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California Energy Commission
1516 Ninth Street
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RE: Docket No. 08-IEP-1G -- 2008 Integrated Energy Policy Report – Self Generation Incentive Program Cost Benefit Analysis

Dear Commissioners:

San Diego Gas & Electric Company (SDG&E) and Southern California Gas Company (SoCalGas) respectfully submit the following comments related to the September 3, 2008 workshop on cost benefit analysis of the Self Generation Incentive Program (SGIP), and distributed generation (DG) in general.[1] SDG&E and SoCalGas appreciate this opportunity to provide these comments for consideration by the California Energy Commission (Energy Commission).

SDG&E and SoCalGas believe a well constructed cost benefit analysis could be a useful tool for analysis of programs and technologies. SDG&E and SoCalGas also believe the intent of the SGIP program is to develop and establish market transformation for clean distributed generation technologies similar to the California Solar Initiative (CSI) program. Cost benefit analysis could help to achieve the objectives of the SGIP in the most economically efficient manner.

I. Use of Declining Discount Rate

SDG&E provided comments on the use of a social discount rate in comments on the August 18, 2008 workshop presentation and discussion paper, "Discounting Future Fuel Costs at a Social Discount Rate." Many of the problems with a social discount rate are problems with the declining discount rate proposed by TIAX.[2] In addition, it has been documented that there are potential problems of irrationality and time preference inconsistencies that are introduced by the declining discount rate approach.[3] The Energy Commission should not use a methodology in government policy-making that

[1] The comments are based both on Attachment A and Workshop presentations. Several versions of Attachment A appeared on the Energy Commission website. These comments are based on the August 21 23 page version.
[2] TIAX presentation at the September 3, 2008 Energy Commission workshop, "Cost-Benefit Analysis of the Self-Generation Incentive Program (SGIP)," page 17.
[3] Akerlof, G. A. , "Procrastination and Obedience," *American Economic Review*, 1991, 81(2), pp. 1– 19; and Harris, C. J. and Laibson, D. "Hyperbolic discounting and consumption," in eds. Mathias Dewatripont, Lars Peter Hansen, and Stephen Turnovsky, *Advances in Economics and Econometrics: Theory and Applications, Eighth World Congress, Volume 1*, 2002, pp. 258-298.

can generate irrational behavior.[4] In addition, there is no basis for the 3.5 percent starting discount rate for discounting environmental benefits.[5]

As stated in comments on the August 18, 2008 workshop, the use of scenarios or sensitivity analysis is a much preferred strategy for accounting for the risks of natural gas price uncertainty and/or the cost of greenhouse gas allowances of conventional natural gas in the cost benefit calculation, rather than attempting to alter the discount rate.

II. Criteria Pollutant Benefits of Self Generation

First, "lifecycle emissions" should be replaced with "emissions" in the criteria pollutant analysis. On page 8 of Attachment A, the values in Table 5 are described as "lifecycle emission factors." However, on the same page, the document indicates that criteria pollutant emissions from upstream processing, transportation, and distribution of energy are not considered. SDG&E agrees with not considering upstream criteria pollutant emissions since they are complex to calculate and in many cases speculative.

Second, there is no basis for the assumption in Attachment A that the average mix of resources is replaced by self-generation. With regard to existing resources, increased self-generation will reduce gas resources primarily, not nuclear or renewables. At the September 3, 2008 workshop, TIAX stated that Attachment A was incorrect and the avoided pollutants will be based on a natural gas fired combined cycle combustion turbine (CCGT) as a marginal resource. For the future, after the RPS requirements have been met, the marginal resource should include a renewable component. Since distributed generation reduces utility load, it lowers the amount of required renewables. A marginal resource for environmental analysis should be 80 percent central station gas-fired generation and 20 percent renewables after the mandated RPS level has been reached.[6]

It is also unclear why a CCGT would need to be assumed if the analysis described in section 3.5.c, Grid Benefits, is completed as expected. If a production cost model representation of the WECC dispatch is completed, the modeling effort can identify specific plants with reduced outputs that could be used for any environmental benefit calculation in place of the CCGT proxy approach.

