Decision 09-06-051 June 18, 2009

BEFORE THE PUBLIC UTILITIES COMMISSION OF THE STATE OF CALIFORNIA

Order Instituting Rulemaking to Implement the Commission's Procurement Incentive Framework and to Examine the Integration of Greenhouse Gas Emissions Standards into Procurement Policies.	Rulemaking 06-04-009 (Filed April 13, 2006)

DECISION GRANTING PETITION FOR MODIFICATION OF DECISION 07-08-009

1. Summary

This decision addresses the petition to modify Decision (D.) 07-08-009 (Petition) filed by the Energy Producers and Users Coalition (EPUC).[1] In that decision, we clarified the methodology for calculating the greenhouse gas (GHG) emissions performance standard (EPS) associated with cogeneration facilities (Conversion Method) adopted in D.07-01-039. Upon reconsideration, we agree with EPUC that further clarification of the Conversion Method is needed to ensure that regulation of GHG emissions for bottoming-cycle cogeneration facilities is consistent with the overall framework of Assembly Bill 32 and our decision in Phase II of this proceeding. We therefore modify D.07-08-009 to state

[1] EPUC is an ad hoc group representing the electric end-use and customer generation interests of the following companies: Aera Energy LLC, BP West Coast Products, Chevron U.S.A. Inc., Shell Oil Products US, THUMS Long Beach Company and Occidental Elk Hills, Inc.

that when calculating the EPS for bottoming-cycle cogeneration, the Conversion Method shall not include the emissions associated with the industrial or commercial process, but rather, shall only include emissions associated with any supplemental firing that might occur.

2. Background

In D.07-01-039, we adopted GHG EPS for new long-term financial commitments to baseload generation undertaken by all load-serving entities, consistent with the requirements of Senate Bill (SB) 1368 (Stats. 2006, ch. 598). Among other things, we adopted the Conversion Method, a methodology for calculating the effective GHG emissions rate associated with cogeneration facilities.[2] The Conversion Method formula, shown below, calculates the effective GHG emissions rate in either tons/kilowatt-hour (kWh) or pounds/megawatt-hour (MWh), as specified:

$$\frac{\text{Total GHG Emissions From Cogeneration Facility}}{\text{kWh Electricity + British thermal unit (Btu) Thermal Energy (expressed in kWh)}}$$

The adopted Conversion Method recognized both the thermal and electrical output associated with cogeneration. D.07-01-039 stated that the Conversion Method formula could be applied to all cogeneration facilities, irrespective of the order in which useful thermal energy is produced.[3]

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[2] D.07-01-039 at 106.

[3] There are two types of cogeneration facilities. In a "topping-cycle" facility, the energy input into the system is used to produce electricity; the waste thermal energy (*e.g.*, steam) is a by-product that can be used directly for other purposes (*e.g.*, for an industrial or commercial process). A "bottoming-cycle" facility is one in which the energy input to the system is first applied to a thermal energy application or process (such as the industrial process of calcining petroleum coke), and then at least some of the waste thermal energy emerging from the application is used to produce electricity.

On February 26, 2007, EPUC, along with the Cogeneration Association of California (CAC),[4] filed a Petition for Modification of D.07-01-039 (EPUC/CAC Petition). In their petition, EPUC/CAC argued that it was not possible to apply the Conversion Method to calculate the effective emissions rate for bottoming-cycle cogeneration facilities because these facilities did not have any useful thermal output. According to EPUC/CAC, this is because all the energy input into the industrial process is used to produce the industrial commodity and the waste heat from the industrial process is what is used to generate electricity. Consequently, EPUC/CAC requested that the Commission recognize that a bottoming-cycle cogeneration facility does not consume any fuel to generate electricity and either deem the electrical generation function to comply with the EPS, or find that bottoming-cycle cogeneration facilities are exempt from SB 1368.

On August 27, 2007, we issued D.07-08-009, which denied the EPUC/CAC Petition. The decision noted that in order for EPUC/CAC's assertions of "no emissions" associated with the production of electricity from bottoming-cycle cogeneration facilities to be true, there would be no "cogeneration" involved at all. Further, D.07-08-009 modified D.07-01-039 to clarify how the Conversion Method could, in fact, be applied to bottoming-cycle cogeneration facilities. First, it clarified that the Total GHG Emissions from Cogeneration Facility

[4] CAC represents the power generation, power marketing and cogeneration operation interests of the following entities: Coalinga Cogeneration Company, Mid-Set Cogeneration Company, Kern River Cogeneration Company, Sycamore Cogeneration Company, Sargent Canyon Cogeneration Company, Salinas River Cogeneration Company, Midway Sunset Cogeneration Company and Watson Cogeneration Company.

