# Siting Solar Energy Facilities in New York State: Sources of and Responses to Controversy

By

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## Abstract

Human reliance on fossil fuels has led to a wide range of adverse environmental and health effects. As our understanding of these impacts has grown, so has the search for other, more sustainable sources of energy. One such source is solar power, and the federal and state governments in the United States have created various policies and financial incentives to encourage adoption of solar energy technologies. While solar energy offers tremendous potential benefits, siting utility-scale ground-mounted photovoltaic arrays can give rise to strong public reaction.

With this in mind, this thesis explores the controversy, or lack thereof, surrounding the siting of utility-scale solar energy facilities in New York by examining two case studies - the Skidmore College Denton Road solar array and the Cornell University Snyder Road solar array. While these two solar energy facilities share many commonalities, there is one key difference – the Skidmore College array created a much greater level of controversy than the Cornell University array.

Analysis of this divergence indicates that choice of site is a crucial determinant of the extent of controversy. While local impacts are an important concern, this thesis demonstrates that the reasons for controversy go well beyond those impacts. Issues related to information, equity, and trust were other key sources of controversy.

In addition to analyzing the sources of controversy, this thesis also offers some recommendations that may be helpful for entities involved in the development of solar power facilities. It is hoped that these recommendations will help to eliminate or mitigate future solar power siting controversies.

**Thesis Supervisor:** Professor Lawrence E. Susskind
**Title:** Ford Professor of Urban and Environmental Planning

**Thesis Reader: Terry Szold**
**Title:** Adjunct Professor of Land Use Planning

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## Disclosure Statement

I am a resident of the town where Skidmore College's solar array, which is one of the case studies in this thesis, is sited. I became aware of the project as the result of a flyer distributed to my parents, and subsequently attended a town planning board meeting about the project with my mother, Wendy Stein. She later became actively involved in opposition to the project. I was not involved; I did, however, follow the project through meeting minutes and newspaper articles, and believed that it was illustrative of the controversy that can arise in regard to the siting of solar arrays. I expect that this issue will increase in prevalence as the use of solar energy ramps up in the United States, and felt that exploration of the reasons for controversy was an interesting and timely topic. I do not believe that my mother's involvement resulted in bias, as my goals of exploring the reasons for controversy were not aligned with her goals of stopping the project. My aim was to understand why the controversy existed, in the hopes of shedding light on possible methods to mitigate future controversies. Most of the material in this thesis was obtained from public records which reflect both proponent and opponent voices. I also reached out equally to both proponents and opponents for their comments and thoughts on the reasons for the controversy.

# Contents

Abstract ..... 2
Acknowledgements ..... 3
Disclosure Statement ..... 4
Background ..... 7
Support for Solar Energy ..... 7
Challenges to Scaling Up Solar Energy ..... 9
The Growth of Solar Energy ..... 13
Regulatory Framework ..... 15
Federal Regulatory Framework ..... 15
New York State Regulatory Framework ..... 18
State Government Entities ..... 20
Local Regulatory Framework ..... 22
Financial Incentives ..... 23
NY-York Sun Initiative ..... 26
Net Metering ..... 26
Green Bank Initiative ..... 30
Property and Sales Tax Exemptions ..... 31
Siting Energy Facilities ..... 31
Overview ..... 31
How Controversies Arise ..... 32
Decision-Making Structure ..... 34
Information ..... 36
Case Studies ..... 37
Overview of the Case Studies ..... 38
Skidmore College Denton Road PV Array ..... 42
Background ..... 42
Controversy Overview ..... 51
Causes of the Controversy ..... 55
Status of the Controversy ..... 88
Cornell University Snyder Road PV Array ..... 89

Background ..... 89
Current Status ..... 97
Controversy ..... 98
Analysis ..... 102
Inherent Complexity of Energy Policy ..... 103
Siting Renewable Energy Projects is Similar to Siting Other Energy Generation Facilities ..... 105
Choice of Site is Key ..... 106
Pre-Existing Community Relationships are Important ..... 107
Information Shortcomings and Perceived Inequity Foster Additional Scrutiny and Lack of Trust ..... 108
Role of Local Government ..... 109
Controversy Can Continue Long after a Formal Siting Decision is Made ..... 110
Conclusion ..... 110
Recommendations ..... 111
Recommendations to New York State ..... 112
Recommendations to Local Governments ..... 117
Recommendations to Developers ..... 118
Recommendations to Educational Institutions ..... 119
References ..... 120

# Background

## Support for Solar Energy

Human reliance on fossil fuels has led to a wide range of adverse environmental and human health effects (Keith, Jackson, Napoleon, Comings, & Ramey, 2012). One of the most widely cited impacts of fossil fuel dependence has been a rapid growth in atmospheric greenhouse gas emissions. There is now scientific consensus that this increase in greenhouse gas concentrations is causing climate change, as illustrated by the findings of the IPCC Fourth Assessment Report, which concluded that "most of the observed increase in global average temperature since the mid-20th century is very likely due to the observed increase in anthropogenic greenhouse gas concentrations"(Intergovernmental Panel on Climate Change, 2007). As our understanding of the impacts of fossil fuel reliance has grown, so has the search for other, more sustainable sources of energy. Many consider renewable energy sources, such as geothermal, hydropower, ocean, wind, and solar energy, to be key in providing a safe and reliable energy supply without causing irreparable environmental damage. Additional arguments used in support of renewable energy include energy security, price stability, and job creation (Borenstein, 2012).

Solar energy, which is derived from the sun's light and/or heat, is the most abundant global renewable resource. Some scholars have estimated that photovoltaic (PV) panels installed on only four percent of the world's deserts would produce enough electricity to meet the current global energy demand. In most regions of the world, solar energy's technically available potential exceeds current energy supply (Timilsina, Kurdgelashvili, & Narbel, 2012). In the United States, solar energy is available almost everywhere, with the highest quality resources concentrated in the Southwest. The technical potential of utility-scale PV technologies in the

United States is estimated to be approximately 80,000 gigawatts (National Renewable Energy Laboratory, 2012).

According to Timilsina et al., "solar energy technologies can be classified along the following continuum: (1) passive and active; (2) thermal and photovoltaic; and (3) concentrating and non-concentrating" (Timilsina et al., 2012). Passive solar energy technology harnesses the sun's energy without using mechanical and electrical devices to convert the heat or light into other forms. In contrast, active solar energy technology collects solar energy, and either stores it or converts it for other applications. Active solar energy technology can be generally classified into two groups: (i) photovoltaic and (ii) solar thermal. The case studies in this thesis both use photovoltaic technology.

Photovoltaic technology converts "radiant energy contained in light quanta into electrical energy when light falls upon a semiconductor material, causing electron excitation and strongly enhancing conductivity" (Timilsina et al., 2012). There are two types of PV technology that are commercially available - crystalline silicon-based PV cells and thin film technologies. Crystalline silicon -based PV cells currently dominate the market (Timilsina et al., 2012).

PV arrays can be located on rooftops, or can be ground-mounted. The arrays can also be either grid-connected or off-grid systems. Grid-connected systems dominate in OECD countries, including the United States (Timilsina et al., 2012).

This thesis focuses on grid-connected utility-scale arrays. The definition of utility-scale solar power varies greatly across agencies and organizations, but for the purposes of this thesis, any solar power facility one megawatt (MW) or greater will be defined as "utility-scale."[1]

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[1] This thesis defines "utility-scale" based on the size of the array, regardless of whether the electricity is sold to wholesale utility buyers or to end-use consumers. The 1 megawatt minimum was chosen because solar energy facilities 1 megawatt and greater are subject to Federal Energy Regulatory Commission and Department of Energy reporting requirements.

## Challenges to Scaling Up Solar Energy

While solar energy and other renewable energy sources have tremendous promise, there are significant challenges to extensively deploying solar energy. Two of the largest challenges are 1) cost and 2) integrating solar energy into the grid.

The relatively high cost of solar energy has traditionally been a key barrier to scaling up the use of solar energy. However, the price of photovoltaic (PV) systems has fallen rapidly in recent years, largely as a result of unprecedented growth in this sector globally (Keith et al., 2011). These declines have benefitted New York, where average installed photovoltaic system prices fell from an average of $8.11 per watt in 2003 to an average of $6.38 per watt in 2011 (New York State Energy and Research Development Authority, 2012). Despite this decline in price, the levelized cost of solar energy is still significantly higher than conventional technologies, with the possible exception of gas turbines (The National Academies., n.d.; Timilsina et al., 2012).

To some extent, the difference in cost between solar arrays and conventional electricity sources depends on the size of the solar array. There is a substantial benefit to achieving an economy of scale through building medium-scale and large-scale solar installations. For example, in New York State, the total price of residential rooftop photovoltaic systems is on the order of five or six dollars per watt (*Mark Torpey Interview by Casey Stein.*2014, Apr 04; New York State Energy and Research Development Authority, 2012). In contrast, the price of larger photovoltaic facilities is closer to three or four dollars per watt (*Mark Torpey Interview by Casey Stein.*2014, Apr 04; New York State Energy and Research Development Authority, 2012).

There is significant uncertainty regarding future solar energy prices, and projections vary. A New York State Energy Research and Development Authority (NYSERDA) study of the benefits and costs of increasing generation from photovoltaic systems in New York found that

"the installed cost of photovoltaic systems in 2025 could range from 1.4 to 4.3 million dollars per installed megawatt" (New York State Energy and Research Development Authority, 2012). However, in the near future, it seems unlikely that solar energy will be cost-competitive with fossil fuel sources without either internalizing the externalities associated with the use of fossil fuels, or subsidizing solar energy.

It is important to note that the cost of scaling up solar energy goes beyond the cost of purchasing and installing solar modules. There are additional costs associated with integration of intermittent and variable power sources such as solar into the electric power system. These issues are explored in greater detail below.

Aside from cost considerations of individual systems, the technical, economic, and political feasibility of integrating large amounts of renewable energy into the grid while maintaining the consistency and reliability of the supply of electricity is a related and equally important barrier to scaling up the deployment of solar energy. Failing to meet peak demand is no longer acceptable in our modern economy – a reliable and safe provision of electricity has become an economic and life-sustaining necessity. This requires constant monitoring of inputs and outputs, and complex transmission and distribution planning and operating practices have been developed to maintain the balance between generation and load.[2]

In the most basic model of the grid, power produced by large centralized facilities is fed into transmission lines which move the power from generation plants to substations, at which point voltage levels are dropped and the electricity fed into lower voltage lines (distribution lines) that distribute the power to end users (Kochavi, 2012). Historically nearly all input into the electric grid came from large, centralized power facilities that produced electricity on a

[2] Load is the "total amount of power carried by an electric system at a point in time," and the term is "often used synonymously with 'demand'" (Federal Energy Regulatory Commission, 2013).

predictable basis. However, solar power is markedly different in nature from traditional power sources, such as fossil fuel, hydropower, and nuclear power plants. Solar power produces variable amounts of power on an intermittent basis. PV arrays only provide electricity when the sun is shining. In addition, the output, which fluctuates according to the amount of the sunlight, can increase and fall rapidly in the presence of clouds. Granular weather forecasting is not always accurate, and as a result, the amount of power generated from solar energy over the next month, or even the next few minutes, is more difficult to predict than power available from traditional fossil fuel, nuclear, or hydropower plants.

The variability and uncertainty associated with solar energy pose challenges to the traditional electricity grid at various levels. For example, these properties can result in "steep ramps and lower turndown levels that other generation sources have to meet," particularly because of the lack of an affordable and efficient storage mechanism for large quantities of electricity (Rocky Mountain Institute., n.d.). As a result, an article in the IEEE Spectrum, a magazine edited by the Institute of Electrical and Electronics Engineers, stated that "turning around the world's fossil-fuel-based energy system is a truly gargantuan task" (Smil, 2012). A recent report by the Resnick Institute at the California Institute of Technology concluded that:

> The transformation occurring across the world's electrical systems represents one of the greatest technological challenges industrialized societies have undertaken. Reconfiguring a grid designed to carry power one way from reliable generation sources managed by few agents to a system increasingly laden with unreliable wind and solar energy while involving millions more participants using advanced technologies will introduce a high degree of uncertainty and variability into the future grid. These changes potentially threaten reliability of electrical supply and must be carefully choreographed to avoid widespread perturbations in cost, reliability and efficiency. Yet policy mandates for more and more renewable and distributed energy resources (DER) potentially threaten to outpace the solutions necessary to manage change effectively (Resnick Institute, 2012).

There is still significant uncertainty and debate regarding how much variable and uncertain renewable energy can be integrated into the grid while maintaining reliability, what

political, technical, economic, and social changes would need to take place in order for this to happen, and whether achieving the maximum technically feasible amount of renewable energy sources like solar and wind would be prohibitively expensive. It is likely that advances in technology, policy, markets, and public understanding will be necessary in order to deploy high levels of renewables without sacrificing grid stability, reliability, and affordability.

Jacobson et al. completed at least one preliminary analysis of converting New York State's entire energy infrastructure to one derived from wind, water, and solar power by 2030. Jacobson et al. postulated that this transformation is both technically and economically feasible (Jacobson et al., 2013). However, a critique of their analysis held that Jacobson et al. substantially underestimated the costs and consequences of transitioning to solely wind, water, and solar power by 2030 (Gilbraith, Jaramillo, Tong, & Faria, 2013). In particular, Gilbraith et al. argued that Jacobson et al, ignored the issue of whether the proposed combination of renewable energy and energy storage could reliably meet instantaneous electrical demand throughout the year (Gilbraith et al., 2013). They also held that Jacobson et al. did "not account for the full range of costs likely to be incurred during the transition to a wind, water, and solar energy system – in particular the costs of ensuring system reliability" (Gilbraith et al., 2013). Last, Gilbraith et al. noted that "energy decisions, in NYS and elsewhere, are made within a landscape of interested parties, governing bodies, laws, and cultural norms. We find it difficult to assume that these concerns would be ignored in order to optimize a single objective – minimizing the use of non-renewable energy" (Gilbraith et al., 2013).

In addition to the challenges of integrating large amounts of renewables into the grid, the intermittent nature and reduced controllability of renewable energy sources, like solar energy, is something that must also be accounted for in order to maintain power quality. Power quality

corresponds to parameters associated with variations in voltage magnitude and frequency, transient voltages and currents, and "harmonic content in the sinusoidal waveforms" (New York State Energy Planning Board, 2012). For example, voltage magnitude variations can affect operation of high-tech electronic loads and motors.

For the reasons outlined above, increased investment and subsequently deployment of renewable energy sources including solar power have significant implications for management of the electricity production, transmission, and distribution system. What is also clear is that there is still a great deal of uncertainty as to the short and long-term cost and effects of incorporating solar energy into the energy mix.

## The Growth of Solar Energy

Despite the challenges described above, installed global capacity of solar energy technologies grew tremendously during the last decade. "The recent trend is strong growth in centralized PV development with installations that are over 200 kW, operating as centralized power plants. The leading markets for these applications include Germany, Italy, Spain and the United States" (Timilsina et al., 2012). Recent growth in solar capacity is largely attributed to sustained policy support in countries such as Germany, Italy, China, Japan, and the United States. It should be noted that while solar capacity in the United States has also grown rapidly in recent years, it remains a small share of total generation. It contributed only about .05 percent of total power-sector U.S. electricity supply in 2010 (National Renewable Energy Laboratory, 2012).

The path of solar energy in New York State mirrors national trends. Although solar energy still makes up a small percentage of overall capacity in the state, solar energy in New York State has grown significantly in the last few years, largely due to state policies

incentivizing solar energy. In 2011, New York nearly tripled their solar photovoltaic installations (U.S. Energy Information Administration., 2014). According to the National Renewable Energy Laboratory, New York State currently ranks 5th among all states in the number of solar PV systems installed, and it ranks 9th in terms of capacity (National Renewable Energy Laboratory, n.d). This means that there are almost 7000 PV systems with a cumulative capacity of 130 megawatts in New York (National Renewable Energy Laboratory, n.d). The largest solar project in the state is a 32 megawatt array on Long Island at Brookhaven National Lab. That array is directly connected to the utility wholesale grid. Most, if not all, of the other arrays in the state are smaller and consist of "behind-the-meter" installations (*Mark Torpey Interview by Casey Stein.*2014, Apr 04).

The solar industry's presence in the state is not insubstantial. According to the Solar Energy Industries Association, there are over 400 solar companies working throughout the value chain in New York State (Solar Energy Industries Association., n.d.c). The solar market value chain consists of a variety of business types, including manufacturers, installers, project developers, and financiers. The total number of solar-related jobs in New York State is unclear, since there is uncertainty in reporting and accounting. The Brookings Institution estimated that New York had 556 solar jobs in 2010 (New York State Energy and Research Development Authority, 2012). In contrast, one nonprofit organization - the Solar Foundation – estimates that New York State gained approximately 1700 solar jobs since 2012, and currently has around 5,000 solar jobs. This would mean that New York ranks fifth among the states in terms of solar jobs (The Solar Foundation., 2013).

## Regulatory Framework

In order to understand many of the controversies associated with the siting of solar power facilities, a rudimentary knowledge of the underlying regulatory framework applicable to energy production facilities is essential. This includes current federal and state legislated and/or mandated economic incentives for solar power. This thesis will not detail the regulatory framework for the transmission and distribution of electricity. While the transmission and distribution systems are impacted by solar power, the existing regulatory framework for these systems is somewhat separate from the regulatory framework for solar energy generation, and therefore has little, if any, role in solar power siting controversy.

### Federal Regulatory Framework

The federal government has traditionally had very limited involvement in the siting of electric generation facilities. Its primary focus in regard to regulation of energy is interstate commerce, including the transmission of electricity. Siting has been largely left to state and local governments. This division of responsibility between the federal and state governments has its origins in a series of Supreme Court cases in the 1930s, which drew a line between intrastate activities subject to state control and interstate activities that fall under the purview of the federal government (Lindh, 1989). Around the same time, the Federal Power Act (FPA) of 1935 also established separate roles for the states and the federal government with regard to electricity regulation. The FPA directs the Federal Energy Regulatory Commission (FERC) (formerly the Federal Power Commission) to regulate interstate wholesale electricity transactions and the transmission of electricity in interstate commerce. It also provides the states with authority to regulate the terms and conditions of intrastate retail sales transactions, as well as many siting decisions with respect to distribution facilities, transmission facilities, and energy generation

facilities. There are only a few exceptions. Federal regulation of electricity generation siting extends to hydroelectric and nuclear power, as well as to energy production facilities located on federal lands (A. Stein, 2012). Despite trends towards greater federal authority over areas that were once considered to be essentially local, land use decision-making, including decisions regarding the siting of some types of power generation facilities, remains one of the few areas left overwhelmingly to state and local control.

Although the federal government is not directly involved in siting utility-scale solar arrays other than those located on federal lands, there are federal regulations that have implications for solar arrays. In 1978, Congress passed the Public Utility Regulatory Policies Act of 1978 (PURPA) as part of the National Energy Act. PURPA was enacted in response to the energy crisis to encourage the development of renewable and cogeneration energy production facilities (A. Stein, 2013). PURPA created a process by which independent power producers were guaranteed access to the utility grid, and included several clauses which had important implications for renewable energy. First, PURPA established a new class of generating facilities, called qualifying facilities (QFs), which fell into two categories, one of which was small power production facilities. Small power production facilities were defined as generating facilities 80 MW or less that produced power from renewable sources. PURPA required utilities to buy power from small power production facilities, including solar facilities, at "avoided cost" rates, which is the rate that approximates what it would cost the utility to generate the electricity (Federal Energy Regulatory Commission, 2012; Hausman & Neufeld, 2011). PURPA also extended the FPA to include the authority to impose "federal directives upon state agencies,'" also referred to as "state-must-consider" directives.

The U.S. Energy Policy Act of 2005 amended PURPA by adding additional "state-must-consider" directives, one of which was the financial incentive of net energy metering, also known as net metering. This incentive will be explored in greater depth in a subsequent section of this thesis. The act stated that "each electric utility shall make available upon request net metering service to any electric consumer that the electric utility serves" (United States Government, 2005). However, while states had to consider the new net metering standard, the requirement was primarily procedural. Although states are required to make a yes or no decision on whether to actually adopt that standard, nothing prohibits a state commission from determining that it is not appropriate to implement that standard (U.S. Department of Energy., n.d.b).

The Union of Concerned Scientists (UCS) refers to PURPA as "the most effective single measure in promoting renewable energy" (Union of Concerned Scientists., n.d.). However, the benefit of PURPA today is less clear. The UCS also noted that, "despite its benefits, PURPA is no longer much help for renewables. Due to current low avoided costs, few renewables are able to compete with new natural gas turbines. Technically, PURPA only calls for renewable energy if it is cost competitive with conventional polluting resources" (Union of Concerned Scientists., n.d.).

