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***E-Filing
ARB's Cap-and-Trade Website***

Kevin M. Kennedy, Ph.D.
Assistant Executive Officer – Climate Change
CALIFORNIA AIR RESOURCES BOARD
1001 "I" Street
Sacramento, CA 9 5814

Re: Pacific Gas and Electric Company's Comments on the Air Resources Board's November 24, 2009 Preliminary Draft Regulation to Establish Greenhouse Gas Emissions Cap-and-Trade Program under AB 32

Dear Dr. Kennedy:

Pacific Gas and Electric Company ("PG&E") is pleased to submit these comments on the Air Resources Board's ("ARB") November 24, 2009 "Preliminary Draft Regulation for a California Cap-and-trade Program" (referred to hereafter as the "PDR") under Assembly Bill 32 ("AB 32"). We believe a well-designed, multi-sector cap-and-trade program -- linked with emerging regional, national, and international programs -- will allow California to meet its greenhouse gas ("GHG") emission reduction goals in a cost-effective manner as required by AB 32 (Cal. Health & Safe Code, § 38560).

I. SUMMARY AND RECOMMENDATIONS.

A. PG&E Commends Staff for Considering Cost Containment Alternatives For the Cap-And-Trade Program.

As an insurance policy for our climate and our customers, PG&E strongly supports cost containment mechanisms such as a "soft price collar" to ensure sustained emission reductions at a reasonable cost. We urge ARB to adopt the following measures as part of cap-and-trade design:

- A floor price for allowances to help drive technology innovation and deployment. We recommend that ARB establish a reserve price for the auction of allowances to be set at a level that helps



to avoid prices that are too low to encourage long-term capital investments in low- and no-carbon technologies.

- In the event of sustained high allowance prices, complying entities should be permitted to borrow from a “strategic allowance reserve” consisting of allowances from a future compliance period. The ARB could replenish the reserve by purchasing high-quality offsets with the revenues from the sale of allowances from the strategic reserve.

We believe a soft price collar mechanism, as we propose here, will provide effective cost containment, maintain environmental integrity, and provide a durable and sustained price signal necessary to encourage investment in low-carbon technologies.

B. California Should Create a Cap-And-Trade Program That Can Be Linked and Harmonized With Other Emerging Regional, National, and International Programs to Create Broad and Liquid Carbon Markets.

PG&E supports broad linkage to programs that achieve emissions reductions at a reasonable cost. In reviewing other programs, it is important to consider specific design features in the context of the overall program design, without conditioning linkage on one particular market design feature, such as offset limits.

C. ARB Should Ensure That There is a Sufficient Supply of Offsets Available to Complying Entities.

ARB should allow the use of offsets from a number of external programs, such as Climate Action Reserve (“CAR”) and Clean Development Mechanism (“CDM”), and prevent delays in approval of offsets.

D. Cap-Setting Is a Critical Element of Program Design.

Cap-setting and the trajectory towards our 2020 goal are also very critical design elements that could impact the allowance price and costs of the program. PG&E supports ARB’s proposed analysis of compliance pathway scenarios to ensure that the cap is reasonable and can be achieved in each period.

E. PG&E Believes That Any Proposal that Removes Allowances From the Market Should Preserve the Environmental Integrity of AB 32 and Not Increase the Compliance Costs for Utility Customers and Other Participants.

Proposals to adjust the allowance budget, including those relating to voluntary renewable projects, should not interfere with compliance with mandatory programmatic measures.

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F. Large Natural Gas Consumers That Qualify as Large Stationary Sources Should be Included in the Market From the Outset, As Currently Proposed, But We Do Not Support Bringing Small Consumers Into the Market in 2012.

For small natural gas consumers, PG&E views the emission reduction opportunities to be directly tied to natural gas efficiency improvements and believes that such opportunities are limited.

II. DISCUSSION.

A. Cost-Containment (Discussion of Concept, p. 50).

PG&E commends staff for discussing the concept of cost containment in the PDR and for considering four “soft price collar” options as part of the cap-and-trade program design. We believe that cost containment is one of the highest-priority issues in designing an effective cap-and-trade program because of the implications it has for California consumers and businesses and for our customers’ energy bills. If allowance prices are extremely volatile or increase too rapidly, households and businesses in California will struggle to adapt to the new cap-and-trade regulation.

PG&E structures its cost containment comments as follows:

- Key features of a well-designed cap-and-trade program;
- Environmental and cost benefits of an effective price collar mechanism;
- Review of ARB Staff’s Four “Soft Collar” and “Soft Floor” options; and
- PG&E’s recommended soft price collar mechanism.

1. Key Features of a Well-Designed Cap-and-Trade Program.

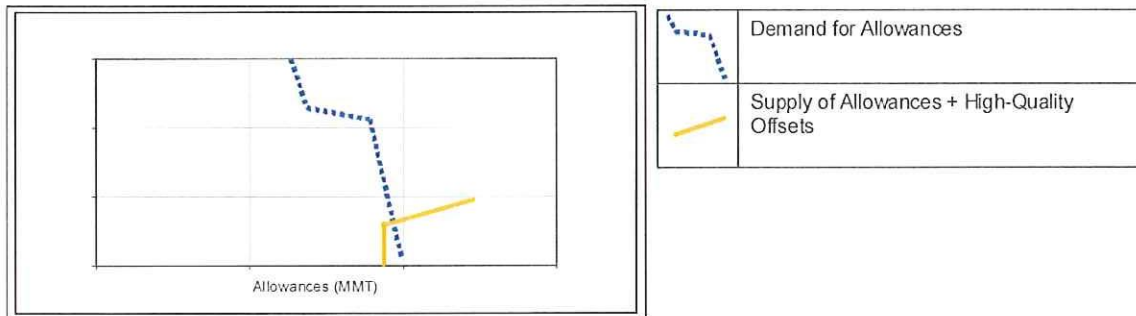
PG&E believes a well designed cap-and-trade program provides the best opportunity for achieving the required emissions reductions at manageable cost. Specifically PG&E supports the following cap-and-trade design features as essential to meeting these dual objectives:

- A robust cap-and-trade program to minimize the costs of reducing emissions by directing capital investment to the lowest-cost emission-reduction opportunities.
- An emissions cap set at a reasonable level at the outset of the program.



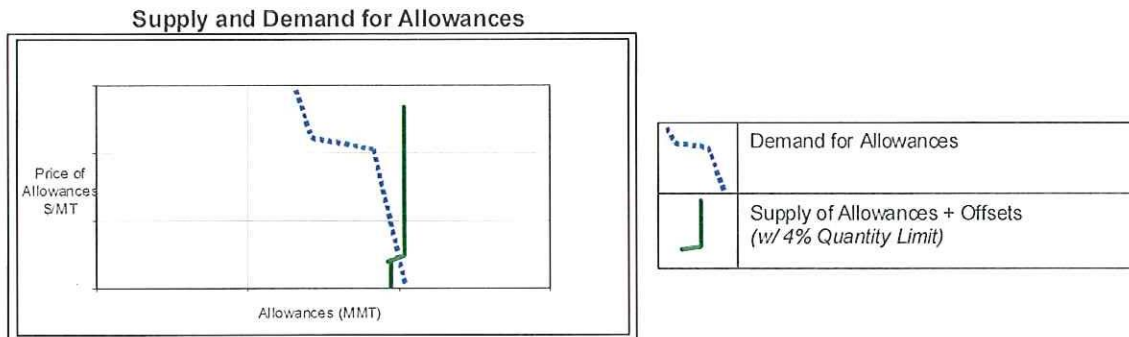
- High quality offsets to promote innovation outside capped sectors and moderate compliance costs, while maintaining environmental integrity.
- Banking and multi-year compliance periods to facilitate compliance planning and minimize the economic impacts of the program.
- Allowances distributed for the benefit of consumers to help them adjust to higher costs for electricity and natural gas, from both AB 32-related programmatic measures and the cap-and-trade program.