In addition, there is a question about the damage values in Table 6, which are health based, but do not seem to vary based on the nearby population. In the September 3, 2008 workshop, it was indicated that the health damage value of criteria pollutant reductions is proportional to population density; however, the value for PM2.5 is from a study of densely populated port areas which is then applied to all conventional generation. It seems clear that criteria pollutant emissions in the middle of California or Nevada deserts would seem to cause fewer health effects compared to emissions near densely populated California port areas. Using data from densely populated port areas for the entire state of California may introduce error.

III. Macroeconomic Benefits of Self Generation

Attachment A would include an estimate of macroeconomic benefits. SDG&E believes any macroeconomic benefits are small and highly speculative and should not be included in the cost-benefit

[4] The declining discount rate has been used to explain consumer behaviors including procrastination, overeating, high levels of credit card debt, and lack of follow-through on New Year's resolutions.

[5] TIAX presentation, page 16.

[6] The California Air Resources Board Draft Scoping Plan includes a provision for a 33 percent RPS requirement. The Energy Commission, the CPUC, the California Independent System Operator and the utilities are currently investigating the feasibility of this recommendation. If this mandate is adopted, the analysis should include 33 percent renewable power after the 33 percent mandate is reached.

framework. The total statewide SGIP amount of 233.6 MW installed over 6 years is a very small amount to try and tease a macroeconomic effect out of, especially since it is replacing spending on conventional generation or consumer spending. The macroeconomic benefit would be a comparison of the impact of new SGIP technology versus the impact of existing or new central station technology. Such a macroeconomic benefit would occur only if 1) the DG technology has a higher likelihood of using resources made in California than conventional generation, or 2) the DG technology leads to more spending in California than would have otherwise occurred based on utility customer spending patterns.

In the first case, the DG technology would avoid the conventional central station gas-fired generation. With the substitution of the DG technology for central station gas-fired generation, there will be DG-related increased spending and reduced central station spending. Where generation costs are avoided, the net macroeconomic benefit would depend on the percentage of construction-related demand for goods and services in California related to the DG technology compared to conventional generation. The bottom line is that the macroeconomic benefit will depend on numerous assumptions about where the primary components of the technologies are manufactured: central station gas-fired generation equipment versus the DG technology. The location of such manufactured products is highly speculative without the SGIP subsidies being contingent on the use of California manufactured goods. And again, the addition of less than 40 MW per year as part of SGIP is unlikely to have any measurable impact.

If the DG technology is more expensive that the central station technology or it is simply reducing existing generation, any calculated benefit would have to be offset against the negative impact of higher electricity rates reducing disposable income of non-participating utility customers. If subsidies are provided, then there is a reduction in purchased power among the non-participating utility customers. To properly evaluate the macroeconomic costs of the higher utility rates would require an analysis of how Californians would likely spend the added disposable income if not for the DG subsidies and what percentage would be spent on goods and services produced in California. While the IMPLAN input-output model may be capable of producing a result, the numerous technical assumptions and very large data requirements make the exercise open to manipulation. The results of the analysis will hinge on speculation on the degree of agglomeration of DG supply industries in California versus conventional technology or general consumption. In the final analysis, consumer groups will argue the rate increases will have a larger, negative impact on California than the positive macroeconomic benefits provided by the DG; while DG proponents will argue the opposite.

IV. Capacity and Energy Benefits of Self Generation

SDG&E agrees that 95 percent of the value of avoided costs are in the energy and capacity value of DG and does agree that local resource adequacy areas, such as the SDG&E service area, should be modeled to provide accurate avoided costs. Important in the modeling effort is whether the production cost model accurately portrays existing generation and planned generation resource and transmission expansions. As has been seen in the E3 modeling effort for analysis of greenhouse gases, it took a significant effort to get the existing stock of generation facilities correct in the production cost model.[7] In addition, the E3 modeling has shown that the cost of future generation can vary significantly depending on assumptions about the type of renewables and conventional resources developed, the location, and the amount. These assumptions should have been provided to stakeholders early in the analysis process to receive adequate vetting; but since they have not been provided, the results expected in the draft report provided on September 18 will be suspect.