While the federal government has very limited jurisdiction over the siting of energy production facilities, it does have oversight over other aspects of the electric power system, including the reliability of the electric transmission system. The Federal Energy Regulatory Commission (FERC) is an independent federal agency with electric energy-related responsibilities that include "protection of the reliability of the high-voltage interstate transmission system through mandatory reliability standards and enforcement of regulatory

requirements through imposition of civil penalties and other means" (New York State Energy Planning Board, 2012). The Department of Energy (DOE) also plays a role; the U.S. Energy Information Administration (EIA), a statistical agency within the DOE, is tasked with conducting "a comprehensive data collection program that covers the full spectrum of energy sources, end uses, and energy flows" (U.S. Energy Information Administration., n.d.).

Small power production facilities, including solar energy facilities, which are larger than one megawatt and meet the criteria for qualifying facility (QF) status, are "required to file either a self-certification (Form 556) or seek actual certification from the Commission [FERC] for every installation making 'sales' of electricity" (Cook, 2010). In addition, utility-scale solar arrays are subject to the U.S. Department of Energy's (DOE) Energy Information Administration (EIA) reporting requirements. Specifically, all owners of solar systems which are one megawatt and greater are required to file two forms annually with EIA: EIA-860 and EIA-923 (Solar Energy Industries Association., n.d.a). The purpose of these forms is to allow EIA to monitor the status and trends of the U.S. electric power industry.

The regulations described above are broadly applicable to many utility-scale solar arrays. Due to site-specific considerations, other agencies or laws may be involved. For example, if a solar array is located on or near an airport, Federal Aviation Agency regulations may apply. This is also true for state and local regulatory frameworks, described below.

## New York State Regulatory Framework

In the absence of a comprehensive federal energy policy and regulatory framework that covers all aspects of electric power production, transmission, and distribution, the authority to make many decisions regarding the electric power supply in the United States is left solely to state and local government (A. Stein, 2012). In New York, energy policy and the regulatory

framework are based on a combination of legislation and agency rule-making. Specific regulations about energy production are found in Energy Law, Public Service Law, and the New York Code of Rules and Regulations (NYCRR) Title 16. Energy law broadly defines state energy policy and mandates the creation of a state energy plan. In addition, it prohibits municipalities from requiring any approval, permit, or other condition for the construction or operation of an alternate energy production facility, other than those necessary to comply with local zoning, building laws, or ordinances, or with state or federal laws or regulations (Laws of New York: Energy.n.d.) . Public Service Law applies to many aspects of energy production, distribution, and transmission (Laws of New York: Public Service.n.d.). NYCRR includes state agency rules and regulations.

There are numerous other entities involved, including the Northeast Power Coordinating Council (NPCC), the New York State Reliability Council (NYSRC), the NYISO (New York Independent System Operators), the State Energy Planning Board (SEPB), the New York State Energy Research and Development Authority (NYSERDA), the New York State Department of Environmental Conservation (DEC), the Department of Public Service (DPS)/Public Service Commission (PSC), and county and local governments. The roles of each of these organizations are described briefly below.

It is important to note that New York's energy framework has been shaped by the de-regulated nature of the state's electric system. Beginning in the 1990s, New York State implemented competitive wholesale markets. As a result independent power providers, not utilities, are the primary owners of electric generation plants.

### *State Government Entities*

The State Energy Planning Board (SEPB) is tasked with developing a state energy plan every four years, and does not have any direct role in siting solar power facilities (New York State Energy Planning Board, 2012). NYISO administers and monitors the state's wholesale electricity markets and operates the state's high-voltage transmission network. NPCC and NYSRC are tasked with various aspects of ensuring grid reliability (New York State Energy Planning Board, 2012). None of these organizations are directly involved in siting or approving solar generation facilities, despite their involvement with managing the grid (*Mark Torpey Interview by Casey Stein.*2014, Apr 04). NYISO, NPCC, and NYSRC also do not have any direct role in the interconnection process – the process of connecting solar arrays to the grid. The interconnection process and requirements associated with interconnection are largely dictated by the local utility (*Mark Torpey Interview by Casey Stein.*2014, Apr 04).

The DPS/PSC, NYSERDA, and DEC all have limited roles in the siting process in New York State. The Department of Public Service is the regulatory arm of the Public Service Commission; the chairman of the Public Service Commission is the chief executive office of the Department of Public Service. The PSC is the primary regulatory body responsible for oversight of electricity production in the state.

The Department of Public Service has limited jurisdiction over the siting of large-scale energy facilities, as a result of the Power NY Act of 2011. This reinstated Article 10 of the New York Public Service Law, which established a new permanent streamlined permitting process for power plants 25 megawatts or greater by creating a "one-stop" siting board, instead of requiring a developer or owner of such a facility to apply for numerous state and local permits (the previous threshold was 80 MW). The 25 megawatt designation is technology agnostic, and reflects the consideration that while plants above a certain threshold require some additional review,

requiring smaller facilities to go through such a process might put an undue cost and permitting burden on those smaller assets. Among other requirements, the Power NY Act calls for the siting process to include environmental and public health impact analyses, studies regarding environmental justice and public safety, and consideration of local laws (NYS Board on Electric Generation Siting and the Environment, 2013).

The New York State Department of Environmental Conservation, whose role is to preserve and protect the environment, also has a limited role in the siting process through the State Environmental Quality Review Act (SEQRA). The SEQR process incorporates the consideration of potential environmental impacts into existing discretionary decision-making processes at state, regional and local government agencies. In essence, state agencies are required to determine whether the actions that they undertake, fund or approve may have a significant environmental effect. An environmental impact statement (EIS) is required if an action is determined to have a potentially significant adverse environmental impact (New York State Department of Environmental Conservation., 2014). In addition to SEQR, state wetland permits and/or stormwater permits may be required.

The New York State Energy Research and Development Authority is a public benefit corporation primarily funded by the System Benefits Charge (SBC) on state ratepayers' electric bills. NYSERDA has been charged with helping New York meet its energy goals by reducing energy consumption, promoting renewable energy, and protecting the environment (New York State Energy Research and Development Authority (NYSERDA), 2013a). While NYSERDA is not directly involved in the siting process, it does allocate funding for numerous solar energy projects. In addition, it is required to go through the SEQR process described above when

funding utility-scale solar arrays. Therefore, it ostensibly has some limited indirect power in site consideration and evaluation.

## Local Regulatory Framework

Local governments hold the power to regulate land use within their jurisdictions. Provisions of New York State's Town, Village, and General City laws grant local governments the power to zone (Laws of New York: Consolidated Laws. n.d.). During the 1990s, New York's zoning enabling statutes were amended to provide a process for communities to adopt a comprehensive plan, which is a formal planning document that provides goals and objectives for the community. Once a comprehensive plan is adopted, zoning and other land use regulations should be in accordance with the plan to ensure that land use decisions are for the benefit of the whole municipality. While adoption of a comprehensive plan under the current state zoning enabling provisions is voluntary, zoning in communities that do not adopt a formal plan must still be in accordance with the court-fashioned definition of comprehensive planning. The purpose of ensuring consistency with a comprehensive plan is to avoid spot zoning, which gives a single parcel or a small area privileges that are not extended to other land in the vicinity. In addition to the state statutes enabling zoning, home rule provisions of the state Constitution, the Statute of Local Governments, and the Municipal Home Rule Law (MHRL) grant local government additional powers to regulate land use (New York State Department of State., 2011). The State Environmental Quality Review Act (SEQRA) also gives significant power to local governments in regard to reviewing potential impacts to the environment and human health. The lead agency for a project controls the SEQR process. In local land use decisions, NYSERDA prefers and recommends that the local authorities be the lead agencies for SEQRA. If the local authorities do not take lead agency, then NYSERDA will.

Counties also have some limited input in projects like utility-scale solar arrays. Under General Municipal Law 239, some proposed city, town and village planning actions and zoning actions are referred to the county planning agency or regional planning council. The county or regional planning council then evaluates the proposed action for countywide impacts. If the county planning agency or regional planning council recommends modification or disapproval of a proposed action, the referring body cannot act contrary to the county's recommendations except by a vote of a majority plus one (Laws of New York: General Municipal, Article 12B - County Planning Boards and Regional Planning Councils. n.d.).

## Financial Incentives

In recent years, financial incentives for renewable energy have become part of federal and state energy policy framework. As noted previously, solar photovoltaic installations have grown significantly in the last few years, and this growth is arguably due in large part to these financial incentives. Financial incentives include, but are not limited to, federal tax credits and a number of state-specific incentives. On the federal level, commercial, industrial, and a few other categories of taxpayers are eligible for the Business Investment Tax Credit (ITC). For the purpose of this thesis, this is the most important federal incentive. It is a 30 percent credit available to eligible systems installed by December 2016. On the state level, incentives include the Renewable Portfolio Standard (RPS), Net Metering, the Green Bank Initiative, and potential exemption from real property tax and sales tax (New York State Energy and Research Development Authority, 2012).

A Renewable Portfolio Standard requires a minimum quantity of electricity to be derived from renewable energy sources by a certain date. As of 2012, New York was one of thirty states that had enacted enforceable renewable portfolio standards or similar policies (U.S. Energy

Information Administration., 2012). New York first established its RPS in 2004; the RPS required 25 percent of electricity to come from renewable energy resources by 2015 (New York State Energy and Research Development Authority, 2012). In 2009, the PSC expanded the RPS goal from 25 to 30 percent.

In most states, the obligation to comply with RPS goals is placed on utilities and competitive energy service providers that supply power to the public. Each megawatt of renewable energy produced also generates an intangible "attribute," sometimes referred to as a certificate or a credit. The power producers can meet the RPS goals either by producing the power themselves, or by purchasing the aforementioned attributes which represent renewable power produced by other parties.

New York's RPS program is slightly different. In New York, the obligation for meeting RPS standards is not on electric power producers directly; instead, NYSERDA is a centralized procurement administrator for renewable power. NYSERDA does not procure renewable energy directly; its role is to provide financial incentives for the production of energy from renewable sources (New York State Energy and Research Development Authority, 2012). The source of funds for these financial incentives is the Systems Benefits/RPS Charge on ratepayer electric bills; the funds are collected by the major private utilities operating in the state, and transferred to NYSERDA (NYSERDA, 2013, June 10).

In the case of solar power, the incentives are provided through one of two RPS "tiers" – the Main Tier and the Customer-Sited Tier. The Main Tier provides production incentives to renewable electric generation facilities that deliver their electrical output directly into NYISO's wholesale power market. In contrast, the Customer-Sited Tier provides incentives to renewable energy installations that are located "behind the meter" (New York State Energy and Research

Development Authority, 2012). The Customer-Sited Tier is further broken down into non-residential and residential programs. It was a Customer-Sited Tier non-residential funding program that provided the financial incentives to both of the case studies of this thesis.

When assessing and reporting on progress toward the RPS goal of 30 percent, all electric energy produced by any project receiving funds through the RPS Customer-Sited Tier program is included. As indicated previously, the generation of the electricity also generates an intangible representation, or attribute, of the generation.

Unlike some of the other states with RPSs, New York does not currently have a market for buying and selling these "attributes." There does not appear to be a definitive source on how ownership of these attributes is allocated, but the Database of State Incentives for Renewables and Efficiency (DSIRE) indicates that attributes generated by New York solar power production facilities that receive funding from NYSERDA are retained by NYSERDA for the first three years of energy production. NYSERDA, as the central procurement administrator for New York, uses these attributes to meet New York's RPS goals (Database of State Incentives for Renewables and Efficiency (DSIRE), 2014). Interviews also suggest that Skidmore College and Cornell University will have the right to these credits at some point in time. Furthermore, no party "shall agree to or enter any transaction that would or may be intended to result in the exportation or transmittal of any electrical energy created by any project receiving funds through the NYS RPS Customer-Sited Tier Program to any party or system outside of New York State" (NYSERDA, 2013f).

New York is considering replacing the RPS with a new Clean Energy Fund. As of the end of 2013, the state had not yet reached half of the RPS "goal of getting 30 percent of the state's energy from renewable sources. In the May 8 filing, the PSC said that the goals of the

RPS and another state energy efficiency program 'have thus far appeared unattainable.' The RPS was set to expire in 2015; the Clean Energy Fund is proposed to be a bridge between that and the intended $1 billion capitalization of the Green Bank Initiative" (Rulison, 2014).

### *NY-York Sun Initiative*

Another financial incentive associated with the RPS is the NY-Sun Initiative. As a means of meeting the RPS goals, the NY-York Sun Initiative, a public-private partnership, was launched in 2012 to promote solar as a clean energy solution in New York State by stimulating the growth and deployment of solar technology. As New York Governor Andrew Cuomo cited in his 2013 State of the State Address, "the long-term commitment to solar energy represented by NY-Sun will make New York State a leader nationally in solar development" (NYSERDA, 2014a). According to Frank Murray Jr., former NYSERDA President and CEO, "Governor Cuomo's NY-Sun initiative has been the catalyst for the unprecedented growth of solar power in the state" (NYSERDA, 2013b). As a result of NY-Sun, "more photovoltaic (PV) systems are now being deployed in the state than in the entire prior decade" (NYSERDA, 2013b).

The scope of the NY-Sun Initiative includes a PV deployment incentive program as well as efforts to advance solar technology and cost reductions (NYSERDA, 2014a). The NY-Sun incentive program that provided funding for the case studies in this thesis was called Program Opportunity Notice (PON) 2589, and was administered by NYSERDA. This particular program was part of the RPS Customer-Sited Tier program, and is described in further detail in a later section of this thesis.

### *Net Metering*

Net metering is a market-based incentive that allows customers who generate their own electricity from renewable energy sources to receive a financial credit at the retail electricity rate for excess electricity that is generated by their system and fed back into the grid (New York State

Energy and Research Development Authority, 2012). Under New York law, a "'net energy meter' means a meter that measures the reverse flow of electricity to register the difference between the electricity supplied by an electric corporation to the customer-generator and the electricity provided to the corporation by that customer-generator," and "'net energy metering' means the use of a net energy meter to measure, during the billing period applicable to a customer-generator, the net amount of electricity supplied by an electric corporation and provided to the corporation by a customer-generator" (Laws of New York: Public Service.n.d.).

The purpose of net metering is to overcome the market barriers that exist for high capital cost renewable energy projects like solar facilities by providing value for the generated electricity. Net metering regulations vary by state. In New York, net energy metering exists for residential solar, farm waste, non-residential solar, micro-combined heat and power generating equipment, fuel cell electric generating equipment, and micro-hydroelectric generating equipment (Laws of New York: Public Service.n.d.).

New York first allowed net metering in 1997. It originally applied only to residential photovoltaic (PV) systems up to 10 kilowatts (kW). Since then, net metering policy has expanded and become more nuanced. In August 2008, New York amended its net metering laws to extend net metering to non-residential PV and wind systems (U.S. Department of Energy., n.d.a).

The current net metering rules in New York State require electric corporations (utilities) to provide for the interconnection and net metering of solar electric generating equipment owned or operated by customer-generators. The definition of a customer-generator includes a "non-residential customer of an electric corporation which owns or operates solar electric generating equipment located and used at its premises" (Laws of New York: Public Service.n.d.). The solar

electric generating equipment must have a rated capacity of not more than the lesser of 2 megawatts or the customer's peak load. New York's net metering law also defines conditions of service, rates, and safety standards. The safety standards are intended to deal with frequency and voltage variations on the line (Laws of New York: Public Service.n.d.).

Net metering is currently available on a first-come, first-serve basis to customers, as there are limits as to the amount of electricity that utilities are required to accept from customer-generators using net metering (U.S. Department of Energy., n.d.a). As of June 2013, the minimums were set at 1% of 2005 peak demand. As of July 1, 2013, the NY PSC issued an order directing regulated New York State utilities to raise the required minimum (RM) net metering limit to 3% of the 2005 peak demand (U.S. Department of Energy., n.d.a). However, there does not appear to be a clear and understandable program for tracking how net metered PV is approaching the RM in any utility territory. There is also some concern that the state's net metering law (NM Rule PBS/4/66-j) is complicated and difficult to understand (City University of New York, 2013).

In June 2011, New York "enacted an expansion of net metering to allow customer-generators to engage in 'remote' net metering of solar, wind, and farm-based biogas systems....The law permits eligible customer-generators to designate net metering credits from equipment located on property which they own or lease to any other meter that is located on property owned or leased by the customer, and is within the same utility territory and load zone as the net metered facility. Credits will accrue to the highest use meter first, and as with standard net metering, excess credits may be carried forward from month to month. Revised utility tariffs incorporating this change for solar, wind, and farm-based biogas systems became effective December 1, 2011" (U.S. Department of Energy., n.d.a). Under remote net metering, the "host"

meter is the meter where the array is physically located, and "satellite" meters are other locations where the electricity credits from net metering can be applied.

A 2013 PSC ruling provided additional clarity on the implementation of remote net metering. Cornell University had filed a petition with the PSC to overturn a requirement of the local utility, New York State Electric and Gas (NYSEG), that there be a minimum load on a host meter. The PSC ruled in favor of Cornell, stating that "While PSL §66-j(3)(e) therefore requires that there be a load and usage to qualify for remote net metering, neither Paragraph 3(e) nor any other provision of the statute requires that there be a minimum load or usage" (New York State Public Service Commission, 2013, May 16). Furthermore, "nor is it necessary for a remote net metered customer to establish that a load has historically been present at a site where it desires to install a host meter. The customer need merely show that it has concrete plans to create at the site a load resulting in usage sufficient to justify installation of the net meter that would become the host meter. The load and usage need only be present by the time the generation facility commences operation" (New York State Public Service Commission, 2013, May 16). The effect of the ruling was to allow customer-generators to site PV arrays on properties with little or no on-site electricity demand.

The rate used to calculate remote net metering credits at a host meter was also clarified during this PSC ruling. NYSEG had argued that allowing remote net metering customers to essentially self-select the tariff rate applicable "would encourage installation of remote net metered facilities at sites where there is presently no or very little load, and where a rate incorporating a comparatively large variable component could be obtained...The larger the variable component of the rate, NYSEG explains, the greater the net metering credits that result" (New York State Public Service Commission, 2013, May 16). Cornell argued that the rate used

to determine remote net metering credits at the host meter should be "the rate set in the service classification in effect at that meter" (New York State Public Service Commission, 2013, May 16). On this point, PSC also found in favor of Cornell.

There has been a significant level of debate about the fairness of the distribution of benefits and costs that result from net metering (Cardwell, 2012; Perlstein & Frantzis, 2013). Although many solar advocacy groups support this financial incentive (Solar Energy Industries Association., n.d.b; The Alliance for Solar Choice., n.d.), there is some concern that the benefits of net metering accrue primarily to wealthier electricity customers, while the costs fall largely on ratepayers who do not own solar arrays – a so-called reverse robin hood concept (California Public Utilities Commission, 2013). Due to current rate structures, net metering essentially shifts some costs to customers who don't have PV systems. This is because "customers who use PV electricity onsite avoid paying a portion of the transmission and distribution rates; these costs must then be recovered from other ratepayers via increases in retail rates" (New York State Energy and Research Development Authority, 2012). Notably, customers who do own PV arrays tend to be fairly well off from a financial standpoint.

### *Green Bank Initiative*

The New York Green Bank, a division within NYSERDA, started business on February 11, 2014, with the goal of stimulating private investment in the state's clean energy economy "by opening up financing markets and expanding availability of capital" (NY Green Bank, n.d.). It is the largest green bank in the United States, and as of February 2014, was seeking "financing proposals from industry participants and financial institutions in which NY Green Bank participation will facilitate private market financing of renewable energy and energy efficiency

projects that have difficulty accessing financing due to market barriers" (Governor's Press Office, 2014).

### *Property and Sales Tax Exemptions*

Section 487 of the New York State Real Property Tax Law provides for a 15-year property tax exemption for grid-connected, net metered residential, commercial, industrial and agricultural solar facilities. The exemption covers an increase in assessed value attributable to the PV system. Taxing jurisdictions - municipalities, school districts, and counties - may opt out of the exemption; however, the exemption is valid unless a local government opts out. New York also exempts the sale and installation of residential and commercial solar energy systems from New York State sales and compensating use taxes. Local governments (municipalities and counties) may also grant an exemption from local sales taxes (New York State Energy and Research Development Authority, 2012).

## Siting Energy Facilities

### Overview

Siting can be broadly defined as the private and public activities relating to the planning, permitting, and approvals for building a particular project in a particular place. Controversies surrounding the siting of certain types of development are not new. What is new is that siting controversies are now associated with utility-scale ground-mounted solar arrays. "With each new energy source, new property rights conflicts emerge and must be adjudicated" (Borenstein, 2012).

The number of controversies associated with ground-mounted solar arrays appears to be somewhat limited. This is arguably because large-scale ground-mounted facilities are relatively

new and few in number. Smaller-scale solar energy arrays, such as rooftop-mounted panels or those in people's backyard, tend to have limited impacts on others, and therefore are much less likely to generate controversy. In contrast, utility-scale ground-mounted solar arrays often have more significant environmental and economic impacts than smaller-scale systems, and examples can be readily found in the news about controversies surrounding these types of solar facilities. These include, but are not limited to, solar projects in the Mojave Desert in California and 2 megawatt solar arrays in Massachusetts and Vermont (Defenders of Wildlife, 2011; Martinez, 2012; Petry, 2013; Woody, 2010). As the push for solar energy intensifies, so does the potential for conflict. There have been a number of siting conflicts in recent years indicating that the development of solar energy is poised to reflect past experiences with siting wind facilities, solid waste facilities, telecommunications facilities, and others.

