine remedies if this is a problem.

We believe it would be beneficial to have more analysis about the price effects of having policies that overlap with cap and trade. First, on a per ton of GHG reduction, are there estimates of the cost of various overlapping policies like the RPS, energy efficiency and car standards? And are there estimates about the degree to which overlapping policies put downward pressure on cap-and-trade allowance prices? If the downward pressure

is significant, there are design choices for the cap-and-trade market that can alleviate this pressure. For example, the existing price floor provides assurance of a minimum value of investments in compliance. But there may be opportunities to supplement the price floor with additional measures, such as additional emissions/price containment points or other adjustments to allowance supply when companion policies have their desired effect. Relatedly, there may be opportunities to align price-based policies like the RPS and the LCFS with the cap-and-trade program provides cost and price management in a complementary way across these programs. We recommend that ARB consider these possibilities and opportunities.

- 2) We ask CARB to evaluate alternative methods to reduce emissions in the transportation sector if the state cannot implement its tailpipe and ZEV standards.

We list below several possibilities, none of which we have examined in detail. We recommend that ARB consider these possibilities.

- a. Consumption based pricing of vehicle miles traveled;
- b. Increase in tax subsidies or direct subsidies for EV purchases;
- c. Feebates associated with vehicles according to technology characteristics;
- d. Additional housing and land use standards to reduce vehicle miles traveled;
- e. Regulations or limitations on extraction of fossil fuel resources;
- f. State fleet mandates, and incentives for corporate and local government fleet conversions;
- g. Carbon intensity of vehicles manufacturing modeled after the Low Carbon Fuel Standard but focused on automobiles rather than fuels.
- h. We encourage ARB and other state agencies to look for opportunities to infuse incentives in regulatory policies that overlap with the cap-and-trade program. We also encourage ARB to look for ways of aligning these efforts to improve cost effectiveness. An example might be linked cost containment.
- i. Without providing guidance about how to do so, the committee urges state agencies including the ARB to rigorously evaluate companion policies to identify their motivation such as market failures, technological or infrastructure development, or research. This effort will help ARB to assess the influence these programs may have or are intended to have on the cap-and-trade program.

43-4

## F. Conclusion

Policies that overlap with the cap-and-trade program affect the performance of the program. This committee advises that ARB and other state agencies be proactive in understanding how that interaction will affect the market as well as how the market might affect the performance of the overlapping policies.

## **Chapter 3: Environmental Justice Implications of California Climate Change Policies**

**Authors: Quentin Foster and Meredith Fowle**

### **A. Context**

California faces intensifying risks from climate change, including more intense forest fires, coastal erosion, prolonged droughts, and more frequent episodes of extreme heat. In response to these escalating risks, California has committed to reducing its greenhouse gas emissions, and to protecting the public against significant climate change related damages. The state is implementing a suite of policies designed to reduce in-state GHG emissions and stimulate the development of low carbon solutions that can be deployed more broadly.

California's efforts to mitigate global climate change are important. However, climate change is not the only environmental concern that poses significant risk to the well-being of Californians. Local and regional air pollution poses significant environmental and health risks. Going forward, these local pollution problems should be addressed as vigorously as global climate change, particularly in marginalized communities which are disproportionately exposed to these risks.

The critical importance of local air pollution problems notwithstanding, our committee is tasked with reviewing California's GHG cap-and-trade program and associated climate change policies. Our charge is not to question the fundamental policy architecture, but rather to evaluate the policy design and governance choices that could have significant implications for program effectiveness. The focus of this sub-committee, in particular, is on how California's climate change policies and programs could impact socioeconomically disadvantaged communities.

In this commentary, we briefly review some of the research that investigates these issues, we assess the ways in which California Air Resources Board (CARB) has been responsive to environmental justice (EJ) concerns, and we highlight some policy design and implementation features that warrant particular attention.

Although conversations with the EJ community were considered carefully in the writing of this report, this is not intended to be a consensus document. This comment seeks to characterize the range of opinions and perspectives on key issues, identify knowledge gaps, and highlight issues that merit careful attention going forward.

### **B. Lessons from literature on cap-and-trade and environmental justice**

Although the GHG cap-and-trade program has attracted a great deal of attention, it is important to keep in mind that cap-and-trade plays a supporting role in California climate policy. More prescriptive programs and regulations are expected to deliver the

majority of mandated GHG emissions reductions.<sup>1</sup> That said, the cap and trade program does have three critical roles to play:

- 1) A binding emissions cap ensures that the state's GHG emissions reduction targets are met.
- 2) Trading of allowances between firms can significantly reduce abatement costs incurred to meet the cap.
- 3) The sale of allowances raises revenues that can be used to mitigate adverse impacts of climate change and/or reduce any inequities in cost burden.

Economists favor market-based climate change policies, such as emissions trading programs, because they are designed to seek out and incentivize the least costly GHG abatement options. Environmental justice advocates have been quick to point out that the least cost climate change mitigation solutions need not be the most equitable or desirable. In principle, revenues raised through the sale of allowances can be used to offset these inequities. In practice, this kind of redistribution can get complicated.

One complication is that GHGs are often co-emitted with local pollutants that cause localized health and environmental damages. Thus, the allocation of GHG emissions abatement responsibilities can have important implications for local environmental quality. Historically, GHG emissions and emissions of local pollutants from point sources have been strongly positively correlated. In the past, changes in emissions have primarily been driven by variation in industrial production levels. However, the relationship between GHGs and local pollution could look quite different if pollution reductions are induced by a policy targeting one form of pollution. For example, a gas-fired boiler could increase combustion temperatures to lower GHGs, but this would increase local pollutant emissions (Holland, 2012). In this case, mandating a decrease in GHGs would lead to a *deterioration* of local environmental quality. The impact of a policy-induced reduction in GHGs on local pollution will really depend on the extent to which local and global pollutants are substitutable.

Economists have begun to empirically investigate the cross-effects of pollution regulations. Holland (2012) examines the response of GHG emissions to an increase in the stringency of NO<sub>x</sub> regulations for California power plants. In this context, electricity generating firms primarily complied with the policy by reducing output which reduced both types of pollutants. Brunel and Johnson (2016) isolate plausibly exogenous spatial and temporal variation in local and regional air pollution induced by the Clean Air Act in order to empirically evaluate complementarities in U.S. manufacturing sectors. In contrast to Holland, they find that significant, policy-induced reductions in local pollution have not had ancillary benefits in terms of GHG reductions, presumably because abatement investments delivered targeted reductions in regulated pollutants. These findings highlight the possibility that historic correlations in local and global emissions

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<sup>1</sup> Companion policies, such as the renewable portfolio standard, are expected to deliver the majority of GHG emissions reductions. CARB estimates that cap-and-trade will deliver less than 30% of mandated GHG emissions reductions by 2020. See [CARBs Climate Change Scoping Plan](#)

trends can be misleading indicators of how a policy-induced change in one form of pollution will affect the other.

A recent paper by Cushing et al (2018) examines temporal patterns in local pollutants, toxics, and global pollutants emitted from point sources regulated under California's GHG emissions trading program. These authors compare emissions levels prior to the policy (2011-2012) and the three years following the introduction of the policy (2013-2015). The study finds that, variation in GHG and local pollutant emissions were positively correlated over this time period. Notably, 52% of facilities regulated under the GHG emissions trading program increased emissions in the post-policy period relative to 2011-2012. The authors estimate find that emissions increases between these two time periods were disproportionately located in low income and minority neighborhoods.

The findings of Cushing et al. are concerning but not dispositive. One complication lies in the inter-temporal comparison that these authors construct. Comparisons across these two time periods confound the effects of the GHG cap and trade program with some other significant determinants of local pollution and GHG emissions. For example:

- 1) Over the period 2013-2015, in addition to implementing the GHG emissions trading program, California (and the rest of the country) was recovering from the recession. With economic recovery comes an increase in industrial production and associate emissions.
- 2) In the electricity sector, the closure of the San Onofre nuclear power plant in 2012. This major shut down induced a significant increase in output among fossil fuel generation in the state. It is estimated that the nuclear plant closure increased greenhouse gas emissions from power plants in California by 35%.

In order to isolate the effect of the GHG cap-and-trade program on the distribution of emissions over this time period, additional work is needed to control for these and other factors.

A second concern pertains to the sensitivity of the results to the chosen time period. Cushing et al. report: "Since California's cap-and-trade program began, neighborhoods that experienced increases in annual GHGs and co-pollutant emissions from facilities nearby had higher proportions of people of color and poor." However, subsequent research looking into this question has found that the answer is sensitive to how the comparison is constructed. For example, Meng (2018) finds no significant difference in average GHG emissions trends over the period 2012-2015 across disadvantaged and non-disadvantaged communities. If anything, emissions trajectories over this period suggest the emissions gap is narrowing.

In sum, the empirical evidence on the cross-effects of local and global pollution regulations is mixed. It is not our role to debate the merits of these aforementioned studies. Instead, we advise the legislature and staff to monitor and analyze the distribution of emissions impacts associated with California's GHG emissions trading program, in addition to other policies.

### C. Governance

CalEPA staff are to be commended for their thoughtful and deliberate approach to addressing some complex issues and tradeoffs across a state that is regionally and culturally diverse. The cap-and-trade program design should continue to reflect its intention of being the backstop to the suite of climate policies that help drive down CO2 emissions. At the same time, the state should also support efforts to address air quality concerns in marginalized communities across the state through additional policies like AB 617, which we agree with environmental justice communities, is but a first step to truly prioritizing addressing local pollution in vulnerable communities.

It is important to recognize and commend the leadership within the environmental justice movement for pushing the concerns of many Californian's to the forefront of our political discourse pertaining to how we will prioritize those concerns within the context of climate action. Environmental justice communities are supportive of the governance changes that have been adopted to ensure their concerns receive the proper attention and action from senior staff within CARB and CalEPA. Today, the California Air Resources Board has expanded to include two voting members with experience on environmental justice issues. Additionally, the Legislature through AB 197 now has two appointments to CARB that are non-voting members but can continue to provide legislative oversight on concerns raised by environmental justice communities before the Board. CARB has also created the role of Assistant Executive Officer for Environmental Justice primarily responsible for coordinating with and representing the interests of environmental justice communities on behalf of the agency.

Finally, in 2015 the agency recommissioned the Environmental Justice Advisory Committee (EJAC), which is comprised of community leaders and experts on environmental justice issues. Since the passage of AB 32 in 2006, the environmental justice advocates and community leaders have grown in influence. That influence is reflected in these governance changes ensuring that these communities can participate more directly and substantively in how California addresses climate change and local air pollution challenges. CARB staff continue to demonstrate the importance of ensuring community leaders are included in the regulatory process through its public workshops held in environmental justice communities, increased transparency with public reporting of data, and willingness to adjust outreach efforts to ensure cultural relevance and competency. We recommend that CARB remain consistent in these outreach efforts both with local communities and with current EJAC committee members.

### D. Monitoring impacts of GHG emissions regulations on local air quality

While climate is the focus of this committee, it is important to recognize the air quality impacts on vulnerable communities of climate regulations. To that end, the 2017 Scoping Plan includes a strong acknowledgement that climate action can only be considered fair and equitable when inequities across communities are addressed.

The passage and subsequent implementation of AB 197 and AB 617 provides an opportunity for the agency and the state to demonstrate the priorities of local air quality

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coupled with climate and the prevention or mitigation of unintended consequences. Coupled with the last update to the CalEnviro Screen, a tool that aides the state in identifying hot spots in communities across the state for investment and encourages collaborative action with local communities. This is especially relevant to identified neighborhoods where local air districts are tasked with addressing toxic and local criteria pollutants that are known to exacerbate poor health outcomes. With the support and backing of the Board, increased local monitoring and real-time data collection, fair and equitable action on climate and air quality can be catalyzed throughout the state.

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The IEMAC committee had the opportunity to meet with environmental justice advocates to discuss, among other issues, the intent and potential of AB 617. Their assessment is that the AB 617 process is extremely new and under development. EJ advocates correctly note that many of the key pillars and programs of AB 617 have yet to be defined. Important concerns were raised about enforcement protocols for air districts. Thus, while the policy constitutes a promising first step, we cannot safely assume that it will sufficiently address environmental justice issues. Although there is real potential, it is far from clear that AB 617 will indeed provide the robust changes necessary to how the state addresses local criteria pollutants. We agree with this assessment.

In order to be successful, implementation of AB 617 will require consistent and adequate funding from the Legislature, and sufficient and dedicated staff. Workshops are being convened throughout the state to engage communities on best practices and planning. Efforts to develop relationships with local leaders that will lead to truly identifying the sources of concerns are ongoing.

There is a critical trust gap that must be overcome if this program development process is to be successful. Given the striking inequities in exposure to harmful local air pollution, environmental justice communities may have low expectations and/or anticipate minimal attention and effort from the agency. This committee recommends that staff continue to have robust engagement with community leaders, ensuring information materials are culturally relevant, and maintain transparency of timelines, goals, and information. We furthermore recommend that communities that have not been included in the first round of implementation continue to be engaged. For example, Richmond was not prioritized in the first round, but given its proximity to a major oil refinery, should be considered for the second round of implementation.

While AB 617 presents a potentially significant step forward in addressing the social needs that run parallel to air quality challenges, understandable skepticism remains. Agencies must earn trust and demonstrate meaningful progress by investing substantively in substantive environmental quality improvements, particularly in communities impacted disproportionately by adverse public health outcomes related to local air quality conditions and other environmental factors such as transportation, proximity to ports, and freight goods movement.

## E. Investing in EJ Communities

California climate change policy includes a number of programs designed to mitigate the impacts of California climate policies on low income households. Programs include: 1) the provision of climate credits directly to households; 2) climate investments and other efficiency, fuel switching, and vehicle mile reducing programs and policies that help households lower their expenditures on electricity, natural gas and gasoline; and 3) low-income rate assistance programs, which although unrelated to the Cap-and-Trade Program, can reduce households' budgetary burden associated with electricity and natural gas consumption. Because the latter two types of measures can lower energy and gasoline bills, they indirectly help to lower any Cap-and-Trade compliance cost passed on to customers.

A 2016 study conducted by the UCLA Luskin Center estimated that low income households would receive more in climate credits than they would pay in Cap-and-Trade associated costs as electricity consumers (Gattaciecce et al. 2016). In other words, low-income households could receive a positive financial impact of between \$215 and \$246 cumulatively, from 2016 through 2020, associated with the Cap-and-Trade Program.

In addition to climate credits, it is estimated that over half of the \$2 billion in implemented projects (\$1 billion) is providing benefits to disadvantaged communities, including 31 percent (\$615 million) going to projects located within these communities. This exceeds the requirement under SB 535 (De León) that at least 25 percent of investments are allocated to projects that benefit disadvantaged communities. In 2016, Governor Brown signed AB 1550 establishing new investment minimums for disadvantaged communities, and low-income communities and households. In addition to subsidizing the cost of critical mitigation projects, additional programs designed to reduce the financial pressure on low-income communities due to increase in energy costs are also supported by investments from the revenue in the cap and trade program.

As noted above, the GHG cap-and-trade program provides an essential means of raising revenues to support promising climate change mitigation investments, and to offset inequalities (pre-existing or policy induced). We encourage CARB and the Legislature to continue working together to prioritize promising investments in disadvantaged EJ communities.

## F. EJAC Recommendations

While there are some stark differences between the EJAC recommendations on which tools the state should adopt to meet its emissions goals and what was eventually adopted, staff and Board support of the committee is helping to build trust. It is important to note that trust does not require that the recommendations from the EJAC be accepted. Even when there are disagreements and discrepancies between recommendations and policy implementation, trust can still be cultivated if

recommendations are received and analyzed by staff, and if the discussion around these recommendations is transparent and substantive.

Shared benefits from the state's climate policies are critical to ensuring equity is achieved. Some examples of this are the state's California Alternate Rates for Energy (CARE) Program that helps to reduce energy costs for low-income families. Programs like these are supported by EJAC members who understand how these programs will be impacted by new regulations. Having this perspective is important to reducing the potential for negative unintended outcomes associated with the agency's strategies.

Also of concern to environmental justice advocates is the definition of what constitutes a "Direct Environmental Benefit". These communities have long held that offsets, which can provide an important means of enhancing cost effectiveness of climate change mitigation, export California benefits and contribute to the creation of toxic hotspots in vulnerable communities. Ensuring that offset projects from outside of California meet specific verifiable criteria on a project by project basis, can alleviate most of the concerns that benefits from approved offset protocols will indeed benefit Californians in some direct way. The creation of the Offset Protocol Task Force by AB 398 will also provide some assurances to environmental justice communities and advocates that more deliberate consideration will be given to new offset projects in the state.

While differences remain between CARB's positions and the concerns of some environmental justice leaders in how air quality and GHG reductions are addressed, it is crucial that CARB continue to engage and work with environmental justice communities. There also remains concerns that AB 197, which calls for CARB to prioritize direct emission reductions is somehow not being implemented with the appropriate intent of the legislation fully realized.

The most important component of AB 197 to environmental justice advocates is the direction it gives CARB to prioritize direct emission reductions at the source level. There continues to be an underlying concern that the state's primary focus particularly with the cap and trade program to reduce GHG emissions will diminish the priority to address localized criteria pollutants from industrial sources. This tension continues to undermine efforts to narrow the communication gap between CARB staff and many advocates adding to lingering sentiments of mistrust. Although these issues fall outside of the scope of this committee, however we do recognize that trust is earned, and CARB should continue to take the necessary steps to build that trust with communities who have historically not played a direct role in creation and implementation of air quality regulations.

The recommendations of the EJAC, while not accepted completely, demonstrate that people are paying close attention to the decisions that CARB is making and want to be a part of the solution to the crisis. The recommendation of this committee is that CARB continue to be transparent and consistent in engaging with and strongly considering the analysis and recommendations without prejudice from EJAC members and local environmental justice advocates.

