KHY/ek4 4/3/2017

**FILED**
4-03-17
09:21 AM

**BEFORE THE PUBLIC UTILITIES COMMISSION OF THE STATE OF CALIFORNIA**

| | |
|---|---|
| Order Instituting Rulemaking to Create a Consistent Regulatory Framework for the Guidance, Planning, and Evaluation of Integrated Distributed Energy Resources | Rulemaking 14-10-003 (Filed October 2, 2014) |

# ADMINISTRATIVE LAW JUDGE'S RULING REQUESTING COMMENT ON AN INTERIM GREENHOUSE GAS ADDER

## Summary

This ruling introduces a Commission Energy Division staff proposal for an interim greenhouse gas adder to be used as an input into a proposed societal cost test or modified total resource cost or program administrator cost test, in the event the Commission adopts such a method for distributed energy resources. The first instance in which such an input may be used would be in the energy efficiency potential study being undertaken as part of Rulemaking (R.) 13-11-005, which will inform future energy efficiency goals. Responses to questions posed in this ruling, which will inform consideration of a societal cost test and related methods, along with comments on the proposal, shall be filed on April 17, 2017; reply comments shall be filed on April 24, 2017.

## Background

Public Utilities Code Sections 454.55 and 454.56 requires the Commission, in consultation with the California Energy Commission, to identify all potentially achievable cost-effective electricity and natural gas efficiency savings and establish efficiency targets for electrical or gas corporations. Decision (D.) 15-10-028 determined that the targets or goals would be updated every other

year to align with the California Energy Commission's Integrated Energy Policy Report.[1] In D.15-10-028, the Commission explained that Commission staff manages the development of an energy efficiency potential and goals study, which is used to set energy savings goals and that the potential and goals study should be provided in alternating Augusts as part of a proposed decision adopting the goals.

On February 9, 2017, a Ruling was issued in this proceeding seeking party comment on an Energy Division proposal, "Distributed Energy Resources Cost-Effectiveness Evaluation: Societal Cost Test Greenhouse Gas Adder, and Greenhouse Gas Co-Benefits (Societal Cost Test Proposal). In the Societal Cost Test Proposal, Energy Division recommends using a greenhouse gas adder to estimate the value of the reduced carbon emissions that distributed energy resources provide and proposes that the adder be based on the marginal cost of abatement. The Societal Cost Test Proposal also recommends that the greenhouse gas adder be determined in the Integrated Resource Planning proceeding (Rulemaking (R.) 16-02-007) but notes that an interim adder may be needed and may have to be determined by another method.

## Discussion

The biannual energy efficiency potential and goals study (Study) is currently underway and, as stated above, is required to be completed in time to set the energy efficiency goals in August. As explained in the attached proposal, the Study relies upon the Avoided Cost Calculator to determine goals. However,

[1] The report assesses major energy trends and issues facing the state's electricity, natural gas, and transportation fuel sectors and provides policy recommendations to conserve resources; protect the environment; ensure reliable, secure, and diverse energy supplies; enhance the state's economy; and protect public health and safety.

the most recent update of the calculator resulted in a decrease in current and forecast fuel cost. Furthermore, the current calculator did not reflect the cost impacts of 2030 greenhouse gas targets, which would result in a greenhouse gas adder significantly higher than the cost of greenhouse gases currently reflected in the calculator. Hence use of the current version of the calculator will result in a decrease of cost-effective energy efficiency.

In the attached proposal, Energy Division cautions that waiting for R.16-02-007 to develop the greenhouse gas adder may result in a decrease in the number of cost-effective energy efficiency programs now but then an increase in the number of programs in the future, creating inconsistencies for planning purposes. Hence, Energy Division recommends creating an adder on an interim basis until the permanent solution can be developed in R.16-02-007.

As discussed in the attached proposal, Energy Division recommends adopting an annualized approach that applies a straight line escalation from $0 per tonne CO2 in 2017 to $250 in 2030, which is the marginal abatement cost indicated for that year by preliminary modeling results of Energy Division's analysis in the Integrated Resource Plan process. Staff asserts that this approach more adequately reflects the value of distributed energy resources over the long term, and mitigates the risk of not have enough resources to achieve the state's 2030 greenhouse gas goals.