These design features together provide the best opportunity for a robust and liquid cap-and-trade market as illustrated below.



A California-only cap-and-trade market is inherently narrow, encompassing at the outset only two sectors within the state. This is evidenced by the virtually vertical demand curve, as illustrated above. As a result, the design features noted above are especially critical to maintaining a stable market.

In contrast, the virtual absence of offsets in the current design of a California market restricts supply. The result is a virtually vertical supply curve.



This supply curve, which is essentially unresponsive to price signals, coupled with a virtually vertical demand curve, create an unstable allowance market. The likelihood of misleading price signals - and very high and/or very low allowance prices - is greatly increased.



This, in PG&E's view, substantially decreases the chances that a California only cap-and-trade market will be successful and sustainable.

2. Environmental and Cost Benefits of an Effective Soft Price Collar Mechanism.

From PG&E's perspective, an effective price collar mechanism will support price discovery, maintain environmental integrity, and encourage sufficient investment in the technology transformation needed to sustain long-term emissions reductions. In addition, an effective price collar mechanism will moderate impacts to California consumers and businesses, both in the short-run and the long-run. Overall, an effective price collar mechanism provides assurance that a California cap-and-trade program will achieve emissions reductions over the long term in a manner that is politically and economically sustainable.

In the following section, PG&E offers comments on the four soft price collar options discussed in the PDR. PG&E then offers a specific cost containment proposal building upon the strengths of the ARB Staff's options.

3. Review of ARB Staff's Four "Soft Collar" Options.

Evaluation of "Soft Collar" options necessarily focuses on adjustments to the supply compliance instrument when allowance prices would otherwise settle below a specified reserve price, as well as a ceiling price and adjustments to the supply of compliance instruments when allowance prices would otherwise settle above this price. The following discussion focuses first on the ceiling price and a review of the alternatives offered by ARB staff. Finally, PG&E offers a proposed floor price mechanism.

In reviewing these ceiling price alternatives and trigger mechanisms, PG&E recognizes that ARB considered issues such as price discovery, cost containment effectiveness and environmental integrity. More specifically, PG&E views cost containment effectiveness from both a short-term and long-term perspective. Long-term allowance prices can settle too low to attract investment in low-carbon or carbon-free technology or too high relative to a long-run global equilibrium carbon price if the cap is set too loosely or too stringently. In either case, the result is a California price which is significantly below or above the long-run global cost of emissions reductions. In the short-run, additional factors, such as unusual physical conditions (i.e., abnormally wet or dry years) or market abnormalities can cause excessive short-term swings in allowance prices, particularly in a narrow California or Western Climate Initiative ("WCI") market. In the discussion below, PG&E reviews the four ceiling price options offered by ARB.

For the purposes of the discussion on the options, PG&E assumes that an allowance price ceiling is set significantly above a global long-run equilibrium price. In addition, PG&E assumes that the ceiling price would mitigate the effect of very high and non-sustainable allowance prices.



OPTION 1

Description: Use an allowance reserve account to release additional allowances when allowance prices are high.

Evaluation Considerations:

- *Price Discovery* – Assuming the allowance ceiling price is set significantly above a long-run global equilibrium allowance price, price discovery should be enhanced to the extent the ceiling price helps avoid excessive volatility. Excessive volatility may detract from constructive price discovery because volatility is the result of market abnormalities.
- *Cost Containment* – In the short-run, this alternative may help protect businesses and consumers from the adverse effects of temporary unsustainably high prices if the reserve is sufficient to cover the increase in short-term demand. In the event the reserve is exhausted, this proposal by itself will not be effective in avoiding the undue burden of unsustainably high allowance prices.
- *Environmental Integrity* – This option maintains the overall integrity of the cap since the number of allowances across compliance periods will not exceed actual emissions.

Summary: Option 1 can be designed to support price discovery and maintain environmental integrity. Option 1 may be an effective cost containment mechanism in the short-run, but may be less effective in the long-run.

OPTION 2

Description: Expand the supply of offsets when allowances reach a ceiling price by relaxing the quantitative usage limit on offsets.

Evaluation Considerations:

- *Price Discovery* – To the extent the ceiling price helps avoid excessive price volatility, price discovery should be enhanced. In addition, the actual cost of offsets available to meet California's emission reduction targets provides additional market information, enhancing price discovery.
- *Cost Containment* – Cost containment will be effective to the extent that offsets are available in the short-run and the long-run. If ARB protocols are not completed in time for the development of an offsets market to serve California, near-term cost containment may be ineffective.



- *Environmental Integrity* – Offsets made available for California compliance purposes must be environmentally additional, real verifiable, permanent, quantifiable, and enforceable. With these criteria, the sum of allowances and offset credits will not exceed actual emissions and environmental integrity will be maintained.

Summary: Option 2 can be designed to support price discovery, effectively contain costs in the short and long-run, and maintain environmental integrity if high quality offsets are used.

OPTION 3

Description: Expand the categories of acceptable offset project types. Although we support increased access to high quality offsets for compliance purposes, PG&E assumes, for the sake of this analysis, that ARB would maintain the quantity limit on offsets to approximately four percent of an entity's compliance obligations.

Evaluation Considerations:

- *Price Discovery* – The quantity of allowances available to complying entities remains virtually unchanged. Allowance prices remain vulnerable to excessive price volatility and consequently price discovery will not be enhanced. To the extent that additional categories of offsets that meet high standards of environmental quality are made available, the additional market information may provide limited value in terms of price discovery.
- *Cost Containment* – No additional supply of offsets will be made available under this option, if the quantity limit remains unchanged. As a result, cost containment is ineffective in both the short-run and the long-run.
- *Environmental Integrity* – As long as the additional categories contain high quality offsets, this option maintains environmental integrity since allowances and limited offsets will not exceed emissions.

Summary: Option 3 remains vulnerable to excessive price volatility and as a result may not support price discovery. This option provides virtually no additional supply and therefore is ineffective in containing costs. This option will maintain environmental integrity assuming that offsets are additional, verifiable, permanent, measureable, and enforceable.

OPTION 4

Description: Allow use of allowances from the next compliance period.

Evaluation Considerations:

- *Price Discovery* – Assuming the allowance ceiling price is set above a long-run global equilibrium allowance price, price discovery should be enhanced to the extent the ceiling price helps avoid excessive volatility.



- *Cost Containment* – In the short run, this alternative will help protect businesses and consumers from the adverse effects of unsustainably high prices. In subsequent compliance period and over the long term, cascading shortages may result rendering this option ineffective in avoiding the undue burden of unsustainably high allowance prices.
- *Environmental Integrity* – This option maintains the overall integrity of the cap since the number of allowances over multiple compliance periods will not exceed actual emissions.

Summary: Option 4 can be designed to support price discovery and maintain environmental integrity. Option 4 can be an effective cost containment mechanism in the short-run but is likely to be less effective in the long-run.

4. Review of Soft Collar Price Ceiling Options

Using the evaluation criteria of price discovery, cost containment, and environmental integrity, PG&E provides the following summary evaluation.