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## G. Conclusion

In this commentary, we have highlighted some issues and concerns that warrant particular attention going forward:

- 1) We encourage the legislature and staff to monitor and analyze the distribution of emissions impacts associated with California's GHG emissions trading program, in addition to other policies.
- 2) We acknowledge the governance changes that have been made to help EJ communities participate more directly and substantively in how California addresses climate change and local air pollution challenges. It is important that CARB remain consistent in these outreach efforts both with local communities and with current EJAC committee members.
- 3) We underscore the importance of investing substantively in critical environmental quality improvements in EJ communities via AB 617 and related regulations.
- 4) We encourage CARB to work with the Legislature to broaden opportunities for meaningful mitigation investments in disadvantaged communities throughout the state.
- 5) We acknowledge EJ concerns pertaining to the implementation and intent of AB 197. We encourage CARB to continue working with the Legislature and EJAC committee members to address and alleviate these concerns.

We are hopeful this commentary will reflect the progress that CARB has made in working to ensure environmental justice communities participate in a robust vetting process of pending regulations so as to feel that they are indeed being heard. It is clear however that in spite of this progress, more is expected and must be done to further an inclusive and transparent process between the agency and local communities. CARB should continue to build trust with communities who have historically not played a direct role in creation and implementation of air quality regulations.

We also sought to provide a balanced analysis of the current program and the EJ perspective that continues to encourage CARB to consider and identify gaps, which may need further action to ensure local communities share in the benefits of California's climate policies. That is an outcome that both the agency, the Legislature, and environmental justice communities want. The IEMAC committee fully agrees with this and believes these recommendations can help continue to keep the state on track to meet its GHG emissions goals, while also ramping up its effort to mitigate and reduce local pollution burdens in California's most vulnerable communities.

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## Chapter 4: Emissions Leakage and Resource Shuffling

Authors: Meredith Fowlie and Danny Cullenward

### A. Leakage

The global nature of climate change creates challenges for California climate policy, which covers only a small subset of the sources contributing to the problem. This creates the potential for “leakage,” a concept that is most easily illustrated by example. Consider an industrial producer operating in California that is required to purchase GHG allowances to cover its emissions. As a consequence, suppose this producer becomes relatively less competitive in the global market and thus loses market share to its out-of-state competitors. This induces a shift or “leakage” of production—and associated emissions—from the California firm to its out-of-state competitors.

For the purposes of this report, it is useful to distinguish between different forms of leakage:

- 1) **“Emissions leakage”** refers to any change in emissions from sources not covered by the GHG policy or program that is caused by the GHG emissions policy or program. It is worth noting that leakage is a potential issue under any state climate change policy that increases operating costs of regulated entities, not just cap-and-trade. Leakage can also happen within California if there is excess capacity at in-state facilities that are exempt from the GHG regulations (e.g. industrial facilities that emit less than 25,000 tCO<sub>2e</sub> of GHGs per year are not covered by the GHG emissions trading program).
- 2) **“Rent leakage”** refers to the transfer of profits from California entities to out-of-state producers that is induced by GHG regulations.

Minimizing emissions leakage caused by California’s climate change policies is a statutory requirement of AB 32 and an important design objective of the cap-and-trade program. Economists have thought carefully about the various channels through which emissions leakage can occur. For the purposes of this report, it is useful to distinguish between two related but conceptually distinct leakage channels.<sup>1</sup>

- 1) **Trade-competitiveness channel:** Policy-induced increases in operating costs can cause industrial production (and associated emissions) to move to jurisdictions outside the reach of the regulation via trade flows.
- 2) **Fuel price channel:** If emissions regulations in a large open economy reduces demand for carbon-intensive inputs (e.g., fossil fuels), global input prices will fall and stimulate demand for these inputs in unregulated regions.

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<sup>1</sup> The economics literature has also identified additional leakage channels via income effects and technology spillovers from induced innovation that can potentially induce “negative leakage” (see, for example, Gerlagh and Kuik 2014).

The conceptual distinction between these two channels is important for the assessment of leakage mitigation alternatives. Measures such as output-based permit allocations and border adjustments are designed to counteract the first channel. The second channel is much more difficult to mitigate or address.

Concerns about leakage loom large, so it is essential that California's cap-and-trade program incorporate a meaningful response to this problem. It is important to acknowledge California Air Resources Board's (CARB) pioneering work in this area. The output-based approach developed by CARB, which involves allocating production subsidies in the form of free permit allocation to those sectors deemed to be at leakage risk, has set a policy design example that other jurisdictions are studying and following. That said, the approach to determining the subsidy levels is increasingly set by political arrangement, rather than evidence-based analysis. In what follows, we acknowledge some of the formidable challenges that complicate leakage mitigation in practice, and point to critical knowledge gaps that could be usefully narrowed with additional data collection and analysis.

### 1. Assessing leakage risk

Correctly identifying the kinds of economic activities most at risk of carbon leakage is a critical first step in the design of effective risk mitigation (Fowlie and Reguant, 2018). Here, we will focus on emissions leakage as this, along with "transition assistance", rationalizes free permit allocations to emissions-intensive industries.

There is a growing body of research in economics that assesses the potential for leakage risk across a range of sectors and contexts. One methodological approach uses multi-sector and multi-region computable general equilibrium (CGE) models calibrated to represent global trade linkages and energy flows. CGE models can, in principle, capture multiple leakage channels. A limitation is that results can be very sensitive to assumptions about key parameters, such as trade elasticities.<sup>2</sup>

An alternative method, called partial equilibrium analysis, involves empirically estimating parameters that determine the extent of leakage potential via the trade/competitiveness channel (see, for example, Fowlie et al., 2016). Intuitively, emissions leakage in a particular industry via the trade/competitiveness channel can be defined as the change in out-of-state production that is induced by California GHG policies multiplied by the emissions intensity of that foreign production:

$$\text{Emissions leakage} = \text{GHG}_{\text{out}} \times \Delta Q_{\text{out}}$$

**GHG<sub>out</sub>** (units: GHG emissions per unit of value of production) is the marginal emissions intensity of the out-of-state production that responds to a change in relative operating

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<sup>2</sup> An "elasticity" refers to the change in a given parameter in response to the change in an input cost. For example, as used here, a trade elasticity refers to the change in the value of traded goods and services in response to an increase in energy prices attributable to California's GHG policies. Elasticities measure the proportional change in one term relative to another. For example, if the trade elasticity is -0.5, this means that for any given increase in energy costs, the value of traded goods and services decreases by half as much.

costs. As we explain in Fowlie and Reguant (2018), these marginal emissions intensity parameters are difficult to estimate empirically for several reasons:

- 1) Reliable data measuring the carbon intensity of out-of-state production can be very difficult to obtain.
- 2) Even if researchers can obtain a reasonable estimate of the average emissions intensity for a given industry and trading partner, this average could significantly over or under-estimate the marginal rate. Past work has documented tremendous variation in emissions intensities across producers in the same industry (Lyubich et al, 2018).
- 3) Marginal emissions rates in a given sector/jurisdiction can change over time as out-of-state producers respond to changing terms of trade and factor prices. A marginal emissions intensity estimate constructed prior to the introduction of a policy need not apply once the policy takes effect.

A more concerted effort to gather data on the emissions intensity of industrial production in various jurisdictions outside would help inform leakage risk assessment efforts in California and beyond.

$\Delta Q_{out}$  (units: value of production) captures the responsiveness of out-of-state production to the introduction of GHG regulations in California. These industry-specific measures of supply responsiveness will in turn be determined by a number of factors, including the elasticity of the supply of imports to California, the elasticity of demand for exports from California, and the elasticity of production within California to policy-induced increases in operating costs. These elasticities are difficult to estimate empirically.

- 1) One limiting factor pertains to data availability. For example, data on intra-national, interstate trade is very limited, making it next-to-impossible to assess how these trade flows might be impacted by changes in relative operating costs.
- 2) A second complication concerns the identification of underlying elasticity parameters. It can be very difficult to disentangle the impacts of California climate change policies from the effects of other exogenous, time-varying factors.

These complications notwithstanding, careful work that seeks to evaluate how in-state production, imports, and exports are responding to policy-induced increases in operating costs can help inform our understanding of leakage potential across affected sectors.

## 2. Emissions leakage mitigation

California, along with other jurisdictions implementing GHG cap-and-trade programs, has been experimenting with using production subsidies to mitigate leakage in sectors deemed to be exposed to leakage risk. Under this approach, emitters are required to purchase cap-and-trade allowances to cover their emissions. But these same firms are freely allocated allowances based on output levels. Thus, the economic effect of this approach is that the producer sees both an emissions tax (via the market-based value

for allowances, which provides an incentive to reduce emissions) and a production incentive (which helps to “level the carbon playing field” with respect to unregulated out-of-state producers).

This output-based free allowance allocation approach used in California can be used to strike a balance between incentivizing emissions abatement and mitigating leakage. However, it is important to stress that this strategy comes with side effects. First, an opportunity cost is incurred when allowances are freely allocated. If allowances were not freely allocated to industry to protect against leakage risks, they could be sold at auction and their revenue used to fund climate mitigation expenditures, cut taxes, or provide direct rebates to consumers. Second, output-based rebating dilutes the carbon price signal in those industries that receive implicit subsidies. This shifts more of the overall abatement cost burden onto producers who are subject to the cap-and-trade program, but ineligible for these subsidies. Thus, the use of output-based subsidies to mitigate leakage will generally increase the total abatement costs incurred within California to achieve a given level of abatement.

In sum, because output-based free allocation has potentially significant implications for both the costs of abatement and the distribution of who bears these costs, these interventions should be judiciously calibrated and targeted. To efficiently mitigate leakage, subsidy levels should ideally reflect the GHG emissions in external jurisdictions that are avoided when production activities remain within California.

Allocating valuable subsidies is an inherently political process, so there is a pragmatic need for a systematic approach that can be applied consistently and transparently across sectors. The current approach to calibrating output-based subsidies is ad hoc. In particular, there is no attempt to rationalize the recent increase in industry-specific allocation factors in terms of factors that determine emissions leakage risk (namely foreign emissions intensity and the responsiveness of out-of-state production to changes in relative operating costs). As we acknowledge above, estimating these parameters is a challenging and imprecise exercise. These complications notwithstanding, more could be done to ensure that production-based subsidies conferred to industry reflect true leakage risk.

As California’s GHG policies increase in stringency and ambition, the efficiency and distributional implications of any mis-calibration of subsidies will become more significant. Additional data collection (e.g., on intra-national, inter-state trade flows) and analysis is needed to refine and improve the current approach to calibrating and conferring leakage mitigation compensation.

#### B. Resource shuffling

Resource shuffling is a specific type of leakage that can occur in energy markets. It is most commonly discussed in the context of electricity markets, but it can also occur in other energy markets, such as those for transportation fuels. The issue is most easily illustrated by example. Suppose a utility once imported power from a carbon-intensive coal plant prior to the cap-and-trade program’s existence. In response to the new

carbon price, the utility might decide to divest its contract with the coal plant and replace it with natural gas-fired electricity. While this swap will reduce the carbon intensity of the utility's imports, and therefore reduce its compliance obligations under the cap-and-trade program, it may not reduce net greenhouse gas emissions to the atmosphere if the divested coal-fired electricity is purchased by a utility outside of the cap-and-trade program.

Under California's cap-and-trade program, electricity importers are responsible for submitting compliance instruments to cover the greenhouse gas emissions associated with all imports.<sup>3</sup> As a result, electricity importers have a financial incentive to divest imports from high-carbon resources and replace them with low-carbon resources. Energy modeling studies have identified a significant potential for resource shuffling in the electricity sector (Chen et al., 2011; Bushnell and Chen, 2012; Bushnell et al., 2014; Borenstein et al., 2014).

Much of the progress California has made in reducing its greenhouse gas emissions in the electricity sector has been attributed to reductions in emissions from imports (CARB, 2018a: Figures 7-8). This underscores the importance of assessing the potential for electricity resource shuffling. In what follows, we identify four potential "channels" through which resource shuffling can manifest in the electricity sector. We then highlight some cross-cutting issues which we see as particularly pressing.

### 1. Bilateral Contract Shuffling

To the extent that California's climate change policies increase the cost of importing power generated by carbon intensive, out-of-state resources, electricity importers have an incentive to shift the type and duration of private bilateral import contracts towards less emissions intensive resources. If the electricity generated by the relatively more emissions intensive resources is shuffled to out-of-state consumers, California's GHG accounting will overstate the extent to which emissions have actually declined. This "contract shuffling" can occur via short-term bilateral trades, or it can manifest via the systematic divestment of California utilities' legacy ownership positions in, and long-term contracts with, out-of-state coal-fired facilities (Cullenward & Weiskopf, 2013).

Although CARB's regulations nominally prohibit resource shuffling,<sup>4</sup> CARB decided to exempt a range of so-called "safe harbor" practices—first via an informal guidance document in late 2012 (Cullenward, 2014a) and subsequently via formal rulemaking completed in 2014.<sup>5</sup> Among the exempted "safe harbor" practices are any trades affecting legacy coal contracts subject to the provisions of SB 1018's Greenhouse Gas Emissions Performance Standard<sup>6</sup> and transactions in the day-ahead and real-time electricity markets operated by the California Independent System Operator (CAISO).<sup>7</sup>

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<sup>3</sup> Cal. Code Regs., title 17, § 95852(b).

<sup>4</sup> *Id.* at § 95852(b)(2).

<sup>5</sup> *Id.* at § 95852(b)(2)(A).

<sup>6</sup> *Id.* at §§ 95852(b)(2)(A)(2), (7).

<sup>7</sup> *Id.* at §§ 95852(b)(2)(A)(2)(10).

For a deeper discussion of how these safe harbors might operate in practice, see Cullenward & Weiskopf (2013: 21-26).

After CARB released its safe harbor exemptions to the prohibition on resource shuffling, California load-serving entities divested several major legacy coal contracts (Cullenward, 2014b). These divestitures reduced GHG emissions as reported in California's cap-and-trade program and GHG inventory. To the extent that electricity generated by affected coal plants was simply re-directed to out-of-state electricity customers, some resource shuffling and associated emissions leakage has already happened. To more rigorously estimate the extent to which resource shuffling has actually occurred, one would need to carefully construct a credible counterfactual scenario against which to measure the unit dispatch outcomes we actually observe.

## 2. Resource Shuffling via Retail Choice

As California embraces various new customer retail choice models in the electricity sector, another potential channel for resource shuffling is emerging. California electricity customers are beginning to transition from legacy retail service providers (e.g., an investor-owned utility) to become customers of new entrants (e.g., a community choice aggregator (or CCA)). According to one projection, by the mid-2020s, CCAs and direct access customers could be responsible for 85% of retail load in California investor owned utilities' service territories (CPUC, 2017: 3).

Many CCAs are contracting with existing out-of-state electricity resources, particularly in service of high-renewable energy retail choice programs. Historically, incumbent utilities have relied on relatively emissions-intensive out-of-state resources. If a CCA procures existing clean energy resources that were previously delivered to load-serving entities outside California, those external entities might replace them with higher-carbon alternatives. As demand for electricity supplied by incumbent utilities declines, the relatively emissions-intensive, out-of-state resources that once supplied California utilities in the past could be re-allocated to out-of-state customers in the future, leading to GHG emissions leakage.

There is some preliminary evidence that CCA procurement may be leading to resource shuffling (Rivard, 2018). Given the growing role played by CCAs, we see the potential for resources shuffling in the CCA context as a topic worthy of further investigation.

## 3. Resource Shuffling in Regional Electricity Markets

Concerns have also been raised about resource shuffling in the context of the CAISO Energy Imbalance Market (EIM). The EIM is a real-time, bulk power market that dispatches electricity generating resources to meet short-term supply imbalances across much of the Western U.S. Out-of-state power plants are dispatched to CAISO if and only if they elect to become subject to the cap-and-trade program and submit a "GHG Bid Adder" that is based on facility-specific GHG emissions factors and the California cap-and-trade market price.

The GHG Bid Adder affects the EIM operator's dispatch order such that lower-carbon resources are preferentially dispatched to serve California load. Low- and zero-carbon resources outside of California thus have an incentive to opt in to the EIM to serve CAISO load. However, as relatively clean out-of-state resources are called on to supply California, higher-carbon resources may be reallocated to serve non-California EIM load. This is sometimes called "backfilling" or "secondary dispatch" (CARB, 2018b: 70-73; CAISO, 2018).

CAISO, CARB, and other stakeholders have been experimenting with ways to address this problem. Until recently, CAISO was testing what it called a "two-pass solution" where the EIM market algorithm would be run twice: once without the carbon price, and again with the carbon price included from entities' bids. By comparing these two real-time optimization results, CAISO hoped to identify resources that were being re-allocated across state borders in response to the carbon price.

However, some observers criticized the method's use for determining which resources should be deemed dispatched to California on the grounds that the two-pass solution could enable gaming of electricity market bidding strategies (Hogan, 2017). CAISO has since moved away from the two-pass approach. In principle, however, this approach could still be used to estimate the policy-induced increase in emissions from generating resources outside of California, even if CAISO adopts another method for determining which out-of-state resources are dispatched to serve CAISO load.

More recently, CAISO developed an alternative approach to mitigating leakage in the EIM that restricts the volume of power out-of-state generators can bid to serve CAISO load (CAISO, 2018) and filed for EIM tariff amendments with the Federal Energy Regulatory Commission in August 2018. FERC's regulatory review is ongoing as of this writing.

#### 4. Renewable Energy Certificate (REC) and GHG accounting

Finally, there may be additional complexities associated with the accounting systems used to track power, GHG emissions, and RECs. One commenter (the Center for Resource Solutions) notes that CARB does not require electricity importers to retire the renewable energy certificates (RECs) associated with out-of-state renewables, yet nevertheless counts these electricity imports as zero-carbon resources for the purposes of the mandatory reporting regulation (MRR) and therefore for compliance obligations under the cap-and-trade program. As a result, the RECs associated with these renewable electricity imports are available for use outside of California and could, if counted by external parties as zero-carbon resources, lead to double-counting of GHG emission savings.

We are unable to independently investigate these concerns due to the IEMAC's expedited schedule but believe that this issue merits analysis going forward. Additional work is needed to understand whether this approach leads to inconsistencies with state or regional mechanisms for tracking power, RECs, and GHG emissions, as well as whether additional data disclosures would allow other jurisdictions to harmonize their

approaches and policy preferences with California's accounting decisions. We take no substantive position on these issues at this time.

