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California Energy Commission
Dockets Office, MS-4
Re: Docket No. # 09-IEP-1E
1516 Ninth Street
Sacramento, CA 95814-5512

Re: GreenVolts, Inc.'s Comments on the Draft Staff Report Entitled "Comparative Costs of California Central Station Electricity Generation."

GreenVolts has reviewed the Draft Staff Report: Comparative Costs of California Central Station Electricity Generation (August 2009), and has some questions and comments.

(1) What is the factual basis for the 27.00% capacity factor assigned to Solar-PV (Single Axis) (e.g. Table 11)? The Draft Report on page 44 states that capacity factor is defined as: "More precisely, it is equal to the energy generated by the power plant during the year divided by the energy it could have generated if it had run at its full capacity throughout the entire year (8,760 hours)." However, we could not find in either the Draft Report or the KEMA Report: Renewable Energy Cost of Generation Update (August 2009) the data on which the capacity factor was determined. Presumably, the Draft Report and/or KEMA relied upon actual output of one or more Solar-PV single axis tracking facilities, and the reported "full capacity" of such facilities, which may have been the "nameplate" capacity. It is not evident whether the Staff Report and/or KEMA relied upon the DC or AC output and "nameplate" capacity in making their calculations. Further, if the Staff Report and/or KEMA is converting DC to AC, it is not evident what losses are assumed from the conversion.

We think you may be understating the capacity factor of Solar-PV (Single Axis). For example, the KEMA Report at page 86 provides as an example the "14.2 MW" single-axis PV system at Nellis Air Force Base. The Renewable Ventures website (www.renewableventures.com/portfolio/project-nellis.htm) states that the Nellis Air Force system puts out 31,467,000 kWh per year. We suspect that the reported "nameplate capacity" is 14.2 MW-DC while the output is reported in AC. If so, the "capacity factor" of that system depends on the losses that KEMA assumes result from DC to AC conversion. If one uses the 22.40% "Plant Side Losses" assumed by the Draft Report in Table 11, and the "nameplate capacity" is DC, then the peak capacity, AC, is 14.2 MW-DC x (1-22.4%) = 11.0 MW-AC. Using the peak capacity in AC and the

output, also in AC, the "capacity factor" for the Nellis Air Force Base system is $\frac{31{,}467\ \frac{MWh}{yr}}{11.0\ MW-AC \times 8760\ \frac{hr}{yr}} = 32.6\%$. Similarly, the capacity factors for two single-axis PV systems that are planned by SunPower and Nextlight, and whose output has been contracted for by PG&E, but have not been built, are calculated below. All information for these calculations came from the Database of Investor-Owned Utilities' Contracts for Renewable Generation, Contracts Signed Towards Meeting the California RPS Targets (http://www.energy.ca.gov/portfolio/contracts_database.html).

Facility Name	Developer Name	Minimum Size (MW)	Minimum Expected Deliveries (GWh/yr)	Capacity factor
High Plains Ranch II	SunPower	210	550	29.9%
AV solar Ranch	Nextlight	230	592	29.4%

(2) What is the basis for the 22.40% "Plant Side Losses" assigned to Solar-PV (e.g. Table 11)? We have not been able to find it in the Draft Report or the KEMA Report. The Draft Report defines Plant Side Losses on page 40 as: "This is the power consumed by the power plant as a part of its normal operation. It can also be defined as the difference between the gross capacity and net capacity." We are not aware of any data indicating that Solar PV uses 22.40% of its electrical output to operate the plant. We suspect that the Draft Report has used 22.40% to reflect the conversion of DC output to AC output and perhaps other losses. Please provide the data or explanation supporting the 22.40% figure.

(3) If the 22.40% "Plant Side Losses" reflect DC to AC conversion losses, or other losses that occur before AC output is measured, then it seems that the Draft Report's calculation of LCOE may be double-counting those losses. The definition of the Capacity Factor suggests that it was based on the estimated AC output of a Solar-PV plant, which would already reflect the losses from DC to AC conversion and other losses prior to the measurement of the AC output. Does the capacity factor calculation determine the "full capacity" based on the gross DC peak capacity or the net AC peak capacity? Again, a clear explanation of how the "Capacity Factor" and the "Plant Side Losses" were determined, and what factual data were relied upon, will allow us to determine whether the Draft Report effectively double counts those losses. Obviously, if there is double—counting, then the estimated cost is incorrect.

(4) We also believe that the assumption of 5% "transmission losses" to renewable and 2.09% "transmission losses" to fossil fueled plants is too simplistic and too often will create an inaccurate cost comparison. The rationale on page E-1 is that conventional plants can be "located near load centers and along existing

transmission corridors" while renewable plants "must be located at the energy source, which typically is located far from load centers or transmission corridors." While that generalization sometimes is true (a solar plant in the desert away from transmission), it frequently is not. "Transmission losses" depend in large part on distance of transmission. Particularly with respect to Solar-PV plants, even at the 25 MW utility scale size assumed in the Draft Report, the plant can be located close to load on existing transmission and/or distribution lines with capacity. The "energy source" (i.e. sunlight) is just as available near many load centers as it is far away. By contrast, efforts to site conventional power plants close to load have met fierce opposition and, in many cases, have been abandoned in California. (As an aside, siting any power plant near existing transmission lines does not mean that the existing lines have capacity or that the addition of generation will not cause significant system upgrade costs.) We think it would be appropriate to reduce the "transmission losses" for Solar-PV as sun shines near load centers and it is more likely that a 25 MW plant would be built near load centers than in the desert. The Draft Report might footnote that "transmission losses" could increase if a larger Solar-PV plant were proposed to be located further away from load centers, as indeed a 250 MW Solar-PV plant might be built in less-populated areas.

We appreciate the opportunity to comment upon the Staff Report and look forward to learning more about the data underlying it.

Respectfully submitted,

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