Option	Evaluation Criteria			
	Price Discovery	Cost Containment		Environmental Integrity
		Short-Term	Long-Term	
1. Establish Allowance Reserve Account	Enhanced	Effective	Ineffective	Maintains Integrity
2. Expand Offset Supply	Enhanced	Possibly Ineffective	Effective	Maintains Integrity through use of High Quality Offsets
3. Expand Available Offset Categories	Not Enhanced	Ineffective	Ineffective	Maintains Integrity
4. Borrow Allowances from Future Compliance Period	Enhanced	Effective	Ineffective	Maintains Integrity

For a soft price collar mechanism to meet the objectives identified in the previous section, it is critical for it to be effective in both the short-run and the long-run.



Option 1 and 4 can enhance price discovery and maintain environmental integrity but are likely to be effective in the short-run but unlikely to be effective in the long-run. Option 2 can also enhance price discovery, maintain environmental integrity, and likely to be effective in the longer-run since an offset market may not develop in time to satisfy California needs in the first few years of the cap-and-trade program.

5. Price Floor

ARB suggested two options for a price floor, and PG&E addresses these in the following section.

6. PG&E's Recommended Soft Price Collar Mechanism

In the context of a cap-and-trade system, a “soft price collar” seeks to maintain carbon allowance prices within a reasonable range to stimulate meaningful emissions reductions and technology advancement, while avoiding excess abatement costs and extreme allowance price volatility. Sustained high allowance prices or extreme price volatility will result in higher costs for consumers while eroding political support for a cap-and-trade program. At the same time, sustained low prices could undermine the incentives to undertake emissions abatement projects and technology investment necessary to meet long-term emission reduction goals. PG&E's proposal – an allowance floor price coupled with a strategic allowance reserve - is a “soft” price collar design intended to provide effective cost containment, to maintain environmental integrity and sustain a durable price signal necessary to attract investment in low-carbon technologies.

(a) Allowance Floor Price

PG&E recommends a floor price for allowances, because price expectations help drive technology innovation and deployment. Therefore, PG&E suggests a reserve price for the auction of allowances to be set at a level that helps to avoid prices that are too low to encourage long-term capital investments in low- and no-carbon technologies. Further, the cost-containment mechanism should permit allowance price signals to become stronger over time. This price could escalate over time at a rate not lower than inflation, and then flatten out around 2025, provided that the price level and overall need for this mechanism is reviewed over time as the carbon market matures and new technology is deployed. This review should determine whether the minimum starting price for auctions should be adjusted, stay the same, or be phased out. In each auction, any allowances not sold at the reserve price should be carried over to the next auction. Any allowances not sold in the final auction for each compliance period should be placed in the strategic reserve as PG&E describes in the following sections.

PG&E evaluated the price floor in terms of three objectives:

i. Price Discovery.

As noted above, price discovery is an important objective. However, PG&E believes that a price floor may prevent excessive price volatility not helpful for price discovery and will encourage long-term capital investments in low- and no-carbon technologies.



ii. Cost Containment.

Most discussion focuses on the need to prevent excessively high allowance prices, but excessively low allowance prices could cause long-range problems in the transition to a low-carbon economy by inhibiting the development of low-carbon technologies. Adopting a reserve price for allowance auctions will help to contain allowance costs within a band, or collar.

iii. Environmental Integrity.

Adopting a reserve price in auctions maintains environmental integrity. The cap is maintained and no new allowances are created. Some emissions may be deferred if some current-period allowances are unsold and transferred to the strategic reserve for possible use in future years.

(b) Strategic Allowance Reserve.

A strategic reserve is one option for limiting the cost of allowances (i.e., the upper end of the collar). A strategic allowance reserve is a special set-aside of allowances to be augmented by high quality offsets available to the market in the event that prices rise above a pre-determined level for a sustained period of time.

A strategic reserve would be established at the outset of the program initially populated with future vintage allowances. By using allowances drawn from future compliance periods, the cost containment reserve maintains the long-term environmental integrity of the cap. In establishing an allowance reserve, the objective would be to avoid shifting too many allowances forward, but providing a large enough pool of allowances to be effective in responding to a run up in allowance prices. An initial reserve would be established at a fixed percentage of the total California market (e.g. thirty to forty percent) and adjusted as necessary over time. When complying entities purchase and retire allowances from the reserve, the revenue would be used to purchase high quality offsets, under the oversight of the ARB. These offsets would replenish the reserve ensuring that real reductions occur. Initial offsets used for this purpose might include those that are difficult for private entities to secure.

The reserve would function as follows: If, for a significant period of time, the average allowance price reaches or exceeds a predetermined level, or if the volume of trades indicates an illiquid market, the ARB would automatically sell from the strategic reserve with the following conditions:

- Only covered entities would be allowed to purchase from the strategic reserve and any allowances purchased would be automatically credited against their annual compliance obligation. Unlike conventional allowances, which can be banked for future use, allowances purchased from the strategic reserve would be used for compliance purposes in the year they were purchased in order to alleviate the run up in prices. Under ARB oversight, the entity



charged with managing the reserve would then retire those credits from the system.

- The number of strategic reserve allowances that a covered entity could purchase would be limited to, for example, fifty percent of that covered entity's prior year's emissions. Accommodations can be made for new entrants.
- The ARB would establish the price or the method to determine the price at which allowances or offsets are sold from the strategic reserve. This price or method would be known to the market in order to provide transparency for investment planning. The price would increase over time at a rate that equals or exceeds the rate of inflation.
- There is also a possibility of including additional options in case these initial measures do not achieve the objective of reducing allowance prices below the trigger-price level, including increasing purchase limits for compliance entities or extending the compliance period.

In selling strategic reserve allowances or offsets, the organization charged with administering the program under the oversight of the ARB will generate revenue that can be reinvested in greenhouse gas abatement projects (i.e., offsets). The reduction credits generated from these investments should then be used to replenish/fill the strategic reserve to its maximum level.

The trigger price for releasing allowances from the Reserve can be considered in stages. For example, in the initial years (e.g. first two three-year compliance periods of the program), more weight should be given to the affordability of consumer energy costs, the competitiveness of trade-exposed and energy-intensive industries, and overall economic impacts of high allowance prices. Once the program has been established and the market and technologies have had time to develop and mature (e.g., from 2017 - 2020 onward), more weight may be given to enhancing incentives for the development and deployment of low-carbon technologies. After the first two three-year compliance periods, it may be necessary to reassess the trigger price level and how the strategic reserve functions, depending upon progress of technology development and deployment.

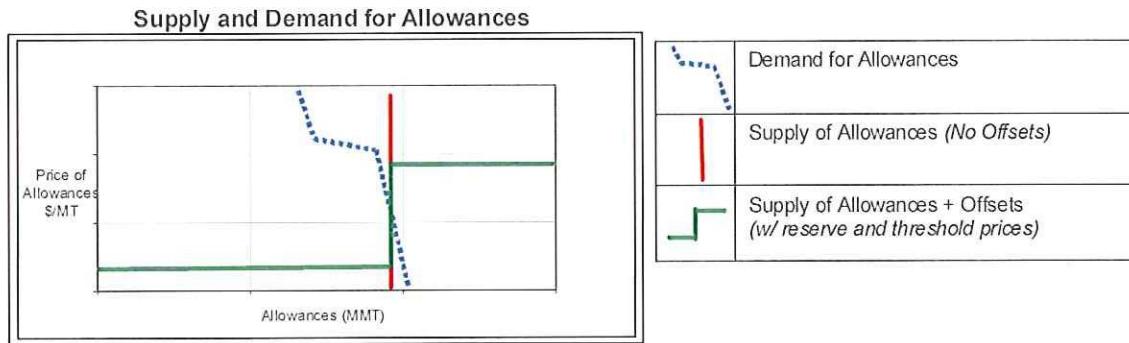
In time, compliance entities may be better able to rely on reserves of banked allowances as protection against untenably high allowance prices, offset markets will mature, and new technology solutions will emerge. California will link to other markets, and the program will become more global in scope. These dynamics may moderate the price of allowances in the long term. If so, the strategic reserve could decline and the sale of strategic reserve allowances could possibly cease after fifteen years or more, and any remaining strategic reserve allowances returned to the original allowance pool.



