DOCKET
02-REN-1038
DATE AUG 05 2011
RECD. AUG 05 2011

John Roitz
CEC Intern
August 5, 2011

Comments on Emerging Renewables Program for Small Wind Guidebook Changes

(Docket Number 02-REN-1038. Staff Workshop on Possible Changes to the Emerging Renewables Program Guidebook)

My name is John Roitz; I was a graduate student intern at the Commission in 2010. My graduate thesis, titled *Program Evaluation of the California Energy Commission's Emerging Renewables Program for Wind Energy*, was completed in May 2011. The thesis offered a critical examination of the ERP and put forward suggestions for changes and updates to the program. I attended the *Staff Workshop on Possible Changes to the Emerging Renewables Program Guidebook* on August 3rd. I here offer these comments on the changes proposed to the ERP by the Commission:

1. Rebates shall not exceed 50 percent of the net purchase price of the system (before ERP incentives)

I believe that a 50% maximum rebate is a sound idea. I did not fully understand the argument of one of the fuel cell proponents present at the workshop that a 50% limit on rebates would unfairly punish those purchasing less expensive systems. For example, under a 50% maximum rebate structure, a turbine customer that purchased a $20,000 system would pay $10,000 out of pocket. If an installer offered the same system for $12,000, then the customer would pay less - $6,000. The customer would therefore save money by purchasing the lower priced system. The ratepayers who foot the bill for the ERP rebate would also pay less.

I am assuming the 50% limit applies to the net purchase price *before* the federal tax credit (currently at 30% of the total system cost) is taken, but this is unclear and the interaction of the ERP rebate and the federal tax credit should be spelled out in the manual. If indeed the federal tax credit can be taken in addition to the ERP rebate, then 65% to 80% of the total installed cost of a system may be defrayed by incentives, depending on how each incentive is calculated.

A 50% rebate is also relatively generous; the state of Wisconsin, a state with a long history in small wind development, has a maximum rebate of just 25% of the total cost of the system. Wisconsin also has a performance-based rebate rather than a capacity-based incentive, performance being determined by the capacity factor calculated during a mandatory site

assessment. It is my opinion that performance-based rebates are preferable to capacity-based ones, and I think the Commission should eventually move to a performance-based rebate system, though I realize that such a large change would likely take many months to develop and implement and that the Commission desires to reinstate the ERP very soon.

2. Rebate payments will be split into two installments: 90 percent of the rebate shall be paid in an up-front manner while 10 percent will be paid contingent on reporting the performance of the installed renewable energy system

One of the telephone participants brought up a good point about this provision: much of this data will be of questionable value for two reasons, one relating to data quality and one relating to data utility. Firstly, the system owners will self report energy production. They may make errors in transcribing the data and may report erroneous data - most likely they will have a tendency to overstate actual energy production. As there will be no way to assure the quality of this data it will be difficult to use it for any meaningful analysis. But more of a concern is that with this provision energy production data will not be tied to wind speed. Energy production data without wind speed measurements will not allow for an analysis of turbine performance over different wind regimes. I don't believe that energy production data absent wind speed data will be that informative, and the paperwork required to obtain this information may be more trouble for both the CEC and program participants than the data is worth for analytical purposes.

I am in favor of eliminating this provision and replacing it with an anemometer requirement such as the one required by state of Wisconsin. While more difficult to administer, anemometer data coupled with energy production data will be invaluable in determining field performance of different brands of turbines. If requiring anemometers on all new installations proves to be too unwieldy, then a larger incentive for anemometer data could be offered to a subset of new installations (maybe on a volunteer basis). To pay for this, the maximum rebate level could be reduced to 45%.

In order to ensure data quality, I also suggest that CEC personnel or a CEC contractor download the anemometer data and record energy production at the participating turbine installations. While this will be an added expense to the ERP, data quality will not be in question and any analysis done using the data will have more weight. Again, it may be advisable to adjust the rebate downward to pay for field data collection.