**Questions on the Staff Proposed Interim Greenhouse Gas Adder**

1. The Staff Proposal states that the most recent update of the avoided cost calculator did not reflect the cost impacts of the 2030 greenhouse gas targets, which will result in decreasing the amount of cost-effective energy efficiency potential. Explain why you agree or disagree with this assertion. If you agree, explain why this justifies adopting an interim greenhouse gas adder.

2. The Staff Proposal recommends the use of a straight line function to the marginal abatement cost, as indicated by Energy Division's preliminary Integrated Resource Plan model results, rather than the annual values produced by the same model. Explain why you do or do not support this recommendation.
3. The Staff Proposal contends that the interim greenhouse gas adder is needed as soon as possible to inform the energy efficiency potential and goals study. Explain why you do or do not support this timeline.

Parties are asked to review the attached proposal and respond to the previous questions no later than April 17, 2017. Reply comments are due on April 24, 2017.

**IT IS RULED** that:

1. Responses to the questions in this ruling shall be filed no later than April 17, 2017. General comments on the proposal may be included with the responses.
2. Reply comments shall be filed no later than April 24, 2017

Dated April 3, 2017, at San Francisco, California.

/s/ KELLY A. HYMES
Kelly A. Hymes
Administrative Law Judge

# ATTACHMENT

## Energy Division Staff Proposal Addendum: Interim GHG Adder

# Energy Division Staff Proposal Addendum: Interim GHG adder

## *Background*

On February 9, 2017, the Commission issued a ruling seeking stakeholder comments on several aspects of distributed energy resource (DER) cost-effectiveness, including an Energy Division Staff Proposal on "Distributed Energy Resources Cost Effectiveness Evaluation: Societal Cost Test, Greenhouse Gas Adder, and Greenhouse Gas Co-Benefits" (Staff Proposal). The Staff Proposal recommends using a Greenhouse Gas (GHG) adder to estimate the value of the reduced carbon emissions that DERs provide, and that the value of the GHG adder should be based on the marginal cost of abatement (i.e., the cost of achieving California's GHG reduction goals). Current DER cost-effectiveness tests only include the value of GHG permits utilities are required to buy as part of California's Assembly Bill (AB) 32 cap and trade program for 2020 GHG targets. They do not include the cost of achieving Senate Bill (SB) 32 targets for 2030 GHG reductions.

The Staff Proposal expresses a preference for a GHG adder that is determined as part of the Commission's Integrated Resource Planning (IRP) proceeding (either explicitly, or derived from the preferred IRP plan identified in that proceeding). However, the Proposal also notes that an interim GHG adder may be needed, and may have to be determined by another method, depending on the pace of the IRP proceeding.

Since the release of the Staff Proposal, a need has arisen to determine an interim GHG adder for use in the Energy Efficiency (EE) Potential Study, which will quantify how much energy efficiency is cost-effective and achievable in the coming years, and inform the Commission's determination of future energy efficiency goals. The results of the potential study are an input to the Integrated Energy Policy Report (IEPR), managed by the California Energy Commission (CEC). Staff expects these results to inform both the CEC's process for establishing EE doubling targets, pursuant to SB350, and the 2017 IEPR demand

forecast. Hence, Staff expects that EE goals and other inputs provided by the Commission will be needed by the October 2017 timeframe[2]. In addition, the Commission's EE proceeding schedule requires that EE goals be adopted by August 2017[3].