"would reflect the total emissions from the facility, including both fuel used in the industrial process as well as any supplemental firing."[5] Second, it clarified that the thermal credit was "for the thermal energy produced by the industrial process that is used for electricity generation in the waste heat boiler."[6]

On September 26, 2007, EPUC filed a Petition for Modification (EPUC Petition). EPUC again argues that, despite the clarification in D.07-08-009, the Conversion Method still does not reflect the operating conditions of bottoming-cycle plants. It argues that since the clarification appears to allocate all of the emissions of the industrial process to electric generation, the methodology fails to consider the process causing the emissions. It then asserts that application of the Conversion Method, as clarified, is infeasible. The Natural Resources Defense Council (NRDC) filed a timely response opposing the Petition. On June 18, 2008, Indicated Cement Companies (ICC) filed a motion for leave to file a response in support of the Petition. In its motion, ICC indicated that it was not a party to the proceeding until June 5, 2008, and that it has been actively participating in Phase II of this proceeding. ICC's motion was granted by an Administrative Law Judge's (ALJ) ruling on July 1, 2008.

3. EPUC's Petition

In its Petition, EPUC argues that the Conversion Method fails to recognize that a bottoming-cycle plant is in essence an energy efficiency project because the method appears to allocate the total industrial emissions to electricity output. Consequently, EPUC asserts that application of the Conversion Method is

[5] D.07-08-009 at 12 (OP 2.a)).

[6] *Id.*

"nonsensical" and results in a distorted EPS for bottoming-cycle facilities. As support, it applies the Conversion Method to a hypothetical bottoming-cycle unit, which produces electricity by capturing waste heat from the calcining of petroleum coke, and notes that the formula results in the facility failing to meet the EPS.

EPUC therefore requests that the Commission modify the Conversion Method in one of two ways. First, it proposes that the methodology be modified to assign zero emissions to the industrial process and only include the emissions associated with any supplemental firing that might occur with the bottoming-cycle plant. Alternatively, EPUC requests that only a portion of the emissions be allocated to the industrial process.

4. Discussion

In D.07-01-039, we determined that the Conversion Method should be applied to both topping-cycle and bottoming-cycle cogeneration. This determination was affirmed in D.07-08-009, which further clarified the formula used in the methodology. As discussed below, we have considered the arguments made in the Petition and are persuaded that when applying the Conversion Method formula to bottoming-cycle cogeneration, only supplemental firing associated with the generation of electricity should be used to determine the EPS.

The EPUC Petition notes while the primary operating function of a topping-cycle cogeneration is to generate electricity, the primary operating function of a bottoming-cycle cogeneration is an industrial or commercial process, where electricity is generated by the capture of waste heat. Therefore, EPUC's Petition concludes, if a bottoming-cycle cogeneration facility is shut down and no electricity is generated, there is no reduction in total emissions,

since the emissions associated with the commercial or industrial process would still occur.[7] In contrast, emissions from a topping-cycle cogeneration are directly tied to the generation of electricity. Therefore, if a topping cycle cogeneration does not generate electricity, there are no emissions.

We recognized this difference between topping-cycle and bottoming-cycle cogeneration in D.07-08-009 and, therefore, clarified that "a thermal credit for the thermal energy produced by the industrial process that is used for electricity generation in the waste heat boiler" would be used in the denominator of the Conversion Formula.[8] However, based on the illustrative calculations included in the Petition and ICC's Reply Comments, we now agree that due to the characteristics of a bottoming-cycle cogeneration facility, there are no emissions associated with the production of electricity from a bottoming-cycle cogeneration facility unless there is supplemental firing. Therefore, we are persuaded that further clarification of the Conversion Method is needed.

In support of its request to modify D.07-08-009, the Petition maintains that use of the Conversion Method is "nonsensical." It then applies the Conversion Method to a hypothetical bottoming-cycle unit and concludes this hypothetical unit would not meet the EPS. By itself, EPUC's illustrative calculation of the EPS using the Conversion Method formula in its Petition could be considered a misunderstanding of how the formula should be applied, especially since NRDC's application of Conversion Method on the same hypothetical unit would conclude that it did meet the EPS.[9] However, ICC's illustrative examples

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[7] EPUC Petition at 4.

[8] D.07-08-009 at 12 (OP 2.a.).

[9] Compare EPUC Petition at 3; NRDC Response at 6.

demonstrate that the term "useful thermal energy" could mean different things to bottoming-cycle generators with the same industrial process, and that use of any of those values in the Conversion Method would yield a value for the EPS.[10] ICC maintains that none of these values are meaningful, since the bottoming-cycle facility was not using supplemental firing, and thus was not adding any incremental emissions beyond what already existed in the industrial process. Further, it contends that under the Conversion Method, a generation unit using pure waste heat would be found to be less efficient than a combined cycle gas turbine.[11]

NRDC argues that the emissions from the industrial process should be included in the calculation of the EPS and states, similar to a topping-cycle cogenerator, that a "thermal credit" will adjust for the fuel efficiency in cogeneration.[12] However, as noted above, the application of the thermal credit does not translate from the topping-cycle to the bottoming-cycle application. Further, NRDC's comments do not recognize that in light of Assembly Bill 32, an industrial source of emissions is already regulated and the EPS is solely measuring the emissions associated with the generation of electricity. Further, as pointed out by ICC, if a regulation compels a facility to decrease the GHG emissions associated with its industrial process, the result would be less waste heat that could be captured to generate electricity, not less GHG intensive

[10] ICC Response at 6-7.

