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Comments of the Green Power Institute on the Staff Workshop on Higher Levels of Renewables in the Electric System

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Introduction

The Green Power Institute (GPI) respectfully submits these comments on the California Energy Commission's *Workshop: Impacts of Higher Levels of Renewables on the Electric System – Summary of Recent Studies*. Our comments address the issues of contract delays and success rates for renewable energy projects, cost impacts, and operational impacts of 33-percent renewables in California.

The 33 Percent Renewables Target

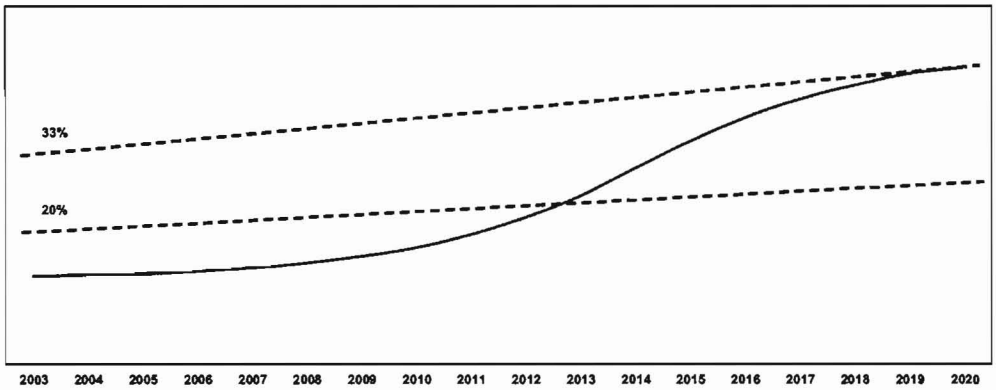
The stretch RPS target of 33-percent renewables by 2020 has been a topic of conversation in California for several years, particularly since the state's *Energy Action Plan* endorsed it in 2005. The California Air Resources Board (ARB) adopted the 33-percent renewables-by-2020 standard as one of the core components of the recently released *Climate Change Draft Scoping Plan*, which will serve as the state's roadmap to the implementation of AB 32, the Global Warming Solutions Act. There is simply no question that renewable energy must be a major part of any set of strategies that can be used to reduce the state's greenhouse-gas emissions, and the institution of a firm 2020 RPS mandate provides the continuing market confidence that is needed to allow renewable energy generating capacity to expand in California.

The GPI has long argued that the only compelling rationale for accelerating the state's 20-percent RPS target deadline from 2017 to 2010 is so that the accelerated goal can be backed up by a higher, longer-term stretch goal for renewables. Otherwise, the policy would result in a quick burst of development activity in the state's renewable energy sector, followed by an abrupt and precipitous halt. Those are not the kind of conditions that are conducive to the development of a stable, sustainable renewable energy industry in the state. Renewable energy generation is a highly capital-intensive enterprise, and in order to sustain a flow of investment capital into the renewable energy sector in California, a long-term stretch goal for renewables is highly desirable. The state's statutory greenhouse-gas-reduction mandate (AB 32) only reinforces the need for the establishment of the 33-percent-by-2020 renewables mandate.

Uncertainty regarding long-term renewables policy in California has long been a major impediment to attracting investment capital. The stretch target of 33-percent renewables by 2020 is exactly the kind of goal that can lead to the development of the renewable energy industry that Californians overwhelmingly desire. Adopting the 33-percent stretch goal for renewables as one of the core elements of the final *Scoping Plan* will greatly enhance the chances for the state to meet its AB 32 targets.

It is now widely recognized that the utilities are not going to meet their statutory obligation to procure 20 percent of their energy supply from qualifying renewables by 2010. Several parties, including some of the utilities who are lagging in meeting their current annual RPS obligations, have argued that their impending failure to make the 2010 mandate indicates that the stretch target of 33 percent by 2020 is equally unobtainable. This is simply incorrect. Due to the long lead time that is still available for reaching the 2020 stretch goal, combined with the head-start that has been provided by the acceleration of the original twenty-percent renewables goal to 2010, it will actually be easier for the LSEs to reach the 33-percent-by-2020 standard than it ever was for them to reach 20-percent renewables by 2010. The Figure below illustrates graphically how this is the case:

Illustrative Scenario for 33 Percent Renewables by 2020



The renewables procurement curve in the figure is based on procurement data for 2003 – 2007 provided by the three IOUs in their periodic *RPS Compliance Reports* to the CPUC, and a growth rate for composite IOU retail sales of 1.5-percent per year. The near-term part of the projection shown in the figure, 2008 – 2010, is based on maintaining the entire existing renewable infrastructure that is currently serving the three IOUs, augmented by the scheduled startups of new renewable capacity that is currently under development for the three IOUs, with a 70-percent success rate applied to all new and restart contracts. The long-term part of the projection, 2011 – 2020, is based on constructing a market-reasonable scenario for connecting the 2003 – 2010 data to a 33 percent renewables contribution by 2020.

The RPS penetration curve for the three IOUs shown in the figure illustrates a scenario that, we believe, the state's retail electricity providers could realistically achieve, although not without focused, diligent, and sustained procurement efforts over the next decade and longer. In 2007 the state's three large IOUs had a composite renewable content of approximately 12.7 percent in their energy mix, down from 13.2 percent in 2006. Statewide, the qualifying renewables content is lower. In order for California's electricity sector to get onto the renewables-growth curve illustrated in the figure, all of the state's retail providers will have to be far more effective in their future renewables procurement efforts than they have been so far. Even if all retail providers are able to

follow the scenario shown in the figure, the twenty-percent benchmark will not be achieved until 2013 at the earliest.

California's two largest utilities, PG&E and SCE, have both argued that, in effect, the state is already running out of renewable resource development opportunities. If true, this would put the 33-percent-by-2020 stretch goal seriously in doubt. We strongly disagree with the assertion that California is experiencing renewable resource shortages at this early stage of the RPS program. Considering the minimal amount of new renewables development that has actually occurred in California since the 2002 enactment of the RPS program, asserting that the pool of renewables is already being depleted is equivalent to saying that the pool was nearly empty from the start. A variety of sources have documented California's bountiful endowment of renewable resources. This includes specific reports on biomass[1], geothermal[2], hydropower[3], solar[4] and wind[5]. According to the CEC *Renewable Resources Development Report*:[6]

> The gross technical potential for wind, geothermal, biomass, biogas, small hydroelectricity, and solar power is estimated to be more than 262,000 gigawatthours per year (GWh/year). By way of comparison, total electricity generated in California in 2002 was 272,509 GWh. [CEC *Renewable Resource Development Report*, p.52]

We believe that there is a clear record showing that California has a more than adequate resource base to support the achievement of the stretch goal of 33-percent renewables in California's energy mix by 2020, and that this resource base has the capacity to support much more new project development than is currently occurring in the state. To the extent that there are impediments to the development of new renewable generating facilities in California, it is not in the area of inadequate physical resources, nor are there inadequate technologies to harness the known available resources.

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[1] California Biomass Collaborative, *Biomass Resource Assessment in California*, Report no. CEC-500-2005-066-D, April 2005.
[2] Sison-Lebrill and Tiangco, *California Geothermal Resources*, Report no. CEC-500-2005-070, April 2005.
[3] Kane, California Small Hydropower and Ocean Wave Energy Resources, Report no. CEC-500-2005-074, April 2005.
[4] Simons and McCabe, *California Solar Resources*, Report no. CEC-500-2005-072-D, April 2005.
[5] Yen-Nakafuji, *California Wind Resources*, Report no. CEC-500-2005-071-D, April 2005.
[6] California Energy Commission, *Renewable resources Development Report*, report no. 500-03-080F, November 2003.

The GPI has little doubt that if the right commercial terms were offered to developers, there would be a plentiful supply of new renewable project proposals with a strong likelihood of achieving commercial operations. During the early 1980s, when the interim standard offer no. 4 PPAs were available, there was no lack of proposals for new renewable energy projects being made to the utilities. Those contracts apparently did offer commercial terms conducive to attracting project proposals. Most of the state's current renewable energy supply is generated by facilities that were developed during this period. Since the suspension of standard offer no. 4 there has been a dearth of new renewable energy projects developed in the state. Thus, our conclusion is that if the right commercial terms were available, without knowing exactly what those terms might be, there would be a flock of responsive proposals with a strong likelihood of achieving commercial operations.

