

Email received 3/23/15 as Public Comments for the 3/24/15 Public Hearing on Renewable Energy Siting

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3/22/2015

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Comments on Solar Energy Siting to Senate and House Natural Resource and Energy Committees

As solar energy is scaled up to meet the extremely ambitious renewable energy targets in Vermont, there are problems of aesthetics and economics. Regarding the former, there is probably a saturation point at which the multitude of planned solar projects will have a deleterious impact on Vermont tourism. I live in Rutland, the "Solar Capital", where there is a greater concentration of existing and planned solar generation facilities. As more projects are installed, I hear more negative comments about solar's negative visual impact.

Thoughtful business oriented people I talk with have also stated that Rutland may be getting into a "rut" by becoming known solely for its concentration of solar sites, and may be incapable of attracting new companies in other sectors. Solar generation facilities are consuming limited vacant spaces, precluding other uses. And solar projects are boring to view. One cannot take a tour inside a solar project to see how beer or ice cream is made, as in other Vermont companies.

Solar projects may have an impact on Vermont tourism in the future. Vermont became famous by banning billboards to improve vistas along its roads, which helped Vermont's tourism image. An obvious irony is that now Vermont has an ever growing crop of roadside solar projects sprouting up that visually are on a par with billboards.

The March 6, 2015 Wall Street Journal had a front page article entitled: "Charm Offensive: Vermont Fights to Keep its Quant Image". The article described the competition between Vermont and other state's tourism bureaus for marketing autumn scenery. Vermont is concerned because tourism is a "top economic driver", bringing \$1.8 billion in 2013 to the state. But Vermont may not keep in #1 place for rustic rural charm. Other states are starting to challenge Vermont in their advertisements.

As these states competing with Vermont for tourists continue their efforts, there may be statements or pictures of large industrial solar facilities amidst the Vermont rustic rural scenes. As in NY Times articles about opiate drug problems in Vermont, a future article could showcase Rutland and other places in Vermont (e.g. New Haven) as overrun with boring, ugly solar projects. Drug problems in the ghettos are not newsworthy, but drugs in peaceful, beautiful Vermont are. A state that is considered the "gold standard when it comes to autumn leaves" becomes more of a target for criticism from other states as the number of solar projects increase.

I suggest that the Vermont Department of Tourism (Megan Smith is mentioned in the WSJ article) provide their take on the future impact of solar and wind energy projects on Vermont tourism. The Department could produce or obtain computer generated pictures of the roadside views of solar projects in various parts of the state and a map of the location of all projects planned to meet future renewable goals. These images could be used for surveys of Vermont tourists to gauge their attitudes of the solar impact on tourism.

There are other aspects to the irony of solar energy in Vermont. The cloudy Vermont weather results in annual average energy production of about half that of solar projects in the sunny southwest US. The carbon reduction achieved in Vermont from solar energy has practically no impact on worldwide carbon emissions. Vermont can do nothing to reduce carbon emissions from the big SUVs of its tourists or the pickup trucks of its citizens, and transportation carbon emissions are comparable to those of the electric sector. Vermont borders Quebec, where additional renewable hydro-electric energy continues to be available. A proposed underwater and underground transmission line from Quebec to near Ludlow, Vermont could serve all the electrical needs of Vermont with renewable energy, without the visual impact and higher cost of solar energy.

Perhaps the biggest irony of all is that the shining example Vermont hopes to achieve with its renewable energy policy may become the exact opposite. Vermont prides itself as a leader for change in the nation. There is an argument that while achieving Vermont's comparably high renewable goals will not affect global climate, Vermont can show the rest of the nation, if not the world, that such goals can be met. It would be terrible if Vermont became famous for exposing the problems from having too much solar energy, before state renewable goals are met.

My other suggestions regarding siting issues are to (1) consider local community planning and siting standards, (2) require the PSB consider cumulative visual impacts and (3) consider charging a fee to developers to help pay PSB expenses.

- (1) Local communities should be allowed to have more stringent zoning requirements that the PSB should follow as part of its approval process
- (2) In communities like New Haven, where numerous solar projects are planned, proposed new solar projects should have additional PSB review of the combined visual impact of all such future projects. While a relatively low concentration of solar projects may be acceptable, a high concentration could have negative impacts that would not be discovered if each project is reviewed on its own. This could be achieved with a two step process in that the SPEED Facilitator aggregates all proposed projects before filing for PSB approval and submits a list periodically to the PSB. This list would include the 150 kW and greater net metered projects. As each project applies for PSB approval, the PSB would evaluate the visual impact of all projects within a specified radius, either existing or planned.
- (3) The PSB staffing level requirements are greater because of the multitude of renewable projects. It seems reasonable to charge a fee to developers to help pay for the extra work at the PSB caused by renewable projects. A study could be done of the amount of PSB time and resources

spent on approving each renewable project. Results of the study could be used to determine the fee. Concern should be given to the numerous other projects under PSB review.

The Committee requested comments on siting concerns rather than economic concerns. The legislature has repeatedly proven its commitment to renewable energy goals. However, I would like to briefly discuss the negative economic impact of solar energy. If there are siting concerns, we must reexamine the goals that caused the siting problem. The legislature should re-examine its commitment to renewable energy for another reason. When these goals were set, some of the negative economic impacts were not known.

One example is the saturation point, soon to be reached, at which solar energy generated in late afternoon moves the summer electric load peaks to later in the day. When this peak shift occurs, the value of all new solar energy projects is diminished, because solar generation decreases as time advances each day. A major benefit of solar energy is that generation is relatively high when the electric load requirement is the highest. But as the hour of highest load moves from mid afternoon to late afternoon/ early evening, the solar value is lowered. In other words, there is a law of diminishing returns to solar's benefit of reducing grid costs.

A few years ago, this peak shift phenomenon was not made known. In contrast, solar energy was hailed as providing a very high output when electric usage was highest, in the mid afternoon period. Now utilities such as GMP have acknowledged that the peak shift is reducing the value of solar energy.

I would be happy to meet with the Natural Resource and Energy Committees to provide further comments. I have worked 26 years for CVPS and GMP in the power supply area. I was part of the GMP team that analyzed the value of solar energy. My background includes a wide exposure to electric utility matters relevant to renewable energy.

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