A recent update of the Avoided Cost Calculator resulted in a significant reduction in current and forecast fuel costs, as well as other cost drivers. The update occurred prior to the adoption of SB 32 and, therefore, did not reflect the cost impacts of 2030 GHG targets now in state law. Because the Potential Study is highly dependent on Avoided Cost Calculator outputs, this is expected to significantly reduce the amount of cost-effective EE potential in the state, based on current cost-effectiveness tests. However, in enacting SB32 California has adopted a 2030 GHG goal which Staff expects will result in an implicit or explicit GHG adder that is significantly higher than the cost of GHGs currently reflected in the Avoided Cost Calculator. The IRP process will not develop a GHG adder value until after the EE goals update, and this timing mismatch is likely have a disruptive effect on EE potential, goals, budgets and programs – if GHG goals are ignored, EE budgets are likely to suffer large cuts, based on current cost-effectiveness restrictions. If GHG goals are later added, EE budgets would then increase significantly.

Consequently, Staff believes that it is important to consider the impact of the GHG adder on EE cost-effectiveness in the EE Potential Study. To this end, Staff has added several new cost-effectiveness scenarios to the EE Potential Study, including several scenarios reflecting what the EE potential would be if the Commission adopted an interim GHG adder. The interim GHG adder proposed herein could be used until such time as the IRP proceeding is able to provide a full analysis and adopt a more permanent value,[4] and the Commission can determine how this value should be used in DER cost-effectiveness analysis.

---

[2] The 2017 IEPR Scoping Order requires an IEPR draft report in October 2017. https://efiling.energy.ca.gov/getdocument.aspx?tn=216389

[3] D.15-10-028 (p. 84-5) on EE Rolling Portfolio Mechanics .

[4] The Commission's guidance to load-serving entities for filing their integrated resource plans is expected to include an implied marginal abatement cost for GHG emissions reductions. A Proposed Decision on adopting guidance for the 2017 IRP filings is currently scheduled to be introduced into the record of the IRP proceeding (R.16-02-007) in August 2017.

*Footnote continued on next page*

### *Technical Approach*

For consistency, Staff looked to the IRP proceeding to help determine an interim GHG adder. In the IRP process, Staff has proposed using RESOLVE, a capacity expansion model based on linear programming techniques, to identify least-cost portfolios of future resources that satisfy the multiple state policy goals required by the IRP statute, including reducing GHG emissions and maintaining reliability.

The inputs to the RESOLVE model include a load forecast (which in turn include assumptions about future energy efficiency, which were determined by previous potential studies), as well as cost and GHG emissions data for traditional electricity generation technologies, renewables (both supply and demand side), demand response, storage, and other DERs.

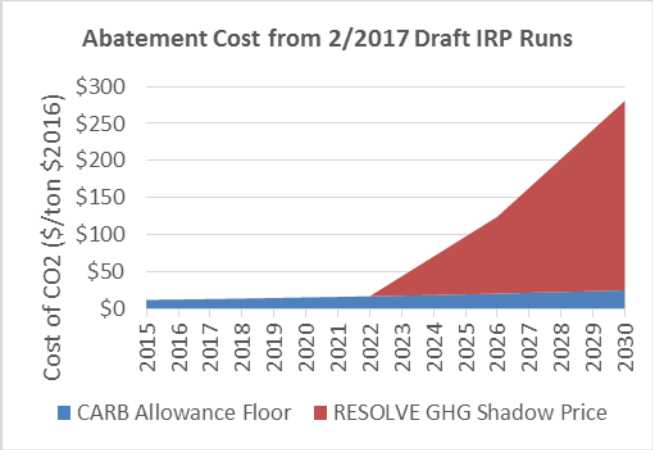


**Figure 1: Carbon abatement costs estimated from preliminary RESOLVE results**

One characteristic of the RESOLVE model design that is relevant to this issue is that because the model optimizes future resources needed to meet GHG and other state goals, the GHG shadow price derived from the model does not reflect the costs of renewable energy contracts already in place. This means that the cost of the significant amount of renewables already procured by utilities to meet, and potentially exceed, the 33% renewable mandate by 2020 are not reflected in the GHG shadow price. Instead, the RESOLVE shadow price reflects the marginal cost of additional GHG reductions beyond those already being achieved and paid for through existing utility contracts.