### C. Leakage-related matters in CARB's proposed regulations

Based on the very limited time in which the IEMAC was able to review CARB's proposed regulations, we have identified three key program design issues with potentially significant implications for leakage and/or resource shuffling.

#### 1. Default unspecified emissions factor

One issue that merits close attention is the role of unspecified power in the cap-and-trade program, and GHG emissions accounting more generally. Under the regulations, electricity imports from specified power plants receive source-specific greenhouse gas emissions factors. But many California utilities import significant quantities of electricity from "unspecified" sources (Weissman, 2018). Under AB 1110, unspecified sources are defined as "*Electricity that is not traceable to specific generation sources by any auditable contract trail or equivalent.*"<sup>8</sup>

In the MRR and cap-and-trade regulations, unspecified resources are assigned a default, time-invariant emissions factor of 0.428 tCO<sub>2</sub>e per MWh.<sup>9</sup> This factor was developed in 2010 and was based on the average western grid supplies from the years 2006 through 2008 (Kaatz & Anders, 2016). Using this factor as the default, there is the potential for coal-fired generation to be classified as unspecified power for delivery to California at a substantially lower cost than it would face if made as a specified transfer.

Calibrating the unspecified emissions factor in a way that accurately reflect the emissions intensity of unspecified imports is challenging for two reasons.

First, the choice of default emissions factor changes the incentive market participants face when determining whether or not to reveal the source-specific emissions of their electricity imports. In other words, the composition of unspecified imports will depend in part on how the default emissions factor is calibrated. Electricity resources that are more GHG-intensive than the default factor (e.g., coal) may prefer transactional arrangements that are reported as unspecified imports, whereas those resources that are less GHG-intensive than the default factor (e.g., renewables) may prefer to find transactional arrangements that reveal them as specified sources, and therefore enable them to reduce costs. The default factor should be chosen with this supply-response in mind.

A second, related challenge stems from the significant heterogeneity in the emissions intensity of sources supplying the California electricity market. The average emissions intensity of generators that comprise unspecified imports could be very different from the average emissions intensity across all suppliers. It can thus be very challenging to

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<sup>8</sup> Cal. Pub. Util. Code § 398.2(e).

<sup>9</sup> Cal. Code Regs., title 17, § 95852(b)(1)(C) (citing *id.* at § 95111(b)(1) (specifying the default unspecified emissions factor)).

identify the marginal resources that ramp up in response to increased demand for California imports.

We note that electricity import data from CARB and the California Energy Commission appear to be diverging, especially with respect to unspecified power (see CARB, 2018c; CEC, 2018). Additional analysis could be helpful to understand the causes of these differences and what, if anything, they mean for accuracy in tracking electricity emissions. There is nothing inherently problematic with different definitions of unspecified power that are used for different purposes. At the same time, however, differences in data reporting may enable analysts to evaluate whether market participants are responding strategically to default emissions factor and associated incentives.

## 2. Accounting for CAISO EIM emissions

As noted above, CARB initially supported CAISO's two-pass market optimization approach as a mechanism to provide a rigorous accounting framework for EIM emissions accounting. However, based on stakeholder feedback, CAISO determined not to implement the two-pass solution and instead has proposed a mechanism to FERC that limits the amount of energy an out-of-state power plant can bid to deliver to serve CAISO load (CAISO, 2018).

In the current cap-and-trade regulations, CARB has developed what it calls a "bridge solution" to address emissions leakage in the EIM market. Under this bridge solution, CARB must first estimate emissions leakage that has occurred. CARB does this by assuming that the true emissions associated with EIM imports is determined by the unspecified emissions factor, and therefore that the calculated leakage from EIM imports is the difference between the unspecified emissions factor and the source-specific emissions of resources that the CAISO EIM algorithm deems to be dispatched to serve CAISO load (ARB, 2018d: 15-16). Then, CARB will retire allowances to account for outstanding EIM obligations from the pool of allowances that remain unsold from the 2016-17 auction collapse. In the new proposal, CARB proposes to retire allowances from future program budget years to account for estimated emissions leakage associated with EIM transactions in 2018 and Q1 2019, rather than retiring allowances from the pool of temporarily unsold allowances from undersubscribed auctions (CARB, 2018b: 73).<sup>10</sup>

Beginning in Q2 2019, CARB proposes to calculate EIM-wide leakage using the method as for the "bridge solution" and assign this leakage in the form of annual compliance obligations for EIM importers on a basis that is proportional to their share of total EIM electricity imports (CARB, 2018b: 72). From this point forward, there would be no need to retire allowances to account for leakage in the EIM because the calculated leakage would be assigned to EIM importers on an ongoing basis. Again, the leakage is

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<sup>10</sup> Such a change may be necessary because the pool of unsold allowances from undersubscribed auctions is temporary and may not be available on an ongoing basis. See the [Managing Allowance Supply subcommittee report](#) for more details.

calculated based on the difference between the source-specific emissions from power that CAISO deems delivered to California and the unspecified emissions rate, which is taken as the “true” emissions profile of EIM imports. Under the proposal, EIM importers would face compliance obligations that are equal to the emissions associated with source-specific imports that CAISO deems to be delivered to California plus a proportional leakage factor (CARB, 2018b: 72-73).

Based on a preliminary review, we believe that retiring allowances to account for emissions leakage from resource shuffling is a reasonable approach to preserving the environmental integrity of the cap-and-trade program, provided that this leakage can be credibly estimated. CARB’s proposal to retire allowances first from the pool of unsold allowances, and later, directly from future budget years, is a sensible way to accomplish these ends.

However, there may be additional economic consequences to the proposed solutions that merit additional analysis. CARB’s “bridge solution” would retire allowances that would otherwise be made available for sale to the entire market, reducing market-wide supplies and increasing the market-wide cost of program compliance to account for leakage. Under this approach—whether allowances are retired from the pool of temporarily unsold allowances from undersubscribed auctions, or future allowance budget years—the cost of mitigating leakage in the electricity sector is borne by all market participants.

In contrast, the proposal for Q2 2019 and beyond would impose the costs of mitigating leakage in the electricity sector on the electricity importers directly, rather than across all sectors in the cap-and-trade program. This could increase the costs of purchasing electricity imports via the EIM, which could in turn affect electricity importing decisions more broadly. It is possible that these effects would induce importers to switch away from EIM imports, where CARB calculates the “true” emissions at the unspecified emissions factor rate, and instead prefer bilateral contracts with the same low-carbon resources, which would be eligible for source-specific emissions accounting outside of the EIM and without mitigating leakage.

The subcommittee has not had sufficient time to review CARB’s proposed methods in detail and therefore cannot express a final view on these important matters. However, it is clear that the concept behind CARB’s new proposal will alter electricity market incentives. The market implications of these incentive changes will be important to study and monitor going forward.

Meanwhile, we note that under both the bridge solution and the proposed regulatory changes that would apply beginning in 2019, leakage in the EIM is calculated based on the assumption that the “true” EIM emissions are captured by CARB’s unspecified emissions factor. Therefore, the effectiveness of this approach depends on the relevance and accuracy of CARB’s unspecified emissions factor. As discussed in Section: Default unspecified emissions factor the unspecified emissions factor has two important shortcomings. First, it is based on older data that may no longer be

representative of actual average WECC-wide emissions. Second, it is a time-invariant estimate of average emissions, not an estimate of the marginal emissions that result from the effect of California's climate policies on electricity imports at any given point in time. The subcommittee believes that further analysis of these issues is warranted.

### 3. Increase in Industry Assistance Factors in third compliance period

AB 32 and AB 398 require that CARB act to reduce GHG emissions while minimizing emissions leakage. To this end, free allowances are allocated to industrial emitters on the basis of their industrial output and leakage risk. As we note above, emissions-leakage-mitigating subsidy levels should ideally reflect the GHG emissions in external jurisdictions that are avoided when production activities remain within California.

CARB categorizes covered industrial sectors operating under specific NAICS codes as either high, medium, or low leakage risk. To calibrate the output-based subsidy, CARB uses the product of an industry-specific emissions benchmark and an "industry assistance factor" (IAF) to determine the number of allowances allocated to industries per unit of production. The IAF assigned to high, medium, and low risk industries has changed over time (see Table 1).

Table 1: Industry assistance factors in CARB regulations

Leakage risk	First Period (2013-2014)	Second Period (2015-2017)	Third Period (2018-2020)	Fourth Period (2021-2023)
2010 Regulation (Original rules) (CARB, 2011: Table 8-1)				
High	100%	100%	100%	N/A
Medium	100%	75%	50%	N/A
Low	100%	50%	30%	N/A
2013 Regulation (Current rules) (CARB, 2014: Table 8-1)				
High	100%	100%	100%	N/A
Medium	100%	100%	75%	N/A
Low	100%	100%	50%	N/A
2018 Regulation (Proposed rules) (CARB, 2018b: 59-64)				
High	100%	100%	100%	100%
Medium	100%	100%	100%	100%
Low	100%	100%	100%	100%
Legal authority:	CARB determines how to minimize leakage risks pursuant to AB 32			AB 398 requirement

As we note above, output-based permit allocation to targeted industries shifts abatement cost burdens to unsubsidized sectors and increases the costs incurred within California to meet California's GHG reduction goals. Given these side effects, production subsidies should be judiciously targeted. If the legal requirement is to mitigate varying degrees of emissions leakage risk, changes to the calibration of IAFs should be justified on the basis of analysis and empirical evidence on foreign emissions intensities and trade responsiveness within targeted sectors (see Section Assessing Leakage Risk of this report). In our judgment, the analysis offered in the proposed regulations does not explicitly provide such a justification. If instead the proposed change in free allocation is also intended to serve broader re-distributional purposes, a broader set of considerations may guide the targeting of production subsidies, including policy judgments that lie outside of this subcommittee's scope. In either case, the subcommittee believes that the benefits of conferring subsidies in the form of free allowance allocation should be weighed against the potentially significant costs.

#### D. Recommendations

We make several recommendations with regard to the monitoring and mitigation of emissions leakage in the context of its cap-and-trade program:

- 1) **Intra-national trade data.** In order to estimate emissions leakage potential for specific sectors in California, one needs data on intra-national, interstate

trade transactions over time. Research to date has not fully leveraged the available data. Additional data sources could be used to construct a more complete picture of interstate trade in EITE industries. CARB could leverage the ongoing efforts of academic researchers to collect and analyze these data.

- 2) **Emissions intensity of out-of-state suppliers.** A critical determinant of emissions leakage is the marginal emissions intensity of out-of-state suppliers. Researchers are actively collecting data on the emissions intensity of industrial production in various jurisdictions outside California. A concerted effort to collect these data and assess their credibility would substantively inform leakage risk assessment efforts in California and other jurisdictions.
- 3) **Evidence-based decision making.** Rigorous empirical assessments of leakage risk are complicated by data limitations and identification challenges, as discussed in this subcommittee report. To date, these complications have limited the extent to which commissioned research informs California's approach to leakage mitigation. The subcommittee notes that the current abundance of caution has potentially important implications for abatement costs and the distribution of those costs. Methodological challenges notwithstanding, CARB should continue to work with the research community to strengthen the link between empirical evidence on leakage risk and the calibration of compensating subsidies.
- 4) **Resource shuffling.** The leakage subcommittee believes that the research and policy communities could benefit from further study of the extent to which emissions leakage caused by resource shuffling may have occurred in response to the cap-and-trade program's carbon price signal, including with respect to divestment of legacy coal contracts and ownership interests pursuant to SB 1368.
- 5) **EIM leakage.** CARB should report its calculation of GHG emission obligations in the CAISO Energy Imbalance Market, including both the outstanding GHG emission obligations related to CARB's "bridge solution" for 2017, 2018, and Q1 2019, as well as for the new compliance obligations that will be imposed on EIM importers beginning in Q2 2019. CARB's analysis of these obligations should be transparent and publicly accessible. Furthermore, we recommend that CARB and other stakeholders monitor the effect of the proposed compliance obligations associated with mitigating leakage in the CAISO EIM. Not only does the estimate of leakage need to be accurate (see Recommendation 6, below), but the potential for the remedy to cause leakage to shift to sectors that lack leakage mitigation solutions should be carefully tracked. Additional analysis to compare the potential consequences of imposing leakage mitigation requirements on electricity importers versus the market as a whole would be helpful in understanding whether these risks are large or small.

- 6) **Unspecified emissions factor.** CARB should evaluate the unspecified emissions factor and consider updating it. The current factor is based on outdated data and may no longer be representative of unspecified imports in the current market environment. We specifically recommend that CARB consider how the choice of a default emissions factor may affect market behavior; higher default emissions factors are likely to encourage relatively low-carbon resources to self-identify as “specified” resources to avoid the higher default emission factor applied to unspecified resources, potentially improving the quality of data on California’s electricity imports. Additionally, CARB should evaluate whether a default parameter that is calculated as an average is a reasonable proxy for the marginal emissions associated with electricity imports.
- 7) **Harmonizing electricity, RECs, and GHG data.** CARB works with the California Energy Commission and the California Public Utilities Commission to collect data on electricity imports, renewable energy certificates, and GHG emissions. Ensuring consistency between the data used across agencies is an important priority. Additional analysis to evaluate the different approaches California’s regulators are using to track electricity imports and their environmental attributes would be helpful. In light of the potential for double-counting of GHG reductions associated with “unbundled” RECs that are used by out-of-state parties yet associated with electricity delivered to California, additional analysis could help evaluate (1) whether the risk of double-counting of GHG reductions is significant, (2) whether alternative accounting mechanisms would better address the multiple needs of REC and GHG reporting systems, and (3) whether additional data reporting could enable external jurisdictions and private actors mitigate the risk of double-counting for any particular accounting system in used in California.

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## **Chapter 5: Offsets**

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### **A. Overview**

Offsets are an important part of both the current and post-2020 cap and trade program. By statute and regulation, the requirements for offsets and the allowable amounts are defined differently for pre-2021 and post-2020 market periods. In the pre-2021 market period, no statutory limits apply, but California Air Resources Board (CARB) has established limits by regulation. Under CARB regulations, regulated entities can submit offset credits to cover up to 8% of their emissions through the end of 2020. Beginning in 2021, new offset limits apply pursuant to the cap-and-trade extension bill, AB 398. Under AB 398, regulated entities can submit offset credits for up to 4% of their emissions associated with the years 2021 through 2025, and up to 6% for the years 2026 through 2030. In addition, no more than half of the offsets used in the post-2020 market period can come from projects that do not generate “direct environmental benefits” to California air or water quality.

The basic idea of the offset program is that a percentage of the reductions in carbon dioxide equivalent emissions under the cap-and-trade program can come from sectors outside of the cap and be used by regulated parties under the cap to meet part of their compliance obligations. The theory behind offsets is that—from a climate change perspective—it does not matter where or how a ton of emissions is reduced since climate change is caused by the accumulation of greenhouse gases in the atmosphere. One fewer ton in the atmosphere is one fewer ton, regardless of its source.

When offsets are used, total GHG emissions from “covered sources” (i.e., those that are regulated under the cap-and-trade program) increase and may exceed the nominal program cap, but the increases are “offset” by reductions outside the regulated sector. This is because for every offset credit used, emissions rise by one ton of carbon dioxide equivalent from covered sources. At the same time, however, every emissions increase at covered sources has a corresponding credited reduction from non-covered sources—most often in other states, but sometimes at in-state sectors not covered by the cap-and-trade program. Thus, even though GHG emissions from covered sources increase as a result of offset use, there is no net change in GHG emissions to the atmosphere.

CARB has approved six offset protocols to date. As of August 2018, CARB has issued over 116 million offset credits under these protocols, each worth a ton of carbon dioxide equivalent (CARB, 2018); Quebec has issued just over 600,000 offset credits from its own protocols (MDDELCC, 2018). The approved offset credits have overwhelmingly been issued by CARB under the U.S. Forest offset protocol, which has generated three quarters of the total supply. The Ozone Depleting Substances protocol is responsible for an additional 15% of the total issued to date, and a relatively small number of credits have been issued under the Livestock and Mine Methane Capture protocols. Two of the

approved protocols, the Urban Forest and Rice Cultivation protocols, have not issued any credits thus far.

The table below shows the categories of offsets that have been approved by the Air Resources Board for use by regulated entities and the total number of credits issued to date.

Table 1: CARB-issued offset credits as of August 2018

Project type	Ozone Depleting Substances	Livestock	U.S. Forest	Urban Forest	Mine Methane Capture	Rice Cultivation
Total credits	17,249,969	5,060,098	89,180,683	0	5,272,971	0
% of total	14.8%	4.3%	76.4%	0%	4.5%	0%

Offsets can serve valuable functions but have also been controversial. The valuable functions include: 1) reducing cap-and-trade program compliance costs (i.e., providing price containment to the market); 2) stimulating innovation in non-capped sectors for reducing GHGs; 3) generating environmental co-benefits from offset projects, particularly with respect to local air pollution reductions; 4) providing revenue to sectors and jurisdictions that generate offsets for compliance purposes, including projects in disadvantaged communities within and outside of California.

The controversies about offsets include: 1) concerns about whether GHG reductions from offsets are real, additional, quantifiable, and permanent; 2) concerns about allowing regulated entities to purchase their way out of facility-level compliance rather than reducing their own emissions on site; 3) relatedly, losing co-benefits (particularly air pollution reductions) due to shifting GHG mitigation away from large stationary source emitters as a result of offset projects; 4) depriving California of program auction revenue from the higher auction market prices that would result without carbon offsets; and 5) the distributional concern that offsets' benefits may largely accrue outside of California yet be financed by California residents.

The state has made a policy determination to allow offsets, subject to statutory limits and conditions. As a result, our report does not rehash whether offsets should or should not be allowed, nor does it analyze whether the percentage of offsets allowed by regulation in the pre-2020 period and by statute in the post-2020 period are set at the optimal level. Instead, our report is directed at analyzing whether the current and proposed programs are meeting legislative and regulatory expectations, maximizing offset benefits and minimizing the risks of offsets.