[7] Two separate efforts were made with stakeholders. The final model and resources can be found at http://www.ethree.com/cpuc_ghg_model.html

The production cost modeling effort will produce hourly profiles of market clearing prices that are "essential to proper valuation of the largest component of avoided costs." But it should be recognized that those prices will reflect the operating cost of the marginal generation resources and will be sensitive to the assumptions about the characteristics of existing generation and new generation and transmission resources added in the entire WECC. Without these assumptions being made explicit, the resulting energy prices over the 20 year future period to be used in the analysis are questionable, especially on a local area basis. The location of resource additions in the future under Market Redesign Technology Upgrade (MRTU) will determine locational marginal prices and marginal losses over the next 20 years.

Calculating the capacity benefits, or equivalently resource adequacy value, has been an area of considerable discussion in cost benefit analysis at the California Public Utilities Commission (CPUC).[8] Attachment A and the RUMLA presentation do not provide an adequate explanation of the intended approach to this calculation, and so at this point SDG&E and SoCalGas cannot provide meaningful comments.[9]

V. Transmission and Distribution Benefits of Self Generation

SDG&E agrees the approach to calculating avoided transmission and distribution (T&D) costs. Transmission is likely not avoided by the technologies in the SGIP program given the relatively small size of SGIP projects and the inherent lumpiness of transmission. Further, statements with regard to distribution avoided costs in Attachment A and at the September 3, 2008 workshop seem consistent with past CPUC decisions on the issue. In D.03-02-068, at page 18, the CPUC stated,

> "SDG&E outlines the criteria distributed generation must meet to allow the utility to defer capacity additions and avoid future cost. The distributed generation must be located where the utility's planning studies identify substations and feeder circuits where capacity needs will not be met by existing facilities, given the forecasted load growth. The unit must be installed and operational in time for the utility to avoid or delay expansion or modification. Distributed generation must provide sufficient capacity to accommodate SDG&E's planning needs. Finally, distributed generation must provide appropriate physical assurance to ensure a real load reduction on the facilities where expansion is deferred. There is potential that distributed generation installed to serve an onsite use will also provide some distribution system benefit, however, unless it meets the four planning criteria describe by SDG&E, such benefits will be incidental in nature."

As noted in the RUMLA presentation, the valuation of this benefit is very difficult. It involves looking for highly saturated, slow growth circuits where the local DG was large enough or will be large enough to make a difference in deferring a distribution upgrade. SDG&E does not believe that any conclusion can be drawn that SGIP installations have deferred distribution capacity upgrades in its service area based on the data it provided. Additionally, based upon a review of distribution planning records there has been no deferral of capacity projects due to SGIP.

VI. Other Benefits

The RUMLA presentation at page 11 contains a list of potential benefits not contained in Attachment A, but it was unclear from the September 3, 2008 workshop presentation, which of these

[8] In R.04-04-025, see D.06-06-063 and D.07-09-040. It has also been an issue in R.07-01-041.
[9] RUMLA is another consultant on the project in addition to TIAX and Jack Fawcett Associates.

benefits will be included in the cost benefit analysis. From the workshop presentations, it is SDG&E and SoCalGas' understanding that the analysis will be done as a societal test only and that a non-participant ratepayer analysis will not be provided. From a societal perspective, the customer environmental credit should be excluded as it would double count a portion of the societal environmental benefit. The customer reliability benefit (and other customer benefits) should be included and could be calculated based on the customer's cost for the DG technology in excess of expected incentive payments, bill savings, and tax benefits. That is, the customer is assumed to find the benefits exceed the costs; if the bill savings and incentives do not cover the cost there are unidentified customer benefits.

The congestion reduction and gas price moderation are not benefits that should be considered given the relatively small size of the SGIP program. With less than 40 MW per year installed, the SGIP program would have negligible impact. In addition, as far as congestion reduction, any calculated benefit will exist primarily if it is assumed that CAISO local resource adequacy would not be met but for the DG technology. A better assumption is that conventional generation would have not been retired or new generation would have been built instead of the DG project to meet local resource adequacy requirements.

