San Francisco
Water Power Sewer
Services of the San Francisco Public Utilities Commission

525 Golden Gate Avenue, 7thh Floor
San Francisco, CA 94102
T 415.554.07255
F 415.554.1854
TTY 415.554.3488

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Rajinder Sahota
Branch Chief, Cap-and-Trade Program
CALIFORNIA AIR RESOURCES BOARD
1001 I Street
Sacramento, CA 95812
Via e-mail

SUBJECT: Comments of the San Francisco Public Utilities Commission (SFPUC) on the California Air Resources Board (CARB) Staff Proposal to Allocate Cap-and-Trade Allowances to Electric Distribution Utilities (EDUs)

Dear Ms. Sahota;

The San Francisco Public Utilities Commission (SFPUC), as an Electric Distribution Utility (EDU) provides almost 1 million MWh each year of clean, zero-GHG electric energy to San Francisco's government facilities and selected retail customers.[1]

As an EDU, the SFPUC offers the following comments on CARB staff's proposal for allocating post-2020 cap-and-trade allowances. CARB's latest proposal;

- Unfairly disadvantages and penalizes EDUs such as the SFPUC that have already taken early action to significantly reduce their GHG emissions;
- Significantly and unfairly underestimates the "cost burden" that even EDUs that are 100% renewable incur under the cap-and-trade program; and
- Would drastically reduce funding post-2020 for the SFPUC's on-going programs to reduce GHG emissions.

To address these concerns, the SFPUC proposes that the floor for allocating allowances to utilities that are 100% renewable should be set at a minimum of 20%, rather than 5% as currently proposed, and should remain constant over the 2021-2030 compliance periods.

[1] The SFPUC also operates a Community Choice Aggregation (CCA) program, CleanPowerSF.

Additionally, the SFPUC supports continuing to allocate all allowances directly to the electric utility rather than allocating electric-related allowances to Energy Intensive/Trade Exposed Industries (EITE) as CARB is proposing. However, if CARB chooses this approach the SFPUC proposes where a single government entity (such as a city) operates both the POU and the EITE industry, allowances would continue to be allocated to the POU. This would allow the government entity to exercise its own discretion to maximize the value and use of the allowances.

Each of these points is discussed below.

Allocation of Allowances to EDUs Such as the SFPUC Should Reflect Early Action and Historically Low GHG-Emissions

In allocating allowances for the initial 2013-2020 compliance period, the SFPUC advocated that any allocation of allowances should reflect, and reward, EDUs that had already significantly reduced their GHG emissions. The California Global Warming Solutions Act requires that;

> In adopting regulations pursuant to this section and Part 5 [cap-and-trade], to the extent feasible and in furtherance of achieving the statewide greenhouse gas emissions limit, the state board shall... ***Ensure that entities that have voluntarily reduced their greenhouse gas emissions prior to the implementation of this section receive appropriate credit for early voluntary reductions.***[2]

The SFPUC provides 100% of its electric energy from GHG-free resources such as its Hetch Hetchy hydroelectric system and in-city solar facilities, and has used these resources to, for example, operate the largest fleet of GHG-free electric powered buses and streetcars in the nation. The SFPUC's GHG footprint is already at a level that California's other EDUs are unlikely to achieve by the end of the 2030 (or perhaps even the 2040 or 2050) compliance periods.

The SFPUC should not be disadvantaged in the allocation of allowances relative to other EDUs that continued to rely on fossil-fuels, including coal-fired generation, to meet their energy needs.

One option, previously proposed by the SFPUC, is that CARB should establish a minimum allocation to each EDU. This allocation should be based on a "best practice" benchmark that CARB uses for other industries. A potential "best practice" benchmark for electric generation, for example, would be the system-

[2] Health & Safety Code 38562(b)(3)

wide average GHG emissions that CARB expects California's EDUs to reach by 2030 as a result of the state's GHG-reduction efforts or approximately 0.17 ton/MWh.[3] EDUs that already meet, or exceed this target, should be recognized for their early action in reducing GHG emissions in the allowance allocation process.

