

# Jean Vissering Landscape Architecture

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**Date: January 30, 2013**

**To: Vermont Energy Generation Siting Policy Commission**

**Re: Comments**

Thank you for the opportunity to comment. I've attached my resume which includes my experience as a landscape architect in energy issues. I have worked with developers, towns, regional planning commissions, citizen groups and organizations concerning the siting and design of energy projects. I am currently on contract with the Department of Public Service to provide an independent review of those facilities seeking a CPG that may involve aesthetic impacts. I have developed methodologies for evaluating wind energy projects for the Vermont Public Service Board, the National Academy of Sciences, and the Clean Energy States Alliance (with a grant from the US DOE). Over the years I have reviewed numerous energy related projects including wind, solar, biomass, and gas as well as substations and transmission lines.

My opinions about energy projects have evolved over the years and I will share with you my current thinking and observations regarding siting and energy project review, with particular focus on wind and solar. I begin with some general comments about how we can provide the Public Service Board (PSB) and the citizens of the state with a better framework for decision making. Then I will make specific comments on the siting, design and review of wind and solar projects.

## **General Comments**

In general I think the Section 248 process works well for the review of energy projects, but there are areas where improvements are needed. Some of my recommendations focus on providing a better framework within which the PSB makes its decisions. This would require the Public Service Department (DPS) to take a larger role in providing planning, guidance, research and assisting interveners in the process. Town and regional planning commissions also need to play a larger role.

- **Energy Planning**

The Department of Public Service (DPS) may need to play a larger and more comprehensive role in energy planning. As our energy sources become more localized and distributed, different impacts have emerged than were envisioned years ago. Wind in particular has been extraordinarily divisive. The environmental and aesthetic costs are readily observable (turbines in many views, roads along ridges) while the public appears increasingly uncertain of the benefits as a result of numerous competing and contradictory studies (extent to which

they reduce carbon, produce harmful noise, reduce property values, etc.) DPS could serve several roles:

- Serve as a clearinghouse for research and information that is legitimate and peer reviewed, possibly even commissioning its own research into the actual impacts of existing projects (noise levels, reducing clearing and grading impacts, wildlife, runoff and erosion, etc.)
- Examine energy alternatives: can we meet our energy goals with a limited number of wind projects for example, or through smaller projects (e.g 3-7 turbines) vs. larger wind projects (e.g. 15-30 turbines); by combining in-state and out of state renewables, by emphasizing solar over wind, etc. What would these alternatives look like and what would be the costs and benefits.
- Provide Siting Guidelines (locational criteria) and Best Practice Guidelines (construction and design criteria) that provide guidance for developers and the PSB. These would need to be updated every five years or so to adapt to new technologies and research, and to address problems that have been identified.
- Provide ways to help towns and non-profit organizations participate in the 248 review process without needing huge investments in hiring legal counsel.

- **Siting Guidelines**

Siting Guidelines would identify sites or site characteristics that are appropriate for particular energy projects, and those which would raise red flags or be inappropriate<sup>1</sup>. These need to be resource based. Possible siting criteria are discussed in more detail for wind and solar below. We are beginning to form a reasonable picture of the kinds of sites that are being considered, and the issues that arise. We should be able to put together a matrix of potential concerns along with their priorities. ANR is working on a study that will identify priority resource lands including unfragmented habitat. Towns can be encouraged to identify particularly valued high elevation habitats or lands that are suited and unsuited to larger scale solar or wind farms. A collaborative exercise similar to the meetings DPS sponsored in 2002 in which stakeholders participated in a series of meetings in the early days of wind energy could be one way to begin this process.

- **Best Practice Guidelines**

We are already beginning to develop informal standards including for conducting impact assessments and for project construction and design, but these are not clearly identified in any documents. By incorporating best practice standards, projects would hopefully become more acceptable and provide less cause for complaints.