#### B. Example: U.S. Forest protocol

In order to approve a compliance-grade offset protocol, CARB goes through an extensive public stakeholder process. The end result is a protocol that has been scrutinized by Board staff and stakeholders and subsequently approved by the Board

itself. The way that offset projects earn credits under approved protocols is by meeting the protocol's eligibility criteria and following its approved methodologies for calculating avoided or reduced greenhouse gas emissions. The protocols attempt to ensure that the accounted for emissions are semi-permanent: for example, the U.S. Forestry Protocol requires that projects have a life of 100 years; for avoided conversion projects (projects that avoid converting forestry land to another use), the owner must record a conservation easement against the property; and offset providers must monitor the projects by visiting the sites every six years. If the offset project experiences a reversal, resulting in the release of carbon that was supposed to remain sequestered, there is a compensation rate that applies to intentional reversals, requiring compensation of allowances based on the number of years the project remained in compliance; there is also a buffer fund for unintentional carbon releases caused by events such as drought and wildfire.

The offsets subcommittee is interested in whether any new information and feedback could or should lead to any changes to the offset protocols.

Given the fact that the U.S. Forest protocol is responsible for three quarters of the offsets issued to date, it may make sense to first consider these issues in the context of the U.S. Forest protocol. For example, under the U.S. Forest protocol, a portion of the credits that would otherwise be awarded to offset projects are set aside in a buffer pool to protect against the risk of "unintentional reversal"—the possibility that fire, drought, disease, or other unexpected problems release the carbon that is stored in a credited forest. In light of the record fire season in California this year and last, is the size of the buffer pool sufficient to cover our best biophysical understanding of reversal risks in California? Across the West?

Similarly, the U.S. Forest protocol makes assumptions about the extent to which emissions will "leak" from offset projects. Take an avoided conversion project, for example (the protocol also covers reforestation projects and projects that improve forest management). The idea is that if a carbon-rich forest is protected to store carbon, rather than harvested to produce timber or cleared for some other land use, some share of the timber production will shift to another location, resulting in a reduction in the GHG benefits of the reductions or avoided emissions at the credited project (see Leakage subcommittee report for more detail).

The U.S. Forest protocol assumes that for Improved Forest Management projects, 20% of calculated project-level benefits will leak (CARB, 2015: 69-70 (see "Secondary Effects" in Equation 5.10)). CARB's protocol is based on the Climate Action Reserve's voluntary forest offset protocol, Version 3.3. Last year, the Climate Action Reserve updated its leakage factor for Improved Forest Management projects. The previous version of the Climate Action Reserve's forest protocol, Version 3.3, used a leakage factor of 20% for Improved Forest Management projects (CAR, 2012: 62 (see "Secondary Effects" in Equation 6.13)). In the new Version 4.0 of the Reserve's protocol, however, the leakage factor for Improved Forest Management projects can

now be as high as 80% for improved Forest Management Projects (CAR, 2017: 62-63 (see “Secondary Effects” in Equation 6.10)).

Leakage factors are a controversial part of forestry offsets and, in fact, the Environmental Commissioner of Ontario recently recommended that Ontario not pursue forest offset credits (Environmental Commissioner of Ontario, 2018: 144-145) because of concerns about the evidentiary basis for the leakage factor. Some peer reviewed studies suggest that a leakage number that is significantly higher and perhaps closer to 80% may be appropriate (Wear & Murray, 2004: 328; Gan & McCarl, 2007: 430). The Environmental Commissioner’s report also cited evidence that in some cases lower leakage rates similar to the U.S. Forest protocol’s number may be appropriate, but noted that the evidence supporting these lower rates excludes international leakage effects and that inclusion of international leakage effects significantly increases leakage estimates in other contexts (Environmental Commissioner of Ontario at 145, citing a study of Pacific Northwest leakage rate estimates). While the subcommittee has not had time to independently survey the academic literature on leakage rates, we note that review studies identify a wide range of leakage rates that range close to zero to more than 90% (Siikamäki et al., 2012: 11). At least in this review, lower leakage estimates are associated with project- or country-level analysis, whereas higher estimates are associated with regional or global analysis.

Given that the U.S. Forest protocol is the largest of the protocols in terms of credits issued, it would be helpful to have a better understanding of the scientific basis for leakage factors and the temporal accounting between reductions that are credited, emissions that leak, and actual physical emissions reductions or avoided emissions that take place. It would also be helpful to know if CARB is considering revising the protocol to reflect the Climate Action Reserve changes. The subcommittee recognizes, however, that leakage factors may be highly contextual to each individual project and therefore empirically difficult to estimate. Nevertheless, if reliance on the protocol continues to be large, additional information would be useful to understand whether and to what degree leakage is occurring, as well as to evaluate whether or not credits under this protocol can be reliably deemed “quantifiable” pursuant to state law.

### C. Post-2020 offsets

One of the key reforms that the cap-and-trade extension bill, AB 398, made to the offsets program is to limit the total number of offset credits that can be used from projects that do not produce “direct environmental benefits,” or DEBs, to in-state air or water quality.

These direct environmental benefits are defined by statute as “the reduction or avoidance of emissions of any air pollutant in the state or the reduction or avoidance of any pollutant that could have an adverse impact on waters of the state.” We have reviewed the draft regulations and accompanying documentation CARB released on September 4 and have only one clarifying suggestion.

CARB proposes to adopt the statutory definition of direct environmental benefits directly from the statute, which seems appropriate as a starting point. In its staff report, CARB has provided helpful examples of the ways in which the existing approved protocols for in-state projects provide direct air and water pollution benefits (for example, reduced runoff from offsets that produce healthy forests and reduced air pollution from livestock projects) and is recognizing them by regulation as producing the direct environmental benefits contemplated by the statute. This treatment seems consistent with the statutory language and intent of the legislature.

One key question is whether project-level GHG reductions or avoided GHG emissions constitute a DEB. This issue has been discussed extensively in the cap-and-trade stakeholder process and in legislative oversight hearings. It is relevant because if offset projects can establish a DEB on the basis of project-level GHG reductions or avoided emissions, then all offset projects would meet this standard and AB 398's restrictions on this point would be rendered meaningless on implementation. We assume that the language in AB 398 requiring DEBs refers to environmental benefits to air or water quality that occur in addition to those impacts that are traceable to reduced or avoided GHG emissions; otherwise, the language of the statute would seem superfluous. On the other hand, we have not conducted an extensive legal analysis of the issue and have not looked for extrinsic evidence of legislative intent to restrict DEBs in this fashion. We are, instead, following a relatively standard canon of statutory construction that words in a statute are to be given effect rather than to have no consequence.

CARB proposes to operationalize the DEBs requirement in Section 95989 of the regulations. In subsection (a), CARB proposes to allow projects that are located in California to demonstrate a DEB either via their location in California or by avoiding GHG emissions within the state based on its analysis showing that in-state offset projects under the currently approved protocols produce air and/or water pollution benefits. In subsection (b), CARB proposes a set of requirements for out-of-state entities. In order to demonstrate a DEB, out-of-state projects must show either "[1] the reduction or avoidance of emissions of any air pollutant that is not credited pursuant to the applicable Compliance Offset Protocol in the State or [2] a reduction or avoidance of any pollutant that could have an adverse impact on waters of the State." The first clause addresses how an out-of-state project can demonstrate a DEB on the basis of air pollution and excludes "pollutants that are credited" under an offset protocol (i.e., it excludes the GHG emissions credited by the offset project). In contrast, the second clause addresses how an offset project can establish a DEB on the basis of a water pollution benefit. Unlike the first clause, however, the second does not explicitly exclude pollutants that are credited by the applicable Compliance Offset Protocol (i.e., the second clause does not exclude GHG emissions).

We recommend that CARB clarify whether it intends to foreclose the argument that a project-level avoided GHG emission or GHG reduction constitutes the "reduction or avoidance of any pollutant that could have an adverse impact on waters of the State." The provision as currently drafted is ambiguous in this regard and could raise questions

on implementation. GHGs are considered “air pollutants” under the federal Clean Air Act (see *Massachusetts v. EPA*) and therefore might be considered “any pollutant” under Section 95989(b). Given this relationship, it may be useful to clarify that to qualify as an offset credit providing direct environmental benefits in state, a project must reduce or avoid not only greenhouse gas emissions but at least one additional air or water pollutant that “could have an adverse impact on waters of the state.”

Finally, the new restrictions on offsets to require that half produce direct environmental benefits in state will restrict the number of offset projects that are eligible for compliance. The subcommittee is interested in knowing what efforts CARB, and/or the Compliance Offsets Protocol Task Force established pursuant to AB 398, are undertaking to increase the supply of offset credits that will meet the DEB requirements. Additionally, the subcommittee thinks it would be beneficial for CARB to analyze the degree to which DEB-compliant offsets are likely to be available in the post-2020 period and whether such offsets will provide cost-containment. One commenter (Dentons) notes that the supply of credits under existing protocols may increase if allowance prices rise; we would encourage CARB to consider whether and how rising allowance prices might affect the supply of offset credits in such an analysis.

#### D. Recommendation for amendments to draft regulations

- 1) As specified above in more detail, we recommend clarifying the definition of DEBs with respect to projects that may adversely affect waters of the State.

#### E. Longer term recommendations

- 1) As described above, we recommend that CARB determine whether the buffer pool amount included in the U.S. Forestry offset protocol is sufficient to protect against unintentional reversals given the recent experiences with drought and wildfire.
- 2) We also recommend that CARB either conduct or solicit research to determine whether the leakage rate for avoided conversion projects in the forestry protocol is appropriate.
- 3) We further recommend that CARB consider whether it should amend the U.S. Forest Offset Protocol to change the leakage factor for Improved Forestry Practices to be consistent with recent changes to the Climate Action Reserve Forestry Protocol.
- 4) Finally, we recommend that CARB either conduct or solicit research to determine how many offsets are likely to be DEB-compliant in the post-2020 period and whether offset credits are likely to provide cost containment in the cap-and-trade program.

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## Chapter 6: Managing Allowance Supply

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### A. Context

The term “overallocation” refers to a market condition where the supply of compliance instruments persistently exceeds emissions. Some independent analysts estimate that the volume of allowances in California’s program, accounting for allowances that will be newly issued after 2020 and the carryover of privately and publicly held allowances from the current period, is large enough to put at risk the State’s ability to achieve its 2030 greenhouse gas limit. California Air Resources Board (CARB) projects a smaller difference between cumulative allowances and expected emissions. We identify steps CARB could take to make it possible for the public and market participants to better estimate this market fundamental, as well as mechanisms that could remedy an allowance supply surplus if it is necessary to do so to comply with statutory goals.

### B. Key considerations

#### 1. Introduction

The cap-and-trade program covers approximately 75% of California’s statewide emissions. Although its coverage is broad, the cap-and-trade program is only one of many climate policies in the state. Some regulations affect emitters subject to the cap-and-trade program (called *covered sources*); others apply to emissions outside of the cap-and-trade program. The interaction between the cap-and-trade program and regulations that affect covered sources is important to understanding the costs, benefits, and environmental effectiveness of California’s climate policies. These companion regulations and policies lead to emission reductions at covered sources, reducing those sources’ need for allowances and thereby reducing the price observed in the market. If the price falls to the price floor, the supply of allowances entering the market will be reduced; if the price rises to the cost containment price tiers, the supply of allowances will be increased. Over a large range of price outcomes (that is, at prices above the price floor and below the cost containment price tiers), there is no adjustment to the number of new allowances introduced into the market (see Policy Interactions subcommittee report). Hence, the supply of allowances in the market and emissions from covered sources is uncertain and contingent on future market conditions.

The terms *overallocation* or *oversupply* are frequently used to refer to the concept of the cap-and-trade program’s supply of compliance instruments (i.e., allowances and offsets) exceeding the demand for those instruments (i.e., emissions from covered sources). Because California has achieved its annual emissions reduction target for 2020 four years ahead of schedule, with allowances issued on a pre-determined schedule that is independent of this outcome, any extra allowances that are not needed for compliance through 2020 can be banked, or carried over, for use in subsequent years. This carry over of allowances from the pre-2021 program period triggers two sources of concern. One is that the state may not have been as ambitious as it could have been in its near-

term emission reductions goals; a second and somewhat opposite concern is that the surplus of allowances in 2020 that can be banked for future use may cause the state to fail to achieve its goals for 2030.

California's cap-and-trade program features unlimited allowance *banking*, meaning that market participants can buy and save significant numbers of allowances for future compliance needs. There are two dimensions to banking in the program. One is the ability to bank across years within a multi-year compliance period, and the second is the ability to bank across compliance periods, which together imply unlimited banking as long as compliance period milestones are achieved.<sup>1</sup>

In practice, this means that cap-and-trade with banking functions as a *cumulative* pollution reduction policy: it does not guarantee that emissions fall to any particular level in any given program year or compliance period, but rather that cumulative emissions across multiple compliance periods are equal to or less than the number of compliance instruments made available over that same time horizon. In contrast, California law sets statewide *annual* emissions limits for the years 2020 and 2030. There is a possibility that firms will use allowances banked from previous years to enable higher-than-allowed emissions in 2030. Moreover, it may be that emissions over the ten years covered by the extension to the trading program, from 2021-2030, are greater than the cumulative issuance of new emissions allowances because compliance entities may draw on banked allowances from the pre-2021 program period. In either case, the surplus of allowances currently in circulation could cause emissions to exceed the emissions budget for sources covered by the trading program after 2020.

The statutory obligations apply to emissions on an economywide basis, meaning both sources covered under the trading program and those that are not. Reductions not achieved under the trading program must be achieved elsewhere. Consequently, a transparent understanding of market fundamentals is not only important to the operation of the market, but also to guiding strategy for regulations and policies that apply to uncovered sources.

For context, the 2017 Scoping Plan calls for the cap-and-trade program to deliver a cumulative reduction of 236 million tons of CO<sub>2</sub>e (MMtCO<sub>2</sub>e) in the market's 2021-2030 period, relative to a scenario that includes the projected effect of all of California's regulatory measures. The number of new allowances (the emissions cap) to be issued in 2020 is 334.2 MMtCO<sub>2</sub>e; in 2030 it is 200.5 MMtCO<sub>2</sub>e.

## 2. The overallocation debate

The size of the projected surplus after 2020 depends on multiple factors, including the allowance price—which determines the number of allowances purchased at auction and

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<sup>1</sup> The proposed regulatory amendments state that "Each compliance period represents either a 2-year or 3-year block in the Program, 2013-2014, 2015-2017, 2018-2020, 2021-2023, 2024-2026, 2027-2029, and 2030 and beyond" (ARB, 2018e: 15). We interpret the year 2030 as a single-year compliance period, which is of course subject to change if the program is re-authorized by statute past its current expiration at the end of 2030.

whether allowances in the program's cost containment reserves are purchased and enter private circulation—as well as future emissions subject to the cap-and-trade program. Several independent researchers and government entities have estimated the number of surplus allowances that will be in private circulation by the end of 2020 and therefore banked for use after 2020:

- 1) 270 ( $\pm$  70) million allowances (Busch, 2017)
- 2) Between 100 and 300 million allowances (LAO, 2017a)  
Central estimate of 200 million allowances (LAO, 2017b; LAO, 2018)
- 3) More than 300 million allowances (ECO, 2017)

Most of the allowances that previously went unsold at auction in 2016-2017 because the price was at the price floor are expected to be re-introduced through subsequent auctions and are included in these estimates.<sup>2</sup> Approximately one third of the unsold allowances will be removed from the normal auction supply and transferred to the post-2020 cost containment reserve.<sup>3</sup>

The studies referenced above were published prior to Ontario's exit from the cap-and-trade program, which increased the net supply of compliance instruments by approximately 13 million allowances (Mastrandrea et al., 2018; CARB, 2018b). The proposed regulation addresses this issue by enabling CARB staff to cancel program allowances to account for the excess Ontario allowances currently held by California compliance entities (CARB, 2018e: 75-76).

These studies were also conducted before CARB published data for 2016 emissions, which indicated that emissions were 58.3 million tons below program caps that year, contributing further to the allowance surplus (Cullenward et al., 2017; LAO, 2018). However, the studies may not fully account for several million allowances to be set aside in the voluntary renewable energy program accounts and to be retired in response to a natural gas power plant's bankruptcy proceeding, nor the potential for CARB to retire tens of millions of allowances to account for resource shuffling in the CAISO Energy Imbalance Market (CARB, 2018a: 8-9; see Leakage subcommittee report for additional discussion).

As suggested above, another important factor influencing the assessment is the role of cost containment measures that contain allowances in government-controlled accounts. If prices fall to the price floor, the number of allowances entering private accounts will

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<sup>2</sup> Each of these studies considers the re-introduction of previously unsold allowances, but it is unclear whether the LAO calculations exclude some 39 million unsold allowances that will be transferred to the allowance price containment reserve as a result of remaining unsold for 24 months (CARB, 2018a; LAO, 2017a; LAO, 2018). Busch (2017: 4) and the Environmental Commissioner of Ontario (ECO, 2018: 4) properly include the transfer of unsold allowances to the reserve (see also Inman et al., 2018b).

<sup>3</sup> All the unsold allowances will either be re-introduced and sold at future auctions or transferred to the post-2020 market reserve. Assuming that the maximum number of previously unsold allowances are sold in the next auction, the total number of allowances transferred to the post-2020 price ceiling will be approximately 39 million (CARB, 2018e: 44 (see Table 8)). This is about 1/3 of the approximately 120 million allowances that went unsold at auction in 2016-17, of which about 2/3 are expected to be purchased at auction and therefore included in private accounts (Inman et al., 2018b).

fall. If demand remains low, some of these allowances will be shifted into cost containment reserve. Even if the price floor is never binding, the proposed post-2020 cost containment reserve will hold 235.9 million allowances, which would begin to enter the market only if the auction price rises to a price tier of \$39.01 (2018\$) in 2021, growing at 5% per year in real terms. Consequently, the total supply of allowances in the market depends on future market conditions.

Of the 239.5 million allowances designated for the post-2020 price containment tiers in CARB's proposed regulations, 160.8 million (67%) originate from the pre-2021 market period (CARB, 2018e: 44 (see Table 8)). These pre-2021 allowances are currently held in government accounts and are therefore excluded from the independent estimates of private banking cited above (Busch, 2017; LAO, 2017a; ECO, 2018).<sup>4</sup> If post-2020 market prices rise to the cost containment price tier levels, then these allowances will also enter the market as part of the allowance supply.

