Comments from Joseph Stagner

Regarding

CEC Proposed Near Term Method for Estimating Generation Fuel Displaced by Avoided Use of Grid Electricity

I. Is a uniform statewide method appropriate for evaluating emissions displacement factors over a long-term (10-15 year) planning horizon? If not, please explain.

Stagner: Yes, it is a useful and necessary tool for a consistent and objective assessment of different options for serving California's energy needs. While it will never be perfect it is far better than having nothing and requiring/allowing individual energy planners to make their own determinations as to what is reasonable and appropriate for estimating this. In our recent long term campus energy planning process here at Stanford University we used a similar method by assuming a displaced grid heat rate of 7,200 to reflect the current average heat rate of grid gas generation, also excluding the CHP and other components and recognizing the small role peaking units play in the overall equation. While we believe that heat rate will decline we conservatively used this current heat rate for the full period of 2015 to 2050 so as to not overestimate the GHG addition or reduction impacts from adding to or reducing required grid electricity generation amounts. As another benchmark we compared this to the trend in average GHG emissions for both the CAMX region from the EPA eGrid tool (which is not updated fast enough) as well as PG&E system GHG factors.

II. Are the assumptions used to calculate the avoided generation for energy efficiency, demand response, and combined heat and power (and other distributed generation) correct? If not, what changes need to be made?

Stagner: I feel the proposed method is adequate for all, however an asterisk should be placed next to CHP and it clearly stated that while these factors can be used to determine the net GHG impact from the addition of on-site or off-site renewable energy generation, energy efficiency, and demand response, they absolutely cannot be used to determine this for CHP because CHP use fossil fuels and emits GHG itself. I agree with SDG&E, PG&E, SCE, and SMUD, and have previously submitted comments with supporting calculations to the CEC and CARB (regarding AB1613 implementation), clearly showing that distributed CHP will actually increase state GHG regardless of the relative efficiency of it to competing SHP options, simply because there is no RPS requirement for loads to be served by CHP…those systems can be 100% fossil fuel and exempt from the RPS and this is a fundamental flaw in current state energy policy and regulation.

Furthermore, while it is appropriate to apply an electricity line loss factor as a credit for on-site electricity generation, for the CHP option a line loss penalty for gas transmission must also be

included. And the line loss factors for natural gas should reflect the combination of extra CO2 for the energy that must be expended to transport the gas from production source to end use, as well as the 6 times higher effect of raw gas release into the atmosphere from leaks int eh production, storage, and transmission system…not just the CO2 from burning some of it to pump the gas through the pipelines. The net energy line losses for any proposed new energy project for both electricity and gas should be calculated using the distance from the current respective centroids of electrical generation and gas production to the geographical location of the proposed new project. If a proposed new gas fired energy project was constructed at the centroid of gas delivery in California then no gas line loss would have to be added because the gas would not have to travel any additional distance to support the new project. Conversely if the project were built many miles from the current centroid then there would be a net increase in gas transmission distance and the line losses/transport energy to get it there should be included. Likewise for electrical energy. But in any case it is inaccurate and biased in favor of CHP to assign electrical line loss credits but not levy gas line loss GHG additions for a project. And gas line losses are currently significantly underestimated and the EPA is embarking upon studies to better understand the true production, storage, transmission, and distribution losses for the nations natural gas infrastructure as raw natural gas is many times a higher GHG than CO2 after it is burned.

I agree with other commenters that 7.8 percent line loss on the electrical grid is too high and that better data is needed for that factor.

I believe that the average grid gas heat rate will actually decline faster than the linear regression suggests because as Cap and Trade takes more effect and as more renewables will be added into the generation mix that in general the least efficient gas grid power plants will be retired first for economic reasons and the decline in the average heat rate for the remaining gas power plant fleet will therefore accelerate faster than has been seen over the past decade. I respect the comments from the pro-gas stakeholders that accommodation of more renewables may result in a higher percentage of peaking gas production but I would suggest models of how the grid would perform under increasing renewable generation capacities should be performed to see if this anecdotal conclusion is real or not, and if so to quantify it objectively. I personally don't believe there will be that much impact as it will be baseload gas grid plants that spool up as the sun sets, not peaking units having to be fired because the overall statewide effect was unforeseen. We will know precisely when the sun will set and when PV generation will decline every day and the grid won't have to react by turning on peakers…but rather a coordinated spooling up of baseload plants will occur. Peakers are only necessary to deal with immediate transients and I don't see any data that suggests that the number and size of short term transients on the grid at higher % renewables will be more than it is today with the current mix of generation assets, especially if more thermal and electrical storage is added to energy systems in the state.

III. Is the treatment of onsite generation and associated electric grid displacement appropriate? Please explain.

Stagner: It is reasonable for all but CHP. As per the discussion above CHP will add more GHG to the state grid because it is exempt from the RPS and adding it into these tables and suggesting that it will result in a net reduction of GHG be supplanting grid electricity generation is misleading to all but very informed planners using the tool. Also, more GHG emissions due to gas line losses to get the gas to the CHP site must be included if electrical line loss credits are to also be given for CHP.

IV. How might this method be applied in program planning and comparison or program impacts? In what circumstances do you see the state using a method like this?

Stagner: It should be used in considering 'must take' energy projects imposed on the IOUs, especially CHP.

V. What programs and/or situations would this method be inappropriate to apply? (For example, would it be inappropriate to use this method to estimate the emissions avoided by geothermal plants that operate as base load?)

Stagner: It is inappropriate to use for CHP without also adding in the other things that must be done to calculate the true net overall impact of a proposed CHP project, rather than just stating one part of the equation for CHP in these tables.

VI. Do you think the approach (as a whole or specific elements of the method) will result in accurate estimate, or will it overestimate/underestimate grid displacement? Please explain.

Stagner: It will underestimate the GHG impacts from CHP but seems reasonable for the other items.

VII. What do you think are the appropriate levels of granularity, such as geographic or temporal, are necessary to provide a reasonable estimate of electric grid fuel displacement? Please use the discussion of method parameters section in Chapter 5 as a starting place for discussion.

Stagner: Establish a centroid of both electrical generation as well as gas generation and estimate line losses for both forms of energy for project locations based on distance from the respective centroids.