Some past examples of such guidance include a report prepared in the 1970s by Terry Boyle on siting and designing electrical transmission line corridors. It was because of his study that our electric lines have been much less intrusive than in other states. I don't remember who commissioned the report, but it became the guideline for siting from then on. Similar recommendations were made during the Dean administration for roadway planning that helped to narrow and reduce the size and impacts of new roads (unfortunately not always) and to change highway design standards as they pass within our town and village centers.

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<sup>1</sup> The term *siting guidelines* is often miss-used to simply refer only to design criteria such as setbacks, landscaping, etc.

This process was the result of the collaborative efforts of many stakeholders and professionals.

- **Cumulative Impacts**

Few if any methodologies exist for evaluating cumulative impacts, but these will be essential to develop, particularly in addressing larger scale wind, solar, and biofuel projects. Identifying cumulative impact thresholds needs to occur both at the planning level and in the 248 review process. I have discussed this in more detail below regarding the cumulative aesthetic impacts of wind and solar (addressed primarily through appropriate siting).

- **Local Participation/Town Plans**

Local participation will be essential at many levels from planning to participation in the review process.

- Towns need to be encouraged to consider the appropriate siting of large solar and wind projects. A clear rationale should be provided in identifying sites where energy projects should be excluded. Sample language might be helpful to provide to towns.
- I have some concerns that the “clear written community standard” under the Quechee Analysis has become so narrowly interpreted that it is nearly impossible to develop language that will pass muster as a standard. This makes towns feel as though their concerns are ignored. Developers, on the other hand, need a reasonable sense of what is expected. Siting guidelines and best practice standards prepared with the participation of towns and regional commissions may help to address some of the common concerns.
- Towns should be notified of all energy projects proposed within their boundaries including solar projects under 10MW. As noted below, these are fairly large objects appearing throughout the landscape. In cases where they are poorly sited, the zoning administrators get questioned by citizens and have no idea how these were reviewed or what considerations determined its approval. Often a local planning commission can provide advice that may lead to better siting of these projects. (I am speaking here as vice-chair of my local planning commission.)

- **Facilitating Intervener Involvement**

Fully participating in the 248 process can be prohibitively expensive for towns and non-profit organizations and yet these are often voices that should be heard, particularly when there are clear issues involved that are of meaningful concern. Particularly important are those interveners who represent a significant group of people. Many organizations and towns are hesitant to participate without legal counsel as these proceeding can be intimidating and they want to be sure not to create problems down the road.

One possible way in which these concerns could be heard would be to sponsor an informal meeting near the beginning of a review process in which DPS and PSB representatives and interveners representing a larger public (e.g. towns and non-profit organizations) could, along with the developer have an open and informal discussion

without legal representation in the room. This might be an equivalent to a “sketch plan review.” Since the concerns of public agencies and non-profits are often different than those of abutting landowners, a similar meeting could be held with abutters within the local community. The intention would be for the various interveners to be heard without refutation in an informal setting. Understanding points of agreement, disagreement and potential solutions or alternatives should be encouraged.

A second approach could be for DPS to have a 248 Ombudsman who would help to shepherd interveners through the process, possibly acting as a public advocate in certain circumstances.

- PSB Website

Compared with New Hampshire, I have found it very difficult to find documents (other than orders) on the PSB website. In New Hampshire every document that comes in related to a Site Evaluation Commission (SEC) case is posted on a web site in the order it arrives. The site is easy to find. I have found that the PSB may post initial documents but later rebuttal testimony can be very difficult to find. Orders for any project tend to be scattered everywhere (usually by date which is not helpful to most people).