This strategic reserve is envisioned to work in concert with what is established as a reserve price (i.e. floor price) for any auction of allowances pursuant to a California or WCI cap-and-trade. This minimum bid price for the auction would essentially establish the “floor” price for allowances and escalate over time at a rate not less than the rate of inflation for some period of time.

During the early years of the program, the cost containment reserve provides an important mechanism to protect consumers and compliance entities from high program costs and reduce overall allowance price volatility. By introducing additional allowances in the early years of the program and coupling this with an auction reserve price, a cost-containment mechanism helps to limit the upward pressure on prices, limiting the economic impacts of the program and allowing additional time for technology development and deployment.

In essence, PG&E’s soft collar price proposal draws upon the desirable attributes of Options 1, 2 and 4, and can be effective in both the short and long term. The assurance of price stability resulting from an effective cost containment mechanism is illustrated below.



From PG&E’s perspective, a soft price collar mechanism as proposed will support long-term sustained emissions reductions at a reasonable cost, and enhance the prospects that California will have a successful and sustainable cap-and-trade program.

B. Linkage (Sub-Article 12, pp. 54-60).

Section 96160 addresses the requirements for linkage with other Emissions Trading Systems (“ETS”). PG&E concurs that the scope of issues described in this section is necessary to successfully implement linkage, and generally supports the requirements except for the ETS requirement in §96160 (b)(5) concerning equivalent offset limits. In reviewing other programs, it is important to consider specific design features in the context of the overall program design, without conditioning linkage on one particular market design feature, such as offset limits. Other ETS may be well-designed and function successfully while still preserving environmental integrity even with higher quantitative offset limits.

It is essential for California to create a program that is broad and integrated effectively with other regional or national programs to render a liquid carbon market for both allowances and offsets. PG&E supports broad linkage to programs that have environmental integrity to ensure actual reductions occur. Specifically, a candidate program for linkage must: **(1)** not have



over-allocated allowances; (2) have accurate reporting and meaningful enforcement; and (3) accept only real, additional, verifiable, quantifiable, permanent and enforceable offsets. ARB should not foreclose the ability to link to a particular program based on specific design features, such as the offsets limit.

C. Offsets Usage Limit (Sub-Article 7, pp. 42).

As stated in prior comments, PG&E believes that real, permanent, verifiable, quantifiable, enforceable, additional offsets are an important mechanism for the State to achieve the AB 32 emission reduction target at the lowest overall cost to the California economy. Offsets manage costs by providing flexible compliance options and increasing market liquidity. The quantitative limit of forty-nine percent of annual emission reductions, which ARB estimates as four percent of each entity's compliance obligation, would be unduly restrictive, especially in the early years. Limiting offsets could leave the State with insufficient options for avoiding unexpectedly high emission reduction costs, and for achieving AB 32 goals in the most cost-effective manner. One reason to consider offset limits is to ensure that capped sectors implement emission reduction measures. However, ARB has already addressed this concern by emphasizing programmatic measures in the Scoping Plan and the PDR, which mandate action in capped sectors. Because these requirements facilitate capped sector reductions, an offset limit that discourages offset developers from pursuing reduction opportunities in sectors outside the cap is unnecessary.

PG&E believes that offset policies should encourage a robust offset supply in the early years of a cap-and-trade program, when low-carbon technologies are achieving economies of scale and commercial maturity. Access to offsets, in these early years, is a means to manage prices and price volatility associated with securing sufficient allowances at reasonable cost. In the event that there are insufficient offsets available in the early program years, PG&E supports a "carry-over" mechanism that allows complying entities to use the difference between expected and actual offset use in later compliance periods.

D. Offset Credits (Sub-Article 13, pp. 60-84).

Regardless of the limit placed on offsets for compliance, PG&E recommends that ARB ensure that there are a sufficient number of appropriate protocols and project types approved early that could yield sufficient supply of offsets. PG&E is concerned that ARB has outlined a number of restrictions on offsets in the PDR that will severely limit their supply. Current and anticipated offset supply is already far below what will be needed in order for offsets to fulfill their potential as a means to achieve AB 32 GHG emission reduction goals in a cost effective manner. Since 2008, the CAR has only issued approximately 2.32 million offsets in the form of Climate Reserve Tonnes, 1.97 million of which came from projects with vintages after December 31, 2006¹. For projects located in California, this number is even lower: CAR has

¹ In contrast, per the ARB's "Example Base Allowance Budgets for the California Cap-and-Trade Program" spreadsheet, the annual offset limit could be approximately 8 million metric tons in 2012. <http://www.arb.ca.gov/cc/capandtrade/meeting/121409/capcalc.xls>.



issued approximately 0.95 million offsets from California projects with vintages after December 31, 2006.²

PG&E recommends that ARB allow the use of offsets from a number of external programs, such as CAR and CDM, and prevent delays in approval of offsets. Otherwise, not enough offsets will be available for even a four percent per-entity-cap on offset use. ARB should retain the functions of: (1) approving external offset programs and project types; (2) approving accredited verifiers; and (3) enforcement (i.e. accepting, rejecting, and revoking offsets when appropriate). This will allow for ARB to have regulatory control over the quality of offsets while also allowing for speedy approval of offsets from external programs. This is particularly important in the first compliance period when supply of offsets will need to rapidly increase in order to meet the demand and reduce costs for California.

In order to prevent harm to the volume and liquidity of the offset market, PG&E recommends that the PDR should:

- Not add additional requirements on top of approved programs with offset quantification methodologies.
- Not require regulatory additionality at the California regulatory level for projects outside of California, as it is unreasonable to expect California regulatory standards to automatically apply across all project types to locations that do not have the same regulatory history, economic resources, or technological capacity as California.
- Not require a Memorandum of Understanding between California and a cooperating U.S. or Canadian regulatory agency in an offset project's location as it is not necessary for adequate enforcement since stringent verification already serves that purpose and contracts are enforceable through well-functioning legal systems.
- Approve offset quantification methodologies more frequently (such as quarterly).
- Allow offsets from projects that have received public or government grants including projects by local governments and non-profit organizations because many offset projects would not take place without non-commercial funding.
- Remove the overbroad, vague requirement in § 96240(h) as it is unnecessary as long as the project is conducted in accordance with all applicable laws and regulations.

² From the "Project CRTs Issued" spreadsheet from the Climate Action Reserve available at: <https://thereserve1.apx.com/myModule/rpt/myrpt.asp?r=112>. Last downloaded: December 28, 2009.



- Approve any project type in any location that meets the core definitions of real, quantifiable, additional, verifiable, permanent and enforceable; this will ensure that ARB is not arbitrarily limiting offset supply or picking winning GHG emission reduction technologies.
 - If ARB still feels the need to create a list of acceptable offset project types, PG&E recommends that ARB develop guidelines and pre-determined criteria that it will follow in deciding whether to approve a given project type through a public process. Furthermore, any decisions on approvals for a given project type need to be made quickly in order for these offsets to play a significant role in cost containment.
- Make covered entities responsible for offset reversals, as covered entities can use contract mechanisms to address risks of reversal as PG&E has done in contracting for voluntary offsets for its ClimateSmart program.