In contrast, CARB (2018a: 8-9) has projected that no more than 150 million allowances are likely to be banked at the end of 2020 and argues this quantity would not put the state's 2030 climate target at risk.<sup>5</sup> Some analysts (including a member of this subcommittee) argued that the staff report is in error and that the surplus of allowances in 2020 will cause the state to overshoot its 2030 target under the Scoping Plan scenario's assumptions (Inman et al., 2018a). A legislative oversight committee found similar concerns (JLCCCP, 2018). CARB continues to dispute these issues (CARB, 2018c; CARB, 2018d).

There are no textbook rules or standard methodologies that specify the ideal size of an allowance bank. Typically, economic models that look for least-cost pathways to achieve deep decarbonization under cap-and-trade programs suggest that large allowances banks may form in the early years of a program; however, large banks may only be consistent with a policy goal of limiting cumulative emissions but not necessarily with achieving annual emission limits. Analyzing appropriate banking levels is a highly contextual exercise that depends on the policy goals of the program. Both the Regional Greenhouse Gas Initiative and EU Emissions Trading System cap-and-trade programs have analyzed this question in their own contexts and made program adjustments to affect the size of allowance banks in their respective programs.

Official analysis of California's cap-and-trade program has evaluated the program as a *quantity* instrument—including the 2008 Scoping Plan, its 2014 update, and the 2017 Scoping Plan, which assume the program will operate as a backstop to limit emissions and ensure the state will achieve its 2020 and 2030 emission limits. However, if the allowance price is at the floor or cost containment price tiers, the supply of allowances

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<sup>4</sup> All three studies exclude allowances in CARB's price reserve accounts, but there is a dispute over whether LAO properly excluded some 39 million allowances that went unsold at auction and will be transferred into the post-2020 price reserves, rather than re-introduced at auction. See footnote 2 for details.

<sup>5</sup> CARB assumed that no post-2020 reserve allowances are introduced to the market.

will differ from expected levels, and the program may not ensure a specific cumulative or annual emissions outcome. Under these conditions, the emissions outcome will be influenced by *price* impacts. CARB made assumptions about price-induced mitigation in the 2017 Scoping Plan (CARB, 2017: 65) that vary from other studies (Borenstein et al., 2017; Busch, 2018; Cullenward et al., 2018a: 11). There is no analysis in the proposed regulations of what prices are required to deliver the emission reductions called for in the 2017 Scoping Plan. In particular, if the price were to fall to the price floor, it would cause a reduced sale of allowances, but it is uncertain what the emissions outcome would be at the designated price floor level.

Empirical evidence continues to indicate that entities are acquiring more allowances than they need in the short term and the private bank is growing. Emissions subject to the cap-and-trade program are below annual program caps (Cullenward et al., 2017; LAO, 2017b). Yet quarterly auctions continue to clear at prices above the price floor and all allowances are entering the market. As detailed further below, we believe that CARB should develop metrics to track these outcomes empirically and consider regulatory reforms that would automatically adjust allowances supplies in response to the accumulation of an excessively large allowance bank—that is, one that would appear to preclude the market from contributing to the attainment of long-run emission reduction goals.

### 3. CARB's proposed regulatory amendments

AB 398 added Section 38562(c)(2)(D) to the California Health and Safety Code, under which ARB is required to:

Evaluate and address concerns related to overallocation in the state board's determination of the number of available allowances for years 2021 to 2030, inclusive, as appropriate.

In its proposed regulations, CARB reaffirms its April 2018 staff report calculations and concludes that no adjustment to the cap-and-trade program budgets is warranted (CARB, 2018d: 7-11). Without expressing a view on this question, the subcommittee suggests that going forward, additional technical disclosures and public analysis from CARB would help address the statutory direction on overallocation. One member of this subcommittee has authored a separate statement on the issues addressed here.

### 4. Public comments

We received comments addressing concerns related to the public's ability to evaluate complex cap-and-trade program reporting data and clarify a common factual understanding of those data with ARB staff. As a general matter, the subcommittee believes it is essential for CARB to produce clearly documented public data that promotes a shared factual understanding of objective program conditions. This norm underlies several of our recommendations below on the need for additional reporting.

## C. Recommendations

Conflicting views of market fundamentals highlight a challenge that needs to be addressed by CARB. Current reporting of allowance supplies and associated private account holdings are not sufficiently timely or transparent to facilitate easy analysis of the status of the program. Additionally, the potential differences in outcomes and the likely persistence of uncertainty even with more transparent accounting suggests there may be value in the development of program adjustments that would automatically occur if the accumulation of surplus allowances continues or if it reaches undesirable levels in the context of the state's long-term emissions reduction goals.

To help address the debate over overallocation and mitigate the consequences of impacts that many expect to arise, we recommend that CARB strengthen its data reporting disclosures and analyze three key issues.

- 1) **Improve and increase program reporting.** Current program data reporting is helpful, but incomplete. We recommend CARB increase transparency by:
  - a) Reporting allowance holdings by jurisdictional type (i.e., distinguishing between allowance holdings from California, Quebec, and Ontario in quarterly compliance instrument reports).
  - b) Reporting the number, vintage, and jurisdictional totals of allowances that are banked at the end of each three-year compliance period.
  - c) Developing a metric that tracks the bank of compliance instruments on an annual basis, not just at the end of three-year compliance periods (e.g., as developed by Inman et al., 2018c).
  - d) Reporting public data on secondary spot market prices (e.g., weekly averages), as is done for other key climate programs such as the Low Carbon Fuel Standard.
- 2) **Develop a report on Ontario's withdrawal.** Most observers expected that Ontario would be a net consumer of compliance instruments through 2020. Instead, Ontario's brief participation increased market supply. We recommend CARB develop a report that:
  - a) Analyzes the impact of Ontario's withdrawal on the net supply of allowances in the cap-and-trade program;
  - b) Analyzes whether the impact of Ontario's withdrawal could have been anticipated and mitigated in advance; and
  - c) Evaluates alternative strategies for managing cross-border allowance transfers in future de-linking events.
- 3) **Develop a comprehensive report on allowance supply.** Given the different assumptions made by public studies, we recommend CARB develop a report that:
  - a) Compares and contrasts all public projections of allowance supply, including the different assumptions and methods used;

- b) Includes all of the “allowance pools” in the pre-2021 and 2021-2030 market periods in the assessment, including the transfers mandated by AB 398 (see Cullenward et al., 2018b);
  - c) Addresses the “self-correcting” auction mechanism in California’s regulations, whereby allowances that go unsold for 24 months are sent to the allowance price containment reserve (Inman et al., 2018b);
  - d) Undergoes a public review process.
- 4) **Develop a report on options to manage allowance supply.** In parallel to an assessment of overallocation, we recommend CARB develop a report that focuses on options for addressing allowance supply concerns that may manifest in the future, including:
- a) Adjustments to the price floor, price containment points, and offsets regulations within statutory constraints;
  - b) Replacement of Ontario allowances with California allowances from different “allowance pools”;
  - c) Cancellation of allowances or transfers of allowances from future year program budgets into the post-2020 reserve or price containment points;
  - d) Comparison of automatic rule-based adjustments to market supplies versus administrative interventions;
  - e) Implications of any potential interventions on linking arrangements.

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## **Chapter 7: Price Ceiling Considerations**

**Authors: Quentin Foster and Dallas Burtraw**

### **A. Context**

This document seeks to provide CARB with input to inform one of the important design elements now a part of the cap-and-trade program: the allowance price ceiling.

The fact that California is four years ahead of schedule to meet its 2020 greenhouse gas reduction goals increases the likelihood that it is indeed possible to build more ambition into the design of the program post-2020. However, uncertainty about market outcomes, technological change, and related policies makes it difficult to predict the allowance price over the next decade although the price floor and previous price containment reserve as well as many other market features provided some helpful stability and predictability. One of the new design elements intended to further mollify uncertainty about the allowance price is the inclusion of a price ceiling. The price ceiling is intended to provide a stronger level of assurance to the Legislature that marginal costs to consumers and producers associated with a declining cap post-2020 do not rise to levels that are economically or politically unsustainable. It also is expected to further limit market volatility. Importantly, California's price ceiling design takes an innovative approach to protecting environmental integrity by requiring that any instrument sold at the price ceiling is backed up by a reduction purchased with the revenue on at least a ton-for-ton basis.

### **B. Key considerations**

#### **1. Implementation of a Price Ceiling**

The price ceiling will be implemented beginning in 2021 and will make available alternative compliance instruments, which currently are called "price ceiling units," at a pre-determined price. The alternative instruments become available only after the reserves of allowances that are available at the three cost containment price tiers are sold, and all these compliance instruments are sold in a secondary process following the regular allowance auction. The highest of these price tiers will be at the price ceiling level. When the allowances that are available at this price tier (the price ceiling) are sold, price ceiling units become available.

A key consideration is the level of the price ceiling. After considering a range of options, CARB has proposed that the price ceiling be set at \$65 in 2021, and that it increase at 5% per year plus inflation. Given the time constraints, it is difficult for this committee to offer analysis on the specifics of the price ceiling level. Nonetheless, we observe that \$65 in 2021 (\$61.75 in real 2018 dollars) is well within the range of estimates of the social cost of carbon from the federal Interagency Working Group (IWG 2016). The 2020 estimate of the social cost of carbon with a 2.5% discount rate is about \$75 in 2018 dollars. We also observe that a higher price ceiling would likely increase the probability of capturing additional environmental benefits. For example, stronger incentives because of a higher price ceiling might create a better market for mitigation

projects with substantial development costs and high average costs per ton, such as carbon capture and sequestration. Providing financial incentive for the development of such projects is valuable given the importance of adaptation efforts in response to more forest fires. At a lower price, these projects might not be economically viable, causing the state to miss the opportunity to further environmental ambition.

However, we also observe that a higher price ceiling has the potential to enable greater price volatility at prices between the price floor and the price tiers and price ceiling, at least in the short/medium term (i.e., over the course of several years), because the supply of abatement options at prices near the price ceiling may be inelastic for several years until new technology and investments are realized.

## 2. Accounting for Emissions Enabled by a Price Ceiling

If the price ceiling is reached and allowances available at that price are exhausted, and price ceiling units are introduced, then emissions from sources covered by the cap-and-trade program will be greater than the number of emissions allowances issued under the emissions cap. An important question for the environmental integrity of the trading program is what the source of the price ceiling units will be, and how the state's overall emissions goal will be achieved.

Stakeholders have suggested that abatement opportunities exist that cannot be taken directly by sources covered by the program, and that many of these options offer emissions reductions at costs far lower than the price ceiling. Examples might include offsets including international forest offsets, innovative investments on natural and working lands, and purchasing emissions allowances from other trading programs. These alternatives would yield emissions reductions that could be used to account for the emissions increases embodied in price ceiling units. Because the cost per ton of these alternatives is likely less than the price ceiling, a ratio greater than ton per ton should be achievable. Coupled with the increased revenue that would be available from the sale of price ceiling units, high quality reductions could be secured outside of the market at greater than ton per ton, leading to greater environmental ambition. CARB may want to design the program so that investments in a reserve of emissions to account for the possible use of price ceiling units occurs before they might be brought into the program. This advance investment would have the indirect benefit of identifying new protocols for out of market emissions reduction opportunities, which might be useful in other jurisdictions. However, it could shift the location of emissions reductions to outside California. CARB may have limited opportunity to maximize reductions in California via the price ceiling, however, given that a price ceiling with instruments backed up on a ton-for-ton basis is required by statute. This dynamic could warrant further consideration.

## 3. Environmental Justice

This committee supports the recommendations from the Environmental Justice Advisory Committee (EJAC) that strongly supports the inclusion of the social cost of carbon (SCC) values as a justification for price tiers and the price ceiling in CARB's modeling.

In light of the continued efforts by the Federal EPA that continues to lessen protections, California can set an important example and signal to EJ communities the importance of impacts in vulnerable communities by including SCC. These values as estimated by the Interagency Working Group, while not tied to any specific price point at the ceiling or floor, can be helpful as a point of reference for policy-makers in the state to underscore the costs associated with carbon pollution, and help support greater environmental ambition. CARB's consideration of SCC can be significant to alleviating some of the criticisms from the EJ community, some of whom are concerned that a low price that did not reflect the SCC would have minimal impact in reducing emissions, specifically in low-income communities, and that taking the SCC into account would imply a price that triggered additional positive health outcomes. Without proper accounting of social costs, critics believe that market-based approaches are more likely to leave behind vulnerable communities and increase hotspots in marginalized regions. Sending a signal that support for a viable carbon market does not exclude the concerns of EJ communities in this state is important to further demonstrating that the social impacts of climate change deserve the same focused attention of the agency as does the health of the atmosphere. An important consideration is how the increased emissions associated with price ceiling units will impact disadvantaged communities, and how measures to account for these emissions are designed.

#### 4. Environmental Integrity

The most important factor to highlight is the level of emissions reductions achieved, not the amount of revenue the program has generated for investments into mitigation projects, etc. The same is true with the introduction of the price ceiling. What is important to focus on are the emissions reductions the state will likely achieve, not whether the ceiling will be reached. Too much focus on where the price is set can create a narrative that puts the focus of our environmental goals secondary to how much revenue is being generated. As important as these investments are, especially those going to disadvantaged communities, these investments and the level of revenue available for them does not in itself suggest whether the program is working.

This was the case a few years ago when the general assumption by legislators and even some stakeholders was that the program was failing as a result of declining revenue, which was attributed to low demand for allowances based on a number of factors, one of which was the uncertainty with the program prior to passage of AB 398. We now know that the program has indeed succeeded as a backstop, working in concert with complementary measures that have led to reducing the state's emissions such that it is four years ahead of meeting its 2020 target. Should the allowance price reach the price ceiling in the future, it would not mean the program had failed. Rather, the success of the program can be judged by whether added abatement opportunities occurred at higher prices, and whether the state secured emissions reductions, including those that might fall outside of the cap using instruments as required by statute in reducing climate pollution from the atmosphere. We suggest that CARB staff strongly consider these implications as the rulemaking process continues forward. The

focus and long-term success of the program should be based on the program's impact on emissions and the environment.

#### 5. Lessons from literature

Public comments to the committee draw attention to literature on the social cost of carbon that considers equity weighting and alternative discount rates, as well as damages that are not monetized because of uncertainty, which yield substantial variation in the social cost of carbon (e.g. Adler et al. 2017; Anthoff and Tol 2010, 2013).

#### 6. Recommendations for cap-and-trade regulatory amendments

- 1) We encourage the state to investigate simplifying the program by providing for the sale of price ceiling units as well as sales of allowances from the cost containment price tiers in the regular auction by assigning reserve prices to the availability of those compliance instruments.

#### 7. Recommendations for longer-term implementation

- 1) Damages from climate change are expected to be severe in California. The state should develop an independent assessment of the social cost of carbon to provide a guide for determination of the price ceiling and other price points in the cap-and-trade program.
- 2) The state should anticipate potential sources of emissions reductions outside the market that can be realized if price ceiling units are made available.
- 3) Continue to ensure that in evaluating and setting the price ceiling, the primary focus for CARB should be whether our environmental goals will be achieved, not the amount of revenue the cap-and-trade program produces.
- 4) Potential out-of-market emissions reductions to account for the potential use of price ceiling units are likely to be less expensive per ton than the price ceiling. The state should consider a ratio greater than ton per ton to account for the use of price ceiling units.
- 5) The state should consider the development of out-of-market emission reduction opportunities in advance of when they might be needed in the program. Initial investments in these opportunities and efforts to develop new protocols that might apply to account for price ceiling units can propagate methods that generate global environmental benefits. Having reductions available before they are needed can also help protect the environmental integrity of the program. CARB could make recommendations to the Legislature or work with the Legislature to explore the role of each body in considering these opportunities.

#### C. Conclusion

These are complex decisions and CARB staff is under enormous pressure to maintain the most successful carbon market in the world. The IEMAC appreciates the opportunity to provide input that we are hopeful CARB staff as well as stakeholders will find helpful. While these recommendations are purely for consideration and not for adoption, we

believe that the aforementioned criteria will ensure that the state's cap-and-trade program continues to function as the backstop for California's suite of climate policies. At the same time, the program can drive further climate ambition, deliver cleaner air for all Californians, and remain a viable market that attracts the technological innovation and investments that are good for the economy and good for the environment.

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## Appendix A

### Comments on Subcommittee Chapters by IEMAC Member Dallas Burtraw

IEMAC did not have an opportunity to adequately discuss two items of potential importance. I wish to draw attention to these items here.

#### Overlapping Policies/ Report on Emissions Leakage and Resource Shuffling

One item is mentioned in Chapter 2: Overlapping Policies, and in Chapter 3: Subcommittee Report on Emissions Leakage and Resource Shuffling. This item concerns **renewable energy certificates (RECs) and greenhouse gas accounting**. After the September 21 in-person meeting of the committee, we received a comment from the Center for Resource Solutions that expressed concern that CARB does not require electricity importers to retire the RECs associated with out-of-state renewables, yet nevertheless counts these electricity imports as zero-carbon resources under the cap-and-trade program. As a result, the RECs associated with these renewable electricity imports are available for use outside of California and could, if counted by external parties as zero-carbon resources, lead to double-counting of GHG emission savings. This issue about the effect of overlapping policies on the integrity of the market for RECs is not particular to California; it has surfaced in other venues. Assuredly, the desire of the state agencies is to strengthen renewable markets and not to undermine them. I urge CARB to consider safeguards against the issues that might arise because of the interaction of these policies.

#### Price Ceiling Considerations

A second item is mentioned in Chapter 7: Price Ceiling Considerations. This concerns the **structure of the auction and the sale of allowances from the cost containment reserve and price ceiling units**. If these compliance instruments entered the market, they would do so outside of the regular allowance auction through a secondary process. They would be deposited directly into compliance accounts and would not be transferable. In recommendations for Chapter 7, we encourage CARB to investigate simplifying the program by providing for the sale of allowances from the cost containment price tiers and the sale of price ceiling units in the regular auction by assigning reserve prices to the availability of those compliance instruments and selling them at the auction-clearing price. In the chapter, we do not present a thorough motivation for this important reform. I want to do so here.

