

December 15, 2014

Mike Waugh
Chief, Transportation Fuels Branch
California Air Resources Board
1001 "I" Street
Sacramento, CA 95814

Re: Pacific Gas and Electric Company's Comments on the Air Resources Board's Revised Draft California Modified Greenhouse Gases, Regulated Emissions, and Energy Use in Transportation 2.0

Dear Mr. Waugh,

Pacific Gas and Electric Company (PG&E) appreciates the opportunity to provide comments on the revised draft version of the California Modified Greenhouse Gases, Regulated Emissions, and Energy Use in Transportation (CA-GREET2.0) model, Version 2.0. The ARB's release of the revised draft CA-GREET2.0 model follows an October release of the draft model, in which PG&E filed comments,¹ and a workshop held by the ARB on August 22 at which PG&E participated and also filed comments.² PG&E thanks ARB for their continued collaboration throughout the CA-GREET2.0 process.

I. ARB SHOULD ENGAGE IN A BROAD STAKEHOLDER PROCESS

As part of the larger Re-Adoption, the ARB staff is updating critical technical information, including the CA-GREET2.0 model. In its October 24, 2014 comments, PG&E recommended that the ARB separate the CA-GREET2.0 model update from the overall regulatory package for the February Board hearing on LCFS re-adoption. PG&E still believes that, given the importance of the CA-GREET model to the overall LCFS program and the limited time before the release of the regulatory package, it would be better to utilize CA-GREET1.8b for the February Board hearing and continue to develop and refine CA-GREET2.0 in 2015. However, if the process cannot be bifurcated, PG&E makes the following recommendations, which would provide market and regulatory assurances:

- **Characterization of Natural Gas, Electricity and Other CIs:** While PG&E thanks ARB Staff for many helpful changes, as described in Sections III and IV, PG&E believes that the

¹ Krausse, M. (2014). PG&E Comments on the Air Resources Board's Draft California Modified Greenhouse Gases, Regulated Emissions, and Energy Use in Transportation 2.0. Website: <http://www.arb.ca.gov/lists/com-attach/16-ca-greet-comments-ws-WytTMIULV2EEXVMw.pdf>

² Krausse, M. (2014). PG&E Comments on the Air Resources Board's August 22 Workshop on the CA-GREET2.0 Model Update. Pacific Gas and Electric Company. Website: http://www.arb.ca.gov/fuels/lcfs/regamend14/pge_09222014.pdf

natural gas CI numbers in the revised draft CA-GREET2.0 are likely still too high. Moreover, updating them would require incorporating studies, such as those on fugitive methane emissions, which have not been published. Thus, when the CA-GREET2.0 update is presented to the Board, ARB staff should clearly indicate, in its staff presentation to the Board, and in the regulatory package that the CA-GREET2.0 is interim in nature and will change before the final Board vote on LCFS re-adoption.

- **Stakeholder Outreach:** ARB should initiate a comprehensive stakeholder process to finalize the CA-GREET2.0 in 2015 prior to the final adoption of the new regulation in 2015. PG&E appreciates ARB staff's willingness to engage with industry groups and also on a one-on-one basis with stakeholders for items related to the LCFS re-adoption. This public process should continue and be accelerated for the CA-GREET model update once the regulatory package is released. Specifically:
 - Industry working groups should become part of process of updating CA-GREET going forward; and
 - ARB staff should hold several public workshops to formally review the CA-GREET2.0 model in 2015, prior to final adoption.

II. ARB SHOULD CORRECT TECHNICAL ERRORS IN NATURAL GAS PATHWAYS

In PG&E's October 24, 2014 comments on the draft CA-GREET2.0 model, PG&E provided a number of technical comments on the natural gas pathways. PG&E appreciates the ARB's work to improve the updated draft version of CA-GREET2.0. Many adjustments in the natural gas pathways have been made from the prior release, and PG&E acknowledges the considerable effort ARB made to address stakeholders' concerns. However, natural gas pathways are still significantly impacted by the GREET2.0 update. Table 1 below shows the updated emissions in compressed natural gas (CNG) by lifecycle stage as compared to GREET1.8.