D. Cap-Setting (Sub-Article 6, pp. 31-34).

The spreadsheet entitled “capcalc.xls” provided by Staff presumes a linear decline in the allowance budget from 2012 to 2020. It is possible that modeling of a linear decline, including availabilities and lead-times for GHG-emission-abatement technology, will suggest high GHG allowance prices that would cause California households and businesses to struggle to adapt to the new cap-and-trade regulation. It is essential that ARB include in the PDR for public comment as soon as possible an analysis of compliance pathway scenarios to ensure that the cap is reasonable, technically feasible, cost effective, and can be achieved in each period without undue cost burdens on consumers and the economy. PG&E recommends that the “slow, stop, reverse” allowance budget be considered among the analysis options with attention to impacts on consumer prices and compliance-cost burdens in the first and second compliance periods.

The PDR’s language on creation of allowances in §95890(a) may cause unnecessary confusion. It notes that “The Executive Officer may issue allowances from any base budget at any time by assigning them a unique serial number and placing them into an entity’s Holding Account”. In the PDR, the term “entity” generally means “complying entity”. However, the Executive Officer should have authority to issue allowances to be held in the Executive Officer’s or some intermediary’s account, not solely into the Holding Accounts of complying entities. Such authority may be needed for establishing a strategic reserve for cost-containment, or for creating a group of allowances before an auction. To make it clear that the PDR contemplates this option, PG&E suggests that the PDR language be modified as follows:

The Executive Officer may issue allowances from any base budget at any time by assigning each one a unique serial number and placing them into a Holding Account.



E. Distribution of Allowance Value (Sub-Article 8, pp. 45-48) and Auction Design (Sub-Article 9, pp. 48-50).

PG&E recognizes that ARB is awaiting the final recommendations from the Economic Allocation Advisory Committee (“EAAC”) prior to providing a detailed proposal on the distribution of allowance value. PG&E is concerned that the EAAC appears to be recommending against allocating allowances to electricity consumers either directly or indirectly through LDCs. EAAC's rationale is that allocating allowances to electricity consumers will mask the carbon price signal. This rationale ignores the electricity rate increases that will occur due to program measures under AB 32, outside the cap-and-trade program, such as measures for renewables and for combined heat-and-power plants. While we support the objectives of AB 32 and the transformation to a low-carbon economy, we think it is important to recognize the substantial and disproportionate burden of the program measures placed upon the electricity sector as a result of AB 32. As such, PG&E supports returning allowance value to utilities for the benefit of their customers to facilitate the transition to the low-carbon economy and potentially help protect against volatile prices, especially in the early years. Similar approaches have been embraced by federal legislators, the California Public Utilities Commission (“CPUC”) and the California Energy Commission (“CEC”), and many other public and private institutions. Please refer to our Joint Utilities letter filed on January 6, 2010 for further comments on the EAAC January 2, 2010 draft recommendations. PG&E will provide further comment once the EAAC’s recommendations are finalized.

Additionally, the ARB has noted in the PDR that they are awaiting EAAC recommendations prior to completing the auction design section of the regulation. Attached please find an auction design recommendation developed by PG&E for your consideration.

F. Use of Voluntary Renewable Energy Credits and Modification of Compliance Budgets (Discussion of Concept, pp. 34).

Section 95910(b) of the PDR presents a conceptual framework for adjusting the base allowance budget for each compliance period in response to low-carbon or no-carbon generation by voluntary renewable sources of electricity. The concept involves estimating the future amount of generation by voluntary renewable generators, placing a commensurate number of GHG emission allowances in a holding account, conducting an ex-post true-up of voluntary renewable electricity generation, and concluding with retirement of the appropriate number of allowances.

PG&E believes that any proposal that removes allowances from the market should preserve the environmental integrity of AB 32, and not increase the compliance costs for electric sector consumers. In addition, any proposal to adjust the allowance budget on behalf of voluntary renewable projects should not interfere with programmatic measure compliance.

Addressing the first criterion, environmental integrity, requires that removal of allowances is tied to: (1) actual electricity generation from renewables, not projections; and (2) the best possible estimate of the GHG emission reduction caused by the renewable electricity. The ARB’s concept includes a true-up process for the amount of electricity generation by



renewables, which is a step in the right direction. However, the true-up process introduces complexity that could be avoided, without impairing environmental integrity, through reliance on Renewable Energy Certificates (“RECs”) issued by the Western Renewable Energy Generation Information System (“WREGIS”). WREGIS issues RECs based on actual generation from renewables, not forecasts or projections. The ARB’s concept could be improved and simplified by retiring allowances in proportion to RECs handed to ARB. This approach would avoid forecasting and subsequent true-up. The GHG emission reduction depends upon the emission rates of the power plants that are displaced by the renewable electricity. PG&E recommends that ARB use the GHG emission rate of a natural gas combined cycle power plant, consistent with existing programs and policies in California. It may not be appropriate to use the default factor ARB plans to apply to electricity imports from outside California, unless it can be shown that the output of renewables decreases California’s electricity imports.

Regarding the second criterion, the proposal could increase the cost of compliance with the Renewable Energy Standard (“RES”). Holders of RECs could hand them over to the ARB, which would cause retirement of allowances. Through this process, holders of RECs might be able to sell their electricity at a premium price because it has reduced GHG emissions. Alternatively, holders of RECs could sell them to a Load-Serving Entity to help that LSE comply with the RES. The REC holder may choose the most profitable choice. Because the CPUC is proposing to place a ceiling on the price certain Local Serving Entities (“LSEs”) can pay for a REC, those LSEs may be at a competitive disadvantage. Therefore, PG&E supports the portion of the ARB’s concept that suggests retirement of allowances “shall not exceed a pre-determined percent of the total allowances from the compliance period in question.” PG&E suggests a limit based on expected emissions from the electricity sector. A similar approach is used by several states in the Regional Greenhouse Gas Initiative (“RGGI”). Also, because this concept has the potential to increase RES compliance costs, PG&E supports it only if the ARB’s RES regulation includes a cost-containment provision.

G. Inclusion of Fuels in 2012 (Discussion of Concept, p. 37).

The PDR discusses the treatment of small natural gas consumers in the cap-and-trade regulation by raising a question about whether fuel deliverers to small natural gas consumers should be included in the cap-and-trade program in 2015, as currently proposed, or from its beginning in 2012.

Of the alternatives available to regulate and control GHG emissions, PG&E supports the use of a well-designed cap-and-trade market, and generally favors bringing into it as many sectors as practical. However, for natural gas, there is a natural division between large consumers and small consumers. We do not support bringing small consumers into the market in 2012 for the reasons described below.