While solar arrays can be linked to many of the same challenges and controversies as traditional centralized generation facilities, they also bring some new challenges and controversies. One of the largest differences is that the location of PV arrays is not constrained by some of the factors that affected the siting of many traditional centralized generation facilities, such as access to transmission lines or access to large quantities of water. From a purely geographic perspective, solar arrays can be sited almost anywhere there is sun. However, notably, the distribution of the benefits and costs of a utility-scale ground-mounted solar array is still, to some extent, dependent upon the choice of site.

## How Controversies Arise

Controversy is defined as "a prolonged public dispute, debate or contention" (*Webster's new universal unabridged dictionary,* 1996). Oftentimes projects, such as waste management, telecommunications facilities, and energy production facilities, have undesirable local impacts,

and can be referred to as "locally unwanted land uses" or LULUs. Siting these facilities can be a controversial process, as "LULUs are the targets of individuals or groups who believe they stand to 'lose' if a facility is built" (Susskind, 1990). The proposed siting of LULUs, whether involving renewable energy sources or not, can trigger all kinds of reactions – from advocates who stand to gain more than they will lose to opponents who feel like their land values and viewsheds are threatened (O'Hare, Bacow, & Sanderson, 1983).

In the case of renewable energy facilities, a favorable public attitude toward a technology can co-exist with resistance to specific proposals or developments (Owens & Driffill, 2008). As a result, local opposition to renewable energy facilities is often labeled as 'NIMBYism'.[3] NIMBYism is a term used to describe opposition to development proposals, often with the connotation that opponents believe that the developments are good for society but should be far away from them. A number of authors have criticized the NIMBY explanation, arguing that opposition to particular technologies, or specific sites, is often inadequately characterized as NIMBYism (Bidwell, 2013; Owens & Driffill, 2008). "What is often dismissed as NIMBYism has been shown in much recent research to be a more complex and multi-faceted phenomenon, of which 'pure' NIMBYism forms only one component. According to one study on the nature of resistance to wind power in the UK, the term 'is an opinion poll perpetuated myth, unhelpful in understanding the wider environmental debate, derogatory to those who are labeled by it and misguiding in its simplistic stereotyping'" (Owens & Driffill, 2008). As a result, a NIMBY label can lead developers to disregard the substance of local opposition, limiting a clear understanding of the issues at stake. Therefore, in many cases, analysts have suggested the need for a more nuanced look at attitudes towards renewable energy facilities, and the drivers of those attitudes (Bidwell, 2013).

[3] NIMBY stands for "not in my backyard."

NIMBYism or not, public conflict over certain types of development seems to have become the rule rather than the exception. Scholars have explored the siting process to better understand where and why controversies develop. *Facility Siting and Public Opposition*, written by O'Hare, Bacow, and Sanderson in 1983, details the siting process and the problems that arise from it.

O'Hare et al. believe that "parties in siting disputes act rationally and effectively to serve their interests as they perceive them. Thus, we think the failure of our conventional facility siting process lies in a decision-making and interest-balancing structure that frustrates the desires of the participants to cooperate or compete constructively, rather than any defect in the intelligence or the character of the participants" (O'Hare et al., 1983). They also note that "much of the facility siting debate is ignorant or ill-informed because the social, political, and economic structures by which information is made available obstruct its efficient use or generation" (O'Hare et al., 1983). Both decision-making structure and the information stream are detailed in greater depth in the following sections.

### *Decision-Making Structure*

Despite variations between siting controversies, a common pattern generates conflict and mistrust between the two major parties affected by the siting process – the developer and the affected community or group or individual(s). This common pattern has sometimes been called the 'Decide-Announce-Defend' model. This model can be described as follows:

> In the first stage, the developer makes a series of technical choices with his engineer, market analysts, and lawyers. He typically has no interaction with local government nor those who would be affected by his decisions....The developer then announces his technology and site package to the public. If he mentions alternatives, they often seem factitious. He appears to approach the public with a single firm decision camouflaged behind impossible alternatives. His strong position sets the stage for conflict. Now the permitting process begins...He [the developer] must prepare and publicize information about the proposed project, and thus the public gets its first opportunity to be heard.

> People with strong concerns about the project and those who don't thoroughly understand it approach this opportunity defensively. They have no reason to expect the developer to change his mind, alter his project, choose another site, or heed the public's concern....In the end, this decision-making process breeds conflict and opposition, without providing constructive methods for incorporating people's concerns and resolving differences. At the end of a process already far along, the developer thus faces a hostile population, composed of people who feel duped – informed of a project in the eleventh hour, and told by government and industry alike, 'love it or leave.' But in many siting cases the developer also feels duped. Even if he has approached local officials with the proposed project and sold them on the concept and its benefits, new voices of opposition are suddenly heard. Indeed, opponents often claim that the local officials are in bed with the developers (O'Hare et al., 1983).

As illustrated above, both parties have expectations of each other that lead to animosity; behavior by one party is often viewed as ignorant or insincere by the other party. Mistrust and suspicion of developers is often exacerbated when opponents of a project scrutinize a developer's behavior for evidence reinforcing their initial perception. "Such evidence is often forthcoming: any inconsistencies between what the developer does and what he says he will do, any reticence in providing information, or any tendency to define the opposition's concerns as trivial or unimportant will encourage mistrust" (O'Hare et al., 1983). It is also problematic that financial constraints or deadlines are used as excuses to limit public debate.

Furthermore, opponents of a proposed project can often organize easily, as "they typically live near each other, they know each other or are at least acquainted, and they share a simple, common perceived objective – to stop the facility (although they may have different reasons for wanting to do so). While they lack experience in public activity, and often find it necessary to work overtime in order to acquire the necessary skills, they are not without resources" (O'Hare et al., 1983). Opponents can and often do use informational and procedural requirements to delay or stop a proposed facility. If opponents are not able to stop a project at the local level, they often try again by resorting to the courts or using political clout.

### *Information*

Information, or the lack thereof, also plays a critical role in siting controversies. Those affected by a project commonly believe that public officials and developers do not have enough information about the potential social, economic, and environmental impacts of proposed facilities to make good decisions. This can be exacerbated by the fact that developers often provide only the information needed to satisfy legal requirements, much of which is generated through the environmental impact assessment (EIA) process.

The environmental impact assessment process has been subjected to significant criticism. Part of the problem is that information is "fundamentally different from most other goods we consume. We rarely consume information for its own sake. Rather, we desire information because it helps us make a decision" (O'Hare et al., 1983). As a result, while the EIA process produces information, opponents to a proposed project commonly assert that they do not have the 'right' information. Charges of bias are also common, since assessing future consequences is a value-laden process that requires assumptions to be made. Since the EIA process creates legal rights that project opponents can use to delay a project, developers are often more concerned with meeting legal requirements than promoting well-informed decision-making.

In New York State, as indicated above, SEQRA is the law that requires environmental assessments. The questions on environmental assessment forms theoretically could be very helpful for understanding a project's impacts. The forms include questions about consistency with community character and community plans, whether permits or changes in zoning are required, impact on noise, impact on energy, impact on open space, impact on land, and impact on aesthetic resources. However, the answers are often somewhat subjective. This can lead to challenges, especially since the forms are generally filled out by a combination of the project applicant and the designated government lead agency.

## Case Studies

A well-conceived siting process should both facilitate the construction of what we want and also discourage the construction of the 'wrong' projects in the 'wrong' place." According to O'Hare et al., a feature of the siting process is a 'problem' if it 1) decreases the efficiency of the process; 2) decreases the efficiency of the outcomes; or 3) decreases fairness or equity. This thesis will explore siting controversies using this basic framework and incorporating the points made above. The purpose is to better understand some of the reasons for siting controversy surrounding ground-mounted utility-scale solar arrays in New York State and to propose some potential options for mitigating controversy and improving the siting process. To accomplish this goal, the siting of two 2 megawatt photovoltaic solar arrays in New York State - the Skidmore College Denton Road PV Array and the Cornell University Snyder Road PV Array – will be examined.

While the two share many commonalities, the level of controversy associated with them has been markedly different. There was significant controversy with the Skidmore project. Public dispute over the project started when the project was introduced to the public in May of 2013, continued through the entire review process, and has not ended to date. In contrast, there was limited controversy in the Cornell case. While the town and a public advocacy group brought up some issues, the issues were limited in scope, and the project approval process was relatively quick.

For the purposes of this thesis, the two arrays – the Skidmore College Denton Road PV Array and the Cornell University Snyder Road PV Array – will be referred to, respectively, as the Skidmore array and the Cornell array. Also, for the purposes of this thesis, in the Skidmore case, project opponents, which included neighbors, lawyers, experts, and some other Greenfield residents, will generally be simply referred to as "the neighbors." Similarly, project proponents –

Skidmore College, Dynamic Energy, lawyers, experts, and others – will primarily be referred to simply as "Skidmore." In the Cornell case, project proponents – Cornell University, Distributed Sun, Ulysses Solar, lawyers, experts, and others – will mostly be referred to simply as "Cornell." This will be true unless there is some benefit to being more specific about the parties involved.

## Overview of the Case Studies

As background, both arrays will be constructed on off-campus properties owned by the two institutions. Skidmore College's campus is in Saratoga Springs, New York; its array will be located on Denton Road in the neighboring town of Greenfield. Cornell University's campus is in Ithaca, New York; the array will be located in the neighboring town of Lansing.

Both universities have entered into Power Purchase Agreements (PPAs) with commercial solar power companies. Under standard PPAs, a "host" customer agrees to site a PV array on its property; a solar power developer owns, maintains, and operates the array. The host customer then purchases the system's output from the solar power developer. In these case studies, the host customers, which are the colleges, will then receive compensation for the power from their local utility, as mandated by New York's net metering law, which requires utilities to accept up to 2 MW per hour of excess generation from alternate energy facilities. The compensation will be in the form of monetary credits, and will be calculated based on the meter's service classification. The avoided cost rate is basically the same price that a user would pay for electricity – supply + transmission + charges. The specific terms of the Skidmore and Cornell PPAs are not known, as these documents were not part of the public record, and were not released through the Freedom of Information Law (FOIL) process.

In both cases, there will be limited, if any, on-site use of the electricity. In a memo to the Greenfield Planning Board, Skidmore stated that they "will not use the actual power generated

by the solar project. Instead the power will flow onto the National Grid wires" (Ferradino, 2013, June 18). In its March 2013 application to the PSC, Cornell described current and projected future use on the Snyder Road site as follows: "In March 2013...it installed a security lighting fixture at the Snyder Road meter in order to prepare for resuming work at the site. Cornell adds that it plans to connect to the meter an electrically-driven pump that will replace an existing pneumatically-driven pump at a groundwater monitoring well located on the RDS site. Together, it anticipates these two loads will total about.36 kW, and consume about .6 kWh per month. In addition, if it were to proceed with installation of the solar facility, Cornell estimates it would draw a demand of no more than .5 kW at night, when the facility does not operate" (New York State Public Service Commission, 2013, May 16).

From a financial perspective, the two projects are similar in terms of associated costs and incentives. Both colleges will receive compensation for the electricity through the net-metering incentive, as detailed above. In addition, both colleges will use New York's remote net metering incentive to aggregate meter use to the 2 MW maximum limit for compensation under remote net metering law.

Both projects will also be eligible for a number of other financial incentives. On the federal level, the 30 percent federal tax credit will be available to the solar power companies, which own the PV systems. On the state level, it is assumed that both projects will be eligible for exemption from certain sales tax credits. While, as detailed above, local taxing jurisdictions can opt-out of New York State's solar property tax exemptions, this is essentially moot in these case studies. Both properties will retain tax-exempt status. In Greenfield, it was not considered a commercial use of property because the college is "using the power." In the case of Cornell array, "since this project is for Cornell and could easily be done by Cornell and strictly serves the

Cornell campus, it has been deemed to fall under their educational exemption and is exempted regardless that the county, Town of Lansing and Lansing Schools have opted out of this exemption" (*Jay Franklin Interview by Casey Stein.*2014, Mar 19).

In addition, both projects are receiving nearly equal funding, approximately $2.35 million each, from the NY-Sun Initiative through the New York Sun Competitive PV Program, Program Opportunity Notice (PON) 2589, which was an incentive program for non-residential customer-site PV projects greater than 200 kilowatts. Project sites located in "strategic locations" received an additional 15% above the project incentive – however, neither the Skidmore array nor the Cornell array was located in a strategic location (NYSERDA, 2013f). PON 2589 was announced in 2012, and had over 100 million dollars in funding available at that time. There were to be three rounds of awards in 2013; the due dates for proposals were December 5, 2012 for the first round, March 14, 2013 for the second round, and August 29, 2013 for the third round. When PON 2589 was originally written, NYSERDA noted that they anticipated that future rounds of PON 2589 would be offered in 2014 and 2015. Notably, as of early 2014, the NYSERDA website listed the PON 2589 funding program as discontinued (Mace & Levy, 2012). As previously detailed in the incentives section, the source of the funds for PON 2589 was ratepayer funds collected by utilities.

The intent of PON 2589, according to press releases from NYSERDA and the Governor's Office, was for on-site use of power. The specific statement that was included in the press releases was: "The projects are meant to produce power for on-site use, not for direct sale to utilities. Under certain circumstances, however, unused power can be added to the grid in exchange for future utility credit" (NYSERDA, 2013b). Program funding guidelines also appeared to stipulate on-site use of power, by defining the Project Site as "the site at which the

PV system is located, where the electricity from the PV system is used, and where the electric customer's utility meter is located" (NYSERDA, 2013f). Changes to the project site were only allowed within two months of notification of award, and were contingent upon submission of a new Project Site package and NYSERDA approval. In addition, PON 2589 called out that this was a "fast-track" program, with installation to be completed within 8 months of the notification of award. Extensions were only to be allowed for good cause (NYSERDA, 2013f).

Proposal selection occurred via a 3-step procedure. First, proposals were screened for completeness and conformity with eligibility requirements. Second, projects were reviewed by a Technical Evaluation Panel (TEP) to ensure that technical requirements were met. Last, from the set of the projects that passed the first two tests, the funds were granted beginning with the lowest incentive bid then progressing sequentially through higher bids (NYSERDA, 2013f).

Eligible applicants were permitted and encouraged to form teams in order to meet eligibility requirements. The Skidmore array "team" consisted of Skidmore College and Dynamic Energy. The Cornell array "team" currently consists of Cornell University, Ulysses Solar, LLC and RenewEnergy Solutions.

Despite the similarities between the two projects, the Skidmore project was subject to much more scrutiny than the Cornell project. In fact, the level of controversy surrounding the Skidmore project has made somewhat of an anomaly in the state (*Mark Torpey Interview by Casey Stein.*2014, Apr 04). Part of the reason for this is that the vast majority of solar energy systems installed in New York have been rooftop residential systems. The state is only starting to see the 1-2 megawatt systems being installed.

The reasons behind this divergence are explained in depth below, relying to some extent on past work exploring siting controversies The divergence allows some exploration of the level

and causes of controversies that develop when a project is scrutinized. The exploration of the causes of these controversies is important, because, as illustrated below, controversies surrounding solar facilities have implications for the future of solar energy.

## Skidmore College Denton Road PV Array

### *Background*

In December 2012, Dynamic Solar LLC (later renamed Dynamic Energy), a Pennsylvania solar power company, submitted a grant application to NYSERDA under PON 2589 for funding for a 2 MW ground and roof-mounted photovoltaic array. The system host was listed as Skidmore College. The project site was identified on the application as 815 North Broadway, Saratoga Springs, New York, which is the location of the Skidmore campus. The meter to be used for connection to the grid (host meter) was identified as one on the North Broadway campus. The application included another meter; the location of the second meter was not identified. The implication was that the second meter was a satellite meter for net metering compensation.

On March 11, before the award was publicly announced or the contract was signed, a Dynamic Energy representative sent NYSERDA an email requesting to add a new meter in addition to the other two that were in the application, "Attached is the new meter/account we would like to use….We will be remote net metering the generation from this meter to the main campus meter which uses 24,240,012 kWh annually" (Plunkett, 2013c). The location of the meter was not identified in the email, but the new meter was the meter on the off-campus Denton Road property in Greenfield. NYSERDA responded that the meter could be added (Cox, 2013d; Plunkett, 2013b).

On March 15, Dynamic was notified by NYSERDA that they had received the award. The deadline for returning the signed contract to NYSERDA was April 14; the deadline to submit the contract between Dynamic and Skidmore to NYSERDA was May 15, and the deadline for the system to be operational was November 15, 2013. The award letter stated that failure to make these deadlines could, or would, result in termination of the contract.

On April 2, prior to signing the contract, Dynamic asked NYSERDA "Do we need to do anything with our Skidmore application if we are adjusting our host and satellite meter? We are still going to use the same meters, but we are going to change which is the host and which is the satellite" (Plunkett, 2013b). NYSERDA's response to the question was "As for the meters for the Skidmore project, is everything else the exact same? Location of pv system, size, etc." If so, then I will just make note that the meters have switched" (Cox, 2013c). It is unclear whether Dynamic ever responded to the question about the location of the PV system. If there was a response, it was not included in the documents released through the FOIL process. This email, however, was the only apparent notification to NYSERDA of Skidmore's decision to change the project site from the Saratoga Springs campus to the Denton Road property in Greenfield.

On April 9, the contract was signed by Dynamic Energy. In the contract, the project was identified as a roof and ground-mounted array, and the project site was still identified as 815 North Broadway, Saratoga Springs, despite the April 2 email requesting the meter assignment change. The contract identified the customer purchase agreement type as a PPA (Standard Performance Agreement, 2013). While the actual details of the PPA were never released through the FOIL process, it was eventually determined that Dynamic was the owner of the PV array.

On May 9, a project narrative was provided to the town, and the project was introduced by Skidmore at a Greenfield Town Board meeting. The town was told that "Dynamic Energy and

Skidmore College have joined forces and have been awarded a grant by New York State through the New York Sun Program, and that, in order to qualify for some of the grant money the project has to be started before the end of August" (Greenfield Town Board, 2013c). Skidmore informed the town that Denton Road was the project site, and that a conduit would be installed to transfer the energy to the college. When asked if they would be connecting to National Grid, the response was that it was primarily for college use. There was "no planned storage facility and unused power would go back to the grid" (Greenfield Town Board, 2013c).

The proposed project site was zoned Moderate Density Residential – 2 (MDR-2). According to the project's Environmental Assessment Form, the predominant land uses with a quarter mile radius of the proposed action were residences, horse farms, a polo facility, vacant land, and an adult living community. The proposed array was not a listed MDR-2 use; there were, and still are, no solar bylaws in Greenfield. Skidmore's options were to wait for zoning law to be amended, obtain a variance, or create a Planned Unit Development (PUD). Skidmore chose to apply for a PUD. Under Greenfield law, any type of use is permitted within a PUD subject to the approval process specified in their code (Town of Greenfield, n.d.b). The proposed PUD would include, among other things, a baseball field, a polo field, and the approximately 8-acre solar array.

**Figure 1: Denton Road. Credit: Times Union**

**Figure 2: Site for Skidmore solar array prior to construction**

The Town Planning Board was designated as Lead Agency for environmental review of the project under the State Environmental Quality Review Act ("SEQRA"). In addition, Saratoga County also had an advisory role. While county governments in New York State do not have land use authority, they evaluate projects like this for county-wide impact per General Municipal

Law 239. If there is an unmitigated county-wide impact, a majority plus one of the local approval board is required to approve the project. Couch White, LLP was the law firm representing Skidmore in their request to the Town of Greenfield to rezone the Denton Road property.

Skidmore's publicly stated reasons for building the solar array were as follows: "The College is developing a plan of overall sustainability and sustainable energy is a composite of that plan. The College feels that their responsibility is two-fold – first they want to lead by example so the students are coming up with the current way of thinking about energy and the second is that this is on the top 10 things that college students are looking for when choosing colleges. Right now 40 percent of the campus is heated and cooled with geothermal. As part of the NYS initiatives, the Governor's Office is encouraging solar use throughout NYS" (Greenfield Planning Board, 2013f).

After hearing the initial project proposal, and some public comments, the Town Board forwarded the proposal to the Town Planning Board and Town Environmental Commission for their review and recommendations. The Planning Board review took place over a series of nine meetings between June 2013 and October 2013. While SEQRA does not require a public hearing, it is within the Board's purview to request one. Since the Board believed that there was likely to be controversy related to potential environmental impacts, they decided it was in their best interest to have a public hearing. The public hearing began on June 25 and was closed on August 27 following comments from the Planning Board about how they had not heard anything new, and that the public hearing could be reopened in the future if necessary (Greenfield Planning Board, 2013b).