The two-stage process of issuing compliance instruments—the regular auction and subsequent conditional direct sale—introduces complexity. One does not need to make a fetish of simplicity to observe that increasing complexity makes the program harder to understand and raises costs for participants. Sometimes additional detail is needed to solve a problem, and sometimes it provides opportunities for unintended outcomes, as applies in this case. The time lag between the primary auction and the availability of

additional compliance instruments conditional on the price in the regular auction creates a situation in which regular auction participants may need to factor in expectations about the behavior of others, introducing a strategic setting that entices auction participants to bid a price different than their marginal cost of abatement.

One appeal of a uniform price auction for a single good is that it provides participants with a robust incentive to bid their true willingness to pay, that is, there is no expected gain from engaging in strategic bidding in response to expectations about how others might bid. In auction theory, there is no guarantee that the same attribute applies in a multi-unit auction such as the auction for emissions allowances, but there is a general sense based on experience in laboratory settings and in the field that entities will approximately do so. This is helpful because it relies on information that bidders have.

The issuance of allowances through two sequential and separate events can result in two different prices for the issuance of allowances because if entities bid their true willingness to pay in the regular auction it is possible for the clearing price to be above one or more price tiers. However, if bidders anticipate the price to be near a price tier at which additional allowances or price ceiling units would enter the market, they have a strategic incentive to reduce their bid in order not to win an allowance at a price above the price tier. These strategic considerations complicate the decision of compliance entities but have no benefits for environmental or market integrity.

In our Chapter 7 recommendations, we suggest a simple program reform that would address this concern. This reform would issue all compliance instruments using information provided during the regular auction. Allowances sold at the price tiers and price ceiling units would be available at reserve prices specific to each tier, in a directly analogous way to how the auction price floor is implemented. This approach is used to issue allowances at cost containment price tiers in the Regional Greenhouse Gas Initiative, where the process has worked effectively. In California, if allowances issued from the cost containment reserve could be issued proportionately among all eligible winning bids and could be deposited directly into compliance accounts. Or, auction participants could indicate whether they want to be eligible to receive these allowances. This reform would simplify the administration of the allowance auction and the participation activities of compliance entities. We encourage CARB to consider this reform.

## Appendix B

### Comments on Subcommittee Chapters by IEMAC Member Dr. Danny Cullenward

#### Managing Allowance Oversupply

I would like to thank my subcommittee colleague and IEMAC Chair, Dr. Dallas Burtraw, for his thoughtful engagement over the past few months. While I endorse our subcommittee report in full and believe its recommendations identify the most practical opportunities to improve the effectiveness of California's cap-and-trade program, I respectfully dissent from the subcommittee's decision not to address the validity of ARB's justification for inaction on allowance overallocation.

##### A. The IEMAC should have reviewed ARB's analysis of allowance overallocation

Cap-and-trade program design is an inherently complex topic. That is why it is especially important for expert advisory bodies, such as the IEMAC, to address critical disputes over key market parameters in plain and accessible language.

In extending the cap-and-trade program through 2030, the California Legislature indicated its concern about allowance overallocation, which multiple independent studies have suggested may put the state's 2030 climate target at risk.<sup>1</sup> AB 398 specifically requires ARB to evaluate whether the program has too many allowances.<sup>2</sup> ARB has since provided its response to AB 398's instruction to analyze allowance overallocation and concluded that no change to allowance budgets is warranted.<sup>3</sup> In particular, the proposed regulation rests on the findings of a disputed April 2018 staff report that are repeated in Appendix D to the Initial Statement of Reasons.<sup>4</sup>

Given the jurisdiction of this subcommittee and the critical importance of the April 2018 staff report to a clear statutory direction, I believe the subcommittee should have expressed its views on the technical validity of the Board's analysis. In my opinion, there is no more significant analytical question in the proposed regulation. If the cap-and-trade program has too many allowances, it will fail to reduce emissions in line with the 2017 Scoping Plan and may put the state's 2030 climate target at risk.

##### B. ARB's analysis of allowance oversupply is technically deficient

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<sup>1</sup> See, e.g., Environmental Commissioner of Ontario, Ontario's Climate Act: From Plan to Progress – Appendix G: Technical Aspects of Oversupply in the WCI Market (Jan. 2018); Chris Busch, Oversupply Grows in the Western Climate Initiative Carbon Market, Energy Innovation Report (Dec. 2017); Legislative Analyst's Office, Cap-and-Trade Extension: Issues for Legislative Oversight (Dec. 2017).

<sup>2</sup> Cal. Health & Safety Code § 38562(c)(2)(D).

<sup>3</sup> ARB, Proposed Amendments to the California Cap on Greenhouse Gas Emissions and Market-Based Compliance Mechanisms Regulation, Staff Report: Initial Statement of Reasons, Appendix D: AB 398: Evaluation of Allowance Budgets 2021 through 2030 (Sept. 4, 2018) at 15-16.

<sup>4</sup> *Id.* at 9-11 (citing ARB, Supporting Material for Assessment of Post-2020 Caps (Apr. 2018)).

Had the subcommittee reached this question, I would have encouraged my colleague to join me in expressing concern about the Board's analysis of allowance overallocation. In my opinion, the Board has offered no analysis that shows how the proposed market design will achieve the role ARB designated for cap-and-trade in the 2017 Scoping Plan. The proposed regulation purports to demonstrate the adequacy of current allowance budgets via two different arguments—one focused on supporting a “steadily increasing carbon price signal” and the other on the number of allowances in the program—but neither analysis provides a sufficient technical basis for determining the proposed regulation has resolved concerns related to overallocation.

Historically, the cap-and-trade program has operated as a “backstop” or “insurance” policy designed to “close the gap” between the effect of regulatory efforts and any remaining mitigation needed to achieve statewide climate targets.<sup>5</sup> This language is found in every scoping plan to date—including the 2017 Scoping Plan, which contains multiple references to this functional role.<sup>6</sup> Now, however, ARB appears to refer to the program as having the primary goal of supporting a “steadily increasing carbon price signal.”<sup>7</sup> This shift in emphasis is profound and calls for a distinct kind of economic analysis.

While I agree with ARB that price-induced mitigation effects are perfectly capable of delivering greenhouse gas emission reductions, nowhere in the proposed regulations does ARB provide an empirical or model-based analysis of what carbon prices might be necessary to achieve the state’s climate goals. Without a basis for determining what prices are necessary to achieve state climate goals and what prices might be expected from the proposed market design, I do not believe this line of inquiry responds to concerns about allowance overallocation.

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<sup>5</sup> Guri Bang, David G. Victor, and Steinar Andresen (2017), California's Cap-and-Trade System: Diffusion and Lessons, *Global Environmental Politics* 17(3): 12-30; Michael Wara (2014), California's Energy and Climate Policy: A Full Plate but Perhaps Not a Model, *Bulletin of the Atomic Scientists* 70(5): 26–34.

<sup>6</sup> ARB, California's 2017 Climate Change Scoping Plan (Nov. 2017) at 25 (stating the Final Scoping Plan's strategy to “Continue the existing Cap-and-Trade Program with declining program caps to ensure the State's 2030 target is achieved”); *id.* at 26 (describing the cap-and-trade program's capability to deliver additional reductions if planned measures are delayed or ineffective, “to ensure the 2030 target is achieved”); *id.* at 30 (describing the final Scoping Plan Scenario and cap-and-trade's projected backstop role to “ensure the 2030 target is achieved”); *id.* at 34 (Table 4) (noting under the criterion “Ensure the State Achieves the 2030 Target” that the cap-and-trade program “scales to ensure reductions are achieved,” despite uncertainty in projected emissions and emission reductions); *id.* at 52 (“Flexibility allows the Cap-and-Trade allowance price to adjust to changes in supply and demand while a firm cap ensures GHG reductions are achieved”); *id.* 53 (“The aggregate emissions cap of the Cap-and-Trade Program ensures that the 2030 target will be met—irrespective of the GHG emissions realized through prescriptive measures”); see also ARB, Responses to questions at the Joint Hearing of the Senate Environmental Quality Committee and Senate Budget and Fiscal Review Subcommittee No. 2 (Jan. 17, 2018) at 2-3 (describing the cap-and-trade program as a program that will achieve certain reductions with prices determined by the market).

<sup>7</sup> ARB, ISOR Appendix D, *supra* note 3 at 3.

The question, then, is whether the number of allowances in the program is sufficient to contain 2030 emissions at a level consistent with the legally binding limit set by SB 32. The only analysis of these quantity effects comes from an April 2018 staff report.<sup>8</sup> As the subcommittee report notes, however, not only does this staff report project a much smaller number of extra allowances than do credible independent reports, but its factual accuracy is in dispute.

My colleagues at the non-profit research organization Near Zero and I have claimed that ARB made a significant modeling error in its April 2018 staff report. We published our step-by-step criticism in May,<sup>9</sup> included our analysis in a comment letter to ARB,<sup>10</sup> discussed it in testimony before a legislative oversight hearing where ARB leadership also testified,<sup>11</sup> responded to ARB's testimony in a follow-up letter to the same legislative committee with a courtesy copy to ARB,<sup>12</sup> and addressed the matter again in a second comment letter to ARB.<sup>13</sup>

Despite this extensive engagement, ARB has never addressed the criticism head-on. Here is the full extent of how Board staff responded in the proposed regulations:

In response to the initial staff analysis, one commenter stated there was an error in the CARB analysis. Staff evaluated the assertion and found that no error existed. The proposed adjustment by the commenter would have actually introduced an error.<sup>14</sup>

In fact, even now staff admit the error Near Zero identified by acknowledging their projections of covered emissions included “fugitive emissions” that are not actually subject to the cap-and-trade program.<sup>15</sup> If staff believe the size of the error is not as large as Near Zero found using ARB's own data, they should show their calculations and not merely assert their conclusion.

Because the debate over ARB's April 2018 staff report concerns a key technical question related to the core jurisdiction of this subcommittee, and because the April 2018 staff report is at the center of ARB's response to AB 398's instruction to evaluate concerns related to overallocation, I would have preferred that the subcommittee

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<sup>8</sup> ARB, Post-2020 Caps Report, *supra* note 4.

<sup>9</sup> Mason Inman, Danny Cullenward, and Michael Mastrandrea, Ready, fire, aim: ARB's overallocation report misses its target. Near Zero Research Note (May 7, 2018), [An Open-Source Model of Supply And Demand in the Western Climate Initiative Cap-And-Trade Program](#).

<sup>10</sup> [Comment letter from Near Zero to ARB](#) (May 10, 2018).

<sup>11</sup> [Testimony of Dr. Danny Cullenward before the Joint Legislative Committee on Climate Change Policies](#) (May 24, 2018).

<sup>12</sup> [Letter from Dr. Danny Cullenward to Hon. Eduardo Garcia and Sen. Henry Stern](#) (May 30, 2018).

<sup>13</sup> [Comment letter from Near Zero to ARB](#) (July 5, 2018).

<sup>14</sup> ARB, ISOR Appendix D, *supra* note 3 at 10-11 (see footnote 11).

<sup>15</sup> *Id.*

evaluate ARB's response to the criticism and make a substantive finding about the staff report's technical validity.

Nevertheless, my sincere hope is that the analysis and metrics recommended by the subcommittee will provide policymakers with an evidence-based framework for evaluating whether adjustments to the current supply of allowances are warranted. I look forward to working with my fellow IEMAC members, Board staff, and program stakeholders to that end.

### Environmental Justice

I write separately to address the subcommittee report on the Environmental Justice Implications of California's Climate Change Policies. I would like to thank my colleagues for revising their subcommittee report in response to public comments at our September 2018 meeting and appreciate its expanded scope. In my judgment, however, the report's evaluation of CARB's engagement with the environmental justice community lacks sufficient balance and remains inadequately supported by evidence.

Furthermore, this particular topic lies outside our committee's proper scope. The IEMAC does not include representation from anyone whose professional role focuses on the interests of environmental justice communities.<sup>16</sup> An inclusive consultation process might fill that gap, but if the subcommittee engaged in substantial discussion with environmental justice organizations during the revision process, the final report contains few details. I therefore respectfully submit that the subcommittee report should not be taken as an adequate evaluation of the interaction between CARB and the environmental justice community in California. Going forward, I would urge the IEMAC to conduct a more balanced and inclusive analysis of environmental justice governance concerns, if indeed it is our proper role to evaluate the processes by which CARB and the environmental justice community interact.

Separately from these concerns, I want to thank my colleagues for expanding the coverage of their subcommittee report to include technical matters related to the relationship between greenhouse gas emissions, local air pollutants, and the distributional consequences of state energy, climate, and environmental policy—all important issues that are relevant to environmental justice communities and state policymakers alike. I believe the IEMAC is well suited to analyze these kinds of issues and welcome the subcommittee's engagement here.

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<sup>16</sup> Four of the five voting committee members are academics who do not specifically focus on environmental justice issues (myself included). A fifth member, Mr. Foster, specifically disclaimed any role in speaking for the environmental justice community in his present professional capacity. CalEPA video recording of the [September 2018 IEMAC meeting, morning session](#), timestamp 1:51:50.

## Appendix C

### Comments on Subcommittee Chapters by IEMAC Member Quentin Foster

#### Managing Allowance Oversupply

I would like to thank the subcommittee for their thoughtful work on this issue. On the whole I believe the joint subcommittee report provides a careful look at what has become a contentious issue around the supply of cap-and-trade allowances. I write separately here to make a few higher level points that are absent from the joint report, noting that the cap-and-trade program is functioning as intended, although there could be an important opportunity to increase ambition.

- A. The Cap and Trade Program was designed to incentivize early reductions through banking and achieving the 2020 target four years early is a clear demonstration of success that is benefiting the atmosphere right now.

From the tone and framing of the subcommittee report it could be unclear to readers whether banking is a positive or negative aspect of the program or what the pros and cons are. I would like to note that the cap and trade program was intentionally designed to include banking which provides a number of benefits. From an environmental perspective, the most important is encouraging earlier emissions reductions. Banking means that if regulated entities can find cost-effective reductions earlier than required by the scarcity of allowances, they can bank allowances for a later date. This dynamic is clear in California's cap and trade program where the state has met its 2020 target four years early. This means at least a delay in emitting GHGs into the atmosphere where they will have a warming effect. Banking can also have benefits for price stability. In short, it is important to note that the cap-and-trade program is working as intended. Meeting the 2020 target four years early is a clear demonstration of the success of California's suite of climate policies.

- B. Banking can create opportunities for increased ambition.

The fact that banking can provide benefits to the program does not mean that a larger bank of allowances is necessarily better. As the subcommittee report notes there are no "textbook rules or standard methodologies for determining the ideal size of an allowance bank." I agree. Under the right circumstances, EDF, the organization I currently work for, has supported decreasing the size of the allowance bank by making cap adjustments. A large bank of allowances and allowance prices consistently close to the price floor can indicate an opportunity to increase the ambition of a program by decreasing the overall supply of allowances. This type of cap adjustment can occur as a onetime cap adjustment or through an automatic mechanism that removes allowances either temporarily or permanently from circulation. To some extent this is already happening in California. As CARB has noted in Appendix D of the current regulatory package, at least 39 million allowances will be moved to the price containment reserves due to the new rule that is triggered if allowances go unsold for a period of 24 months. There has also been advocacy

for a minimum permanent cap adjustment that is equivalent to the 52.4 million allowances that are the difference between cap setting methodologies CARB considered during the regulatory development process. CARB has instead proposed to move these allowances into the price containment reserves as well. Again since there is no clear best practice, these different approaches represent a difference in calculation as to the best way to balance policy objectives.

C. In considering whether it is appropriate to make a cap adjustment, it is worthwhile to consider emissions impact, price impact, and adequate notice to the market.

In considering whether a cap adjustment to increase ambition is appropriate there are two sets of key questions to consider: First, what will the impact of reducing the supply of allowances actually be on overall emissions (and prices)? And second will the method of cap adjustment provide adequate notice to the market or unduly penalize market participants for over complying?

On the first point, the theory of cap and trade means it should be relatively simple to reduce emissions by decreasing the supply of allowances. However, it gets more complicated in practice. As Borenstein et al. have pointed out in a 2017 working paper, there could be a high likelihood that prices are either at the floor or the ceiling meaning there are few cost-effective abatement opportunities between the floor and the ceiling price.<sup>1</sup> Some comments on the regulatory proposal have used this result to suggest that reducing the overall supply of allowances may not have any real emissions impact on the program. However, this argument ignores two key points. First, that there is insufficient real data to test this modeling result and thus it could be significantly underestimating the abatement opportunities between the floor and the ceiling. Second, that there is a requirement to purchase reductions on a ton-for-ton basis if instruments are sold at the ceiling. While this might not result in reductions in California, it will result in reductions to the atmosphere that will reduce the warming impacts of pollution. Therefore, it seems clear that there is an emission benefit to reducing the supply of allowances; the question is balancing that benefit with the potential to increase allowance prices.

The second question regarding notice and penalization is also somewhat subjective. There are two major opportunities for making cap or supply adjustments that are worth considering. First, when initial budgets are being set as they are now for the 2021-2030 period. The market has an expectation about the end point in 2030 that will be used as a fixed goal. But there could be multiple appropriate methods for determining the trajectory and thus annual budgets between two fixed targets in 2020 and 2030 that the agency could freely choose between. The second way to adjust budgets would be to set up an automatic process that is outlined in the regulation for tightening budgets. California has this with the "24 month rule" but it represents a temporary removal from circulation vs. a permanent removal which would guarantee an emission reduction via the ton-for-ton requirement at the ceiling. RGGI has also adopted an Emissions Containment Reserve starting in 2021 which will automatically tighten the cap if prices are below a set trigger price that rises over time.<sup>2</sup>

D. An important factor in California's progress towards achieving climate goals as the state approaches 2030, will be whether and how soon the state can codify ambitious, midcentury goals.

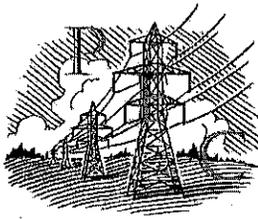
Setting binding, statutory goals and extending the cap-and-trade program beyond 2030 could significantly influence the behavior of the market and market participants as the state approaches 2030. Setting these ambitious goals could keep the pressure on market participants to continue banking and to achieve relatively cost-effective reductions as soon as possible. It could also send a stronger signal to the larger economy that could spur adoption and innovation which could bring more reduction opportunities within that cost-effective range. As described above, there could be an important opportunity to increase ambition through cap adjustments at strategic points. Setting a long-term target that will drive necessary reductions is another important way to keep California on the reduction trajectory that science demands.