For small natural gas consumers, PG&E views the emission reduction opportunities to be directly tied to natural gas efficiency improvements and believes that they are limited. Apart from efficiency improvements, there appear to be very limited cost-effective opportunities for other, lower carbon fuels to substitute for small natural gas consumption. PG&E believes that the emission reduction opportunities that are available for this sector can best be implemented



through a well-integrated set of programmatic measures, which would include state appliance and building efficiency codes and standards, complementary utility or third-party customer energy efficiency programs, and point-of-sale energy efficiency programs. The success of the programmatic approach is evident in this sector. Annual residential gas consumption in California has decreased from 600,000 MMCF in the early 1970s to 500,000 MMCF in recent years, even though California's population has nearly doubled over that period.³

One remaining short-run option for obtaining emission reductions is price-induced conservation, which is of limited effectiveness for small end users of natural gas in cutting GHG emissions. For example, a paper by Dr. Boyce of the Economic and Allowance Advisory Committee and his co-worker cites an estimate of -0.2 for short-run price elasticity of household natural gas demand, meaning that a ten percent increase in retail natural gas prices will cut household use by only two percent.⁴ Including that demand from the beginning of the cap-and-trade market may make the market more vulnerable to prolonged periods of high allowance prices. Additionally, as noted by the CPUC and the CEC, "including the natural gas sector in a cap-and-trade system now could expose small end users in the natural gas sector to greater price risk than small end users in the electricity sector because their utilities have fewer options to mitigate variations in allowance prices"⁵

H. Addressing Bankruptcy of Covered Entities (Discussion of Concept, pp. 41-42).

PG&E supports the flexibility provided by the three-year compliance period. The PDR notes ARB's concern that:

Covered entities could emit GHGs and then declare bankruptcy or otherwise cease operation before fulfilling their surrender obligations at the end of the compliance period.

To address this concern, PG&E supports Staff's Option 1, under which each complying entity would be required to cover a portion of its compliance obligation at intervals (e.g., yearly) through the three-year compliance period. There is a balance between the benefits of the three-year compliance period and the possible risk ARB identifies with bankruptcy of a covered entity.

³ U. S. Energy Information Administration, Natural Gas Consumption By End Use, http://tonto.eia.doe.gov/dnav/ng/ng_cons_sum_dcu_SCA_a.htm California's population was about 20 million in 1970 and 38 million in 2009, according to California's Department of Finance: http://www.dof.ca.gov/research/demographic/reports/estimates/e-7/1900-2009/documents/E-7_Report_1900-July_2009.xls

⁴ James K. Boyce and Matthew Riddle, Political Economy Research Institute Working Paper 150, p. 10, downloadable at http://www.peri.umass.edu/fileadmin/pdf/working_papers/working_papers_101-150/WP150.pdf.

⁵ *Interim Recommendation on Greenhouse Gas Regulatory Strategies*, CPUC Decision 08-03-018, pp. 122-123.



I. Reporting (Sub-Chapter 10, Amendments to Regulation for Mandatory Reporting).

1. Additional Emission Reporting by Oil and Gas Field Operators

Before proposing requirements for additional reporting of emissions from oil and gas field operators, PG&E encourages the ARB to first confirm the availability of accurate and cost-effective quantification methodologies for emissions associated with the proposed source categories. PG&E believes that the ARB should only require reporting if the resulting measurements will provide sufficiently accurate and meaningful data. Regarding fugitive methane emissions, indirect measurement through currently available emission factors is not accurate enough for use in a mandatory reporting program on which a cap-and-trade program depends. Direct measurement would be prohibitively expensive. Neither indirect nor direct measurement methodologies for these emissions meet all the evaluation criteria noted on pages 98 - 100 of the PDR.

The time and expense necessary to establish and administer a standardized reporting protocol for fugitive methane emissions that would be sufficiently accurate across reporting facilities, especially if the reporting threshold is lowered, could very well exceed the value to be gained in identifying and reducing these emissions. This is also true for methane emissions from pipe blow downs, which the ARB proposes to include as part of the cap. Currently, PG&E quantifies major pipe blow downs; quantifying the dozens of small-volume, minor pipe blow downs to the level of accuracy required for a cap-and-trade program would be extremely expensive and would not cost-effectively attain the goals of AB 32.

Since the United States Environmental Protection Agency ("EPA") is currently revising the federal mandatory reporting requirements for fugitive emissions from oil and natural gas systems, PG&E encourages ARB to await the outcome of the EPA's process, before adding additional requirements to California's mandatory reporting rule.

2. Reporting and Verification Deadlines.

PG&E encourages ARB to maintain the reporting and verification deadlines already in the regulation. PG&E questions if shortening the verification deadline would provide sufficient time for all entities to acquire verification services. Also, PG&E discourages ARB from considering moving the reporting deadline earlier, as the current timeframe for collecting emissions data is already challenging.

3. Reporting Threshold.

For administrative simplicity, the ability of reporters to meet reporting deadlines, the comparability of reporting results, and to reduce unnecessary burdens on staff and resources, PG&E strongly advocates uniformity in emissions reporting standards across programs. If ARB intends to maintain separate reporting from EPA's mandatory reporting rule, PG&E encourages ARB to conform the reporting threshold and units to the federal standard.

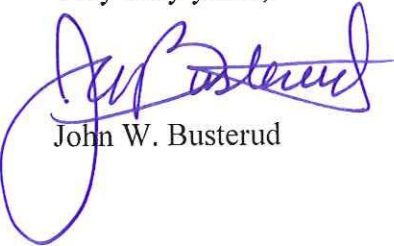


4. Mandatory Third-Party Verification.

Since 2002, PG&E has voluntarily reported and third-party verified its GHG emissions to the California Climate Action Registry and subsequently The Climate Registry ("TCR"). In general, PG&E does not object to third-party verification. However, for the 2010 reporting year, PG&E could be reporting to four different reporting programs: TCR, ARB, WCI, and U.S. EPA. PG&E therefore reiterates its support for uniformity between reporting programs, and in particular, for ARB to conform to federal reporting program standards.

Thank you for the opportunity to present these comments. We look forward to continue working with the ARB and all concerned stakeholders to ensure the successful implementation of AB 32.

Very truly yours,



John W. Busterud

JWB:bd
Attachment

cc: Ms. Lucille Van Ommering, Manager – Program Evaluation Branch, Office of Climate Change



CA Cap-and-Trade: Allowance Auction Design Recommendations

December 2009

PROJECT OBJECTIVES / OVERVIEW

Objectives



- Design a robust greenhouse gas (GHG) allowance auction for California that achieves:
 - Long-term integrity of the GHG emissions cap at reasonable cost to customers / consumers
- Allowance auction design must also take into account:
 - Market efficiency
 - Historical precedent
 - Political environment
 - Societal objectives

Auction Objectives



CARB

- Promote open access
- Ensure fairness and transparency
- Minimize administrative and transaction costs
- Promote economic efficiency
- Prevent manipulative behavior
- Reveal market valuation of allowances
- Minimize price volatility
- Promote allowance market liquidity

PG&E Adds

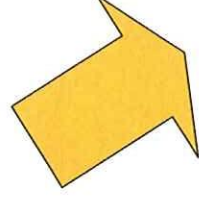
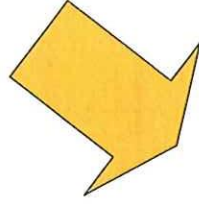
- Provide appropriate price signal for investment purposes

Auction Recommendation Considerations



Design Features

- Auction Format
- Participation Restrictions
- Purchase Limits
- Financial Assurance
- Price Controls
- Information Disclosure
- Auction Frequency



Effective Cost Containment

- Ample use of offsets, with protocols established & approved ahead of time
- Liquid secondary market
- Inter-temporal flexibility (Borrowing allowed in addition to unlimited banking)
- Effective market oversight & ability to enforce rules

Ineffective Cost Containment

- Limited use of offsets, and/or protocols not established & approved in time
- Illiquid secondary market
- Limited inter-temporal flexibility (Borrowing not allowed; Limited banking)
- Poor market oversight & ability to enforce rules