The Latest Proposal Significantly and Unfairly Underestimates the "Cost Burden" that even EDUs that are 100% Renewable Incur Under the Cap-and-Trade Program; A Floor of at Least 20% is More Appropriate

The latest proposal sets a floor of allocating to each EDU a minimum amount of allowances equal to 5% of their forecasted electric demand. This 5% minimum allocation is based on the "assumption that load served by natural gas is assumed to never drop below 5% to account for support for variable renewable resources."[4] This appears to correspond to the "duck curve" developed by the California ISO which identifies the need for flexible resources (currently primarily fossil-fueled) that are needed to account for the ramping up of renewable resources in the morning, their ramping-down in the afternoon, as well as their fluctuations in output over the course of the day.

As discussed below, a more appropriate range of a minimum of 20% to 25% should be adopted. This higher value represents the even greater variation between renewable energy during the daytime versus night-time hours. The current 5% allocation actually has the effect of penalizing utilities with high renewable usage by failing to recognize the GHG cost burden these utilities incur in order to balance their supply and demand in real time.

CARB is basing its allowance allocation to EDUs using supply/demand forecasts (S-2 forms) submitted to the California Energy Commission (CEC) by California's electric utilities. These forms are based on an annual summation of supply resources against annual demand.[5] There is no requirement that a utility's reported resources match its demand in real-time.

As a result, even a utility that reports on its S-2 form that it is 100% renewable could still incur a significant cap-and-trade "cost-burden" to the extent its renewable generation does not match its load profile, particularly between daytime and night-time hours.

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[3] Assuming a 50% RPS requirement in 2030; 10% of California demand being met with hydro-electric resources; and no remaining use of coal for electric generation, statewide average GHG emissions from the electric sector would be around 0.17 metric tons/MWh.
[4] CARB Power Point presentation at October 21, 2016 Workshop
[5] Forms and Instructions for Submitting Electricity Resource Plans (CEC Final Staff Report, CEC-200-2012-007-SF) Prepared in Support of the *2015 Integrated Energy Policy Report*

A useful analogy is California's net energy metering program for roof-top solar. While a solar customer can claim that he/she is "off-the-grid" and the utility reports that its net energy consumption is zero on an annual basis, in reality the customer is generating 100% of his/her energy during the day, providing the surplus solar generation to the grid, and then receiving energy back from the grid (with the associated GHG-cost burden) during the night.

The same situation occurs with a California utility that is 100% renewable, particularly given the prevalence of wind and solar resources that California's utilities have used to meet California's RPS standards. During the day-time the utility would be meeting its needs from its renewable resources, providing its excess zero-GHG energy to the grid, and using this to offset on an annual basis (as reported in their S-2 forms), energy acquired from the grid during the night to balance its supply and demand in real-time.

The California ISO tracks the hourly generation of energy supply relative to demand in its daily Renewable Energy Watch. As shown in the attached Renewable Energy Watch for October 28, 2016[6], while almost 100% of the wind/solar generation occurs during the hours of 8 AM through 6 PM, (See chart in upper right corner of p. 1) over ½ (56%) of the system demand occurs between the evening hours of 7 PM till 8 AM when there is little or no wind/solar generation. (See bottom of p. 2). Thus a utility that reports it is 100% renewable based on its wind/solar generation during the day could still end up incurring a 50% cap-and-trade cost burden for the energy it purchases at night to match its supply and demand in real-time. Zero-GHG hydroelectric generation can also vary significantly over both the course of a day as well as seasonally.

Based on the above examples, a cost-burden of up to 50% of annual demand could be justified even for a utility that is reporting that it is 100% renewable on its CEC S-2 forms. Moderating this to some extent is the presence of some zero-GHG resources (such as geothermal and hydro) that are available at night, although not likely in sufficient quantities.[7] Electric storage is still a nascent technology under development, and also represents an additional "cost burden" that a 100% renewable utility would need to incur.

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[6] This was picked to be contemporaneous with the comment period. During summer periods, when demand is higher, this ratio could be even lower as additional gas-fired generation is brought on line to meet demand. .

[7] PG&E's Diablo Canyon generation is largely utilized by PG&E, and thus not available to other utilities, and presumably will be retired by 2024/2025.

Instead, the most likely outcome is that electric demand during the night-time hours will be met with fossil-fueled resources and imports. (See bottom of page 1 for the percent of renewables, relative to fossil-fuels and imports, in meeting demand during evening hours). Embedded in the price of these resources that the utility is paying would be the associated "cost burden" of the necessary GHG compliance obligation.