## **Wind Energy**

Wind energy has undoubtedly become one of the most divisive environmental issues the state has faced in a long while. This is in part because projects occupy such prominent and visible locations and extend over a considerable distance. They are also located on what are often highly “valued” locations either because they are part of a common view or because of our general attachment to mountain ridges and the sense that these are “wild” landscapes.<sup>2</sup>

My general feeling is that wind energy needs to be part of the Vermont landscape. We are blessed with abundant scenic beauty but we need to do our share with climate change. Still, I think we need to proceed with caution on wind energy. Two of my concerns are: 1) the machines are so large that it won’t take many projects to make it hard to find places, especially mountain summits, from which they are not visible; and 2) utility scale wind projects involve significant alterations to mountain ridgelines for roads and turbine pads. We have to learn from the projects we’ve built and we need to be sure we get it right.

Many people oppose them automatically based on what they hear about them and without ever having seen one. There is also a fear that they are going to be built all over the state and that we will be seeing them on every hill top. Siting guidelines will be essential (see below). We also need better information about the link between these projects and the real contributions they make to reducing carbon within Vermont and within the larger New England region. If we are going to look at turbines out our windows and build roads along our mountain ridges, we need

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<sup>2</sup> Wind energy is also complicated by the fact that some people find them beautiful and others ugly industrial machines. When evaluating aesthetics however, the issue is not whether any individual finds them beautiful or ugly, but rather, what resources are involved in that landscape and how will the project affect those resources.

assurance that it will make a meaningful difference. At present there are too many conflicting studies.

### **Wind Siting and Design Considerations (Examples)**

#### **Roads**

Building roads in rugged high elevation settings isn't easy. It requires many curves and considerable cut and fill. Although they aren't particularly visible to most people (except when viewed from above such as from a mountain summit or the Long Trail), the idea of this level of terrain alteration in areas that have been relatively wild and untouched (except perhaps for logging roads) is disturbing to many people.<sup>3</sup> We need to figure out how to build projects with minimal site disturbance. This may require:

- Requiring construction and design techniques that minimize site disturbance. The Lowell and Sheffield projects appear to have resulted in far different levels of site disturbance and may provide lessons for the future.
- Selecting sites which require minimal regrading such as those with limited topographic change and close to or including existing roads.
- Selecting sites which have already been disturbed, for example by logging roads.
- Requiring sites to be under 2500 feet in elevation (or lower in certain circumstances).

#### **Project Size**

One question worth exploring is whether we should encourage more smaller projects (3-7 turbines) or a few large ones (15-25 turbines). Advantages of smaller projects would be that they can often be accommodated on lower, smaller ridgelines. Aesthetically these are more likely to appear as part of numerous hills or mountains rather than dominating a major ridgeline throughout a region.

#### **Noise**

Noise produces a lot of concern, much of which may be unwarranted beyond a half mile away. But we need better studies on this including examining sound (audibility) as well as noise (above identified thresholds). Many people assume that when a noise assessment finds no impact, that it means there will be no sound at all. So we need to talk honestly about sound. Identifying sound qualities in valleys and on opposite hillsides will be important.

- Get good data based on existing projects and their effects at varying distances and elevations.
- Be sure to analyze both sound and noise (above acceptable levels)
- Keep projects a reasonable distance from residences unless compensation is provided.

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<sup>3</sup> It is true that the amount of disturbance for the 21-turbine Lowell project equaled about the same as the area required for one 2.2MW solar project (each Lowell turbine is rated at 3MW). However solar projects are usually located on already disturbed land and/or land zoned for commercial or industrial development. They also usually require minimal regrading.

### **Lighting**

Lighting is often identified as one of the most visually disturbing parts of wind projects. With the new radar activated technologies this impact can be significantly reduced. However, it is not yet clear where the FAA will approve these kinds of systems. In Vermont where the lack of night lighting is such an important characteristic of most of landscape, the ability to employ a motion activated collision avoidance system (e.g. OCAS) will be an essential siting criterion. (This was identified in the 2012 State Energy Plan.)