One of the serious impediments to the development of new renewable generating capacity in California in the short term is the lack of adequate transmission infrastructure. We readily acknowledge that the state's existing transmission infrastructure is inadequate for today's needs, and that new transmission will need to be developed in the state in order to achieve the 33-percent renewables-by-2020 goal. While the inadequacy of the existing transmission system poses a serious challenge to the procurement of sufficient renewables to meet the state's stretch goal, we believe that it is not an issue that will ultimately prevent its achievement. With the compliance date set in 2020 there is sufficient lead time to update and expand transmission capabilities to areas of the state that can support high renewable energy production, and efforts to make this happen are well underway in the state on a number of fronts, including the statewide Renewable Energy Transmission Initiative (RETI), on whose Stakeholder Steering Committee the GPI sits. Moreover, we are aware on an anecdotal basis of a number of viable renewable energy projects that would not require major transmission upgrades. These projects have been overlooked in the current RPS solicitation process. Transmission access is indeed an impediment to increased renewables development in California, but it is also being used as an excuse for failure to meet current annual procurement targets, and as a rationale for arguing against setting aggressive future procurement targets (33 x 2020).

In both instances the problem of inadequate transmission, while significant, is probably being oversold.

Contract Delay and Success Rates

The adoption of the long-term stretch goal of 33-percent renewables-by-2020 will help to stabilize and drive renewable market growth in California. The physical resources necessary for the development of adequate renewable energy to serve 33 percent of all statewide energy procurement are available within the state, and can be augmented by some amount of imported renewables. The 33-percent renewables-by-2020 goal is undeniably technically feasible. As such, the GPI believes that it is only a matter of establishing the right commercial terms in order to achieve the goal of 33-percent renewables by 2020. We note, however, that if retail providers continue to gear their procurement activities to acquiring just barely enough power-purchase contracts to provide their mandated requirements, they will surely fail to meet the 33-percent mandate. This is so because of the reality that not all signed contracts will result in operating generating facilities. This has been true since the independent-energy generating industry was created by PURPA some thirty years ago.

The IOUs and the Commission all have publicly acknowledged that twenty percent renewable content by 2010 will not be achieved. Nevertheless, all three of the IOUs have stated publicly that they expect to achieve twenty-percent renewables in their supply mix by 2012 or 2013, and to fulfill their 2010 procurement obligations using flexible compliance means. We are not convinced that this level of confidence is in any way justified. We are particularly concerned that all three IOUs are continuing to assume that 100 percent of their signed RPS contracts for projects under development will be fulfilled. The GPI has worked diligently in the RPS Proceedings of this Commission and those of the PUC, in an effort to instill into the deliberations an understanding that not all contracted-for new RPS generating capacity will result in operating projects. The CEC sponsored a study on the subject of RPS contract-fulfillment risk in 2005,[7] and concluded

[7] Kema, Inc., *Building a "Margin of Safety" in Renewable Energy Procurements: A Review of Experience with Contract Failure*, consultant report to CEC, report no. CEC-300-2006-004, January, 2006.

that parties to the procurement-planning process should assume that at least 20 – 30 percent of contracted-for new development projects will never achieve operational status. This study should be added to the list of previous studies that are being considered in this phase of the IEPR process.

The question being asked here is: What are the implications of the fact that some fraction of the contracts for new renewables will fail, and another fraction of the contracts will experience delays, for the prospects of achieving a 33-percent renewables-by-2020 standard? The answer, we believe, is clear: If retail providers fail to adequately anticipate and accommodate contract delays and failures in their renewable procurement efforts, which essentially has been their approach so far, they will surely fail to achieve the 33-percent target by 2020. On the other hand, if they conduct their procurement activities with an understanding and accommodation of marketplace realities, and build an adequate margin into their portfolio of development projects, there is no reason why they couldn't achieve the 33-percent-by-2020 target.

The final question in this section of Attachment B (3d) asks: "What can be done to increase the rate that new renewable energy begins operation?" In the opinion of the GPI, the utilities are simply not bringing enough quality renewable development projects into their portfolios. We define the term "quality renewable development project" as being a project that has a high probability of achieving full operational status, and of operating reliably (within the parameters of the given technology) for the duration of the power contract and beyond. This is a subjective judgment, and takes into account factors such as the experience and technical expertise of the developer, the technology being deployed and the resource being harnessed, and whether the PPA provides sufficient remuneration based on industry average costs to allow the project to operate successfully employing best engineering practices.