RECOMMENDATION

California Allowance Auction Recommendation Summary



	Effective Cost Containment	Ineffective Cost Containment
Balanced Recommendation for PG&E	<ul style="list-style-type: none"> ▪ Participation restrictions: None ▪ Purchase limits: Slightly higher than net quantity needed by highest emitter (~15%) ▪ Information disclosure: Total quantity demanded, quantity awarded, clearing price, entities bidding, winning entities ▪ Financial assurance requirements: combination of cash and letter of credit (to cover bid) ▪ Auction frequency: Quarterly ▪ Price controls: Reserve price (floor) \$10; Strategic reserve (ceiling) based on consumer impact ▪ Auction format: Single round, sealed bid, uniform price 	
Recommendation Based on Economic Theory	<p>Everything would be the same except:</p> <ul style="list-style-type: none"> ▪ Price Controls: floor only ▪ Information disclosure: reveal aggregated demand curve 	<p>Everything would be the same except:</p> <ul style="list-style-type: none"> ▪ Price controls: ceiling only ▪ Information disclosure: reveal aggregated demand curve

Detail: Participation Restrictions



PG&E Recommends	<u>None</u>
Why?	<ul style="list-style-type: none"> ▪ Ensures maximum economic efficiency <ul style="list-style-type: none"> - Improves liquidity - Allows for implementation of related financial products ▪ Participation restrictions can be easily circumvented
Alternatives considered	<ul style="list-style-type: none"> ▪ Restrict to compliance entities only

Detail: Purchase Limits



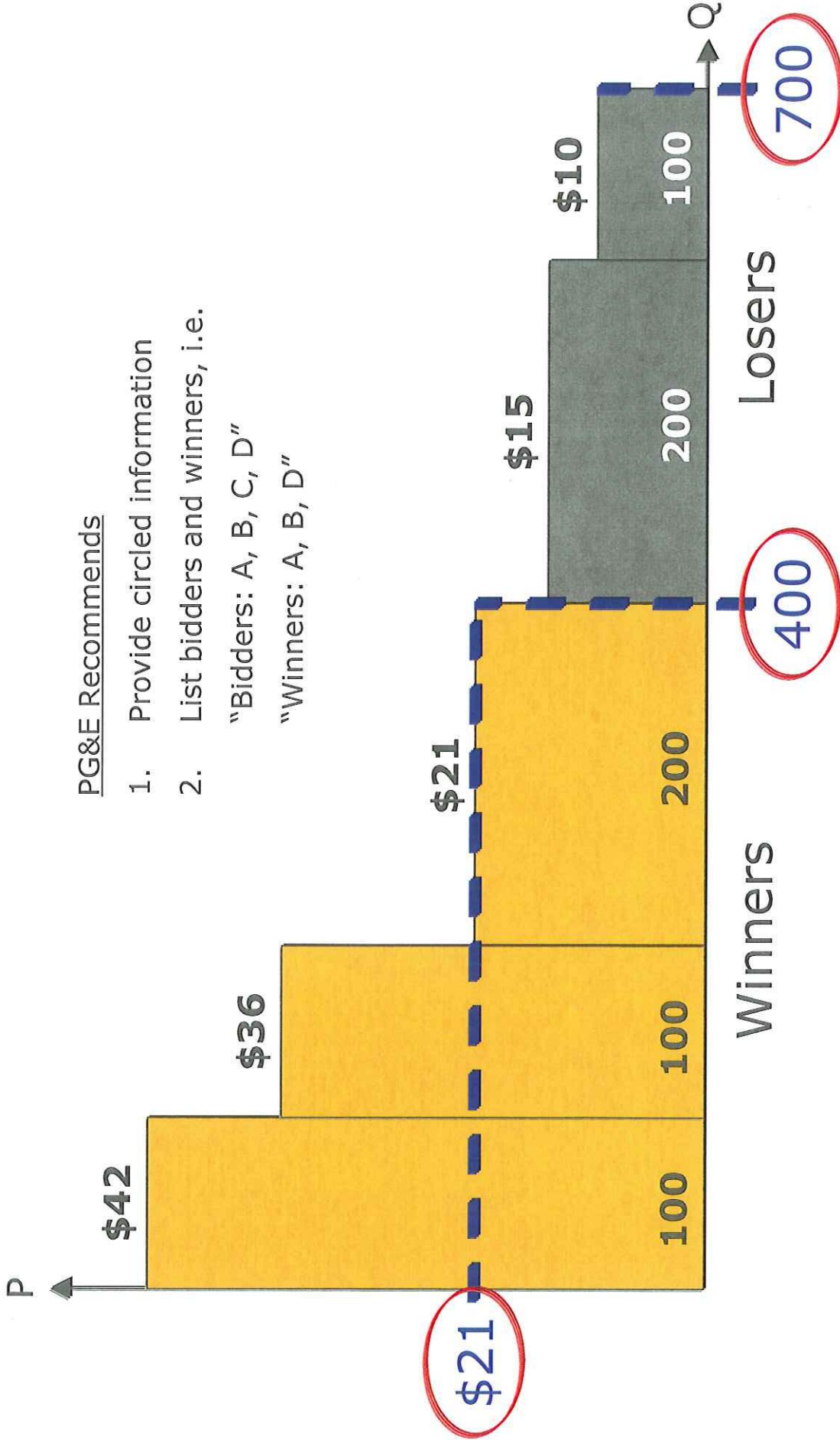
PG&E Recommends	<u>Purchase limit slightly higher than net quantity needed by highest emitter (~15%)</u>
Why?	<ul style="list-style-type: none">▪ Reduces issues associated with market power
Alternatives considered	<ul style="list-style-type: none">▪ No purchase limits▪ Different purchase limits for compliance versus non-compliance entities▪ Purchase limits between 5 and 33%▪ Cumulative position limits

Detail: Information Disclosure



<p>PG&E Recommends</p>	<p><u>Identify the following:</u></p> <ul style="list-style-type: none"> ▪ Total quantity demanded ▪ Quantity awarded ▪ Clearing price ▪ Bidding entities ▪ Winning entities
<p>Why?</p>	<ul style="list-style-type: none"> ▪ Avoids disclosure of confidential individual valuations ▪ Increases learning
<p>Alternatives considered</p>	<ul style="list-style-type: none"> ▪ No information disclosure ▪ Identify bid curves in aggregate ▪ Identify individual bid curves without tying to winner

Illustration: Information Disclosure



PG&E Recommends

1. Provide circled information
2. List bidders and winners, i.e.

"Bidders: A, B, C, D"

"Winners: A, B, D"

Note: In this instance, bidder A placed two bids, one losing bid and one winning bid

Detail: Financial Assurance



PG&E Recommends	<u>Any Mixture of Cash + Letter of Credit Equivalent to Your Bid</u> Minimize the duration between posting date and auction date
Why?	<ul style="list-style-type: none">▪ Stringent requirements allow some flexibility but ultimately minimize the potential for market anomalies
Alternatives considered	<ul style="list-style-type: none">▪ No financial assurance▪ Cash only▪ Letter of credit only▪ Vary levels of required assurance based upon credit or bond rating

Detail: Auction Frequency



<p>PG&E Recommends</p>	<p><u>Quarterly</u></p> <ul style="list-style-type: none"> See Appendix for proposed vintage allotment across quarterly auctions
<p>Why?</p>	<ul style="list-style-type: none"> More frequent auctions balances the values of flexibility and learning against administrative cost concerns. Provides flexibility both for advance planners and people that would prefer to wait (such as those who have uncertain emission profiles)
<p>Alternatives considered</p>	<ul style="list-style-type: none"> Annual More frequent than quarterly