Over the course of the Planning Board review, a number of other project-related events transpired. The Greenfield Environmental Commission reviewed the proposed PUD and

recommended approval with two suggestions. The Saratoga County Planning Board reviewed the application and found that there would be no county-wide impact. In response to official requests, Skidmore College made numerous revisions to the proposed Local Law and the Development Agreement required by the Local Law (Greenfield Town Board, 2013b). Also during this time, the Denton Road neighbors requested that the Town of Greenfield implement a moratorium on solar arrays until bylaws were added to zoning code. The town declined to consider a moratorium at that time, stating that it was neither necessary nor fair because the application was already under review (Greenfield Town Board, 2013a).

On September 24, the Planning Board adopted a SEQRA Negative Declaration for the PUD, finding that there were no potential significant environmental impacts associated with the project (Greenfield Planning Board, 2013j). During the next meeting on October 8, the Planning Board reaffirmed its Negative Declaration decision, directed the Town Attorney's office to file the Negative Declaration for the PUD, and adopted a resolution recommending approval of the Skidmore College Planned Unit Development proposal with two conditions. The two conditions were related to the issuance of bonds to ensure adequate screening and decommissioning of the solar array. Five Planning Board Members voted for approval, one Planning Board member was absent, and the Planning Board Chairman voted against the project, because she did not think it was consistent with the Town's Comprehensive Plan. The Planning Board Members who voted in favor of the project found, among other things, that the proposal "conforms to the Town's comprehensive planning objectives, meets the intent and objectives of a Planned Unit Development, complies with the general requirements listed in §105-129B of the Zoning Law, and will not be detrimental to the natural characteristics of the site or adjacent land uses" (Greenfield Planning Board, 2013i).

The Town Board met four times between October and December 2013 to discuss and review the proposed PUD; one of these meetings was a public hearing. During the course of the PUD approval process, the Town received and reviewed 52 submissions about the project from the project applicants, the neighbors of the proposed solar array and associated lawyers, other Greenfield residents, Saratoga County, and experts employed by both sides in the debate (Greenfield Town Board, 2013b). NYSERDA also granted Dynamic Energy an extension on the project. The extension required that Skidmore obtain all necessary permits by mid-December, the solar modules be delivered to the site by December 30, and that the system be live in April 2014 (Greenfield Town Board, 2013e).

Additionally, during this period, the Town Supervisor and one Town Board member also had informal conversations with Skidmore representatives early in the process to discuss provisions of the Development Agreement. The provisions were provided to the Town on August 12, 2013 as part of the PUD draft. Among the provisions discussed were payments to the Town to be used for Brookhaven Park, which is the town golf course (Ferradino, 2013, June 12; Ferradino, 2013b). Skidmore did attest that the Town Supervisor and the Town Board member did not conduct official business and that they provided no promises or assurances that the Development Agreement or the PUD would be approved by them or the Town Board (Ferradino, 2013, Dec 04).

At the last Town Board meeting in December, where all five Town Board Members were present along with the Town Counsel, Highway Superintendent, and approximately 40 residents, the Town Board approved the solar project by adopting "Local Law No: 2 of 2013 amending the Town Zoning Law and Map to create Planned Unit Development District No. 5, Skidmore College Planned Unit Development District" (Greenfield Town Board, 2013b). Four out of the

five Town Board members voted in favor of the project; one Town Board member voted against the proposal. The Town Board's finding was as follows:

"The Town Board recognizes that this is a very controversial application for rezoning and some neighbors have expressed some legitimate concerns about it" (Greenfield Town Board, 2013b). However, the "Town Board and Town Planning Board have thoroughly reviewed the application and these concerns and the Town Board believes that, on balance, the proposed use of land is suitable and more beneficial to the Town than numerous other potential uses which would not require rezoning. In exercise of its legislative discretion, the Town Board believes that as a result of the exhaustive review by the Town Planning Board and the numerous revisions and conditions which will govern the proposed uses if adopted, the proposed rezoning is beneficial to the Town of Greenfield and its residents" (Greenfield Town Board, 2013b).

The final application and Local Law No. 2-2013 included conditions and requirements that Skidmore was to meet to protect the welfare of the community. These included, but were not limited to: visual screening, noise monitoring, restriction and elimination of additional uses, prohibition of expansion of the solar facility, provisions for decommissioning of the solar array, assessment of property taxes on any portion of the property which ceased to qualify for tax exemption, and execution of a Development Agreement to provide economic contributions in furtherance of Town projects (Greenfield Town Board, 2013b).

After the Town Board's approval was issued, the project went back to the Planning Board, which approved the site plan review for Skidmore College's PUD. This approval was contingent upon a series of conditions, which included measures to mitigate visual impacts and potential safety issues, a required pre-construction meeting, and the prerequisite that the

applicant comply with the Town of Greenfield Building Department's requirements (Greenfield Planning Board, 2013c).

In January, owners of two of the neighboring properties filed an Article 78 proceeding in State Supreme Court. The Daily Gazette reported that "The massive solar energy farm Skidmore College is proposing off Denton Road is facing a legal challenge from a pair of neighboring property owners claiming town officials negotiated a half-million-dollar payment from the school out of public purview before giving the project its final approvals" (Mason, 2014). The neighbors accused "former Greenfield Town Supervisor Richard Rowland and Deputy Supervisor Daniel Pemrick of negotiating a $500,000 deal with Skidmore in exchange for a zoning change on the 120-acre property....The legal action also questions whether the town properly determined 'the true nature and extent' of Skidmore's solar project before referring it to the Planning Board." In response, the new Greenfield Town Supervisor stated about the petition "'It's unfortunate but not surprising'" (Mason, 2014).

In response to the Article 78 petition, Skidmore College representatives began negotiations with the neighbors offering some guarantees restricting use of the remaining portions of the 120 acre-parcel in exchange for the neighbors dropping the Article 78 petition. An agreement was reached, and the Article 78 petition was withdrawn. Among other conditions, the agreement states that as long as the solar field is in operation, Skidmore cannot utilize the remainder of the property bordering three of the neighbors' property for any new function. However, the Article 78 petition could be reinstated if the neighbors feel that Skidmore abrogates the contract (*Interview with Anonymous by Casey Stein.*2014, Mar 28).

### *Controversy Overview*

**Figure 3: Denton Road. Credit: Times Union**

The controversy surrounding the Skidmore project started at the first Town Board meeting on May 9, and continued to grow, both in scope of the issues involved, and in number of people involved. At the first Town Board meeting where the application was considered; there were twenty-two residents in attendance. However, the Skidmore application was not the only item on the agenda, and many of those residents were there to discuss the hot button issue at the time - the ambulance service. Three people did voice concerns; all three were Denton Road residents (Greenfield Town Board, 2013c). In contrast, at the October 30 special meeting/final public hearing for the project, eighty-five people were in attendance and a petition against the project signed by 204 people, approximately 160 of whom were town residents, was presented (Greenfield Town Board, 2013e). Thirty-one people commented; nine in favor, twenty against, and two not sure. Of the nine in favor, four were town officials and four were Skidmore officials

or associated with Skidmore; the ninth was a town resident who identified himself as one who lived off the grid (*Wendy Stein Interview by Casey Stein.*2014, Mar 28).

NYSERDA had noticed the controversy, and in early August, requested information from Dynamic Energy about the situation. Dynamic noted that "this process is fairly typical for a project like this and we are working diligently with Skidmore to make sure the Town receives everything they need to move through approval....Opposition appears to be down to the couple vocal neighbors identified in the article. We are moving forward on the project with a high level of confidence based on Skidmore's deep commitment and our expectation of approval from the Town" (Thibodeau, 2013). A few days later, Dynamic Energy contacted NYSERDA to inform them that "there is a zoning hearing for our Skidmore College solar project... and Skidmore's attorneys were hoping that an official/representative from NYSERDA could attend the meeting and speak about the project and support of the state's sun initiative" (Plunkett, 2013d). While two NYSERDA representatives originally planned to attend the meeting, three days later they informed Dynamic that they were no longer going to be able to attend (Cox, 2013h; Cox, 2013i).

On September 9, a Greenfield resident who opposed the solar array also asked NYSERDA to step in. In an email to a technical contact at the agency, she stated that she was in favor of solar power but not this project. She also noted that the Denton Road site did not appear to meet the PON 2589 funding guidelines, but the Skidmore campus on 815 North Broadway did, leading to her conclusion that something was not right. She wrote "I expect that when the first lawsuit is filed and people start looking into this, it will rapidly become clear that the intent of the NYSERDA program was not to site a commercial power array in a residential neighborhood, i.e., the backyard, yet somehow Skidmore received funding to do just that" (W. Stein, 2013, Sept 09). Furthermore the letter asked NYSERDA to step in, stating:

> What they are doing appears to be in direct conflict with the program's directives, it is causing a lot of problems up here for both town officials and residents of Greenfield, and I am writing to you in the hopes that NYSERDA can provide some assistance in sorting this out.... The prime issue is, does a commercial power array of this size belong in a residential neighborhood? Greenfield is grappling with that issue, and I believe that a large factor in their decision-making process is that this project appears to have state support. If this didn't have state support, it is unlikely that this project would be given the level of consideration that it is receiving.... This situation has the potential to cast a negative light on everyone and everything involved - solar power, the NYSERDA/NY-Sun Initiative, Skidmore College, Greenfield town officials, and the residents of Greenfield, particularly those who reside on Denton Road. This is absolutely not desirable. I strongly believe that all of this can be resolved in a manner that will prove to be positive for all parties involved, but in order for that to happen, NYSERDA, Skidmore, and Greenfield town officials need to be on the same page in terms of understanding everything that is going on here: I am fairly certain that is not the case now, and I am hoping that your office will be able to help clarify the situation (W. Stein, 2013, Sept 09).

The next morning, on September 10, she received an email response from a high-level NYSERDA attorney requesting that she call him. They spoke on September 11; according to the resident, the attorney emphasized that the Denton Road site was allowed under net metering law. That same day, an attorney for the neighbors opposing the solar array sent a FOIL request to NYSERDA via email asking for all documents and correspondence in regard to the Skidmore project (*Wendy Stein Interview by Casey Stein.*2014, Mar 28). Also on September 11, the following correspondence was sent from NYSERDA to Dynamic: "Can you send an aerial photo of the Denton Rd. site? Preferably one that is scaled out to show the roads and location?" (Cox, 2013f). With the exception of an email from Dynamic to NYSERDA requesting a project extension, and a return mail from NYSERDA mentioning an upcoming conference call, there appears to have been no further written correspondence between NYSERDA and Dynamic between then and the release of the information requested through the FOIL process almost two months later (Cox, 2013b; Plunkett, 2013a). Whether or not NYSERDA ever spoke with any Greenfield official about the project is unknown; the neighbors used the FOIL process to review

all Greenfield correspondence and documents regarding the project, and did not see any indication that any conversations had occurred (*Wendy Stein Interview by Casey Stein.*2014, Mar 28).

Despite these exchanges between NYSERDA and Dynamic, and the more limited exchanges between NYSERDA and the neighbors, it is unclear if the state agency was aware of the extent of the Greenfield controversy. This may be attributed to the limited coverage of the issue by the local media along with correspondence from Dynamic Energy to NYSERDA that indicated that the controversy involved only a couple of upset adjacent neighbors. While the controversy was originally centered on a few abutting neighbors, as the process went on, that small group of neighbors evolved into a larger group of concerned Greenfield residents with multiple attorneys.

Two days after NYSERDA received the letter referenced above, two major changes were announced by the agency. On September 11, NYSERDA filed a petition with the PSC to use approximately 165 million dollars in uncommitted funds to launch the Green Bank Initiative, which would leverage private sector financing for clean energy programs (NYSERDA, 2013d). On September 12, NYSERDA announced that the president and CEO of NYSERDA, Francis Murray, was being replaced by John B. Rhodes (NYSERDA, 2013e). News stories stated that the reason for his replacement was unknown. In addition, on September 23, the NYSERDA project manager who had been assigned to the Skidmore and Cornell projects informed another of her university clients that she had accepted another position at NYSERDA (Cox, 2013e). It is not known whether these events had any relation to, or effect on, Skidmore's project.

It is also notable that one of the neighbors sent correspondence to the New York State Office of the Inspector General and the Office of the State Comptroller requesting that the

agencies look into a number of issues associated with the project; neither agency responded. The same Greenfield resident also spoke with NYSERDA's internal audit agency, who said that NYSERDA had been forwarded that mail for their response. According to the resident, there was no response from NYSERDA (*Wendy Stein Interview by Casey Stein.*2014, Mar 28).

### *Causes of the Controversy*

As previously detailed, siting controversies arise for numerous reasons. For the purpose of this thesis, they will be classified into five categories, as follows: information, choice of site, local impacts, equity concerns, and lack of trust. In the case of the Skidmore array, issues that led to controversy, which are expanded on below, overlap and may fit into more than one category. While local impacts and the choice of site appear to be the initial reasons for the controversy, information, equity, and lack of trust were key factors in why the controversy escalated. Part of the reason for this was that neighbors educated themselves as to the nature of the project, and the overall policy and regulatory framework in New York State. Notably, throughout the project, the neighbors took great care to emphasize that they were not opposed to solar power; they were just opposed to this project.

Much of the information in the following sections was extracted from public records about the proceedings, and from information provided by the neighbors and a NYSERDA representative. Requests were placed to representatives of Skidmore, Dynamic Energy, and others associated with Skidmore to speak about controversies surrounding the siting of solar arrays in general and this project in particular. All declined to be interviewed, or to provide comments on the Skidmore array, before May 2014. Their viewpoint is represented, as much as possible, from information gleaned from public records and public accounts.

## Information

As noted by O'Hare et al., information plays a critical role in the evolution of opposition. Project opponents commonly believe that public officials and developers do not have enough information about the likely impacts of proposed facilities to make informed decisions. This problem can be exacerbated by the fact that developers often only provide the information required by law, rather than responding to public concerns. Furthermore, the information they do provide is oftentimes perceived as biased or inaccurate by project opponents (O'Hare et al., 1983).

This is what happened with the Skidmore project; information played a critical role in the evolution of opposition. Public officials, Skidmore, and neighbors disagreed about the type and sources of information required to make a decision about whether placing the PV array on Denton Road was appropriate. In particular, the neighbors contested the validity of information provided by Skidmore, or argued that there was simply not enough information. Neighbors also believed that Skidmore intentionally withheld or delayed the disclosure of key facts about the project and that much of the information that was provided was incomplete or in conflict with other statements made by Skidmore project representatives. In contrast, Skidmore's comments in meetings indicated that that they went above and beyond to try to assuage neighbors' concerns, and that the neighbors' criticisms were not fair or warranted. For example, Skidmore's belief that there had been a thorough analysis of local impacts was reflected by the following statement from a Town Board meeting: "They have looked at the effect on air, water, sound, visual, glare, impact on Putnam Brook, etc. They required Skidmore College to conduct studies on traffic, visual impact, wetlands analysis, thermal studies, sound methodology and reflectivity. Army Corp of Engineers and DEC have been to the site and have walked the wetlands" (Greenfield Town Board, 2013e).

### *Lack of Trusted Information*

An ongoing complaint of the neighbors was the town's perceived lack of insistence on prompt, public, and evidence-based responses to address public concerns. Over the course of the approval process, there were numerous written and verbal requests from neighbors, town residents, and attorneys hired by the neighbors, and Planning and Environmental Board members, requesting clarification of issues. Despite the Planning and Environmental Board member's questions, the neighbors felt that the Town did not adequately press Skidmore to obtain "missing" information. According to one of the lawyers working for the neighbors, "the scant information which has been submitted by Skidmore does not permit the public and Board to analyze the reasons and justification for this project in a residential area" (Tuczinski, 2013a). A letter sent in early July to the Town Planning Board from an attorney representing one of the neighbors stated the neighbors' frustration with the information stream.

> What has become abundantly clear is that there are a plethora of issues surrounding this proposal which have not been properly investigated and in some cases not even identified by the applicant in its earlier submissions....Section 105-129 further requires a narrative setting forth the impact on the surrounding neighborhood and its character. No such studies or impacts have been properly submitted by the applicant. Moreover, the Planning Board must submit to the Town Board a recommendation as to whether the project conforms with the Town Comprehensive Planning Objectives and must further determine that the project is not detrimental to the natural characteristics of the site or adjacent uses. In order to make this determination there must be evidence submitted in the record which at present is lacking....While the applicant has submitted an environmental assessment form, it is clear that this document is incomplete and fails to identify the multiple individual and cumulative potential impacts for the project....Much of the discussion at the Public Hearing centered around Skidmore's actual need for a project of this size and magnitude and whether there were viable alternative locations available. The applicant has made no showing for the need for such an extensive project for the College or whether this project has become a commercial opportunity. Moreover, applicant has failed to identify and study alternative sites where such a project could be better situated, and has neglected to offer any proof from the utility company or public service commission that such a project could not be located in a less intrusive area (Tuczinski, 2013b).

Furthermore, much of Skidmore's information was provided through emails or written correspondence to town officials, resulting in the neighbors relying on the FOIL process to learn about many aspects of the project. In contrast, it is likely Skidmore felt that they had been very responsive to requests for information, as illustrated by prior quotes.

The neighbors also felt that there was a lack of response from state government to requests for either information, or assistance in clarifying disputes surrounding information. As mentioned previously, requests were sent to NYSERDA, the Office of the Inspector General, and the Comptroller's Office. The neighbors believed that responses from these groups were incomplete or never given. In addition, a number of documents requested through FOIL were withheld, some because they had been labeled as Confidential based on trade secrets. Others, such as the DEC SEQRA Short Environmental Assessment Form (EAF), were not released with no explanation as to why they were withheld. Some of the neighbors concluded that both Skidmore and NYSERDA were attempting to prevent disclosure of project information (*Wendy Stein Interview by Casey Stein.*2014, Mar 28). NYSERDA and Skidmore's reasons are unclear.

In processes like this, where public input is generally limited to formal hearings and specific timelines, the timing of information availability can be equally as important as content. It is notable that some of the FOIL information was not released until after the public hearing on the PUD ended. This was despite the fact that other FOIL documents that had been requested at the same time had been released much earlier. The initial FOIL request to NYSERDA was dated September 11 (Wechsler, 2013). Some information was released on October 17, along with a statement that specific requests about the extension status would be released within 10 days. There was no information released between October 17 and the date of the final public hearing on October 30. Another set of information was released on November 1, and included in that

was the correspondence between NYSERDA and Dynamic about the meter/site change. The extension status information was not in there and was never sent.

In some of the documents that were released via FOIL, some of the information was "blacked out." The following excerpt from an October 17 email from NYSERDA to one of the neighbor's attorneys explains why:

> With respect to your request for the proposal that NYSERDA received for the project, the proposal was marked "Confidential" by the proposer. Under FOIL and NYSERDA's regulations...an exception to disclosure is available for "trade secrets." Trade secrets include material which, if disclosed, would cause substantial injury to the competitive position of the subject enterprise. For proposers who request confidential treatment, NYSERDA will provide the opportunity, pursuant to POL § 89(5)(b)(2) and 21 NYCRR § 501.6(e)(2), to submit a written statement indicating why it is necessary to except the proposal or portions thereof from disclosure. If you require these pages, please inform us and we will request that the affected submitting party make its written submission, which is subject to our review and determination. Please note this determination would be subject to appeal pursuant to POL § 89(5)(c) and 21 NYCRR §501.6(e)(2). Additionally, NYSERDA is currently in contract negotiations with other awardees of funding under Program Opportunity Notice 2589, the initiative under which we accepted Dynamic, LLC's proposal. NYSERDA therefore is unable to release information related to the amount of payments to Dynamic, LLC at this time. Under FOIL (*see* POL § 87(2)(c)), there is an exception to disclosure for records that "if disclosed would impair present or imminent contract awards (Wechsler, 2013).

The media also played a part; the neighbors believed that reporting about the project and the controversy was inaccurate. They believed that the media had failed to thoroughly research or investigate the claims made of college use of the power, environmental benefits, and reasons for the neighbors' objections, and was simply passing on information they received about the project from Skidmore. NYSERDA also noted the media's lack of accuracy and requested that this issue be addressed. In an email to Dynamic Energy, a NYSERDA representative said "While I am very excited [about] all of the press that Skidmore is getting on their project I want to express some concerns. First, as our Director in Communications points out below there have been some inaccuracies with the articles (both with what program and also with the project

team….With that, can you please make sure than any press that Skidmore does regarding these projects be sent over to our Communications Department as to ensure accurate information?" (Cox, 2013g). Interestingly, evidence suggests that, in some instances, Skidmore may also have felt that the neighbors were feeding incorrect information to the newspapers.