It appears to us that some of the project proposals that are being made to the utilities may be too good to resist, but ultimately not viable in the real-world marketplace. If there is one crucial element that is lacking in the current solicitation selection and monitoring process, it is a keen insight into the true marketplace viability of the projects that are

proposed in response to a utility's solicitation. What the utilities need is a way to assign realistic probabilities of success to the various bids they receive, so that they can avoid the trap of being seduced by attractive bids that can never be fulfilled, while overlooking realistic bids that, while more expensive, actually could lead to real delivered renewable energy. We believe that the success rate for new projects could be improved if better and more predictable commercial terms were available to project developers. One way to accomplish this is the use of standard contracts with pre-set feed-in tariffs. The GPI recently submitted comments on this topic to the IEPR docket (*Comments of the Green Power Institute on the 2009 IEPR – Renewable energy Feed-in Tariffs*, July 11, 2008).

Cost Impacts

The cost of implementing a 33-percent renewables-by-2020 standard has been the subject of considerable analysis and debate. The GPI's overriding concern with this discussion is that the uncertainties pertaining to many of the variables are so great that they virtually preclude the drawing of any robust conclusions from the analyses.

For purposes of these comments, we wish to address Question 4a. in Attachment B, which asks: "Would wholesale energy costs to the utilities increase or decrease by implementing a 33 percent goal?" The 33-percent stretch RPS goal was originally articulated in California well before the passage of AB 32. Nevertheless, AB 32 has fundamentally changed the course of future energy policy in the state, and the adoption of the 33-percent mandate today has to be considered in the context of the implementation of AB 32. There is little doubt that overall energy costs will increase in the future with the phasing out of fossil fuels. Achieving 33-percent renewables content in the state's electricity supply mix is one of the principle means by which California will be able to reduce its greenhouse-gas emissions to 1990 levels by 2020. We are not sure whether it matters if implementing the 33-percent goal for renewables increases wholesale energy costs in and of itself, if it is true that wholesale energy costs will increase inevitably, as a consequence of implementing AB 32, no matter how implementation is accomplished. Indeed, it is unlikely that the AB 32 target can be achieved without renewables contributing on the order of 33 percent to the state's energy mix, whether or not the 33-

percent-by-2020 standard is installed as a specific requirement for the utilities. At this point in time, we believe that it makes more sense to try to understand the implications of complying with AB 32 generally, with the 33-percent-by-2020 standard looked at as one component of the program.

Operational Impacts

Like cost, the operational implications of implementing a 33-percent renewables-by-2020 standard have been the subject of considerable analysis and debate. The GPI's urges all parties to take a more holistic approach to operating the grid with increasing penetration of intermittent generating resources. The recent CEC workshop on higher levels of renewables in the state's electricity supply heard discussions about a variety of approaches and means to operate the grid with greater amounts of intermittent energy in the supply mix, ranging from combining storage with individual intermittent generators to firm their output, to installing independent storage facilities on the grid near load, to using electric vehicles as balancing sources on the smart grid of the future. We have always argued that the uncertainty associated with intermittent generators is simply one more source of grid uncertainty, in many ways analogous to load, which has to be managed in maintaining the integrity of the grid.

One of the key means to managing the uncertainty of intermittent generators is weather forecasting, again similar to the case of managing the uncertainty of load. Wind output forecasting is improving, and already contributes to California grid management. It is interesting to note that while many critics of wind point to the fact that during the extreme heat wave in California in July, 2006, wind generation across the state was less than 70 MW, what the critics usually do not point out is that while this particular event was indeed accompanied by low-wind conditions, the fact was that the lack of wind, while unfortunate, was anticipated well in advance, and planned around accordingly. The sudden, unexpected loss of a major generating unit or transmission link, which can also happen when the system is under stress, is much more difficult for grid operators to deal with.

Conclusion

The stretch RPS goal of 33-percent renewables statewide by 2020 should be one of the cornerstones of California's efforts to implement AB 32. The state has more than adequate resources to produce this amount of renewable energy, but harnessing it will require a firm, long-term commitment on the part of utilities and customers. Nothing less will do in the effort to combat global climate change.