Preliminary results from the RESOLVE model are provided in Figure 1. Figure 1 indicates that the marginal cost of achieving GHG reduction targets over the next

five years is approximately the California Air Resource Board's floor price for carbon allowances, which is the avoided cost of carbon that is already embedded in the current DER cost-effectiveness framework. Since the GHG adder is defined as the cost of carbon reduction *in addition* to the cap and trade price, the RESOLVE model results in a GHG adder value of zero until 2022, then escalating to approximately $250 per tonne of carbon in 2030.

The rapid escalation of marginal GHG costs after 2022 is due to the cost of integrating an increasingly large proportion of renewables into the grid, as renewable curtailments increase and relatively expensive technologies such as storage are procured to minimize curtailments. The low marginal cost of GHG abatement prior to 2022 is largely the result of the fact that the costs of renewables that have already been contracted to meet the 33% RPS mandate have already been incurred and, along with DERs already in the forecast, may have effectively crowded out opportunities for DERS to provide additional GHG reductions to meet state mandates in the next five years.

There are several methods which could be used to develop an interim GHG adder based on these preliminary RESOLVE results. The most direct method would be to use each year's marginal abatement cost as each year's interim GHG adder. This approach implies that the current DER cost-effectiveness approach, which bases the value of GHG reductions on cap and trade prices, would continue to be the basis for determining the GHG value of resources for the next five years. However, Staff believes there are several drawbacks to this approach.

First, it may be difficult to authorize funding for DERs already included in the CEC's IEPR demand forecast and taken as a given in the current RESOLVE model inputs if these GHG reduction benefits are not included in the cost-effectiveness model, since inputs to the Avoided Cost Calculator have reduced significantly since the demand forecast used in the RESOLVE model was developed.

Second, the use of the preliminary RESOLVE annual marginal cost value is likely to undermine the ability of the market to deliver DERs in the future. A low marginal GHG abatement cost implies that we should only incorporate relatively low-cost technologies right now, and then quickly start incorporating other technologies later on, as the value of carbon reductions increase, to meet our 2030 goals. While it may be logical for an optimization model to produce such a result, this may not reflect a feasible timeline. It may not be possible to ramp

DERs at a fast enough rate if they are not procured until 2022 (the year in which modeled results for marginal GHG abatement cost start to increase significantly).

An important part of Staff's proposed approach to IRP is assessing the lead time of the resources that appear to provide the least-cost path to meet the state's goals. Most traditional fossil fuel, nuclear, hydroelectric, and geothermal technologies have a long lead time associated with bid solicitation, project selection / contract development, and construction period, after which a relatively large amount of new capacity and energy are available. On the other hand, while individual DERs can typically be installed much more quickly than power plants can be built, the programs and markets necessary to spur widespread DER adoption will require many years to develop and refine to achieve higher penetrations, since DER programs tend to ramp up slowly as marketing and outreach programs reach more and more customers annually.

Consequently, it may be desirable for the Commission to authorize the development of programs that support adoption of higher-cost DERs well in advance of when their deployment would be cost-effective (on a modeled basis) compared to other resources. Staff anticipates that these issues will likely be identified and addressed more fully in the IRP proceeding itself. (Appendix A provides an illustration of this disparity in the time associated with procuring conventional resources versus developing DER markets.)

### *Proposed Values*

For these reasons, Energy Division Staff recommends a modified approach to using preliminary RESOLVE results to determine an interim GHG adder. Rather than using the preliminary year-over-year values produced by the RESOLVE model, Staff proposes a linear ramp from the $0/tonne value in 2017 to the $250/tonne value in 2030.

This approach will serve as a (partial) counterweight to the delayed need for a GHG adder that results from excluding the cost of existing renewable contracts from the RESOLVE model, and it will also provide an earlier avoided GHG value that will in turn provide a more gradual ramp period for DER markets than a flat GHG value through 2022 followed by a rapid ramp from 2023 to 2030 will provide, while the IRP process considers and addresses the procurement differences between conventional resources and DERs.

Table 1 depicts the GHG adder values resulting from Staff's recommendation. Note that these values represent the GHG cost above the ARB allowance floor price, in dollars per tonne CO2.