The neighbors' response to what they saw as a lack of unbiased information was to seek out their own information sources and experts. In this case, the neighbors had the funds, resources, and time to be able to do this. They researched solar power, the regulatory framework, local and state laws, and environmental issues. Interestingly, as the neighbors increased their knowledge base, their critiques became much more detailed and delved deeper into the specifics of New York State and NYSERDA laws and program guidelines, and whether this was an appropriate use of public funds. Their sources and experts were frequently in conflict with the information provided by Skidmore, and the result was an ongoing cycle of opposing information claims. The information presented by Skidmore was refuted by the neighbors; the neighbors' information was in turn refuted by Skidmore. All of this contributed to the neighbors' belief that Greenfield officials did not have the knowledge or expertise necessary to make an informed decision about the project (*Wendy Stein Interview by Casey Stein.*2014, Mar 28). It is unclear what Skidmore thought.

### *Conflicting Information Due to Ambiguous Laws*

In the course of the project, disputes arose over ownership and characterization of the project and the subsequent tax status, conformance to the underlying NYSERDA funding guidelines and contract, compliance with underlying federal and state regulations and laws, conformance with the town's zoning laws and comprehensive plan, environmental benefits and costs, economic benefits and costs, and the level of local impacts, including, and in addition to,

those identified through the SEQR process. The focus in this section is on conflicting information that resulted largely from ambiguous laws or program guidelines. Conflicting information over environmental and economic benefits and costs, and local impacts are covered in separate sections.

Ambiguity or a lack of clarity in local and state laws and guidelines was one of the reasons information presented by the two parties came to very different conclusions. As a result, there was disagreement between the parties on the meaning and usage of certain terms and words used in the funding guidelines and regulatory framework. Outcomes allowed by the law were very different depending on the interpretation.

The PON 2589 funding guidelines and the ensuing contract defined the project site as "Where the PV system is located, where the electricity from the PV system is used, and where the utility meter is located" (Standard Performance Agreement, 2013; NYSERDA, 2013f). Skidmore claimed that purchasing the energy from Dynamic through the Power Purchase Agreement constituted use. The neighbors disagreed; they believed that use meant consumption, drawing on a federal definition of use, which was "to 'use' renewable energy, in compliance with the wording in the law, means the agency must consume renewable energy....Simply producing renewable energy on a Federal site does not count as use" (U.S. Department of Energy: Office of Energy Efficiency and Renewable Energy., n.d.). Under the Skidmore definition of use, the project was in compliance with the funding guidelines and law; under the neighbors' definition of use, it wasn't.

In addition, the definition of use was an important determinant in the project's classification under New York law as either an electric corporation, or an alternate energy facility. Under New York law, electric corporations providing power for "public use" are subject

to oversight and regulation by the Public Service Corporation; alternate energy production facilities generating power for "use on or near a project site" are not subject to the same level of regulation. Skidmore's definition that the power was being used by their campus supported their designation as an alternate energy facility, which largely exempted them from regulatory oversight by the PSC (Laws of New York: Public Service.n.d.).

There were also additional disagreements over numerous terms, including what constituted a campus, and what it meant to "use" solar electric generating equipment. Skidmore believed that their campus included all off-campus properties owned by the college and therefore the array was on campus; the neighbors did not agree with this definition (Greenfield Planning Board, 2013e). New York's net metering law defines a "customer-generator" as "(iii) a non-residential customer of an electric corporation which owns or operates solar electric generating equipment located and used at its premises" (New York State Public Service Commission, 2011). The neighbors believed that definition indicated that the power generated was to be used on the premises where the PV array was located.

Another significant source of contention was whether the Denton Road site was the NYSERDA-approved project site. In mid-October, through the FOIL process, the neighbors obtained FOIL documents indicating that the project site approved by NYSERDA was not Denton Road. Both the funding application and an addendum to the contract between NYSERDA and Dynamic Energy listed the project site as 815 North Broadway, Saratoga Springs, which was the site of the Skidmore campus. The neighbors brought this to the attention of the Town Board. Skidmore's response in the October 30 public hearing was that "the original grant application contemplated the location on the campus and offsite at the Equestrian Facility, however the grant was not site-specific" (Greenfield Town Board, 2013e). The neighbors

disagreed, based on their belief that that a contract that stated that "the Contractor shall install 2.084.50 kW at the Project Site as identified in Exhibit D" was site-specific (Standard Performance Agreement, 2013).

Another information dispute was disagreement over whether a solar power facility was an allowed use in a Planned Unit Development (PUD). According to Greenfield Town Code, Planned Unit Developments were "to permit establishment of areas in which one use or diverse uses may be created together, containing both individual building sites and common properties, in a compatible and unified development" (Town of Greenfield, n.d.b). The neighbors' contention was that a PUD was intended to allow a development such as the elderly residential facility in the neighborhood, which was a PUD; it was not intended to allow siting of a utility-scale solar power facility. In contrast, Skidmore believed that because "any type of use is permitted within a planned unit development subject to the approval process specified herein," solar facilities were allowed in PUDs (Town of Greenfield, n.d.b).

A related controversy was whether a PUD on this site was consistent with the town's Comprehensive Plan. The lack of agreement between Planning Board members on this point added to the controversy, particularly as the Planning Board chairperson, who was the only Planning Board member to vote against the PUD, gave the stated reason for her vote as lack of conformance to the Comprehensive Plan (Greenfield Planning Board, 2013i). This led to further debate over the classification of the Denton Road area. Skidmore disagreed with the neighbors on their classification of the area as a residential and farming community. According to the meeting minutes, Skidmore noted that "three of the five adjacent uses to the 120 acre site are actually commercial, Prestwick Chase Adult Care Facility, Commercial Horse Breeding Facility and the Saratoga Polo Facility that hosts the Polo matches as well as does off season catering"

(Greenfield Town Board, 2013e). The neighbors' response was that the owner of the horse farm did occasionally sell horses but it was not a commercial business, and that Prestwick Chase was a residential community that actually did meet the concept envisioned in a PUD.

### *Anecdotal Information*

Some of the information presented at Town and Planning Board meetings was also anecdotal as opposed to evidence-based. For example, one Planning Board members stated that "I visited a solar farm once and the neighbors said that their property values had not gone down." Another example was the following statement by a resident at a Town Board meeting:

> The company that he works for has solar arrays on their property and they also sell solar panels. They started out with about 75 people and are down to 5. He has heard a lot of higher readings this evening, however he went out and checked the readings on their solar array today and on a 50,000 watt array the average for the year was 8,500 watts. He compared the numbers being heard this evening to the MSRP on a car and that they were not true. He mentioned that snow on the panels greatly reduces the amount of energy produced. He stated that as far as glare was concerned, there absolutely was glare. When the glare hits the snow it sends an over voltage to the solar panel causing hot spots in the panel and they burn out. They have to go out every day and check their panels. With this array being out of the way he did not believe that anyone was going to be out monitoring it on a regular basis….He mentioned that they have had two fires at their array. He explained that the panels produce power that goes into an inverter and sends the power out to the grid. If you shut the grid off, the solar panels stop producing to the inverter. On the load side of the inverter there is still a substantial amount of DC voltage… (Greenfield Town Board, 2013e).

## Choice of Site

As noted by O'Hare et al., "In the first stage, the developer makes a series of technical choices with his engineer, market analysts, and lawyers. He typically has no interaction with local government nor those who would be affected by his decisions….The developer then announces his technology and site package to the public. If he mentions alternatives, they often seem factitious. He appears to approach the public with a single firm decision camouflaged behind impossible alternatives" (O'Hare et al., 1983). O'Hare's descriptions lines up with what

happened in the Skidmore case. In addition, the site controversy was exacerbated by local impacts, information, equity and trust issues, all of which are explored in greater depth in other sections of this thesis.

While Skidmore had applied for funding in December 2012 and funding awards had been officially announced in early March 2013, discussions with the town and residents did not begin until early May, when the project was introduced at the first Town Board meeting. In response to a question about whether Skidmore College notified neighbors about the proposed array before the first Town meeting about the project in May, one Greenfield resident stated "Yes...via phone...and then a preliminary meeting with one neighbor. But they had already filed plans etc. with Town of Greenfield" (*Interview with Anonymous by Casey Stein.*2014, Mar 28).

At that time, Skidmore approached the Town with a PUD application for only one site - the Denton Road site. Neither the Town of Greenfield nor its residents were involved in the choice of site for the solar array. The choice of site was immediately met with significant and ongoing opposition, as neighbors did not believe that it was an appropriate site. Regardless of the various mitigation measures taken by Skidmore, this point of contention remained throughout the entire approval process.

The primary reason that neighbors did not believe that it was an appropriate site was because it was a residential area, both by use and by zoning, and they believed that the array fell into the category of light industrial or commercial use. At the time the solar array was proposed, the area was home to high-end residential properties, fields, horse farms, and an independent senior living community. The parcel where the solar array was to be sited was open space and wooded area. Uses that were permitted as of right included exempt childcare, home occupation Type I, In-law apartment, non-grid wind tower, personal farm activities, single-family dwelling,

single mobile home, small stables, and two-family dwellings (Town of Greenfield, n.d.a). Neighbors were concerned that an eight acre solar array would change the nature of the area. One neighbor argued that the Denton Road area of Greenfield was probably the highest, most prized area for development in the Town, and that the property owners in the area are assessed at a higher value.

The neighbors also believed that Skidmore should have been required to bring forth alternatives before the Planning and Town Boards. Since the Planning Board made a determination that the project would not result in significant environmental impacts, an environmental impact statement (EIS) was optional, and the Planning Board decided not to require one. An EIS would, at minimum, have required a description of the evaluation of reasonable alternatives (New York State Department of Environmental Conservation, 2014).

During the process, Skidmore was unwavering as to choice of site, for a number of reasons. This was their preferred site, and, by the time it was apparent that there was going to be significant controversy, Skidmore could not change their site without risking losing their funding. In an August Planning Board meeting, Skidmore introduced a letter from NYSERDA, which stated that the time frame to bring forth an alternate site had expired, and if the project team were to bring forth an alternate site at this time, NYSERDA would terminate the current award (Greenfield Planning Board, 2013a).

As stated earlier, meeting minutes also indicate that Skidmore thought the neighbors were misrepresenting the neighborhood character. At the last hearing, Skidmore stated that "a lot of information has been circulated stating that the area was predominantly residential and agricultural. Three of the five adjacent uses to the 120 acre site are actually commercial, Prestwick Chase Adult Care Facility, Commercial Horse Breeding Facility and the Saratoga Polo

Facility that hosts the Polo matches as well as does off season catering. Of the 187 acres adjacent to the property, 22 acres are residential and the remaining are commercial" (Greenfield Town Board, 2013e).

As a result, while Skidmore was willing to negotiate on smaller details, such as where the solar array was located on the site, they were not willing to change the site. Neighbors and some of the town officials repeatedly questioned why Skidmore picked the Denton Road parcel out of the hundreds of acres that Skidmore owned in both Greenfield and in the neighboring City of Saratoga. According to the meeting minutes, one of the Planning Board members stated that this is residential and farming area, while the solar array "is an industrial fit," and as such, he would encourage Skidmore to propose alternative locations for this project. At the same meeting, another Planning Board member stated "he does think that the applicant needs to take another look at another location" (Greenfield Planning Board, 2013g). At one point, one of the neighbors even offered to help Skidmore mitigate the cost, if they were to move the project to a site other than Denton Road.

In particular, the neighbors requested to know why Skidmore did not put the array on their own campus. One neighbor's query was that if Skidmore is "so intent on energy and want to show their students their sustainability, why are they not putting the panels on their campus in front of the Music Center where they have about 15 acres. He added that it was because they did not want to look at the panels" (Greenfield Town Board, 2013e).

The neighbors raised the question of why this site instead of others many times, but felt that they never received a satisfactory answer to their queries. Furthermore, they believed that the answers that Skidmore gave them kept changing. In minutes, Skidmore's initial response was

that the site was chosen due to its southern exposure, easy access, and the minimal clearing necessary. Later on, Skidmore cited PSC rules as being an integral part of site choice.

Skidmore, while they did not comment on this thesis, may have felt that they did adequately answer the neighbor's questions. At the July 9 Planning Board meeting, Skidmore addressed the site choice as follows:

> The last issue that they wanted to address was alternate solar array locations....this is an issue that the College studied at length before selecting this site. They looked at the financial costs and benefits related to location in different places and looked at the impacts of the land. It is certainly true that Skidmore has a fair amount of acreage, around 1000 acres, but most people don't know that most of that land is constrained by either wetlands or steep slopes. So that is not 1000 acres of useful land. After studying several different locations they found that this was the absolute best of the sites to locate this. She states that the original site proposed is the preferred site, the western side of the property. They made the decision to relocate this to the eastern side, at an additional cost of a quarter million dollars, because the neighbor's requested that it be moved.... they have a NYSERDA grant and that grant has a pretty tight timeframe and it was granted on the first round based upon NYS wanting projects that were kind of ready to go and could be implemented fairly quickly. A change in the location may cause the College to lose the grant, because this is the first round there are not a lot of clear rules and they are not sure if they would even be eligible for the grant if they shifted off this 120 acre site. National Grid also needs to do a fair amount of homework resulting in about 3 months of work for the engineering in order to figure out how a new project like this connects into their existing power supply. She states that they are 2 months into that project, they have another month to go. Switching the site would start that timeframe over (Greenfield Planning Board, 2013d).

The neighbors, who had acquired extensive knowledge of Skidmore's land holdings, did not find this argument convincing. Adding to the controversy, in mid-October, the neighbors obtained documents through the FOIL process that indicated that the approved project site on the funding application and on the contract wasn't Denton Road, it was the Skidmore campus in Saratoga Springs. The neighbors brought this to the attention of the Town Board. As previously referenced, Skidmore's response was that "the original grant application contemplated the location on the campus and offsite at the Equestrian Facility; however the grant was not site-specific" (Greenfield Town Board, 2013e). This claim was also disputed by the neighbors.

In November 2013, the neighbors obtained a half-page undated document that had been submitted to the town by Skidmore at some point in time (it was resubmitted in November but may have been also delivered to the town in July). The document stated the following in regard to alternative locations that had been explored: 1) A roof-top model was investigated for the main campus (with a small ground array), but was ultimately rejected because of the cost, an unfavorable economic model, and the fact that there was not enough space for 2 megawatts. 2) Daniels Road Tree Farm was rejected because there was no meter on the property (Skidmore does note that a subsequent ruling by PSC seems to have changed the requirement for a meter to be located on site prior to project siting), unfavorable economics, neighborhood opposition, and the site had already been designated to be used for a possible composting project. 3) Behind riding stables on Daniels Road was rejected because of insufficient space for 2 megawatts, higher cost for installing, various levels behind stables, the surface is rock which will be more difficult to install, and unfavorable economics. (Skidmore College, 2013) After reading Skidmore's document, the neighbors were particularly annoyed that one of the reasons that Skidmore gave for not putting it on another parcel of land was that the neighbors didn't want it there (*Wendy Stein Interview by Casey Stein.*2014, Mar 28).

## Local Impacts

As noted in the siting section above, concerns surrounding locally unwanted land uses relate to a series of local impacts. In the Skidmore case, there were a number of potential impacts that the neighbors raised. These included aesthetic and noise impacts, impacts on property values, potential damage to wetlands and a trout stream, stormwater runoff, impairment of cultural resources and power quality, as well as safety considerations in regard to fire and potential emissions, and the potential effects of a magnetic field.

The local impacts detailed in greater depth below were featured in meeting minutes, articles, and discussions about this project. Many of the local impacts were of concern to Greenfield residents. Others may have been used to slow or prevent the project, rather than because they were the source of significant concern. As illustrated below, conflicting information presented by the two parties influenced concerns about local impacts.

In the examples listed below, Skidmore felt that it took significant measures to mitigate any potential impacts. Their view was supported by a letter from Saratoga County to the Town of Greenfield, which stated that "the degree to which the applicant, its consultant and the planning board have incorporated revisions and pertinent measures of mitigation into the site plan (as delineated in the extensive discussion of record is commendable." In contrast, the neighbors often felt that potential impacts were not adequately addressed, or at least were not adequately mitigated until they pressed the issue.

### *Aesthetic Impacts*

One of the largest points of contention was the visual impact of the solar array. The extent of these impacts was the primary point of debate – particularly in regard to the array's visibility and glare. Skidmore noted that there would be some visual impacts, but that these impacts would be largely mitigated by a fence and trees that would buffer the array from the neighbors. One letter stated that "the array will be virtually undetectable from the roadway and the neighboring properties" (Ferradino, 2013, Nov 12). These mitigation measures were altered and increased during the course of the Town of Greenfield's project approval process. Bonds were also added to ensure that the Town of Greenfield could add additional vegetation to the buffer and that decommissioning would be paid for at the end of the project's life.

Despite these mitigation measures, the neighbors still believed that there would be a big visual difference between a field, and an array located behind a wooden fence. It had been determined that the array would still be visible at certain elevations despite the fence, and they also felt that fences were used in an attempt to mask the presence of something undesirable, such as a junkyard or a prison.

Some of the neighbors also felt that neither Skidmore nor the town ever adequately addressed the question of glare. Skidmore had provided the Planning Board with a report detailing the characteristics of the collectors, but had not included any information about reflectivity until they were pressed to do so by both the Planning Board and the neighbors. According to Dynamic Energy, the manufacturer of the panels had not performed any reflectivity tests. Dynamic Energy did note that the modules use an anti-reflective glass, and that the modules they are using meet or exceed industry standards in their design to absorb energy. This meant that the solar array's reflectivity would likely be 2 percent or less. According to the minutes, which are very detailed, there appears to have been no explanation of what 2 percent means. After receiving all of this information, one Planning Board member's conclusion was that it "is unfortunate that there is not an absolute number, but apparently no one is giving one at this point" (Greenfield Planning Board, 2013b). Another Planning Board member reiterated that he had visited a solar array, and spoken with the neighbors, who said there was no glare. The neighbors were not convinced by this information.

At that time, Skidmore also submitted an FAA report, which stated that there were no glare issues associated with PV arrays. However, when this information was submitted, the FAA was in the process of revising their regulations. On October 23, 2013, the FAA released an interim policy, effective that day, for the review of solar energy systems projects on federally

obligated airports, in response to issues with glare at the Manchester, NH airport that resulted in the panels being covered with tarps (Jones, 2013). The new policy required demonstration by an airport sponsor that a proposed solar energy system had "no potential for glare or "low potential for after-image" along the final approach path… defined as two (2) miles from fifty (50) feet above the landing threshold using a standard three (3) degree glidepath…and that the ocular impact "must be analyzed over the entire calendar year in one (1) minute intervals from when the sun rises above the horizon until the sun sets below the horizon." While the policy applied only to airports, it also stated that "Proponents of solar energy systems located off-airport property or on non-federally-obligated airports are strongly encouraged to consider the requirements of this policy when siting such systems" (Federal Aviation Administration, 2013).

The report was brought to the attention of the Town Board by the neighbors, because the Denton Road location is in close proximity to a local airport. Skidmore's response to glare concerns was that an FAA Solar Guide dated November 2010 indicated that airport glare was not an issue, "as an added measure, the panels will be located behind a fence that is taller than the array," and "the Planning Board considered this issue in detail, with several members visiting other solar installations, also examining a sample panel provided by the college, and concluded unanimously the proposed project would not have glare" (Ferradino, 2013, Nov 12). There was no response from the town to the report; it is unknown whether the airport or the FAA was ever consulted for guidance. The neighbors were not convinced by Skidmore's explanation that the issue had been adequately explored or addressed.

### *Effect on Property Values*

Neighbors expressed significant concerns that their properties would be devalued. The neighbors also provided town officials with an ordinance from another governing body that stated: "the appearance of Solar Farms without setbacks and screening of the same can have adverse impacts on the value of properties adjacent thereto as well as other properties located nearby" (Clay County Board of Commissioners, 2011). One of the neighbors noted that typically solar panels are used in industrial parks, brown-fields, and landfills, since in those areas the impacts are minimized and have less aesthetic impact on neighborhoods. The research that he had done showed him that it would be likely that the Skidmore solar array would depreciate his property and the surrounding properties. A town resident who is a realtor specializing in equine property stated that if the panels go in, the value of the horse farms will decrease. She sent a letter to the town stating that "as a real estate agent, and an agent that specializes in equestrian properties and estates, there is no doubt this project will diminish the real estate values of all the properties on Denton Road and the surrounding areas…Don't do this to the people and their equity in their farms and homes. It will have a rippling effect on all" (Cunningham, 2013, Dec 05). Neighbors were also concerned about the perceived lack of response to this issue on the part of Skidmore and town officials; one neighbor noted that it would be too late after the fact when someone says that they have lost their property values. One of the Planning Board members did visit a solar array in Vermont, and had talked to property owners in the area who said that they had not had any issues with property values. One of the neighbors did not find this information reassuring, as he was familiar with the solar array referenced. He stated that the "site is a dilapidated racetrack. It is a plus to have that type of thing there instead of an old stable area and barns that are falling down" (Greenfield Planning Board, 2013b).