[11] ICC Response at 7.

[12] NRDC Response at 5.

electricity.[13] Because of this disconnect, we find NRDC's arguments unconvincing.

Moreover, we more fully considered bottoming-cycle cogeneration with respect to GHG emissions and the allocation of administrative allowances in Phase II of this proceeding. In D.08-10-037, we recognized that in a bottoming-cycle cogeneration, if there is no supplemental firing, there are no additional emissions associated with the generation of electricity.[14] Further, we stated that since there were zero additional emissions associated with bottoming-cycle cogeneration facilities, those facilities did not need administratively allocated allowances for compliance in a cap-and-trade system.[15] Thus, in D.08-10-037, we stated that no allowances needed to be allocated to a bottoming-cycle cogeneration facility when there is zero supplemental firing because there are no new emissions associated with the generation of that electricity.[16]

In light of the arguments presented in the Petition and ICC's Response, as well as our subsequent determinations in D.08-10-037, we are persuaded that since the electric output of a bottoming-cycle cogeneration facility is generated using waste heat from the industrial process (assuming no supplemental firing), there are no associated GHG emissions. As such, D.07-08-009 should be modified to state that in the case of zero supplemental firing, there are zero additional emissions associated with the generation of electricity in a bottoming-cycle cogeneration application.

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[13] ICC Response at 9.

[14] D.08-10-037 at 238.

[15] *Id.* at 251.

[16] *Id.*

We now turn to the case where there is supplemental firing that occurs in the generation of electricity from a bottoming-cycle cogeneration facility. Supplemental firing can occur to either regulate the heat across the entire industrial process including the generation of electricity or to maximize the capture of waste heat for the generation of electricity. While the purpose of supplemental firing might vary from case to case, we believe that it is reasonable that all of the additional emissions that result from the supplemental firing count towards the EPS. If there were no bottoming-cycle cogeneration at the facility, then there would be no supplemental firing and no additional emissions would occur. While not all of the emissions might directly go to the generation of electricity, we believe that it is reasonable to attribute all of the emissions from supplemental firing to the generation of electricity and subsequently apply them to the EPS. Accordingly, in the case where supplemental firing occurs in a bottoming-cycle cogeneration facility, the emissions from that supplemental firing are additional and should be counted towards the EPS.

5. Comments on Proposed Decision

The proposed decision of the assigned Commissioner was mailed to the parties in accordance with Section 311 of the Public Utilities Code and comments were allowed under Rule 14.3 of the Commission's Rules of Practice and Procedure. Comments supporting the proposed decision were filed on June 1, 2009 by EPUC and ICC. No changes were made to the proposed decision.

6. Assignment of Proceeding

Michael R. Peevey is the assigned Commissioner, and Amy Yip-Kikugawa is the assigned Administrative Law Judge to Phase 1 of this proceeding.

Findings of Fact

1. D.07-08-009 clarified the Conversion Method for calculating the GHG emissions rate for bottoming-cycle cogeneration facilities.

2. The Conversion Method for calculating the GHG emissions rate for bottoming-cycle cogeneration facilities requires further clarification.

3. The emissions associated with the industrial process at a bottoming-cycle cogeneration facility would be the same whether or not the generation of electricity occurred.

4. When there is zero supplemental firing, there are no additional emissions with the production of electricity in a bottoming-cycle cogeneration facility.

5. Where there is supplemental firing, the additional emissions from the supplemental firing should be fully attributed to the electric generation.

Conclusions of Law

1. EPUC's Petition for Modification of D.07-08-009 should be granted for the reasons stated herein.

2. The clarifications made in D.07-08-009 to D.07-01-039 should be further clarified to state that when applying the Conversion Method to bottoming-cycle cogeneration facilities, only the emissions associated with supplemental firing shall be used in calculating the EPS.

O R D E R

IT IS ORDERED that:

1. The Petition for Modification filed by the Energy Producers and Users Coalition on September 26, 2007 is granted.

2. Ordering Paragraph 2.a of Decision 07-08-009 is deleted and replaced with the following:

> "The following language shall be *added* to footnote 140, which appears on page 107:
>
> The numerator of the conversion formula for a bottoming-cycle cogeneration facility would reflect the emissions associated with supplemental firing for the generation of electricity. The denominator of energy produced will consist of the kWh of electricity produced by the facility."

3. Rulemaking 06-04-009 remains open.

This order is effective today.

Dated June 18, 2009, at San Francisco, California.

MICHAEL R. PEEVEY
President
DIAN M. GRUENEICH
JOHN A. BOHN
RACHELLE B. CHONG
TIMOTHY ALAN SIMON
Commissioners