### **Cumulative Impacts**

I have seen no good methodologies for evaluating cumulative impacts but I believe we can create one. We have traditionally conducted visual assessments using a 10-mile radius around the project. Wind projects are visible up to about 20 miles away, but beyond 10 miles they become a much smaller part of any particular view. Certainly when any 10-mile radii intersects with another project's 10-mile radius, this should raise a red flag and require studies of any cumulative impacts including the number of resources affected and any resources from which both projects might be visible. As part of general planning we may want to limit the number projects of a certain size within any one region.

### **Importance of Wild/Natural Areas**

In terms of sensitivity in evaluating the aesthetic impacts of wind projects, I believe we need to give the highest priority to places valued for an experience of nature. These are the areas we go to in order to get away from civilization. They include hiking trails, for example the Long Trail, publically accessible natural areas, and lakes or ponds which are largely undeveloped and accessible primarily to non-motorized boats. Such places are unique and irreplaceable. Most involve a commitment of public funds. Some of these areas are entirely forested and visibility would be limited. But where views exist, especially if they are relatively close and include a large number of turbines, and the view is otherwise predominantly natural in character, this should raise concerns. In my opinion, these natural views present a much greater level of concern than views from private homes or developed lakes and ponds.

### **Solar Energy**

I have reviewed quite a few solar projects within Vermont and observed many others. Solar panels are quite large objects and are appearing across the landscape in various forms (solar farms and individual panels or groups of panels). A typical 2.2MW solar farm occupies about 15 acres of land. Most have been well sited, but given the potential for a significant number of these panels and projects around the state, along with their size and industrial character, siting guidelines at all project scales would be helpful. In a recent decision, the PSB expressed concern about a 2.2MW solar farm located in a scenic agricultural residential setting, but noted that there were no guidelines for their appropriate or inappropriate siting.<sup>4</sup>

### **Solar Siting and Design Considerations (Examples)**

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<sup>4</sup> Order available at: <http://psb.vermont.gov/sites/psb/files/orders/2012/2012-4/7844%20OrderReInterventions.pdf>

## **Solar Farms**

- Strongly encourage solar farms on land that is within or near already developed areas especially within commercial or industrial zoning districts.
- Avoid areas of high agricultural, natural, or forest resource values (unless in commercial or industrial zones)
- Encourage Towns to identify where they would like to see projects; encourage towns to build them and/or benefit financially from them.
- If they are located in residential or rural areas they should be screened from view as much as possible. Screening is especially important if the back (north) side is visible from a public vantage point as this side tends to be light in color (often white which is highly visible) and visually cluttered.
- Consider the design and location of associated infrastructure. Inverter structures for example should be simple in design, unobtrusively located and dark in color, preferable a similar black to the solar panels themselves to keep the project simple in form and design.
- Keep the layout as compact as possible.

## **Individual Solar Panels or Groups of Panels**

My biggest concern about the siting of individual and groups of panels is that they often appear randomly located and ignore many of the basic principles we expect in siting other forms of development. Here are a few basic recommendations:

- Keep them as close to existing development as possible (e.g barns, outbuildings, villages) vs. scattering them in valuable open space.
- Reflect the traditional landscape patterns in siting them: e.g. along existing hedgerows (at the edge rather than in the center of a field), orient them as close as possible parallel or perpendicular to nearby buildings. This is a classic pattern in the Vermont landscape. While solar panels need to be oriented south, most of our historic structures have a similar orientation that can be repeated as closely as possible.
- Keep them compactly organized. Attached panels, or closely staggered groups of three panels to break up long rows.
- If the back side (which is often white and more visual cluttered in appearance) is visible from the road or to neighbors, add some plantings to screen it or located it where natural plantings screen the back side of the panels.
- Pay particular attention to the design and location of the inverter equipment. These are often on very slapdash wooden boards that are highly unattractive and noticeable due to the light colors and thoughtless construction. Place these where they can be screened or softened with existing vegetation, and as low as possible. Developers and installers need to come up with better standard designs for these associated facilities, which can be more unattractive and noticeable than the panels themselves.