*Safety considerations*

To date, there is not a public water supply in this area of Greenfield. Neighbors were concerned that a fire at the solar array would be difficult to control, especially since there had been a large fire at a solar array in New Jersey around the time of the Skidmore approval process. Neighbors provided documentation from Homeland Security and national fire councils about the issues with fighting solar array fires, the potential for hazardous emissions, and the need for training and evacuation plans in light of the nearby senior living residences. Although local firefighters appear to have not been included in most or all of the discussion during the project approval process, the town did eventually require fire training.

One of the Planning Board members did ask whether there was a chance of electrocution if someone were to jump the fence and hit a panel with a baseball bat. Dynamic Energy assured the Planning Board that the panels are actually extremely difficult to break.

*Environmental Impacts*

Neighbors expressed concern about impact to wetlands, impact to Putnam Brook (a trout stream), wildlife displacement, and other environmental impacts. This concern was heightened by what they viewed as the lack of thorough and comprehensive evaluation of these impacts by Skidmore.

Skidmore held that while there were wetlands on the property, there would not be wetland impacts. Neighbors alleged that there would be environmental impacts from the project on the wetlands. Because of conflicting evidence presented by both the neighbors and by Skidmore, the true impacts of the project at the time of its approval are unclear. DEC had reviewed wetlands at the project site around the time it was originally submitted to the Greenfield Town Board, and had found that the project was outside of their jurisdiction. There was some debate between the neighbors, the planning board, and Skidmore about whether there

were federally protected wetlands on the site, mandating involvement of the Army Corp of Engineers (ACOE). Eventually, Skidmore did contact ACOE; ACOE's finding was that "based solely on a review of the information provided, it appears that a Department of the Army permit…will not be required for your proposal" (U.S. Army Corps of Engineers., 2013, Oct 11).

The existence of potential impacts to Putnam Brook was similarly contested, especially in light of provisions in the state Environmental Conservation Law stating that discharges from these types of facilities cannot exceed 70 degrees (Greenfield Town Board, 2013e). Skidmore held that the solar array would not have an impact on Putnam Brook, and cited a test where a solar panel had been put at the same degree angle and the same position to the sun as that in the proposed array. In the test, they introduced hose water to simulate rainwater, and measured the temperature of the water. However, neighbors did not accept these findings, again stating that the evidence was not convincing. One of the experts hired by the neighbors stated that the study Skidmore cited seemed inadequate and did not accurately represent what would happen, especially since one module would not represent the impact of 7000 modules.

Neighbors also expressed concern about the consequences of destroying vegetation, of putting up a fence so that animals would no longer be able to traverse the area, of the impacts on ground water that was 2 feet below the surface, and the impacts of chemicals from the solar array.

### *Noise*

The source of sound in a solar array is the inverter, which converts direct current to alternating current power which can then be sent through the electric distribution system. Several people had spoken up at public hearings with anecdotal stories about listening to noise from inverters located at the places where they worked. This added to the neighbors' concerns

about potential noise impacts. One neighbor stated that noise carried in that area, and asked about the Town's recourse if there were complaints about noise in the future. According to Skidmore, a test they conducted at an existing site led them to believe that the inverter would not be audible at the corner of the nearest neighbor's property. They noted that they were going to take certain precautions anyway by surrounding the inverter with an enclosure and providing muffling within the enclosure and insulation in order to even further muffle the 65 decibels. The Planning Board did not require any further mitigation of noise. However, the Town Board did require that a noise-monitoring provision be added to the PUD that would establish thresholds and require mitigation if the decibel level was exceeded.

### *Voltage Variations*

There were stated concerns about the impacts of feeding 2 MW of solar power into a local distribution line. The concerns were based on previous experiences of the local residents with power outage, notably the great Northeast blackout, when Denton Road was, according to the neighbors, the only local area to have power restored almost instantaneously. The neighbors were told by an electrician that the distribution line was a local loop that also fed the local hospital and possibly a large number of outpatient medical facilities in the immediate area (*Wendy Stein Interview by Casey Stein.*2014, Mar 28). Further internet research indicated that this could be a potential issue. The neighbors asked the Planning Board to bring the utility into the process, specifically to discuss the impacts of adding the power from the solar array to the lines. This did not happen. Instead, Dynamic Energy told the town that there would be no issues with voltage. Based on their own research, the neighbors did not believe this.

### *Traffic*

According to the neighbors, there were ongoing traffic issues on Denton Road on seasonal, intermittent occasions because of activities on the other Skidmore-owned properties of the baseball field and the polo field, which were both part of the PUD. They felt that the traffic issues had never been adequately addressed, despite past requests. The statement in the first Town Board meeting that this would be a model project and would be of interest to others set off fears on the part of the residents that what they viewed as an already bad situation would get worse. Skidmore did a traffic study indicating that there would be no problems. The neighbors did not believe the traffic study was thorough or complete.

### *Cultural Resources*

This was not one of the larger issues. The neighbors expressed concern about whether there were cultural resources in the area. The project proponents stated that, according to a resource that the state refers developers to, there were not any archaeologically sensitive areas on the parcel. Skidmore also spoke to the Town Historian, who stated that there should not be any cultural resources in the area.

### *Magnetic Field*

The neighbors did raise some concerns about the magnetic field, but this appeared to be viewed as a less important issue by both sides. A representative of Dynamic Energy stated that he did not believe that solar arrays pose any danger at all on the electromagnetic field topic, as there would be a very limited amount of electromagnetic field coming out of the solar array itself.

## Equity

The neighbors believed that there was a significant disparity in fairness and equity; they believed that Skidmore was accruing significant economic benefits, and that they, along with other New York residents, were going to bear large economic and environmental costs. In contrast, Skidmore's message was that they were trying to do the right thing from an environmental standpoint, and any adverse impacts would be mitigated. In general, the equity issues in the Skidmore case can be separated into three general categories – economic costs and benefits, environmental costs and benefits, and equal consideration.

### *Economic Costs and Benefits*

The pairing of a not-for-profit (Skidmore College) with a for-profit solar company (Dynamic Energy) allowed this team to maximize incentives as described below. The exact cost of the project is not known; that information was blacked out on documents obtained through the FOIL process. However, the neighbors estimated the cost of the PV array to be around five million dollars based on the size of other similarly-sized arrays in New York State.

The upfront cost of the array is estimated to have been largely offset by the NYSERDA PON 2589 grant and the federal tax credits. The PON 2589 funding was approximately 2.35 million dollars; the federal tax credit was estimated by the neighbors, based on 30 percent of cost, to be in the 1.35 million range (*Wendy Stein Interview by Casey Stein.*2014, Mar 28). As a not-for-profit, Skidmore was not able to take advantage of the federal tax credit, but by use of a PPA, Dynamic retained ownership of the array and the energy it produced, and as a tax-paying entity was eligible for the federal tax credit. The NYSERDA funding award was also to Dynamic, as the owner of the array. It is unclear how much benefit the New York State sales tax exemption on solar construction would provide, as specific financial details of the project were

not available. The benefit of net metering income is also unknown, but the energy value estimate provided to the town was 382,916.43 dollars per year (Ferradino, 2013, Jun 18). With the estimated life of an array to be twenty years, the neighbors calculated potential net metering compensation to be in the 7 million dollars dollar range (*Wendy Stein Interview by Casey Stein.*2014, Mar 28).

The neighbors believed that all of the economic incentives described above, which they estimated would exceed 10 million dollars, were coming from public-supplied funds which they felt were earmarked for environmental benefits, and instead were being used to pay Skidmore's electric bill for the next twenty years.

According to Town Board minutes, Skidmore felt that the neighbors' claim that they would receive no economic benefit from this project was untrue, since a Development Agreement was required by the PUD Legislation, and under that agreement, the town would accrue some financial benefits as a result of the solar project. According to October 2013 Town Board minutes, Skidmore stated that there would be an initial lump sum payment to the Town as well as annual payments over the life of the solar array (Greenfield Town Board, 2013e).

The neighbors felt that the financial benefits Skidmore was giving the town were small compared to the amount of money that would be realized from the project. This inequity was magnified by Skidmore's not-for-profit status; the neighbors believed that Skidmore was not paying their fair share. At a Planning Board meeting, one of the neighbors commented that "Skidmore owns 545 acres in Greenfield that they pay no taxes on and the assessed valuation of those properties is 3,700,000 dollars (Greenfield Planning Board, 2013g).

Furthermore, Skidmore will not be paying property taxes on the parcel, which was another equity issue. The property and array were deemed to be tax-exempt, because, according

to the local assessor, the energy produced was being used for the benefit of the college, and was not returning a profit to the college (*Wendy Stein Interview by Casey Stein.*2014, Mar 28) . The neighbors disagreed with this assessment of the situation. While they agreed that the array was for the economic benefit of the college, they did not believe that property owned by not-for-profits and leased for commercial use was exempt from taxation under New York State law.

Magnifying this perceived inequity was a pending town tax increase of 23 percent that has since been instituted. The neighbors thought that the proposed project was going to work counter to providing property tax revenue, and that the tax base would be better served by increased residential development.

### *Environmental Costs and Benefits*

Another significant source of contention was the perceived environmental benefits of the array. Skidmore believed that the solar project would result in shared environmental benefits. In the project narrative, the town was told that "environmental benefits for this solar installation are considerable to the college, the surrounding communities and indeed to the world" (Dynamic Energy, 2013, May 09). In fact, Skidmore noted that "the college's interest in developing solar was primarily the commitment to be more green and environmentally friendly. Savings in energy was important, but the environmental benefits were overriding" (Ferradino, 2013, Aug 12). The initial PUD legislation written by Skidmore stated that "the Town of Greenfield is taking significant steps to demonstrate their commitment to energy conservation and the use of renewable energy in order to reduce environmentally harmful emissions and attain greater national energy independence" (Ferradino, 2013, June 12). At another Planning Board meeting, Skidmore stated in response to why solar, "you are getting away from the burning of fossil fuels,

eliminating the need to dam further rivers, reducing the need for fracking…" (Greenfield Planning Board, 2013d).

The neighbors had a different view of the environmental benefits. While Skidmore stated that the energy produced by the array was akin to taking 383 cars off the road or burning 4200 barrels of oil, the neighbors believed that these were general statistics and not indicative of the actual environmental benefits of Skidmore's solar array (Greenfield Planning Board, 2013d). The neighbors, many of whom were long-time residents of the area, held that northern and western New York, where the Skidmore array was to be located, already had a glut of power, most of it generated by clean sources, and that there were significant constraints in the transmission system that prevented the power from these arrays to be moved to downstate where it could be used. In addition, they were aware of a nuclear plant in central New York, in the area where the Cornell array was to be located, that was becoming uneconomical because of cheap natural gas, and was facing shutdown as a result. They believed that shutting down the nuclear plant would be undesirable for several reasons including the loss of jobs and the potential need for nuclear power in the future. They thought that the money being spent on the Skidmore and Cornell arrays could be better spent on projects that they believed would be more effective at reducing greenhouse gas emissions.

It is interesting to note that the Skidmore neighbors became aware of the Cornell solar project, and another university's solar project, as a result of their research. One of the neighbors also acquired information about these other two arrays. The neighbors' belief that New York was not paying enough attention to the big picture was, in part, a result of the knowledge acquired about these additional projects. Some of the information that they acquired was shared with the Town of Lansing.

*Equal Consideration*

The neighbors were also concerned about what they felt was a lack of equal consideration. Specifically, they felt that their participation in the process had been significantly limited, and that Skidmore's interests and views were being given greater weight by the town. In addition, they believed that the town's lack of pursuit of key information put them at a disadvantage.

For example, an August 7 letter from a neighbor's attorney stated the following: "In order to give the Board and public a fair chance to review the project proposal, I respectfully request that the Planning Board request the following data and information from Skidmore…" (Tuczinski, 2013a). This was followed by a list of 10 bullet items, which included "a copy of all grant documents explaining the terms of the grant proposal, a copy of all lease documents and agreements between Skidmore, Polo, and any third parties concerning the use of the real property subject to the PUD including future proposals, all documents, information and financial studies concerning alternative locations, all community impact studies undertaken by Skidmore (including tax analysis and potential impacts to neighbors' property values), all financial proposals allegedly; made by Skidmore through its representatives to the Town of Greenfield in connection with the project proposal, and a proper visual impact study" (Tuczinski, 2013a). In response, the Planning Board chair sent the following email to a town attorney. "Could you please review the letter forwarded & comment? It is my opinion that anyone in the public may make comments about the information they believe the Planning Board should have to review. However, it is my belief that it is up to the Planning Board members to themselves decide upon the appropriate information required to make an informed decision….The Planning Board is not obligated to request such information. Am I correct?" (Yasenchak, 2013). Most of the information was never obtained.

Additionally, the neighbors believed that laws and regulations were being applied in a manner that favored Skidmore. Specifically, the neighbors identified what they believed to be numerous irregularities and brought these to the attention of town and state officials. Verbal and written communication of their concerns were provided to NYSERDA, the Office of the Inspector General, the Office of the State Comptroller, Greenfield officials including the Planning Board, the Town Board, the Town Supervisor, and the town attorney. The neighbors said that there was no response to most of the communication, and there was no discernible action to address any of their concerns.

Two examples of what the neighbors considered to be inequitable treatment are as follows. First, in the final public hearing, members of the public questioned why the applicant was able to have more time to speak when other individuals were not able to do so (Greenfield Town Board, 2013e). Second, neighbors believed the Town had waived the required procedures for obtaining a spot on meeting agendas for Skidmore.

The neighbors also felt that the proposal would never have been considered by the town if it had been introduced as a Dynamic Energy project instead of as a Skidmore project producing power for campus use. In the final public hearing, one neighbor stated that "it really is a utility.... It should have been treated like a utility by New York State but due to some odd discrepancies in the law it is not being treated like one" (Greenfield Town Board, 2013e).

### Lack of Trust

As noted by O'Hare et al., "Behavior that seems reasonable to each party appears ignorant or even willfully insincere to the other" (O'Hare et al., 1983). The lack of mutual trust is thought to be one of the key causes of controversy. The mistrust and suspicion of developers described above is often exacerbated when opponents of a project scrutinize a developer's initial

behavior for evidence reinforcing their initial perception of mistrust and suspicion. "Unfortunately, such evidence is often forthcoming: any inconsistencies between what the developer does and what he says he will do, any reticence in providing information, or any tendency to define the opposition's concerns as trivial or unimportant will encourage mistrust" (O'Hare et al., 1983). "Quite often, financial constraints or scheduling deadlines are used as excuses to cut off public debate" (Susskind, 1990).

All of the above happened with this project. There was a lack of mutual trust between Skidmore and the neighbors. The neighbors' mistrust was exacerbated by what they saw as inconsistencies in information, reticence in providing information, dismissal of concerns, and the constant emphasis on moving the process along in order to meet the NYSERDA funding deadlines. As the process proceeded, the lack of trust was extended to include public officials.

### *Lack of Trust – the Neighbors and Skidmore*

The public record indicates that Skidmore felt they had been reasonable and thoughtful throughout the entire process. In the last public hearing on October 30, they reviewed everything they had done to accommodate the neighbors. Skidmore indicated that it felt it had been a "good neighbor," and that it had been responsive to the concerns of the neighbors. One Skidmore representative noted that the college "has listened to comments from the Greenfield community and members of the Planning Board and has proposed many measures to mitigate their concerns….He felt that this was another exceptional partnering opportunity between Skidmore and the Town of Greenfield" (Greenfield Town Board, 2013e).

The neighbors did not feel the same. One neighbor commented that he has lived in Greenfield for almost 20 years and has not seen anything like a partnership from Skidmore (Greenfield Town Board, 2013e). Another neighbor noted that Skidmore "told him they could

put a pig farm there [instead of a solar array]....The fact is that you can't threaten him or try to intimidate him by saying you could do something worse. If they put homes back there at least Greenfield will get revenue" (Greenfield Planning Board, 2013g).

A letter from one of the neighbors further illustrates the lack of trust between Skidmore and the neighbors:

> As of this writing Skidmore has changed PUD language, location and access points 3 different times, which begs the question: When can we take them seriously? At the meeting on July 9th, Skidmore replied with opinions (at best) to answer the board's June 25th information requests. Determined to evade an EIS they seemingly are looking PAST the Planning Board to "fast track" this project and get it to the Town Board because of some timetable that no one seems to understand or comprehend. They insinuate "the grant" should compel Greenfield to act quickly and be bound by it. While almost reprimanding the board with rather casual and disingenuous replies, Skidmore continues their act of being the bully on the block and leaning on the backs of Greenfield's respective boards to make a decision based on what they perceive will benefit Greenfield. They care little for our questions, positions and fears while assuming that they are entitle to free reign to utilize property in a rather obnoxious and anger proving fashion. If a solar farm is deemed (to use Ms. Ferradino's words) an agricultural / recreational endeavor, I would wonder who reaps the agricultural harvest or enjoys recreation utilizing a solar field. The contention is ludicrous and should be heaped on the pile of the many mistakes, insulting changes, and rather deceptive language.... They were asked to provide information on relocating this "agriculture" to a less obnoxious site. The reply was "it's too late and we spent 250k to redesign already." Can anyone take them seriously after that statement? (Mina, 17 July 2013).

### *Lack of Trust – the Neighbors and the Town*

Some of the neighbors did not believe that town officials were acting in their best interest. Specifically, they thought that town officials too often did not insist on answers, or failed to notice when questions had not been answered. They also thought that most of the officials did not understand the project, and lacked the expertise to properly review it. In addition, some of the neighbors had concerns about officials' motives, their ethics, and their general behavior toward the public. Overall, they had little trust in Greenfield to "do the right thing."

For example, some of the neighbors believed that two members of the Town Board had been inappropriately discussing financial incentives for the town while the review process was underway. The neighbors obtained correspondence through the FOIL process between Skidmore and the town supervisor and the assistant town supervisor discussing, among other conditions, a monetary payment for the town's golf course (Brookhaven Park) as part of the development agreement. The town supervisor had been instrumental in acquiring the golf course a few years previously, and the acquisition had been a point of contention because of fears of the cost of supporting it. After the neighbors saw the email from the town supervisor, they suspected that one of the motives for approving the PUD was to get money to offset golf course expenses. They alleged that this was a case of contract zoning, and this allegation was the basis of the Article 78 petition filed against the town (*Wendy Stein Interview by Casey Stein.*2014, Mar 28). In response to these allegations, Skidmore sent a letter to the town stating that "no negotiations ever took place. Skidmore provided the town with the payment amount and structure. That has not been modified at any time. The sole purpose of the opponents' allegations are to cast doubt on project on a basis other than its merits" (Ferradino, 2013, Dec 04).

Furthermore, neighbors believed that the relationship between the town and Skidmore, based on emails, was not professional, and that there were some conflicts of interest. One of the most interesting signs of the lack of trust was a letter sent by one a neighbor's attorney alleging that one Planning Board member had a conflict of interested based on a relationship with Skidmore. The Planning Board member in question held that the attorney's accusation was unfounded, and did not recuse himself (Greenfield Planning Board, 2013i).

The lack of trust between the neighbors and the town was fueled by "negative" remarks made by both sides. A Planning Board member in attendance at the Public Hearing loudly

referred to a pair of the neighbors as "bitch one and bitch two." At a public meeting, the town supervisor told one of the neighbors to "put his big boy pants on and talk to Skidmore." The associate town supervisor made comments such as "we've heard enough from the public." Comments like these do not appear to have been included in the written minutes of public meetings. While less colorful, at least one neighbor also made very public comments indicating that they thought the Planning Board and the Town Board members were inept and, in some instances, corrupt (*Wendy Stein Interview by Casey Stein.*2014, Mar 28).

### *Lack of Trust of State Agencies*

The neighbors expressed concerned that Skidmore was violating some of NYSERDA's contractual stipulations (such as identification of the incorrect project site). However, as referenced in previous sections, there was limited, if any, response by state officials to neighbors' requests for investigation and/or clarification. Correspondence was sent to the New York State Office of the Inspector General and the Office of the State Comptroller by one of the neighbors requesting that the agencies investigate the irregularities and the responses associated with the project. The letter stated that "a FOIL request submitted by a local attorney to NYSERDA has resulted in sparse and incomplete information. From what we have been able to determine, this project violates the NYSERDA program requirements and in our opinion is a waste of taxpayer money which, as you know, is a funding mechanism for NYSERDA" (W. Stein, 2013, Oct 24). According to the neighbors, there was no response from the agencies. (*Wendy Stein Interview by Casey Stein.*2014, Mar 28).

In addition, there were other sources of this lack of trust. At a November 14 meeting, Skidmore stated that they needed project approval from the town in order to retain the NY-Sun grant. According to the neighbors, a town official stated that approval would not be given that

evening and if immediate approval was required, then there was no point proceeding with the meeting. Numerous other requirements and issues were raised at the meeting, indicating that PUD approval may not be imminent (Greenfield Town Board, 2013d). Four days later, newspapers reported that Skidmore College entered into a partnership to develop a statewide program to help start ventures in renewable energy and clean technology. The program, called New York Executive Clean Energy Leadership Institute, is funded by 400,000 dollars from NYSERDA (Grey, 2013). The neighbors were unsure what the motivation was for this program, but suspected that it had something to do with the outcome of the November 14 meeting.