To address these concerns, the SFPUC proposes that the "floor" or minimum allocation of allowances issued to each EDU be set at a minimum of 20%, which is itself likely to be conservative. Absent some recognition for the need for utilities with high renewable usage to balance their supply and demand in real-time over a 24-hour cycle, as currently written CARB's proposal could actually disadvantage these utilities relative to other utilities that have fossil-fueled resources that can be flexibly dispatched to meet their demand.

Finally, any minimum allocation should remain constant and not be reduced over the 2021-2030 time-period. Once a utility reaches the 100% renewable level, there is no further opportunity for GHG-reductions.

CARB's Proposal Would Drastically Reduce Post-2020 Funding for the SFPUC's On-going Programs to Reduce GHG Emissions.

In addition to being available to cover any GHG cost burdens incurred by the SFPUC, the SFPUC has used its allowance allocation to develop additional in-city GHG-free solar resources.

Funding for this program will be significantly reduced post-2020. As the attached chart shows, the SFPUC's allowance allocation will drop 88% from 2020 to 2021. This is the second largest percentage drop[8] out of all of California's electric utilities. This precipitous drop-off will significantly affect the continuation of SFPUC's efforts to promote new GHG-free resources. A phased-in reduction of allowances, or setting a minimum floor for allowances, would allow this program to better transition to new funding sources.

The POU Should Continue to Receive All Allowances for its Customers

The SFPUC supports continuation of the current process that allocates all allowances directly to the electric utility. For the investor-owned utilities, the California Public Utilities Commission (CPUC) is in the process of developing the appropriate mechanisms to allocate the value of allowances to affected Energy Intensive/Trade Exposed Industries (EITE). POUs can allocate the allowance value back to EITE industries through using their allowances either to reduce their own compliance costs and/or through their rate design policies.

[8] Surprise Valley Electric Cooperative is first with a 90% reduction.

However, if CARB chooses this approach the SFPUC proposes where a single government entity (such as a city) operates both the POU and the EITE industry, allowances would continue to be allocated to the POU. This would allow the government entity to exercise its own discretion to maximize the value and use of the allowances.

Conclusion

The SFPUC appreciates the opportunity to comment on CARB's proposal and looks forward to working with CARB staff as it develops the necessary allowance formulas to successfully implement a post-2020 cap-and-trade program.

Please feel free to contact us at either (415) 554-1526 or jhendry@sfwater.org if you need any additional information.

/s/James Hendry
James Hendry
Regulatory & Legislative Affairs
San Francisco Public Utilities Commission

cc: Barbara Hale, AGM-Power, SFPUC
Theresa Cho, Deputy City Attorney, City & County of San Francisco
Lori Mitchell, Manager – Renewables, SFPUC
Mary Jane Coombs, Air Resources Board
Jason Gray, Air Resources Board
Bill Knox, Air Resources Board
Craig Segall, Air Resources Board
Jodean Giese, Air Resources Board

ATTACHMENTS

Renewables Watch

California ISO

For Operating Day: Friday, October 28, 2016

The Renewables Watch provides important information about actual renewable production within the ISO grid as California movestoward a 33 percent renewable generation portfolio. The information provided is as accurate as can be delivered in a daily format. It is unverifed raw data and is not intended to be used as the basis for operational or financial decisions.

Renewables Production

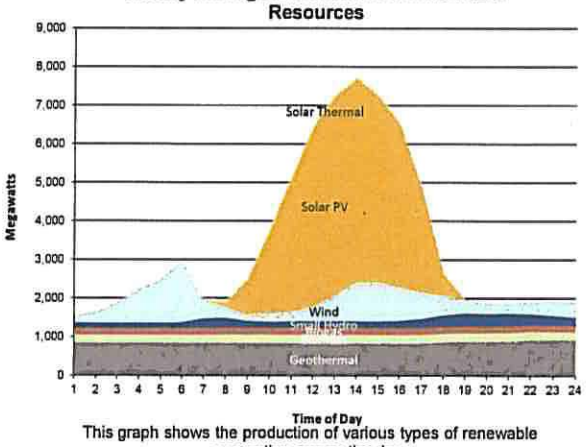
24-Hour Renewables Production

Renewable Resources	Peak Production Time	Peak Production (MW)	Daily Production (MWh)
Solar Thermal	16:36	46	47
Solar	13:01	5,721	34,128
Wind	5:14	2,304	12,616
Small Hydro	18:47	354	5,241
Biogas	0:17	177	4,105
Biomass	16:12	224	5,148
Geothermal	23:49	921	20,631
Total Renewables			**81,915**

Total 24-Hour System Demand (MWh): *605,426*

This table gives numeric values related to the production from the various types of renewable resources for the reporting day. All values are hourly average unless otherwise stated. Peak Production is an average over one minute. The total renewable production in megawatt-hours is compared to the total energy demand for the ISO system for the day.