3. Manufacturers will no longer be allowed to receive listing on the eligible list of small wind turbines by providing 12 consecutive months of performance data
and
Manufacturers will be required to receive third-party certification in order receive listing or remain listed.

I think these provisions are essential. If these provisions had been in force the Dyocore situation would not have occurred. There are undoubtedly other turbines on the current approved list that do not perform as advertised, and these provisions will weed them out. I also agree with requirement that the turbine power coefficient not violate the Betz Limit.

4. Dropping the rebate level to $2.50/watt but allowing $3.00/watt for 30 days after program restarts.

Sandy Miller pointed out at the workshop that allowing applicants to secure a rebate of $3.00/watt for 30 days after the rebate program restarts will likely lead to a rush of applications and followed by a lull. I agree. I would suggest one of these three options: leaving the rebate level at $3.00/watt for a year, or dropping the rebate level to $2.75/watt or $2.50/watt immediately upon reinitiation of the program.

5. Demonstrable wind resources at installation sites

The April 14th workshop had mention of the possibility of adding a requirement to show a certain level of wind resource at the proposed installation site. I think this would be a good idea. The state of Wisconsin wind incentive program requires site assessments as a condition for wind rebates, and the CEC could model a site assessment program on this program. Other ways to assure adequate wind resources would be for the CEC to predetermine areas of the state with known high quality winds. Potential rebate recipients outside these zones could submit 12 months of anemometer data to show their site has adequate wind. Having a minimum wind speed requirement would help weed out wind turbine installations in inappropriate areas.

6. Site Inspections

The CEC might want to consider instituting site inspections for new and existing turbine installations as a quality control measure. In conjunction with field visits to download anemometer data and collect energy production values mentioned in Comment 2, these inspections could help determine the durability of small wind installations and how turbines are maintained by their owners.

7. ERP Program Goals and Target MW goals

This would be an opportune time to revisit the goals of the Emerging Renewables Program to ensure they are still pertinent and consistent with current California Energy Commission policy objectives. The state of Wisconsin wind program goals are "adding renewable kWh on grid and creating jobs", somewhat different than the goals of the ERP.

Also, the current ERP Guidelines have no numerical target for MW added to the grid. The Commission may want to consider setting a target amount for installed small wind capacity, e.g., 10 MW by 2015.

8. State of Wisconsin Small Wind Energy Incentive Program

Throughout my comments I have mentioned the state of Wisconsin Small Wind Energy Incentive Program. This program is run by a private contractor, Focus on Energy, and seems to me to be particularly well thought out. Mick Sagrillo, the principal at Focus on Energy, has been involved in small wind power for many years and is widely known as an expert in the field. Some of their requirements are listed below.

- All rebate recipients must first get a wind energy site assessment. The assessors are like home inspectors, and their incentive is to be accurate in their assessment, not try to sell someone something. Some, however, are turbine dealers.

- The assessors use wind resource maps for their assessments, not real anemometer data. AWS Truewind made a special wind map for Wisconsin that they use.

- The homeowner/applicant pays for part of the site assessment and the state chips in the rest. The cost is $500-$600. Currently only 1 in 10 that inquire actually put up the money for the assessment, and only 1 in 10 of those actually buy a turbine.

- Wisconsin offers an incentive of up to 25% of the total installed cost of the turbine. However, the incentive is performance based, based on the capacity factor identified in the site assessment. 20% capacity factor or over gets the full amount. The incentive is pro-rated for lower capacity factors.

- Wisconsin requires that recipients install an old-style mechanical kWh meter so that total energy production can be measured and will not be lost if the inverter goes down.

- They have an anemometer requirement, and it must installed one rotor diameter down from hub to keep out of the rotor wash. $1,000 is offered to recipients if they upload a

year's worth of wind and energy output data to the web. This program is working very well and is thought to be cheap relatively speaking.