### *Status of the Controversy*

The Skidmore solar array has been constructed, but only after a protracted battle.

**Figure 4: Aerial photo of the Skidmore solar array under construction. Spring 2013.**

Skidmore's stated reason for declining to comment on this thesis was because "of some of the animosity that was developed during the approval process and some of the wounds that are not yet healed." Skidmore and the neighbors were both adversely affected by the process, and it is unlikely that either group came away from this process satisfied with the results. The neighbors have a solar array "in their backyard" that they feel should never have been approved. Skidmore now has a negative relationship with many of the residents abutting its property, and the project has received negative press. Both parties had to spend a significant amount of money on lawyers and experts. Additionally, the neighbors are in the process of setting up a not-for-profit watchdog foundation to address what they believe to be ethical and procedural issues with government processes.

## Cornell University Snyder Road PV Array

### *Background*

On March 13, 2013, Distributed Sun LLC, a Washington, D.C. solar power company, submitted a grant application to NYSERDA under PON 2589 for funding for a 2 MW ground mounted photovoltaic array (Distributed Sun, 2013, Mar 13). Distributed Sun proposed to construct this solar array on behalf of Cornell University. The project site was identified as Cornell University-owned property on Snyder Road in Lansing, New York,[4] application as 870 Snyder Road, Ithaca, New York.

The selected site was located within Lansing's Industrial/Research (IR) zone, which allows for power generation facilities. The purpose of the IR district was to designate areas where light manufacturing, fabrication, mining, and power generation/utilities would be

[4] Some of the documents submitted to NYSERDA by Distributed Sun incorrectly stated that the project was located on 870 Snyder Road, Ithaca, New York. While Cornell's campus is located in Ithaca, the project site is located in a nearby town – Lansing.

appropriate uses (Town of Lansing, 2005). Land use in the vicinity of the site was industrial, commercial, and park, forest, or open space. Specifically, land uses adjacent to the site include the Ithaca-Tompkins Regional Airport, Cornell's radiation disposal facility, Cornell's chemical disposal facility, open space, and forested land. There are no residences adjacent to the site (Distributed Sun., 2013, Mar 13b).

**Figure 5: The Ithaca Tompkins Regional Airport, across the road from the Cornell solar array.**

**Figure 6: Area near the Cornell solar array.**

At the time the solar array was approved, there was a moratorium in the Town of Lansing on High Impact Industrial Uses, including "large scale commercial or industrial power generation by solar farming" (Lansing Town Board, 2013). However, according to a Town of Lansing government official, "the solar array proposed by Cornell University was not considered to be a "High Impact Industrial Use" and thus not prohibited by the Moratorium on High Impact Industrial Uses. The 2 Mega Watts generated are to be used by CU [Cornell University] for their own power needs and are considered a small scale power generation system. It is the size of the project and disposition of the electricity generated that determines if it is High Impact Industrial" (Miller, 2014).

According to the project manager for the Cornell array, there were a range of criteria used to choose the site. These criteria included a parcel size that was large enough to site a two megawatt project, adjacency to a distribution line, accessibility, the slope of the parcel, the

amount of clearing that would be required, shading considerations, and other potential uses for the site. In regard to the last potential point, "these are long-term, 20-30 year, agreements....Close in to campus there is not a lot of wired spots that folks can't envision other uses for in the next 30 years. So that was really the hard part. It's easy to kind of look at a map and pick out lots of land, but ones that aren't well-suited for other purposes are a little harder to come by" (*Sarah Zemanick Interview by Casey Stein.*2014, Mar 27). The site that was chosen "sits on top of a groundwater plume and some monitoring wells so it is not officially characterized as a brown field site but it wasn't a site that other people were interested in using for other purposes for that reason" (*Sarah Zemanick Interview by Casey Stein.*2014, Mar 27).

Distributed Sun's application to NYSERDA noted that there were two potential meters located on the utility line that could be used as interconnection points for the proposed solar array. One of the identified meters supported loads of approximately 300 megawatt hours yearly and paid into the RPS, which was a PON 2589 funding requirement. The other meter did not pay the RPS surcharge, and the 12-month historical electric usage on the meter was zero. Distributed Sun identified the latter meter as the preferred meter because the other meter "would substantially increase costs to install and subsequently, increase our bid into the PON 2589 grant" (Cover letter, 2013). While the preferred meter did not support any load at the time, Distributed Sun informed NYSERDA that Cornell was in the process of upgrading several pumps in the area and would connect them through this meter. According to the documents sent to NYSERDA, Distributed Sun had discussed this with the local utility - NYSEG (New York State Electric and Gas) - and they "have expressed a willingness to support remote net metering in order to avoid the installation of redundant electrical equipment and electrical line" (Cover letter, 2013). It is presumed that NYSERDA approved Distributed Sun's preferred meter,

because of a letter sent by Distributed Sun to the Town of Lansing Planning Board in September 2013 stated that "the project will interconnect to NYSEG's grid at a service pole along Snyder Road that currently has no electrical service or load on it" (Switzer, 2013). Additionally, as referenced above in an earlier section on net metering, in March 2013, the Albany law firm Couch White, LLP, which was the same firm representing Skidmore College in their re-zoning request to Greenfield, filed a petition with the New York PSC to overturn NYSEG's determination that the Snyder Road Site was not an eligible Host Account, because that the Host meter must have a minimum level of load (Loughney, 28 Mar 2013). The need for the petition appears to contradict the March 13 statement of Distributed Sun in regard to NYSEG's willingness to support remote net metering.

Three days earlier, on May 13, Cornell representatives had presented an informal sketch plan for review at a Town of Lansing Planning Board meeting. The presentation was brief and stated that they would stay within groundwater standards, use glare resistant panels to avoid any issues with planes (at the adjacent airport), and submit for airport acceptance on the project. Questions were posed about the tax status of the property, since Distributed Sun, a for-profit company, would own the array. Cornell responded that they were not prepared to answer the question at that time. The town requested that Cornell and Distributed Sun apply upon completion of the grant approval (Greenfield Planning Board, 2013h).

On July 9, NYSERDA announced the second round of PON 2589 grants (NYSERDA, 2013c). The Cornell project was awarded a grant; the proposal that was approved described the arrangement as follows: Distributed Sun and Cornell negotiated an arrangement whereby Distributed Sun will develop, construct, maintain and finance the PV array pursuant to a Power Purchase Agreement (Distributed Sun., 2013, Mar 13a) . While Cornell will retain ownership of

the land, the solar array equipment will be owned and operated by Distributed Sun. The power generated will be sold to Cornell under a PPA. The total cost estimate for the array was $4.6 million dollars (Distributed Sun., 2013, Mar 13c).

Shortly after receiving the award from NYSERDA, Distributed Sun requested a transfer of the rights and responsibilities of their contract with NYSERDA to Ulysses Solar LLC. Their explanation was that the contract awardee, Distributed Sun LLC, was a solar portfolio manager and "typically establishes project companies to own and operate the solar systems under its control to ensure the most legally and financially efficient ownership of assets. To this end, Distributed Sun LLC formed Ulysses Solar LLC on August 9, 2013 with the express purpose of utilizing it to own and operate the Cornell project" (Weiss, 2013).

NYSERDA consented to the transfer, and the project was transferred from Distributed Sun to Ulysses Solar in October 2013. It is unclear whether Town of Lansing and Tompkins County are aware that this transfer occurred – both indicated that Distributed Sun owns the array. Around the same time, Distributed Sun also changed their engineering, procurement, and construction (EPC) partner from HyPower, Inc to RenewEnergy Solutions (Cox, 2013a).

Like the Skidmore case, a number of state and local approvals were required. Required state approvals included a NYSERDA Interconnection Approval, NYSERDA Net Metering Approval, and NYSDEC SEQRA Approval. Required local permits included Town of Lansing Site Plan Review approval, a Town Building Permit, and a Town Electric Permit. Tompkins County also evaluated the project for county-wide impact per General Municipal Law 239. Additionally, due to the array's proximity near the local airport, Cornell was required to do a glare analysis, and obtain approval from the FAA-New York Airports District Office (FAA-NYADO), in conjunction with FAA Headquarters in Washington, D.C., and the Ithaca Tompkins

Regional Airport. The Cornell project manager noted that Cornell passed this analysis with "flying colors" (*Sarah Zemanick Interview by Casey Stein.*2014, Mar 27). Also, according to the Cornell Project Manager, the local airport was not opposed to the project. In fact, "the local airport was very supportive of the project, and…they would like to pursue their own solar project" (*Sarah Zemanick Interview by Casey Stein.*2014, Mar 27).

To obtain the local approvals, in October 2013, Distributed Sun submitted the application for the Site Development Plan Approval to Lansing. The application stated that Cornell would retain ownership of the property and purchase the power produced (Distributed Sun, 2013). The anticipated construction time was 8 months, and it was stated that 40 jobs were expected (Switzer, 2013).

On October 7, 2013, the Lansing Planning Board held the first meeting, and public hearing, on the project site plan approval. At the meeting, a letter from the Tompkins County Planning was read, which discussed the county's review of the project per its power granted by General Municipal Law 239 (Lansing Planning Board, 2013b). As previously noted, this approval is essentially the county's sole involvement in this kind of process. Two potential negative intercommunity or county-wide impacts were identified. First, the County recommended that the Town require the applicant to include a description of how the proposed array would relate to the nearby former refuse and radioactive material disposal sites. Second, the County recommended that the full Glare Analysis and FAA correspondence should be included for review (*Scott Doyle Interview by Casey Stein.*2014, Mar 27).

An interview with a County representative revealed that the Cornell array was the first array that the County had reviewed. Since this was a different type of project than they normally saw, and since they thought there was a good likelihood they would see more of those projects,

they wanted to look closely at this project, and in particular at the unique aspects tied to the site and scale of this type of development, so that they could think through best management practices for these kind of projects in the future. After looking into this project, the County felt that the two pieces listed above were key missing pieces. While Distributed Sun/Cornell had some narrative in their initial application that talked about the former disposal site, there was very minimal information about how the project would interact with the dump site. Similarly, there were references to some visual impacts on the site on the application, but a formal glare analysis had not been submitted to the Town of Lansing. In response to the county's concerns, the applicant submitted this information (it appears they already had it). Once those pieces were included, the County subsequently issued a no county-wide impact (*Scott Doyle Interview by Casey Stein.*2014, Mar 27).

At the October 7 meeting, Planning Board members also inquired about what benefits if any would or could the Town reap from the project. In addition, the decision was made to hold the public hearing open until the New York State stormwater specialist's comments were heard. A representative from Cornell asked that a request with a timeline be given to the DEC stormwater specialist so that she would meet the next Planning Board deadline of October 28. There was limited other discussion (Lansing Planning Board, 2013b).

On October 28, 2013, after a brief discussion stating that the town engineer had given permission for the project to move forward, one attendee brought up the issue of fire risk, and asked if the local fire chief had consulted with risk management. The response was that the firefighters were most likely aware of it, and "the grass that will be grown around the fencing will not be high risk for fires" (Lansing Planning Board, 2013a). The Lansing Planning Board then found a negative determination of environmental significance; this meant that an

Environmental Impact Statement would not be required. At the same meeting, the Planning Board granted Final Site Plan Approval for the proposed solar array. However, the Town of Lansing Planning Board did note that they "would like to see a little cooperation and neighborly consideration by the people making the money on this project" (Lansing Planning Board, 2013a). Thirteen members of the public were present at the October 28 meeting; it is not clear how many of them were there for the Cornell array, as other items were also on the agenda.

The final site plan approval for the array included a few conditions, most centering around stormwater management. One condition did relate to the nearby hazardous waste disposal site, noting that "in regard to the potential presence of radioactive or other hazardous substances under the surface of the project site that may have migrated from the adjacent former Radioactive Disposal Site (RDS), appropriate occupational safety measures shall be employed during construction, as recommended by the Cornell University Environmental Health and Safety (EH & S) office. If any evidence of buried waste or contamination is observed during the execution of the project, the Cornell University EH & S should be notified to investigate, and the Town Code Office shall be notified" (Lansing Planning Board, 2013a).

### *Current Status*

According to documents submitted to NYSERDA, all permits were to be obtained by September 1, 2013 and the system installed by December 15, 2013 (Distributed Sun., 2013). As of March 2013, the solar array had not been built, leading to the conclusion that Cornell received an extension. The reasons for this extension are unclear. Construction on the site has now begun, and the solar array is expected to be operational by the end of the summer (*Sarah Zemanick Interview by Casey Stein.*2014, Mar 27).

### *Controversy*

While a NYSERDA representative noted that the Cornell project was not necessarily a "slam dunk" (*Mark Torpey Interview by Casey Stein.*2014, Apr 04), other interviews and public documents indicate that there was limited controversy surrounding the Cornell array, especially compared to the Skidmore case. There were only three Planning Board meetings in Lansing about the project. The project was introduced to the public at the May 13 Planning Board meeting. The meeting started at 7:15 pm and was adjourned at 8:45. There were 10 people in attendance at the meeting, two of whom were Cornell project representatives. The project was one of three items on the agenda, plus general business. There were no public comments about the project that were recorded in the meeting notes. The next meeting about the project was the October 7 Planning Board meeting. The meeting started at 7:15 and ended at 9:25. There were 16 people in attendance, a number of whom were associated with the Cornell project team. The project was one of two items on the agenda, plus general business. According to the minutes, there was one public comment from someone who "is keen for the project to be a success, concerns are… herbicides, view shed, quality of product" (Lansing Planning Board, 2013b). The final meeting was October 28. The meeting started at 7:15 and adjourned at 9:17. There were 13 members of the public present, some of whom were Cornell representatives. There were five projects discussed at the meeting, Cornell being one of them, plus general business. There was one public comment about fire safety, and then the project was approved (Lansing Planning Board, 2013a).

Concerns about the project that did arise primarily came from two sources - the Lansing Planning Board, and the Environmental Review Committee (ERC) of the Tompkins County Environmental Management Council, which is a volunteer public advocacy group. Notably, on the whole, both the Lansing Planning Board and the ERC were in favor of the solar array, but

they did raise some concerns about details of its implementation. These concerns can be grouped into three categories – local impacts, equity, and Cornell's responsibility as a land grant college.

## Local Impacts

### *Stormwater Management*

According to Cornell's project manager there was "a little bit of back and forth with the local municipality regarding stormwater and that wasn't so much a controversy as just needing to figure out what stormwater scenarios were appropriate" (*Sarah Zemanick Interview by Casey Stein.*2014, Mar 27). In particular, the Town of Lansing "wanted time to interface with the New York State DEC," because "they were very conscious about this project being one of the first big solar arrays in the state and wanted to set the right precedent" (*Sarah Zemanick Interview by Casey Stein.*2014, Mar 27). The ERC also requested that the project set aside "sufficient areas and budget for construction of storm water settling ponds in the event that a combination of soil compaction, site de-vegetation, fire-fighting access roadways, and rainwater concentration by the solar panels results in greater storm water runoff than currently characterizes the site and that is greater than that currently predicted by Distributed Sun's engineers" (Tompkins County Environmental Management Council, 2013).

### *Vegetation Management*

There was also some debate about how the vegetation on the project site should be managed (*Scott Doyle Interview by Casey Stein.*2014, Mar 27). The ERC was interested in exploring alternatives to pesticide use and mowing, and recommended that "an array of different ground cover options should be tested in the initial three years of the project with a goal of finding a natural vegetative ground cover that can be grazed by sheep (or other PV-friendly herbivores) without the need of mowing or the use of herbicides" (Tompkins County

Environmental Management Council, 2013). According to a county planner, this recommendation about grazing "got Cornell a little up in arms" and "also drew some reaction from…the town and the applicant" (*Scott Doyle Interview by Casey Stein.*2014, Mar 27).

### *Other Potential Impacts*

In addition to the stormwater and vegetation management concerns mentioned above, the ERC made a few other recommendations, none of which appeared to be included in the Town of Lansing's final site plan development approval. First, the ERC requested that "if the PV array is not reconfigured onto just the green field portions of the parcel, careful delineation and differing ground-cover management regimes will be needed for the respective green field and brown field portions of the project until it is proven that above-ground biomass in the brown field portion remains free of contaminants" (Tompkins County Environmental Management Council, 2013). Second, the ERC recommended that "careful planning of fire prevention and firefighting methods may result in a safe project with lower insurance premiums" (Tompkins County Environmental Management Council, 2013). Third, the committee noted that "an evergreen hedge planted just outside the chain-link perimeter fence – at a minimum along the south-facing exposure – should be low-cost to maintain and offer the triple benefits of i) view shed protection ii) better protection of the solar panels from vandalism as well as possible stray arrows and bullets from hunters in the adjoining unique natural area (UNA), and iii) better protection from deer that otherwise might jump the perimeter fence" (Tompkins County Environmental Management Council, 2013).

### *Equity*

According to a Tompkins County planner, Cornell's involvement in a project is often doubly scrutinized, both because of the tax implications and because Cornell is a major

landholder, partner, and player in the county (*Scott Doyle Interview by Casey Stein.*2014, Mar 27). The key equity issue in the Cornell case surrounded the tax status of the site. While all three taxing jurisdictions in the area (county, town, and school) opted out of the state exemptions for solar power tax exemptions, the Cornell project will still be exempted from property taxes pursuant to Cornell's educational exemption, Real Property Tax Law Section 420-a. According to the Director of Assessment in Tompkins County, "since this project is for Cornell and could easily be done by Cornell and strictly serves the Cornell campus, it has been deemed to fall under their educational exemption and is an exemption regardless that the county, Town of Lansing and Lansing Schools have opted out of this exemption" (*Jay Franklin Interview by Casey Stein.*2014, Mar 19). The Director of Assessment noted that four different attorneys agreed on this determination. Cornell also agreed with this finding; the Cornell project manager noted that "the municipality was not thrilled that that was the outcome, but that is the correct legal interpretation of the situation" (*Sarah Zemanick Interview by Casey Stein.*2014, Mar 27). The Cornell project manager's statement that the town was not thrilled about the outcome was supported by Lansing Planning Board meeting minutes, which stated that the Planning Board "would like to see a little cooperation and neighborly consideration by the people making the money on this project" (Lansing Planning Board, 2013a).

### *Cornell's Responsibility as a Land Grant College*

ERC felt that Cornell could have improved the project by adding a research component. "The tax-exempt status and…teaching mandate of land-grant universities oblige Cornell to remain an active partner in the project and to ensure that it will be a model for New York State and the country on how photovoltaic capacity on this scale should be installed and managed" (Tompkins County Environmental Management Council, 2013). In their opinion, Cornell will

have "abjectly dropped the baton with respect to its Morrill Land Grant obligations to the citizens of New York State" if it allows the PV installation to be "a plain vanilla, non-research out-of-sight, out-of-mind installation with little or no teaching and research components" (Tompkins County Environmental Management Council, 2013). ERC further recommended that Cornell's Development office line-up a grant so that an active teaching and research component can be built into the solar project.

ERC also recommended that Distributed Sun and Cornell endorse the idea of creating a Snyder Road PV Management Advisory Committee "to assist in the guidance of this project over the next 20-30 years. Such a committee could advise the project owners and other stakeholders over the life of the project regarding management issues including minimization of view shed impacts, ground cover options, stormwater management, conservation of biodiversity, and teaching, tourism, and research options.... Similar to Cornell's modern new dairy barn, this site should merit being on tours provided to alumni, other donors, prospective students, and others interested in how Cornell is grappling with the climate change, energy needs, and other problems of the 21st Century" (Tompkins County Environmental Management Council, 2013).

## Analysis

Siting controversies usually revolve around the impacts on the area where a project is to be sited, and the impacts on those who live near a proposed site. However, the impacts of a power generation facility can extend far beyond a local project site or municipal borders. Governments recognize this, and have regulated the production, transmission and distribution of electricity in the United States almost since the beginning of its use, based on the Supreme Court decision Munn v Illinois, 94 U.S. 113, which stated that: "Property does become clothed with a public interest when used in a manner to make it of public consequence and affect the

community at large. When, therefore, one devotes his property to a use in which the public has an interest, he, in effect, grants to the public an interest in that use, and must submit to be controlled by the public for the common good…" (Munn v Illinois, 94 U.S. 113.1877).

Regulations have largely applied only to electricity produced for public use; power generation on private land for private use was not for the common good, and therefore was usually only subject to applicable local land use laws, if even that. Virtually all of the electricity generated for public use was, and still is, produced by a limited number of large generation facilities owned and operated by a limited number of entities, and a significant percentage of these facilities relied, and still do, on fossil fuels as their energy source. The electric power generation system is at the beginning stage of a huge transformation away from fossil fuel sources and toward cleaner renewable energy sources, the nature and impacts of which are very different from traditional fuel sources. As a result of these differences, power generation facilities using renewable resources do not always easily map on to the existing regulatory system. The controversy that erupted in the case of Skidmore, and to much more limited extent in the case of Cornell, is illustrative of what happens when regulatory frameworks do not keep up with underlying changes in the system being regulated.