Table 1: North American CNG Pathway Emissions

Lifecycle Stage		GREET1.8b	CA-GREET 2.0 updated	Change
Upstream	Recovery	3.50	3.98	+0.48
	Processing	3.70	3.39	-0.31
	Transportation and Distribution	0.97	6.06	+5.09
	Compression	2.14	2.75	+0.61
Tailpipe	Embedded Carbon Content	55.20	56.09	+0.89
	Emissions	2.50	4.78	+2.28
Total		68.00	77.06	+9.06

The issues related to the natural gas pathways that have been identified thus far in the revised draft CA-GREET2.0, and which are detailed in ICF's updated technical report³, include:

- **Tailpipe Emissions of Natural Gas Vehicles Should Rely on Consistent, Accurate, and Recent Information:** The tailpipe emissions calculations in GREET2.0 should reflect the emissions of today's natural gas vehicles (NGVs). The tailpipe emissions of NGVs in the newest version of GREET2.0 are derived from 2002 data. PG&E appreciates ARB's efforts to update this data and will continue to engage with ARB, other stakeholders, and industry experts to ensure the most recent studies on the methane emissions from medium- and heavy-duty NGVs are incorporated.
- **Fugitive Methane Emissions Should Be Representative of California:** GREET2.0 should rely on state-specific data for fugitive methane emissions. Additionally, the calculation of transmission and distribution fugitive emissions should ensure there is no inadvertent double-counting. PG&E thanks ARB for their consideration of on-going studies in this area and looks forward to working with ARB to review the most accurate, up-to-date and appropriate data.⁴

III. ARB SHOULD CORRECT TECHNICAL ERRORS IN ELECTRICITY ASSUMPTIONS

Additionally, in updating the CA-GREET model, ARB staff also provided some updated values used in electricity pathways. PG&E thanks ARB Staff for the opportunity to review and provide comments in response to these updates. PG&E highlights three assumptions below and looks forward to continuing to work with ARB Staff to update these assumptions.

- **Coding Error in the Calculation of Power Plant Efficiency and Improve Efficiency Calculation for California Electricity:** One of the critical factors in the calculation of upstream generation emissions is the assumed efficiency of power plants. In the draft version of CA-GREET 2.0, there is an apparent coding error in the calculation of power plant efficiency, which should be corrected.

Additionally, power plant efficiency for CAMX should be drawn, preferably from CAMX (eGrid), instead of WECC. These efficiencies are approximately 10% higher for CAMX compared to WECC, reflecting the policy efforts within California to improve the energy efficiency and emissions of in-state generation.

- **The CA Resource Mix Should More Closely Reflect California In-State Generation and Imports:** The CAMX grid mix in CA-GREET 2.0 includes 10.4% renewables which would qualify under the Renewable Portfolio Standard (RPS). For several utilities in CA the amount of in-state renewable generation and out-of-state facilities owned by CA utilizes was and is increasingly much higher than 10.4% in 2010 included in CA-GREET

³ ICF International (December 2014). Technical Review of CA-GREET 2.0 Model (Updated)

⁴ ARB Workshop on ARB's Oil and Natural Gas Regulation, Dec 9, 2014. Slide 13 references several studies on methane emissions that PG&E has previously recommended for consideration under LCFS.

2.0. In addition, CA utilities import renewables to meet the RPS and this also accounted for in the CA-GREET 2.0 final version along with other imports (non-renewables). While PG&E understands that ARB Staff cannot update the California grid mix in isolation, it would like to explore how to properly credit renewables going forward.

IV. CONCLUSION

Thank you for the opportunity to submit these comments on the ARB's release of the revised draft CA-GREET 2.0 Model. PG&E appreciates the significant efforts ARB has taken to pursue the LCFS re-adoption and looks forward to working with you to further update and improve the program. Please feel free to contact me if you have any questions or concerns.

Sincerely,



Mark C. Krausse
Senior Director, State Agency Relations

Cc: Wes Ingram (wes.ingram@arb.ca.gov)
Katrina Sideco (katrina.sideco@arb.ca.gov)
Hafizur Chowdhury (hafizur.chowdhury@arb.ca.gov)
Chan Pham (chan.pham@arb.ca.gov)
Todd Dooley (todd.dooley@arb.ca.gov)