Hourly Average Breakdown of Renewable Resources

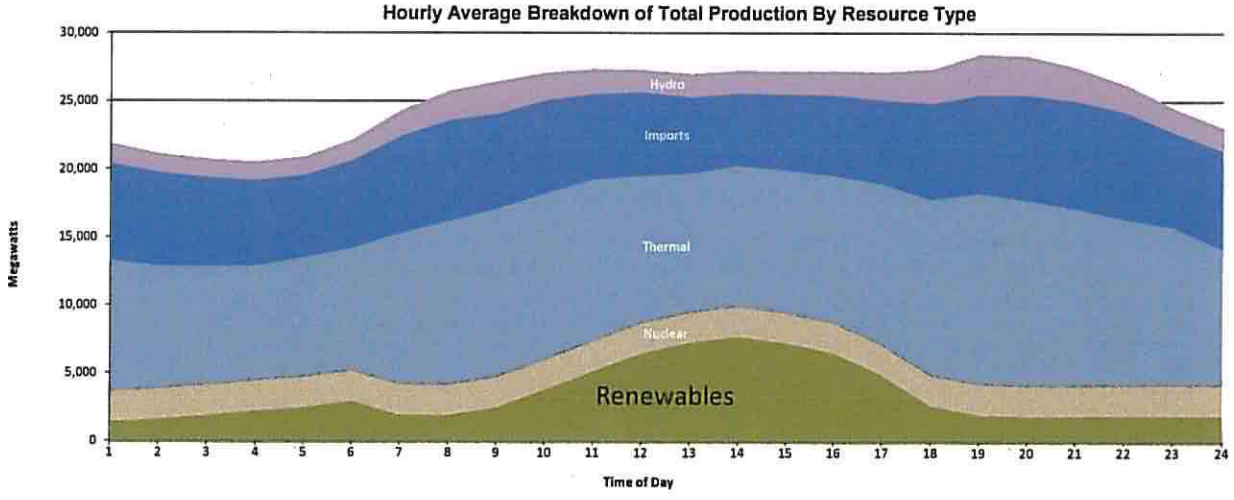


This graph shows the production of various types of renewable generation across the day.

System Peak Demand (MW) **28,762**
*one minute average

Time: **18:43**

Hourly Average Breakdown of Total Production By Resource Type



This graph depicts the production of various generating resources across the day.

Previous Renewables Watch reports and data are available at http://www.caiso.com/green/renewableswatch.html

This table gives numeric values related to the production from the various types of renewable resources for the reporting day. All values are hourly average unless otherwise stated. Peak Production is an average over one minute. The total renewable production in megawatt-hours is compared to the total energy demand for the ISO system for the day. Solar PV and Solar thermal generators that are directly connected to the power grid. "Solar PV" is defined as solar generating units that utilize solar panels containing a photovoltaic material. "Solar Thermal" is defined as solar generating units that convert sunlight into heat and utilize fossil fuel or storage for production which may occur after sunset.