Detail: Auction Format



<p>PG&E Recommends</p>	<p><u>Sealed Bid, Uniform Price, Single Round</u></p>
<p>Why?</p>	<ul style="list-style-type: none"> ▪ Balances auction objectives: efficiency, simplicity, price signals, reducing volatility, prevent manipulation, fairness and transparency. ▪ A single round auction limits collusion associated with signaling
<p>Alternatives considered</p>	<ul style="list-style-type: none"> ▪ Sealed Discriminatory ▪ Sealed multi-unit Vickrey (pay the amount of the bid that was displaced) ▪ Open Descending ▪ Open Ascending ▪ Efficient Open Ascending ▪ Anglo-Dutch (start open ascending, end with sealed round)

Detail: Price Controls



<p>PG&E Recommends</p>	<p><u>Price Collar w/ Strategic Reserve at Trigger Price (ceiling)</u></p> <ul style="list-style-type: none"> ▪ Reserve price ~ \$10, yearly escalation factor (based on index TBD) ▪ Strategic reserve trigger price based on “tolerable” consumer impact.
<p>Why?</p>	<ul style="list-style-type: none"> ▪ Provide certainty and increase likelihood of acceptance. ▪ Initial reserve price in auction of ~ \$10: <ul style="list-style-type: none"> – USCAP: \$10 price floor for long term low-carbon investment – Correlated to offset prices
<p>Alternatives considered</p>	<ul style="list-style-type: none"> ▪ No price controls ▪ Only strategic reserve at threshold price (ceiling) in ineffective cost containment scenario & only reserve price for effective cost containment scenario ▪ Undisclosed reserve price, Other ways to set reserve price

Auction Risks



Risk	Mitigation
<p>Incorrect price set by market</p>	<ul style="list-style-type: none"> ▪ Price controls ▪ Frequent auctions with information disclosure
<p>Manipulative behavior</p> <ul style="list-style-type: none"> ▪ Larger players depress clearing price ▪ Hoarding ▪ Limited transparency 	<ul style="list-style-type: none"> ▪ Purchase limits ▪ Reporting requirements for secondary trades ▪ Stringent financial requirements ▪ Information disclosure ▪ Effective monitoring
<p>Concentrated market</p> <p>Liquidity concerns (Both stemming from stringent financial requirements)</p>	<ul style="list-style-type: none"> ▪ Publish auction dates well in advance ▪ Minimize time between posting date and auction date ▪ Chosen auction format encourages smaller players
<p>Excessive price volatility</p>	<ul style="list-style-type: none"> ▪ Price controls ▪ No participation restrictions ▪ Purchase limits
<p>Collusion</p>	<ul style="list-style-type: none"> ▪ Sealed bid format ▪ Effective monitoring ▪ Information disclosure (can stop revealing winning bidder info)

Cap-and-trade risks



Risk

Mitigation

<p>Market manipulation</p> <ul style="list-style-type: none"> ▪ Hoarding ▪ Price manipulation 	<ul style="list-style-type: none"> ▪ Price controls and purchase limits in auction ▪ Reporting requirements and monitoring in secondary market
<p>Supply-demand imbalance due to non-achievement of program goals</p> <ul style="list-style-type: none"> ▪ If program goals for GHG reduction are not met, demand for allowances through cap and trade is higher 	<ul style="list-style-type: none"> ▪ Closely monitor program performance internally ▪ Advocate for broad based reporting of program performance and monitor ▪ Adjust forecasts for allowance requirements as needed

Risk Mitigation Detail - Monitoring

- Monitoring and enforcement will be critical to ensure the success of auction implementation under AB 32
- Recommend: An independent third party team of auction experts for monitoring

Suggested monitoring list:

1. Bid curves and patterns in bid curves, that may point to collusion, or demand reducing behavior
2. Beneficial ownership to ensure adherence to purchase limit
3. Verification of financial assurance prior to each auction
4. Secondary market trading for price trends

APPENDIX

Auction Design Methodology

1. Literature review
 - Academic articles
 - Analysis of previous auctions
2. Auction Design Feature Analysis
3. Integrated recommendation framework
 - External scenarios
 - Design perspective
4. Integrated recommendation
 - Theory-based
 - Balanced
5. Risk Assessment and Mitigation Strategies

Linkage



- Proposed federal auction similar to existing programs and recommended AB 32 auction design, which eases the burden of transitioning programs
- Suspends implementation of a California or WCI "cap and trade program" under AB 32 during calendar years 2012-2017
- Entities holding allowances from RGGI, California or WCI could exchange them for federal allowances so that participants are value neutral (i.e. 3 \$5 RGGI allowances for 1 \$15 Federal allowance)

Waxman-Markey Auction Design (Proposed)

- Sealed bid, uniform price
- Quarterly frequency, single round
- 20% (of an individual entity's GHG obligation) purchase limit for each auction
- Reserve price of \$10/ton (in constant 2009 dollars) for auctions in 2012, increasing by 5% per year plus inflation

RGGI Auction Design (Actual)

- Sealed bid, uniform price
- Quarterly frequency, single round
- 33% purchase limit for each auction
- Reserve price equal to 80% of secondary market price

General Assumptions for Auction Allowance Design

- In the first compliance period (2012-2014), the percentage of allowances auctioned will range from 5-50%. The rest will be allocated to compliance entities.
- Auction revenue allocation will not encourage manipulative bidding behavior
- Bidder asymmetries: significant asymmetry in the allowance market in terms of market power, size and information
- Most players know their own valuations (i.e. the marginal cost to reduce emissions by 1 ton) with a reasonable amount of certainty
- Penalties are high enough so that non-compliance is not a viable option

Definitions for auction formats

- Two dimensions of an auction
- **Dimension 1: Sealed or Open**
 - Manner in which bids are submitted and what information is made available to the market at the same time that bids are being placed.
 - Open auctions can be conducted in **Ascending** or **Descending** formats.
- **Dimension 2: Price setting**
 - Manner in which winning bidders' costs are determined.
 - **Discriminatory pay your bid:** In this auction format, the winning bidders pay the prices they bid in.
 - **Uniform price auction:** While bidders submit their individual demand curves, the actual price paid is the market clearing price. This clearing price is the price at which supply equals quantity demanded.
 - **Multi-unit Vickrey:** Winning bidders each pay different prices, but the price is set not by their own bids, but by the bids they displace.
 - **Ausubel Efficient:** In this format, winning bidders pay the price at which they “clinch” allowances, i.e. it is mathematically impossible for them not to win those allowances.

Auction Frequency Detail: Vintages

Scenario - If vintages are specific to one year

Vintage	2011				2012				2013				2014				2015			
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
V ₂₀₁₂	25%	25%	20%	10%	10%	5%	5%	C												
V ₂₀₁₃		5%	5%	10%	10%	20%	20%	10%	10%	5%	5%	C								
V ₂₀₁₄						5%	5%	10%	10%	20%	20%	10%	5%	5%	5%	C				
V ₂₀₁₅										5%	5%	10%	10%	20%	20%	10%	10%	5%	5%	C
...																				

Scenario - If vintages are specific to the three year period

Vintage	2011				2012				2013				2014				2015				2016				2017				...
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	
V1	5%	5%	5%	5%	5%	10%	10%	10%	10%	10%	5%	5%	5%	5%	5%	C													
V2													5%	5%	5%	5%	5%	5%	10%	10%	10%	10%	5%	5%	5%	5%	5%	C	

Allowances offered well in advance of compliance date to facilitate LT planning
 No more than 3 vintages in an auction to minimize administrative complexity
 Some portion of vintages offered just before submittal date