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<sup>1</sup> [2017 working paper](#)

<sup>2</sup> [Elements of RGGI](#)





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**Re: Panoche Energy Center LLC Comments on September 4, 2018 Cap and Trade Rulemaking Package**

Panoche Energy Center, LLC (“PEC”) respectfully submits these comments to provide recommended changes to the Cap and Trade Rulemaking Package. The requested changes pertain primarily to PEC’s lingering unresolved status as a Legacy Contract. The comments explain how this unresolved situation impacts not only PEC, but also other stakeholders and in turn the integrity of the Cap & Trade Program (the “Program”) generally. This important issue has been buried deep within the broader functioning of the Program, but now is the time to resolve it as the adverse impacts on the broader electricity and carbon markets will only grow over time. The timing is ripe to finally resolve this issue during this current rulemaking effort.

PEC fully understands that California Air Resources Board (“CARB”) would prefer a contractual solution, but that takes two willing counterparties engaging in a common effort to solve a common problem. That basic prerequisite to a bilateral solution simply does not exist here. Our renewed request for a regulatory solution is necessitated because PEC’s counterparty, Pacific Gas & Electric (“PG&E”), is unwilling to find a solution aligned with the interests of the Program. Because this is a multi-year, multi-faceted and historically complex issue, PEC has prepared this letter in greater detail than previous comment letters. The goal of the extended detail is to both summarize and consolidate the facts about this regulatory, market and environmental problem in one place with the hope that a regulatory solution can be completed under this rulemaking. It must be noted that PEC has never stopped pursuing a good faith contractual solution, and in fact, has presented our counterparty numerous opportunities for settlement with conditions that PEC believes *exceed* those that have already been agreed to by PG&E and approved by the California Public Utilities Commission (“CPUC”).

PEC has segregated this letter into the following topic areas:

- I. PEC Overview
- II. Cap and Trade Background, Legacy Contract Elements & Other Regulatory History
- III. Background and Status of Counterparty Negotiations
- IV. Impact of a Lack of Carbon Price Signal on PEC’s Electric Energy Dispatch Price
- V. Requested Relief
- VI. Potential Solutions

**I. PEC Overview**

PEC is a large natural gas peaking plant located near Fresno, California. According to the Jobs and Economic Development Model, PEC contributes more than \$20 million dollars per year and generates over 80 jobs for the local and California economy. PEC’s quick-start capability and operational flexibility are critical in supporting grid reliability as California continues its build out of intermittent renewable generation. Those characteristics, along with PEC’s proximity to fuel supply and connectivity to the grid make PEC an essential piece of California’s energy infrastructure.



Because the total volume of available permits – the “cap” in cap and trade – declines each year. That raises the price for each permit, in theory, giving companies a financial incentive to reduce their emissions.

CARB has attempted to simplify the explanation of the program. The following excerpt is pulled directly from CARB’s Cap and Trade homepage:

“The AB 32 Scoping Plan identifies a cap-and-trade program as one of the strategies California will employ to reduce the greenhouse gas (GHG) emissions that cause climate change. This program will help put California on the path to meet its goal of reducing GHG emissions to 1990 levels by the year 2020, and ultimately achieving an 80% reduction from 1990 levels by 2050. Under cap-and-trade, an overall limit on GHG emissions from capped sectors will be established by the cap-and-trade program and facilities subject to the cap will be able to trade permits (allowances) to emit GHGs.”

“Cap-and-trade is a market based regulation that is designed to reduce greenhouse gases (GHGs) from multiple sources. Cap-and-trade sets a firm limit or cap on GHGs and minimize the compliance costs of achieving AB 32 goals. The cap will decline approximately 3 percent each year beginning in 2013. Trading creates incentives to reduce GHGs below allowable levels through investments in clean technologies. With a carbon market, *a price on carbon is established for GHGs*. Market forces spur technological innovation and investments in clean energy. Cap-and-trade is an environmentally effective and economically efficient response to climate change.<sup>3</sup> (emphasis added)

California is committed to cutting carbon emissions another 40 percent by 2030<sup>4</sup>, a pretty ambitious goal, and analysts believe emissions permit prices will climb so high that they will make companies get more serious about reducing their carbon footprint.<sup>5</sup> Appendix D of the current regulatory package acknowledges this: “Staff is not aware of any data or analyses that indicate allowance prices would not continue to steadily increase over time.”<sup>6</sup>

This policy mechanism, a “price on carbon”, has generally already been applied throughout the California economy, with the vast majority of all fuels and industrial emissions covered by it, and thus incented to be reduced. There are a very limited number of entities for which the price of carbon cannot be incorporated into their operations due to existing contractual relationship. These entities have been defined as “Legacy Contract Holders” under the Cap and Trade regulation. This determination by CARB is an acknowledgement that even though the program is generally working, in an economy as big as California’s, and with a program as broad in scope, there are a few outliers that must be addressed on a case-by-case basis. These remaining entities are engaged in bi-lateral contracts which preceded the AB 32 construct and cannot be superseded by the regulation.

In enacting and implementing the Program, CARB rightfully recognized, in September 2013, that PEC, along with a handful of other similarly situated entities, were stuck between a regulatory requirement to cover the cost of compliance of the new program and a contractual obligation which did not provide an avenue to recoup compliance costs. It was the recognition of this issue that CARB created the term Legacy Contract.

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<sup>3</sup> <https://www.arb.ca.gov/cc/capandtrade/capandtrade.htm>

<sup>4</sup> [https://leginfo.ca.gov/faces/billNavClient.xhtml?bill\\_id=201520160SB32](https://leginfo.ca.gov/faces/billNavClient.xhtml?bill_id=201520160SB32)

<sup>5</sup> <https://www.Californiacarbon.info>

<sup>6</sup> <https://www.arb.ca.gov/regact/2018/capandtrade18/ct18398.pdf>

**Legacy Contract Elements**

The definition of a Legacy Contract (located in Section 95894 of the Cap and Trade Regulation) has three required criteria, which PEC has historically satisfied and continues to satisfy. In the spirit of completeness, the criteria are provided here.

- 1) **The Contract Must have been Entered Into Prior to Enactment of AB 32.** *The legacy contract was originally executed prior to September 1, 2006, remains in effect, and has not been amended since that date to change the terms governing the price or amount of electricity, the GHG costs, or the expiration date;* (PEC: TRUE)
- 2) **A Contract that Does Not have the Ability to Recover the Cost of Carbon.** *Each legacy contract does not allow the covered entity to recover the cost of legacy contract emissions from the legacy contract counterparty purchasing electricity;* (PEC: TRUE)
- 3) **Legacy Contract Holders Must Demonstrate Efforts to Resolve Contractual Issues with Counterparty.** *The operator of the legacy contract made a good faith effort but failed to renegotiate the legacy contract with the counterparty to address recovery of the costs of compliance with this regulation.* (PEC: TRUE)

PEC in good faith signed the PPA on March 28, 2006, invested significant capital and committed to supplying needed energy capacity to PG&E, predating all of the following:

- *September 2006* - AB 32 was signed into law, thus requiring GHG reductions statewide for the first time;
- *December 2008* - The Original AB 32 Scoping Plan, which suggested putting a price on carbon as a foundational policy choice of the state, was approved;
- *June 30, 2007* - The policy recommendations of the Market Advisory Committee which debated implications of power sector obligation assignment;<sup>7</sup>
- *2007-2010* - The regulatory debate and decision as to where the allowance allocation should land for carbon emissions from the power sector—power plants or Utilities;
- *2011-Present* - The numerous CPUC proceedings on power sector carbon structure for Investor Owned Utilities, of which PEC's counterparty is one;<sup>8</sup>
- *2009-Present* - The Cap and Trade Regulation was presented identifying the compliance structure of the Program, including obligated parties, allocations, reporting and Legacy Contract relief;
- *December 2011* - The adoption by the CARB Board of the Cap and Trade Program (the "Program")
- *January 2013* - The beginning of the obligation to pay for carbon emissions (January 2013).

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<sup>7</sup> <https://www.energy.ca.gov/2007publications/ARB-1000-2007-007/ARB-1000-2007-007.PDF> "California faces special challenges in reducing emissions from the electricity sector because of the quantity of imported electricity generated from coal. The Committee recognizes and appreciates the leadership already shown by the California Public Utilities Commission and the California Energy Commission in seeking appropriate means of regulating these out-of-state emissions. To address emissions associated with imported electricity within a state-based cap-and-trade program, the Committee recommends a "first-seller approach." Under this approach, the entity that first sells electricity in the state is responsible to meet the compliance obligation established under the greenhouse gas cap-and-trade program. For electricity generated within California, the owner or operator of the in-state power plant is the first seller and would be required to surrender emissions allowances. For power imported from outside the state, the first seller is most often an investor-owned or municipal utility or a wholesale power marketer who sells the electricity to an in-state, load-serving entity, another power marketer, or a large end-user."

<sup>8</sup> <http://www.cpuc.ca.gov/General.aspx?id=5920>

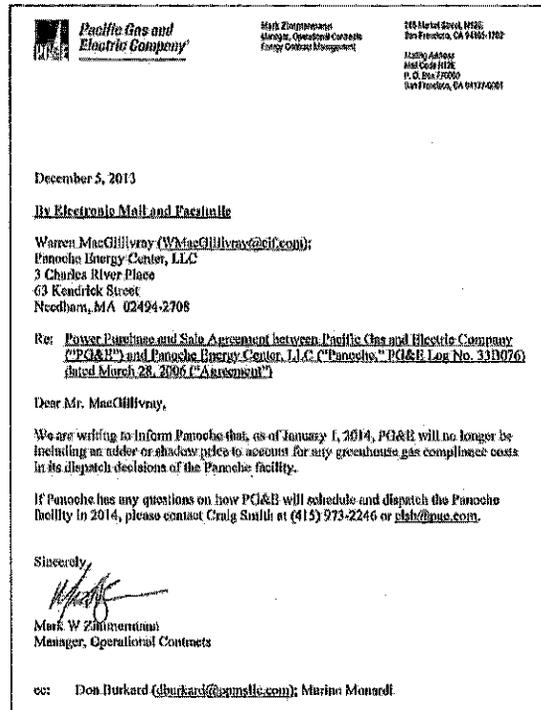
**Other Regulatory History**

CARB amended the Program to provide “Transitional Assistance” to Legacy Contracts in an effort to allow for the renegotiation of their contracts. The assumption of CARB staff was that such renegotiation would be done with willing counterparties and could be accomplished within the timeframe provided.<sup>9</sup>

Many significant and directly applicable events have transpired since CARB first adopted the Legacy Contract provisions to the Program. All of the following have occurred after PEC was determined to be a Legacy Contract:

- SDG&E and Otay Mesa settled their Legacy Contract issue as SDG&E accepted the full greenhouse gas compliance obligation (approved by CPUC in December 2012);
- PG&E agreed to amend the Legacy Contract for the Starwood Midway Project, a facility that is literally adjacent to PEC, by accepting the price of carbon for a contractual adjustment as more fully discussed below (approved by CPUC in January 2013);
- The Cap and Trade regulation has been amended seven times;
- The CARB Board has on multiple occasions acknowledged the need to solve the Legacy Contract issue, and the need to resolve it;
- PG&E specifically removed the price of carbon from PEC’s dispatch profile as stated in the letter sent to PEC in December 2013 (displayed in Figure 3);
- PEC’s operations have increased dramatically since the disparity in carbon price bidding was initiated by PG&E; and
- PEC has offered seven (7) separate proposals to PG&E for resolution, as more fully described later in this document.

Figure 3



<sup>9</sup> <https://www.arb.ca.gov/regact/2013/capandtrade13/capandtrade13.htm>

PEC has diligently worked with the staff and policy makers at CARB for six years. In addition to efforts at CARB, we have also sought solutions from the CPUC and the California Independent System Operator (“CAISO”). PEC has participated in no less than half a dozen Cap and Trade Rulemakings, attended countless meetings with staff and Board Members, submitted multiple comment letters, testified several times and continually engaged our counterparty, PG&E, in a good faith effort to seek a contractual resolution.

The CARB Board has remained engaged on this issue and as recently as last July adopted Resolution 17-21 directing staff to provide “reasonable” relief for the remaining Legacy Contracts.<sup>10</sup> PEC appreciates the fortitude and commitment of the Board to this issue.

This current rulemaking package reinstates the Transition Relief for Legacy Contract Holders Without an Industrial Counterparty (PEC’s type of Legacy Contract). PEC is appreciative of the Board for their direction under last Fall’s Resolution to staff, but believe the staff proposal is inadequate to either solve the underlying impediment to resolution (i.e., an unwilling counterparty to a contract that doesn’t contain a mechanism to pass along the price of carbon), nor does it supply a remedy to the many harms that are more fully laid out in the impacts section below. With the Third Compliance Period already underway, Legacy Contracts like PEC are completely exposed to the regulatory obligations of the Program now. The proposed relief, starting in 2021 and based on the 2012 emissions baseline, is neither timely nor adequate.

### **III. Background and Status of Counterparty Negotiations**

PEC has made numerous proposals to solve this issue directly with PG&E, all of which aimed to take full responsibility for PEC’s carbon cost obligation *assuming an energy dispatch price that includes the cost of carbon*. PEC believes that many of these offers have exceeded what PG&E accepted (and the CPUC approved) in other transactions, by as much as 160%.

However, it takes two motivated parties to renegotiate a contract. Here, PG&E has an active **disincentive** to negotiate with PEC, in order to preserve its ability to exercise market power in a seemingly manipulative manner. PG&E profits from that manipulation through the regulatory loophole allowing for PEC to be dispatched without a cost of carbon included in its dispatch price (the “Status Quo”), thereby making the prospect of an equitable renegotiation nearly impossible. The only “positive” results of the current contract appear in PG&E’s bottom-line. They retain a systemic and substantial advantage to the market *by avoiding paying legitimate costs that are borne by all other market participants*. The Status Quo will only lead to PG&E realizing increased revenues as PEC’s projected capacity factor is expected to continue to increase if the cost of carbon is not included in PEC’s dispatch cost (see Figure 6).

This is where the CARB staff proposal has proven to be ineffective over the years. CARB’s previous regulatory relief assisted Legacy Contract holders like PEC by offsetting some of the compliance costs, but such relief did not provide a reason for counterparties to negotiate in good faith. By regulation, PEC had to continue to work toward a solution, although no such requirement was placed on PG&E. Without regulatory motivation, the profit motive of the Status Quo dominated every negotiation in contravention of the spirit of the Program.

In an effort to find a solution that PG&E would accept, PEC sought to compare its settlement proposals against those that were already agreed to by PG&E and approved by the CPUC, primarily the approved amendment to the PPA for the Starwood Midway Project (“Starwood Midway”). The Starwood Midway resides adjacent to PEC, and its PPA was also a Legacy Contract that is substantially similar to the PEC PPA at issue here. In fact, in PG&E’s application to the CPUC requesting approval of the Amendment they argued that the Amendment merits approval because it “provides substantial benefits for PG&E’s customers compared to the potential

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<sup>10</sup> <https://www.arb.ca.gov/board/res/2017/res17-21.pdf>

outcomes of regulatory or adversarial proceedings that would be risked in the absence of a negotiated compromise, and demonstrates that parties to a pre-AB 32 PPA can successfully agree to realign their obligations for AB 32 costs or “GHG compliance costs” so that regulatory intervention is unnecessary.”<sup>11</sup>



With that goal in mind, PEC made CPUC public information requests to review the approved amendments for Starwood Midway. In each case, PG&E intervened to prevent PEC from accessing the amendment. Nonetheless, PEC was able to verify its benchmarking via publicly available information on the FERC EQR website. After a thorough analysis of the Electric Quarterly Report website, PEC determined that the Starwood Midway PPA amendment effectively exchanged approximately \$3/kW-yr of fixed capacity payments in exchange for its counterparty (PG&E) to assume responsibility for its carbon cost obligations. We encourage CARB to compel production of the approved PPA settlements to verify this analysis.

PEC's efforts at a good faith resolution with PG&E have included the following proposals over the course of several years:

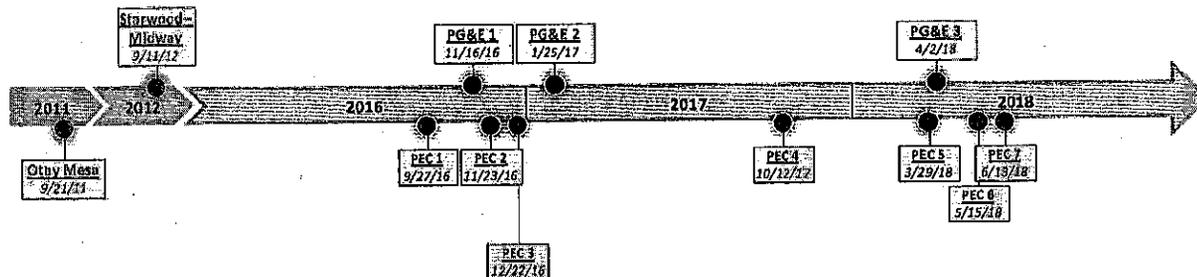
- Settlement proposals that were benchmarked against other CPUC-approved amendments (exchanging a reduction in fixed PPA Capacity Payments in exchange for PG&E taking over responsibility for the variable carbon costs associated with PEC's dispatch), including one proposal that was ~160% higher than already approved amendments according to PEC's research noted above;
- A settlement that provided a larger fixed capacity payment reduction than CPUC-approved amendments during the current PPA term, in exchange for a low-cost PPA extension that would provide economic benefit to both PEC and PG&E;
- An “outside of the box” offer to terminate the current PPA, negating need for Legacy Contract relief;
- A settlement structured to have a one-time payment sufficient to retire enough CT allowances to cover PEC's dispatch for the term of the PPA (assuming the inclusion of carbon in the dispatch bids)

These efforts can be seen in Figure 4 which highlights the sequence of attempts PEC has made to solve this issue.