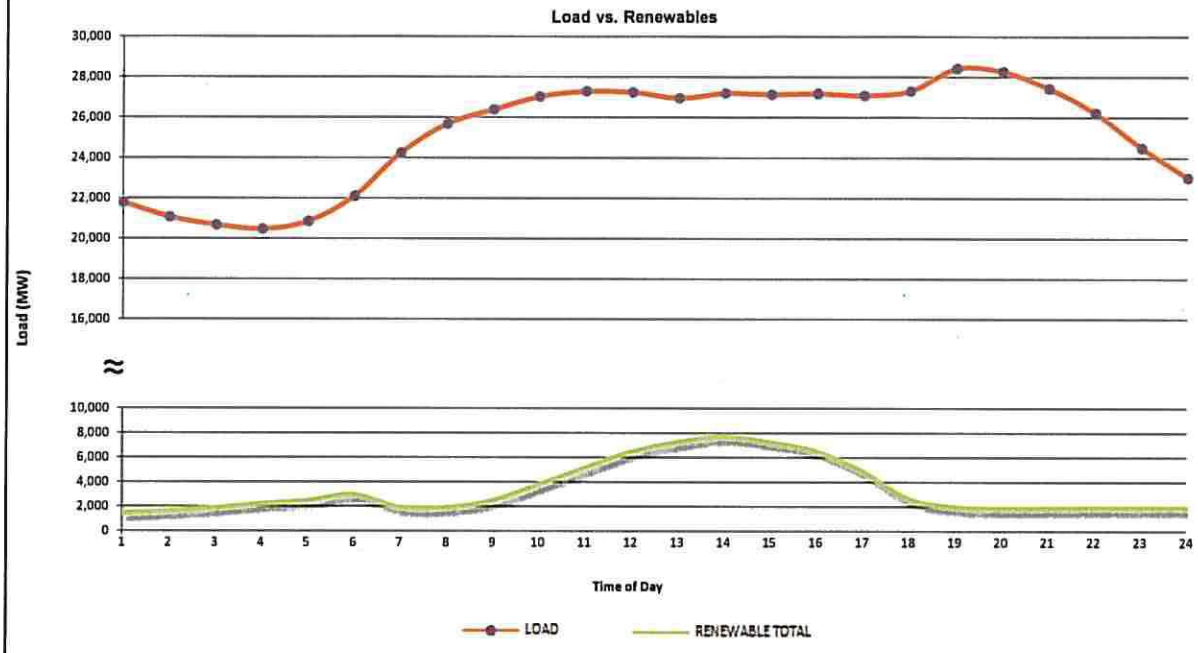
Renewables Watch

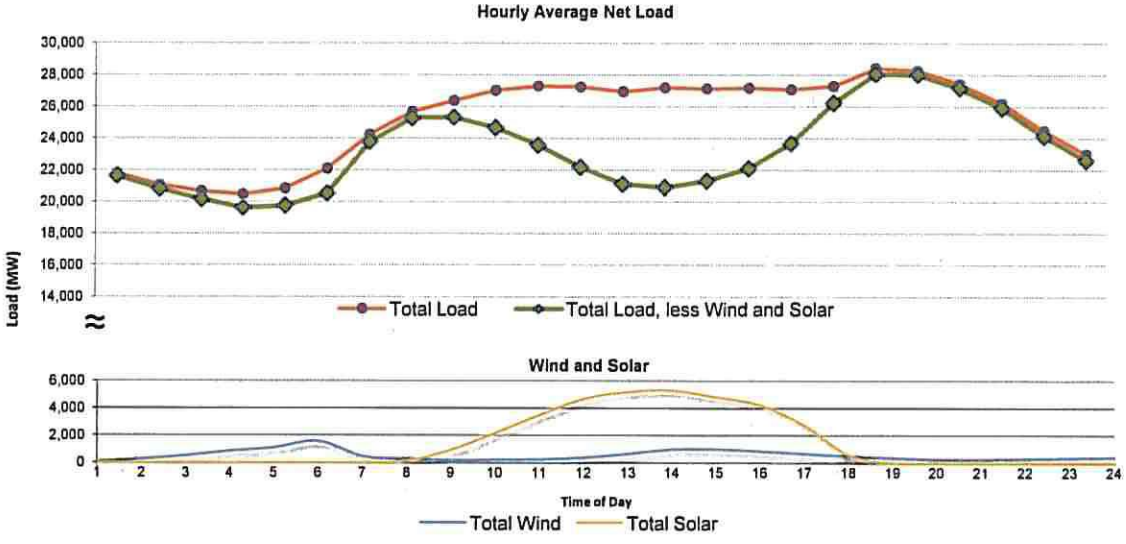
California ISO

For Operating Day:

The first graph provided on this page shows how much energy renewable resources are contributing to the grid, and when those resources are producing their daily maximum and how that production correlates to the maximum energy demand.

Comparison to Load





REDUCTION IN GHG ALLOWANCES FROM 2020 TO 2021 (BY PERCENTAGE)