## TABLE 1. Proposed Interim GHG Adder Values

| YEAR | *GHG Adder ($/Tonne CO2)* |
|---|---|
| 2017 | $ 0 |
| 2018 | $ 19 |
| 2019 | $ 38 |
| 2020 | $ 58 |
| 2021 | $ 77 |
| 2022 | $ 96 |
| 2023 | $ 115 |
| 2024 | $ 135 |
| 2025 | $ 154 |
| 2026 | $ 173 |
| 2027 | $ 192 |
| 2028 | $ 212 |
| 2029 | $ 231 |
| 2030 | $ 250 |
| Note: Values are incremental to the forecasted AB32 cap + trade floor price | |

## Appendix A: Comparison of Conventional and DER Procurement Timelines

Assume a utility has filed two applications at the Commission to serve an identified need in Year 7 of a resource planning forecast: one for a 100 MW gas turbine and another for a 100 MW combined energy efficiency and demand response program to reduce both overall and peak energy use of residential HVAC equipment. If those two budget applications are approved at the same time, each will ultimately provide 100 MW of new capacity, but the DR program will ramp up gradually, as shown in Figures 2 and 3 below. Both options will, ultimately, provide the same amount of capacity in the year in which a capacity need is determined (as indicated by the horizontal axis in the figures), but the DER programs will provide additional capacity (and energy) savings in the intervening years, as indicated by the area under the blue line in Figure 3.

Short-term procurement decisions that appear not to be least-cost, in terms of either system costs or GHG abatement costs at the time of procurement, can be considered a risk mitigation strategy. By funding the development of programs that support relatively high-cost DER resources now, the Commission could reduce the risk of DERs failing to materialize in the future when the If the expected quantity of DER resources is not available in the future, ratepayers may be forced to acquire even more expensive fast-tracked (so called "Just-In-Time Procurement") resources to replace them or tolerate higher levels of curtailment than would otherwise be needed. In that sense, the premium paid for any DERs that are not least-cost in the short run can be seen as a way to minimize the risk of exposing ratepayers to much higher costs in the future.

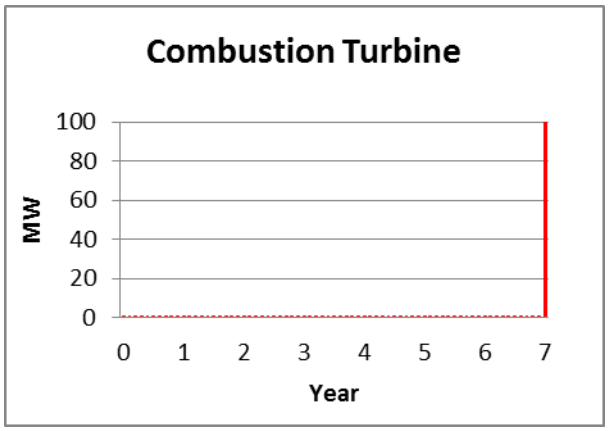


Figure 2: Possible new capacity from hypothetical CT approved in year 0

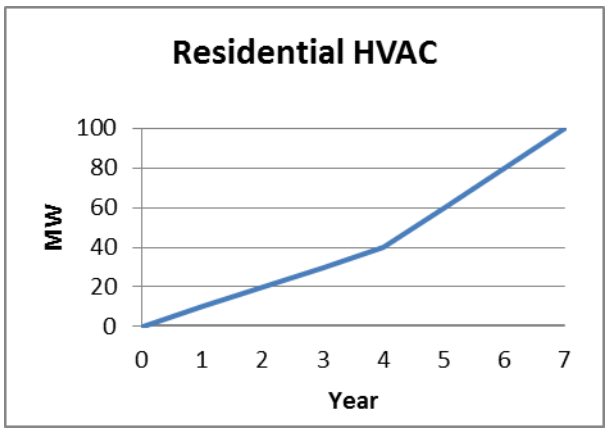


Figure 3: Possible new capacity from hypothetical solar program approved in year 0

(END OF ATTACHMENT)