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<sup>11</sup> See Application 12-09-016 (Filed September 26, 2012) “Pacific Gas and Electric Company (PG&E) seeks approval of an amendment (Amendment) to the Power Purchase Agreement (PPA) between Starwood Power-Midway, LLC (Starwood) and PG&E. The PPA was approved by Decision (D.) 06 11-048.

Figure 4



PEC has clearly acted in good faith to settle the legacy contract dispute and provided seven offers to PG&E with several different creative solutions, each one providing compensation based on values associated with a properly-dispatched, carbon price included, peaking power plant. Each time, these proposals were rejected, ignored, or countered with values associated with the Status Quo operations. Until such time as PG&E is forced to negotiate in a manner in which the good of the Program is the goal, such an agreement isn't possible, and therefore CARB must provide PEC with additional transition relief due to the fact that as currently structured the Program is causing direct economic harm to PEC by virtue of allowing PG&E to continue to dispatch the Project with no carbon price signal.

#### IV. Impact of a Lack of a Carbon Price Signal on PEC's Electric Energy Dispatch Price

The Program clearly expects there to be a uniform price on the electrical energy bid into the market to provide the necessary price signal to consumers<sup>12</sup>. Furthermore, PEC understands that CAISO *assumes* that a carbon price will be included on ALL electrical energy bid into their system. Such a uniform market signal ensures that California's electricity grid operates in a manner that is both efficient and equitable for all market participants. If one entity's electric energy bid includes a carbon price, and another does not, it skews the electricity market in a number of negative ways. Generators that bid electric energy into the market with no carbon price in their electric energy bid skew the market clearing price for electric energy lower.

The impacts of this issue are broad and stretch beyond just the PEC facility. The impacts are also unsustainable and will lead to permanent economic damage and contribute to long-term environmental degradation.

Since the day PEC's counterparty, in its sole discretion, strategically removed the price of carbon from PEC's electric energy dispatch price, PEC has been exposed and the market price for power has been impacted. Such a price is expected to be passed through to consumers in a market signal. *It is this fundamental policy component that is missing under the current arrangement.* As such, there are environmental, energy market, carbon market and broader policy impacts of having a single entity not playing by the same rules as everyone else. As the Scheduling Coordinator, PG&E confidentially controls the energy dispatch of the PEC power plant. How they dispatch, why they dispatch, and when they dispatch PEC is not transparent, and appears to be without oversight on this issue. The negative impacts listed below are NOT the result of any decisions made by PEC, nor the CPUC, CARB, CAISO or the Local Air District. Those impacts fall solely on PG&E.

Without a price on carbon—the broad market signal that is intended to normalize all power contracts—the following unintended consequences occur:

<sup>12</sup> "If California is going to reduce its emissions to 1990 levels by 2020, we need to find a way to ensure we are going to meet this target and do it in a way that sends a signal to businesses that aren't currently involved in any existing regulations that there's a value in reducing carbon. *The way to do that is to put a price on carbon emissions.*" As stated by Chairman Mary Nichols in Climate Action Reserve interview in 2010. (<https://www.standardcarbon.com/2010/12/qa-with-mary-nichols-chair-of-the-california-air-resources-board/>)

- 1) **Environmental Impacts to the San Joaquin Valley**
  - o Increased localized air pollutant emissions in a severely Disadvantaged Community
  - o Increased usage of limited Groundwater
- 2) **Local Economic Impacts**
  - o Unsustainable economic pressure on PEC which could result in permanent loss of high paying energy jobs
  - o Associated loss of local economic tax base from permanent shuttering of the facility
- 3) **Long-term Economic Impacts**
  - o Potential chilling effect on clean energy investments in California
- 4) **Electric Market Impacts**
  - o Uneconomic dispatch of a California power plant
  - o Misuse of a peaking power plant built to supplement RPS
  - o Setting the reference price for the entire power market based on faulty inputs to the system (lack of inclusion of GHG costs)
- 5) **Increased Natural Gas Usage**
  - o Increased operational pressures on infrastructure
- 6) **Cap and Trade Implications**
  - o Manipulation of the Starwood Midway dispatch
  - o Carbon market distortion
  - o Potential of Program to bankrupt critical renewable energy infrastructure
  - o Potential for CARB Adaptive Management review of the issue due to increased Environmental Justice community emissions
  - o Windfall profits due to the Program's design
- 7) **Impact to PEC Owners and Project Bond Holders**
  - a. Retirement funds, pension funds, and others could be materially harmed financially

I 68-1

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I 68-3

All of these impacts are negative, but they could all be remedied with the inclusion of a GHG price in PEC's dispatch cost, resulting in PEC operating like the Program was intended. The fact that this happening in the San Joaquin Valley is disconcerting.

At the March 2017 Board meeting, CARB staff committed to identifying additional emission reductions for meeting PM2.5 standards in the San Joaquin Valley (Valley). One direct and immediate measure would be to assure a carbon price signal is used in all Valley power plants, like PEC. The SIP document also highlights one of CARB's biggest air quality objectives, to electrify the transportation sector and the agricultural sector where possible. Facilities like PEC need to be able to operate in the manner that they were intended, as a fast-response peaker plant for renewable energy support, to maximize the benefits of these electrification policies. Having a simple cycle peaker plant run *in place of* a more efficient combined cycle power plant due to the Cap and Trade Program's unintended consequences, is in conflict with the two items being proposed on October 25<sup>th</sup>.

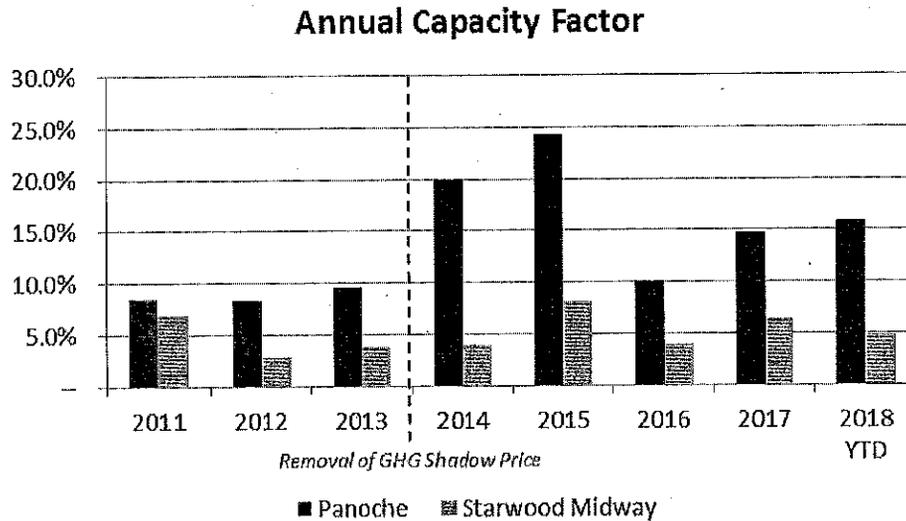
PEC has provided public comment on numerous occasions and have previously met with CARB's Cap and Trade Adaptive Management Staff on this issue, testified at the Joint Board/EJAC meeting to inform the Board and those committee members, and generally tried to make it known that these negative environmental consequences were occurring.<sup>15</sup> This needs to be addressed as the absence of a carbon price signal has negative environmental impacts on disadvantaged communities.

In summary, PEC has dispatched at materially higher capacity factors after the removal of the AB 32 shadow price from its dispatch cost, leading to numerous unintended consequences. As a comparison, Starwood

<sup>15</sup> April 26, 2017 meeting <https://www.arb.ca.gov/cc/ejac/meetings/meetings.htm>

Midway's dispatch (which PG&E also controls) has remained in line with an expected capacity factor for a peaking facility during this same timeframe. Figure 5 compares PEC's annual capacity factor to Starwood Midway's over the last several years to illustrate this.

Figure 5<sup>16</sup>



## V. Requested Relief

This is not a new issue for CARB Board Members, as last year you passed Board Resolution 17-21 acknowledging that a solution is still needed for remaining Legacy Contract Holders without an Industrial Counterparty<sup>17</sup> like PEC. PEC is still hopeful that a contractual solution can be found, but time is of the essence. PEC requests that CARB act now with regard to its ongoing status as a Legacy Contract Holder without an Industrial Counterparty.

**PEC supports the Board's stated commitment to address this issue in any of the ways listed in the following section, and welcome other creative solutions. But in any event, PEC requests the following amendments to the September 4 staff proposal to be adopted into the current rulemaking:**

1. Allowances should be granted for the Third Compliance Period (2018-2020) for Legacy Contract Holders without an Industrial Counterparty that previously received legacy contract transition assistance (2013-2017).
2. Allowance allocation calculations should be based on actual dispatch and not a static historic baseline.

Facilitating a solution is important to ensure the Program continues to be consistent with the principles of AB 32<sup>18</sup> as it moves toward SB 32's<sup>19</sup> goals under the direction of AB 398<sup>20</sup>. PEC commits to continue to work

<sup>16</sup> [www.snl.com](http://www.snl.com)

<sup>17</sup> <https://www.arb.ca.gov/board/res/2017/res17-21.pdf>

<sup>18</sup> [http://www.leginfo.ca.gov/pub/05-06/bill/asm/ab\\_0001-0050/ab\\_32\\_bill\\_20060927\\_chaptered.html](http://www.leginfo.ca.gov/pub/05-06/bill/asm/ab_0001-0050/ab_0001-0050_ab_32_bill_20060927_chaptered.html)

<sup>19</sup> [https://leginfo.legislature.ca.gov/faces/billNavClient.xhtml?bill\\_id=201520160SB32](https://leginfo.legislature.ca.gov/faces/billNavClient.xhtml?bill_id=201520160SB32)

<sup>20</sup> [https://leginfo.legislature.ca.gov/faces/billNavClient.xhtml?bill\\_id=201720180AB398](https://leginfo.legislature.ca.gov/faces/billNavClient.xhtml?bill_id=201720180AB398)

toward a solution that upholds the integrity and success of the Program. As such, PEC's additional potential solutions are proposed in the following section.

## **VI. Potential Solutions**

No less than three distinct potential contractual solutions have been proposed by PEC to our counterparty in the past year. Each proposal sought a remedy to solve the policy issue facing CARB—ensuring a price of carbon in the power generated at PEC. CARB is aware that PG&E, as PEC's Scheduling Coordinator, controls 100% of PEC's dispatch and has been doing so, since January 1, 2014, without a price of carbon on PEC's dispatch causing it to run more than true market economics would dictate. As the price of carbon is mandated to increase under the Program, this situation will only get worse through the remaining life of PEC's Legacy Contract, which runs through 2029, if it is not addressed by CARB.

PEC believes that there are two simple means of solving the issue with PG&E:

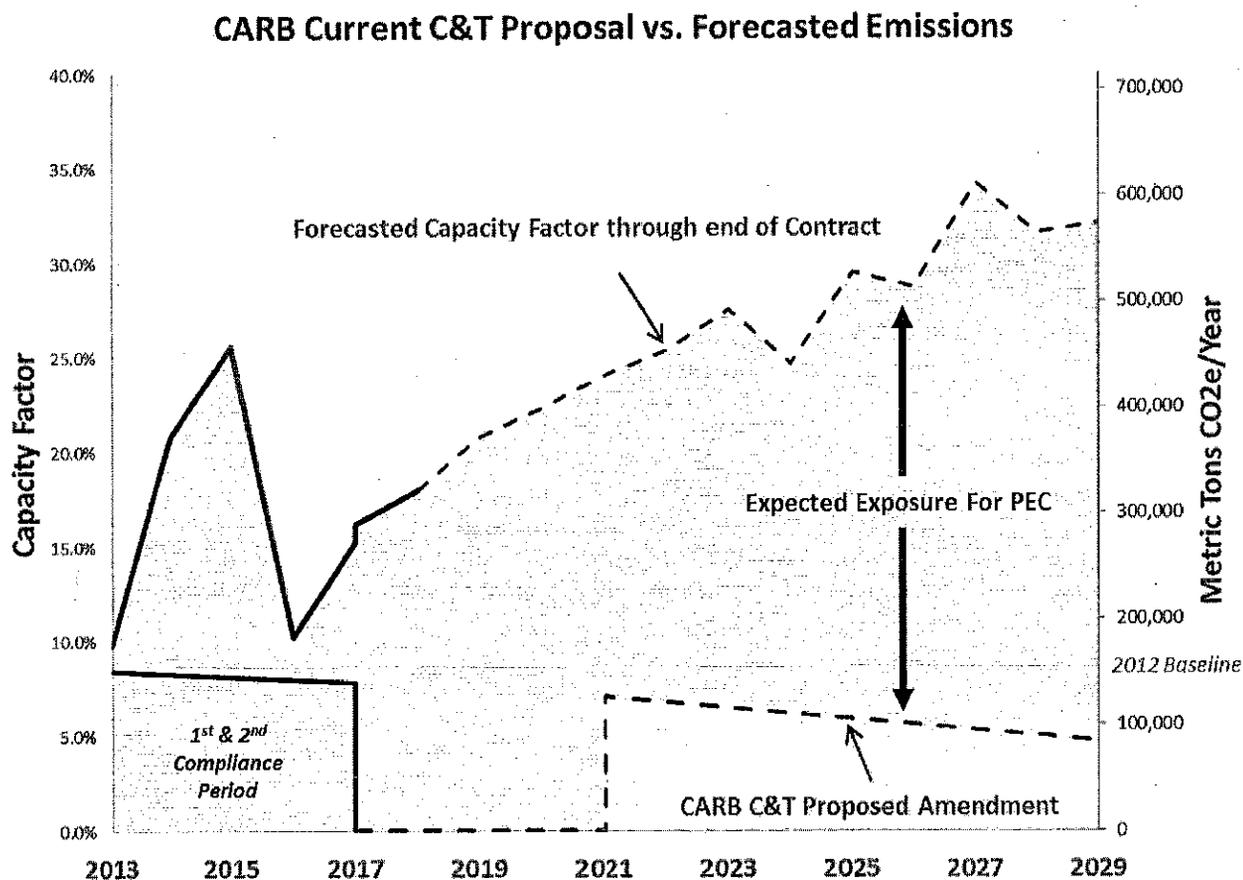
- 1) **Capacity Price Reduction:** As agreed to in other settlements discussed above (e.g. Starwood Midway), PG&E takes on the carbon compliance obligation in exchange for a reduction in the PPA capacity payment rate to PEC.
- 2) **One-Time Payment:** PG&E takes on the carbon compliance obligation in exchange for a PEC acquiring and retiring enough credits into PG&E's account for the projected remaining emissions during its PPA term, assuming the cost of carbon is included in PEC's dispatch price.

However, as noted previously, there is not an incentive for PG&E to settle via either of these solutions under the current regulatory construct. As such, CARB is needed to compel PG&E to solve the issue in a manner that considers the goals and principles of AB 32 as the top priority, rather than the interests of PG&E's customers/shareholders. PEC believes that the following would incentivize PG&E to settle the issue in such manner:

- 1) **Diablo Canyon Incentive(s):** SB 1090 has been signed into law and requires PG&E to fulfill its earlier commitment to replace Diablo Canyon's zero-GHG emission profile power with equally zero-emission renewable power. Considering that CARB policy dictates that renewable power costs are not eligible for allowance allocation and the allocation of credits to PG&E associated with the shutdown of Diablo Canyon was given to cover the emissions costs associated with natural gas replacement power, CARB is now free to simply reallocate the millions of tons of allowances provided to PG&E to entities that are truly exposed to increased costs directly related to the Program. PEC would be a minor player in such a scenario and the vast majority of the ~\$2 billion of allowances granted to PG&E could go back into the Greenhouse Gas Reduction Fund.
- 2) **Abbreviated Transition Assistance:** CARB grants PEC's Requested Relief and compels PG&E to settle the longstanding Legacy Contract matter by adopting the already CPUC approved Legacy Contract amendments for PEC. This should be a very brief process provided PG&E is willing to play ball.
- 3) **Hybrid Solution:** Much like our offer to PG&E above where PEC acquires and retires sufficient emissions credits to cover PEC's dispatch (with a carbon price included) for the duration of its Legacy Contract, PEC could acquire and retire those credits into the state account and CARB could create a direct requirement under the Program that requires a price on carbon for all power produced in the state. This would accomplish a price signal on all power and hold PEC accountable for its carbon costs produced during the term of its Legacy Contract.

As described in the PEC Overview section, PEC contributes more than \$20 million dollars per year and generates over 80 jobs for the local and California economy, while playing a critical role in maintaining the grid's reliability. As can be seen in the Figure 6 below, the viability of PEC is truly at stake if none of the above (or another potential solution) is pursued by CARB.

Figure 6<sup>21</sup>



#### Summary

PEC remains committed to finding a contractual solution, but in the absence of this, CARB must protect the integrity of the Program and reinstate relief for Legacy Contract holders without an Industrial Counterparty. Without such relief, the Program would continue to harm PEC, its bondholders, its ultimate owners (which include public pension funds in the State of California), and all other stakeholders including PG&E ratepayers and the citizens of the San Joaquin Valley.

Transition Assistance from CARB is still necessary to offset the unrecoverable cost burden of the Program on the PEC facility. Nothing has changed with respect to PEC's Legacy Contract status or ability to recover these costs. Therefore, so long as the Legacy Contract between PG&E and PEC remains unamended, PEC's power will continue to be dispatched into the California market without a cost of carbon attached.

<sup>21</sup> Based on third party consultant's dispatch that assumes carbon is not included.

The Board has acknowledged that a solution is still needed. PEC supports continued efforts in this direction and looks forward to working, in parallel, with both our counterparty on a contract resolution, and with CARB on a regulatory solution. The timing of these dual-track efforts will most certainly cross as any PPA amendment would still need CPUC approval. Therefore, the regulatory solution is still needed. PEC fully understands that upon a CPUC-approved Legacy Contract amendment, the provisions of the regulatory solution would no longer continue.

We have actively engaged at all levels of the CARB process and we look forward to resolving this issue. If you have any questions, please contact me at (781) 292-7007, or Robin Shropshire at (406) 465-2231, [rshropshire@ppmsllc.com](mailto:rshropshire@ppmsllc.com).

Sincerely,

/s/

Warren MacGillivray