VII. SGIP Moving Forward

Attachment A references the many technologies that have been eligible for SGIP incentives at various points:

> The eligible generation technologies through 2006 and considered in this report include: photovoltaics (PV), microturbines (MTs), gas turbines (GTs), wind turbines, (WD), fuel cells (FCs), and internal combustion engines (ICEs). The incentives for DG technologies that rely on fuel (i.e., all except PV and WD) were further distinguished by the use of renewable and non-renewable fuel. (Pg. A-3)

It should be noted that under current SGIP rules, PV projects have not been eligible since January 1, 2007. And, only fuel cells and wind projects have been eligible since January 1, 2008. SDG&E and SoCalGas believe that while it makes sense for PV projects to continue to be addressed separately in the CSI program, it makes sense for microturbines, gas turbines, and internal combustion engines to be re-instated as eligible technologies if there are environmental benefits and they are cost effective. SDG&E and SoCalGas support efficient combined heat and power (CHP) projects, especially those that use renewable fuel. Re-instating these technologies to the portfolio of eligible SGIP technologies will provide more options for customers with a wide range of needs, and will help further transformations in the DG market.

Attachment A at page 21 suggests that only Sterling engines and energy storage may warrant attention as future SGIP eligible technologies beyond fuel cells and wind turbines. SDG&E agrees with these additions, but is hopeful that CHP is re-instated and notes that the CPUC Office of Governmental Affairs (OGA) identified as a priority for 2008, new SGIP legislation to expand the suite of eligible technologies, and this recommendation was unanimously approved by the CPUC on January 10, 2008.[10]

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[10] Public Agenda 3206 page 16 approved No. 5: MODIFY SELF GENERATION INCENTIVE PROGRAM TO ALLOW THE CPUC TO DETERMINE ELIGIBLE TECHNOLOGIES Recommendation: Amend Section 379.6 of the Public Utilities Code to delete the requirement that Self-Generation Incentive Program (SGIP) payments only be awarded to projects using wind or fuel cell technologies by 2008 and return the decision of which technologies are eligible back to the Commission. This proposal would delete the recently enacted statutory prohibition on providing SGIP rebates for clean, gas-fired distributed generation (DG) and combined heat and power (CHP) projects after January 1, 2008 and return discretion to the Commission to determine eligible technologies as was the practice under the original SGIP.

Attachment A at page 21 also states incorrectly that "[t]he minimum size for currently incented SGIP systems is 30 kW per site…" This is incorrect since the 30 kW limitation applies only to renewable projects (SGIP Level 2) but not for non-renewable projects (SGIP Level 3). In fact, SoCalGas received and is processing the first application requesting a rebate for a 10 kW residential fuel cell (two units of 5 kW each).

Attachment A at page 22 further states "…energy storage systems should be considered a candidate for SGIP." It should be noted that in fact, a Program Modification Request for advanced energy storage systems has been submitted, reviewed and endorsed by the SGIP Working Group, and is being considered by the CPUC who is expected to render a decision on this matter in the near future.

VII. Conclusion

SDG&E and SoCalGas look forward to working further with the Energy Commission and Staff on the development of a manageable and accurate cost benefit framework. The cost benefit framework should avoid speculation and be manageable to implement and update. SDG&E and SoCalGas hope that this effort at developing a cost benefit analysis for DG can be in collaboration with the CPUC. While the time frame for the report on the SGIP program does not allow for interaction with the CPUC, the fact that the CPUC is reviewing cost benefit methods for DG in R.08-03-008 including the methods proposed in R.04-03-017 could be a forum for further work on the cost benefit methodology for DG. And to reiterate the statement in the opening paragraph, SDG&E and SoCalGas believe the intent of the SGIP program is to develop and establish market transformation for clean distributed generation technologies. SDG&E and SoCalGas look forward to actively participating in this process to further this objective.

Yours sincerely,

Bernie Orozco