### *Inherent Complexity of Energy Policy*

Policy is not perfect, it is often not fair or equitable, and it tends to be ambiguous. Whether or not one agrees with the aims of a specific policy does not change these underlying problems. Similarly, government is not perfect, it makes mistakes, and its representatives, out of fear of reprisal, often make information difficult to obtain

Issues involving energy can be especially problematic for government. The energy system is a vast and complex mechanism overseen by numerous international, national, state and

local government agencies, quasi-agencies, and private entities. While energy is a public necessity, there are a multitude of ways that demand can be met, all of which correspond to different distributions of benefits and costs. Policies and the regulatory framework that apply to the energy system in general, and solar power in particular, are difficult to understand, and becoming increasingly more so as government struggles to craft policy solutions that meet energy demand while simultaneously trying to reduce greenhouse gas emissions.

Adding to this inherent complexity, energy policies have their roots in a world of centralized generation of power based on fossil fuels and, as a result, they often do not map cleanly to the realities of today's emphasis on distributed generation. As E.O Wilson said, "This is the time we either will settle down as a species or completely wreck the planet. We will have to evolve a better world order than the one we have now, which I like to call our Star Wars civilization. I mean, we have stone-age emotions, medieval institutions, and godlike technology" (Pomp from the past.2014).

The result of all of the above is a public that is largely unaware of how the energy system works. The same can arguably be said of local government, especially volunteer boards who have neither the knowledge or resources to spend long hours studying PSC law and NYSERDA funding guidelines in order to understand the vagaries of net metering law, or to map out, from a technical perspective, where solar arrays would have the least impact on local distribution lines. Two significant implications of this lack of knowledge in regard to siting solar arrays are as follows. First, the lack of local knowledge can lead to processes and outcomes that are perceived as unfavorable or unfair by parties opposing a facility. Second, the details of a policy's imperfections or a government's mistakes often do not become apparent until policies and government actions are subject to scrutiny. When a solar array is sited in someone's backyard, it

opens the door to scrutiny, and that level of scrutiny is likely to be increased when the public supplies funds in the forms of financial incentives and when two groups that arguably do not have large levels of public trust – government and developers – are involved.

### *Siting Renewable Energy Projects is Similar to Siting Other Energy Generation Facilities*

The controversy outlined in the Skidmore case study, and to a limited extent in the Cornell case study, occurred and will continue to occur because the impacts of power generation facilities exist regardless of the fuel source involved. These include environmental impacts, health and safety impacts, and impacts on the electricity and transmission system. There are also economic impacts on the ratepayers and taxpayers who fund the energy production, distribution, and transmission systems through electricity bills and taxes. Some of these impacts, particularly on land use, are primarily local, while others, such as the economic impacts and potential environmental benefits and impacts, are not limited by municipal borders.

There is some debate about whether solar energy will experienced the same level of siting controversy as other types of renewable energy facilities. Some of the people interviewed in connection with this paper mentioned that solar energy is less impactful than other types of energy generation facilities, such as wind energy, and as a result, they do not anticipate high levels of future controversy. However, to date, there have been a number of controversies surrounding utility-scale ground-mounted arrays in the United States, despite the fact that it is a relatively new type of project. Furthermore, abutters and other affected groups are not deciding between a solar facility or another type of energy facility, they are simply making a yes-or-no decision on a single solar facility. In addition, the environmental tradeoffs or consequences of choosing to approve or not approve a single facility were not obvious in either the Skidmore case or in the Cornell case. Therefore, if New York State continues to support solar energy, it is likely

that controversies will continue to erupt and escalate, especially around utility-scale solar arrays smaller than 25 megawatts. As previously noted, these arrays are in the unique situation where they do not fall under the purview of the New York State's Siting Board, but they are large enough that residents can view them as "power plants." As demonstrated by the Skidmore case study, when local government has the primary responsibility for approving the siting of larger-scale energy facilities which have both local and far-reaching benefits and costs, it is likely that there will be difficulty balancing the diverse sets of interests involved.

### *Choice of Site is Key*

While the Skidmore array was surrounded by significant controversy, the Cornell array was not, despite the fact that many of the criticisms leveled at the Skidmore array could be equally applied to the Cornell solar array. This is especially true with regard to environmental and equity concerns, and concerns about the underlying state policy and regulatory framework. To a large extent, the level of controversy, and whether potential underlying legal issues were raised, depended ultimately on the choice of site.

Since battles over solar arrays generally happen on a site-by-site basis, with the yes-or-no choice of a particular solar project or not, using the argument that something worse could theoretically be sited in the same location does not appease local residents. The inherent problem with doing things on a site-by-site basis is that those affected are not comparing solar with something worse, or solar with wind; they are comparing solar with the status quo. This problem is exacerbated when the "losers" are not convinced there is any reason to choose the site in the first place, other than the fact that it is economically beneficial to the developer.

This was illustrated by the Skidmore case study. Skidmore opted for a site located in a rural, residential, and affluent neighborhood. Since the neighbors had neither been involved in

the site selection nor trusted Skidmore College, Skidmore was forced to continuously defend its site choice throughout the process. These efforts were only partially successful. While town officials did eventually permit the site choice, the neighbors never found Skidmore's defense of the site convincing.

Furthermore, Skidmore's site choice led to intense scrutiny of the project that would likely not have happened otherwise. Once neighbors directed significant resources to scrutinizing the project, other issues that may have gone unnoticed suddenly became very important, such as the neighbors' difficulty obtaining trusted information about the project. Had Skidmore been fully aware during the site choice process of the consequences of choosing Denton Road, they might have been more willing to consider alternate locations.

In contrast, Cornell selected a site in an unpopulated area, near an airport and a former radioactive waste site. In the Cornell case, there was no one group significantly impacted by the array to the point where they were willing and able to expend the resources needed to obtain information and research the environmental and economic costs and benefits associated with the underlying policy and regulatory framework. A representative of the Tompkins County Planning Department did indicate that if the Cornell array had been located in a more residential area, or if it impacted an important view, it would have been subjected to a higher level of review, and subsequently there might have been a higher level of controversy.

### *Pre-Existing Community Relationships are Important*

Due to their educational purposes, the vast majority of private and public universities and colleges are tax-exempt entities. Land-grant colleges, including Cornell, receive additional financial benefits from the government. While universities can and often do bring benefits to the

communities in which they are located, they can also impose local costs, both monetary and non-monetary.

While there was some grumbling about Cornell's tax-status by Lansing, Cornell has a large presence in the surrounding area. In addition, as a large university, Cornell has many of its own services, which reduces its reliance on some community-funded services. It is also a major employer for the area, and has a large positive economic impact on Ithaca and the surrounding communities.

Skidmore, as a small college, relies more heavily on community-based services such as police and fire protection. As an undergraduate-only school with mandated on-campus housing, its interaction with local communities, as well as its economic impact, is more limited. For example, Skidmore's assertion that this was another opportunity for partnership with Greenfield was not taken well by the neighbors, who indicated that they were largely unaware of any previous partnerships with Greenfield over the years, and instead had been engaged in lengthy and ongoing disputes regarding traffic, noise, on-road parking, and the college's previous plans to put up stadium lights on the baseball field, which is in the same Denton Road neighborhood. One neighbor described living near college students as follows: "there are kids running around nude throwing Frisbees, Polo puts on big events and he cannot even tell the Board the things he finds when he walks his dog. He states that he does not complain." This history between the parties added to the perception of the neighbors that whatever Skidmore was doing was most likely not in their best interest.

### *Information Shortcomings and Perceived Inequity Foster Additional Scrutiny and Lack of Trust*

A perceived lack of information, combined with economic inequity, creates an atmosphere of suspicion, which in turn leads to both increased scrutiny and lack of trust. This

happened in the Skidmore case. In response to a shortage of trusted information, the neighbors hired their own experts and did a great deal of research on their own. The internet has exponentially expanded the information available to the public; the Freedom of Information Law has created avenues for obtaining data pertaining to government actions. The neighbors were able to estimate the economic benefits that Skidmore was likely to accrue, and questioned the tax-exempt status of the property, when they learned that the town believed the college would be able to retain its tax-exempt status. This may have been one of the reasons that Skidmore held meetings with town officials to craft a "development agreement" clause in the PUD legislation. If Skidmore and Greenfield had been forthcoming with information about the project and a plan to share some of the economic benefits right from the beginning, there likely would have been a greater amount of trust, communication, and possibly less contention.

### *Role of Local Government*

These case studies also raise questions about the proper role of local government in the siting of energy production facilities. Currently, local government is the primary siting authority for 2 MW solar arrays in New York. This goes beyond setting and interpreting traditional local land use laws. As noted above, NYSERDA often prefers and recommends that the local authorities be the lead agencies for implementing SEQRA. This can be problematic for the local government, since the type of decision contained in environmental impact assessments is inherently subjective and open to criticism, especially given the lack of knowledge inherent in boards staffed primarily by volunteers in regard to energy production in general and solar power production in particular.

When local governments are the primary government authority involved in siting, the proper scope of local government review can be unclear. In the Skidmore case, comments

recorded during meetings indicate that the Town felt that its role was to review local land use impacts. They did not address many of the more wide-ranging impacts raised by the neighbors. For instance, when one of the neighbors asked the Town to determine whether Skidmore College was abiding by federal reporting requirements, the Town Planning Board indicated that the request was outside its purview (*Wendy Stein Interview by Casey Stein.*2014, Mar 28). The Town also did not delve into the neighbors' concerns about alleged contract irregularities.

### *Controversy Can Continue Long after a Formal Siting Decision is Made*

The Skidmore array was ultimately approved. However, the contention surrounding the approval process led to an Article 78 proceeding filed against the Town of Greenfield. While the petition was dropped, the controversy has not gone away, and the neighbors are in the process of forming a not-for-profit to address what they perceive to be issues with local and state government processes. In addition, at least one of the neighbors is pursuing other avenues for addressing the perceived issues regarding state law and the funding of the Skidmore array. Documents are being prepared requesting that funding, contractual, legal, and ethical aspects of these projects be reviewed by the appropriate state agencies.

## Conclusion

Projects are often controversial because one party benefits while another party loses. Good siting can prevent the creation of clear "losers," and it can make sure that the "winners" serve a public purpose. A single project may or may not lead to challenges to local government or its policies or state government or its policies. However, if there are enough controversial solar projects, those projects have the potential to reflect poorly on New York State, especially since charges of unethical or potentially problematic actions from a legal point of view are often forthcoming from at least one party whenever money is involved. Allegations of both legal

irregularities and lack of compliance with ethical standards involving state and local government, developers and the college surfaced in the Skidmore case and resulted, as previously mentioned, in an Article 78 petition being filed against the town. In addition, the scrutiny of the Skidmore project by the neighbors led to an awareness of the Cornell project, plus one other university project, by the neighbors, and now those two, and the actions of officials in those cases, are also under scrutiny by at least one of the Skidmore neighbors.

New York State's support of solar energy in an attempt to move away from reliance on fossil fuels is admirable. New York is not alone in this. Many states have similar policies supporting the development of renewable energy. However, if states like New York fund projects like the Skidmore array without ensuring that siting practices are efficient, equitable, and result in environmental benefits that are to some degree supportable, they open the door to opponents of solar power to challenge subsidy programs. With this in mind, states and local municipalities would be well-served to reconsider the traditional architecture of the facility siting process. Some initial recommendations for New York State are below. While this thesis proposes a start, there is significant research still to be done.

## Recommendations

Currently, solar power generation facility siting is subject to varying degrees of regulation based on a fragmented collection of federal, state and local policies and regulations. A cohesive national policy and associated regulatory framework that would address energy and climate issues is needed. While detailing that framework is far beyond the scope of this paper, it is important to note that larger issues relating to overall energy policy including the division of responsibilities among federal, state and local government played a role in this controversy.

Addressing these issues would go a long way toward reducing some of the controversies noted in this paper. In the absence of a cohesive national energy policy, the following recommendations for addressing siting controversies will focus on changes to existing processes, with the goal of reducing some of the broader-based reasons for controversy.

There are a number of actions that can be taken in New York State to avoid future controversies surrounding the siting of utility-scale arrays. The recommendations laid out below are divided into four general categories – recommendations to state government, recommendations to local government, recommendations to developers, and recommendations to educational institutions. Many of the recommendations are geared towards improving the fairness and efficiency of the siting process in order to both prevent projects from being sited in unsuitable places and to ensure good projects can be sited in appropriate locations.

## *Recommendations to New York State*

### Performance Standards for State Incentive Programs

Some level of increased state regulation and oversight of the siting of utility-scale ground-mounted renewable energy facilities that are smaller than 25 megawatts is necessary. These arrays are small enough that they do not fall under the purview of the State Siting Board, but their land requirements, and related impacts, are potentially significant. It is important to note that in the near-term, the extent of state incentives for additional utility-scale solar projects of this size is unclear. Although originally planned to go until 2015, PON 2589 has been discontinued. However, a new NY-Sun Competitive Photovoltaic (PV) Program – PON 2956 – was recently introduced; NYSERDA announced that up to 60 million dollars is available for the installation of customer-sited PV projects larger than 200 kW in New York (NYSERDA, 2014b).

As a result, the state may want to mandate that all solar arrays funded by state programs abide by performance standards to improve the fairness and efficiency of siting processes, and to ensure that taxpayer dollars do not support projects in areas where conflicting uses or environmental concerns are likely to generate strong opposition. Through these performance standards, the state can be the party responsible for outlining best practices for the review of solar facilities; these performance standards could supplement the existing SEQRA process, which, as explained above, is often left in the hands of local government.

To create these performance standards, New York State could work with a series of stakeholders at the state level – including utilities, relevant government agencies, community representatives, and solar power developers. While outlining these metrics is beyond the scope of this thesis, performance standards should probably address:

- Characterization of the types of areas where solar arrays are not well-suited
- Information access
- Safety standards
- Project notification requirements

In addition, funding for large-scale arrays should assume realistic siting timetables. As noted by Susskind, when it comes to facility siting, it is often necessary to 'go slow to go fast' (1990). Neither Skidmore nor Cornell met the "mandatory" NYSERDA timeline, and the lack of enforcement of NYSERDA's initial deadline was an issue that was brought up in the Skidmore case.

### Substantiate Existence of Environmental Benefits of Project

For at least some of the neighbors, their opposition to the project was furthered by their belief that it would not result in environmental benefits. This concern stemmed from the fact that while all photovoltaic arrays have equal emissions, not all photovoltaic arrays have equal environmental value. Instead, the value of a renewable energy facility is based on avoided

emissions—the emissions that would have occurred in the absence of the operation of the facility.

New York State has statistics on energy usage in given areas, the capacity and limitations of transmission lines, and the other types of energy generators that generally serve a given area. New York State could, and arguably should, be using this information not only to decide where solar power is needed, but also to justify its public subsidies to those affected. Had the neighbors been convinced that the solar array would lead to direct environmental benefits commensurate with its cost to the public, they might have been more likely to accept it. This is a responsibility of the state, since local governments cannot provide this support. It is not their role, or within their expertise, to determine how best to maximize the benefits and minimize the adverse impacts of solar power.

## Clarification of Laws and Terms

As solar development increases in New York, relevant laws and regulations will be subject to increased use and increased scrutiny. This could be problematic for the state - as written, some of the laws are not clear, and in certain cases, may conflict with other state or federal laws and definitions, or with funding guidelines. Many of these conflicts correspond with questions about what it means to "use" electricity – a concept which has been stretched by net metering. The federal government has said that to "use" renewable energy, means that an agency "must consume renewable energy. Simply producing renewable energy on a Federal site does not count as use" (U.S. Department of Energy, n.d.). As written, New York law allows a much broader definition of "use." For example, in New York, the remote net metering law allows application of credits to a meter anywhere within a load zone, which can be hundreds of miles away. However, not all state definitions of "use" are consistent. In contrast to the remote net

metering definition of use, PON 2589's funding guidelines appeared to be more in-line with the federal government - PON 2589 stated that the Project Site was "where the PV system is located, where the electricity from the PV system is used, and where the utility meter is located." While PON 2589's definition of a project site indicates that the funding program may have been meant to encourage projects where the energy is used on site, state remote net metering provisions allowed Skidmore and Cornell to feed all or most of the energy into local distribution lines.

The concept of "use" also has tax implications. New York State should clarify the tax status of tax-exempt property leased to solar power companies for the production of electricity. In both the Skidmore and Cornell cases, it was determined that the land leased to the solar power company would retain its tax-exempt status because the purchase of the power by the colleges, through Power Purchase Agreements, constituted use, and therefore this was not a commercial operation. This was a source of controversy in both cases.

## Provide Additional Resources for Local Governments

The great disparities in knowledge and application of the law between different local governments can lead to increased cost and inefficiencies that are not desirable in situations that have wide-ranging impacts extending far beyond municipal borders. Furthermore, many municipalities are not prepared to deal with the ramp up of alternative energy sources like solar. This is an area where the state could provide guidance to local municipalities to smooth the transition to a cleaner energy future.

NYSERDA has already begun to put together resources to assist decision-makers in municipalities in the state which have responsibilities for permitting PV systems, and also for those, like first responders, who might encounter a PV system in their work environment. Among other initiatives, NYSERDA offers a standardized residential/small business solar permit

for systems up to 12 kilowatts. Beginning in the spring 2014, NYSERDA and its partners will be "conducting PV training in localities across NYS for code enforcement officers, building and electrical third party inspectors, fire inspectors, commissioners of public safety, building department plan examiners, village engineers and other public officials who might have a role in the permitting, inspection or approval process for a PV system or who might encounter a PV system in their work environment, for example, firefighters and other first responders" (State of New York, n.d.).

While NYSERDA's initial steps are commendable, additional measures may prove helpful, such as outlining a model solar energy zoning by-law that communities could use as a basis for their zoning. Guidance for permitting and monitoring systems larger than 12 kilowatts could either be part of the model bylaw or as a separate advisory document. The state could also require developers to sponsor peer review of relevant local studies. Last, New York may want to consider creating a state office that could provide assistance to municipalities on issues surrounding the siting of solar energy.

### Improve Information Availability

In the Skidmore case, a significant issue for the neighbors was the difficulty they faced in obtaining complete and timely information about proposed projects. New York's Freedom of Information Law (FOIL) is not as robust as it needs to be. Developers appear to have great leeway in labeling information as confidential based on trade secrets. This prevents disclosure. State agencies also appear to have great leeway in determining if and when information must be released. When public funds are involved, it would seem reasonable and appropriate to provide the public with easy access to all relevant public documents, to limit discretionary labeling of documents as confidential, and to enforce timely release.

### Respond to Concerns

The state may want to consider being more responsive to concerns expressed about solar projects when state funding is involved. In the Skidmore case, there was a lack of response from state officials to the neighbor's written and verbal requests for investigation of alleged irregularities (Stein, 2014). These concerns could have been somewhat alleviated if the state had responded or investigated the allegations when they were made.

## *Recommendations to Local Governments*

### Good Neighbor Agreements and PILOTs

If proposed solar arrays are likely to impact groups of stakeholders in the community, such as abutters, local government should encourage or require the creation of what is generally called "a good neighbor agreement." A good neighbor agreement is a written contract that contains terms agreed upon by two or more parties. Among other things, it can define how to resolve problems that may arise or provide a community with easy access to information. As part of the development of a good neighbor agreement, towns could encourage a consensus building approach by contracting with mediators and requiring that developers shoulder the associated costs of working out formal written agreements that anticipate problems that might arise and indicate how they will be handled.

PILOT agreements (payments in lieu of taxes) could be used in addition to, or as an alternative to, good neighbor agreements. A PILOT compensates local governments for some or all of the tax revenue that it loses on tax-exempt property. An agreement of this sort could reduce controversy over various kinds of inequalities (from the perspective of resident tax payers).

### Improve Information Collection and Dispersal

Another recommendation for municipalities would be to improve their system of information collection and dispersal. A great deal of the information about the Skidmore project was provided in hard-copy outside of the public meeting process. Subsequently, access to much of the project information was provided only through the FOIL process. While the Town of Greenfield was very accommodating with regard to FOIL, it would be preferable to have all documents having to do with utility-scale solar projects submitted electronically and posted online. In Lansing, some of the documents were available online, and others were only available through FOIL.

## *Recommendations to Developers*

Developers can also take actions to address potential controversies before they arise. Consulting with stakeholders early is crucial. If there is more than one possible site under consideration, stakeholders can be involved *before* siting decisions are made. For example, at one point, one of the neighbors offered to defray costs if Skidmore willingly moved the array to an alternate site. By that point, the economic costs of switching sites would have been prohibitively high. Had Skidmore realized the extent and impact of neighbors' concerns early in the process, controversy might have been avoided by simply switching to a different site.

Developers should also be open and honest about the solar array, including its benefits, and its costs. As Susskind notes, in the vast majority of cases, secrecy is counterproductive (1990). Admitting mistakes is recommended. Threatening that something worse could be put on the disputed parcel is rarely helpful. The same goes for prevarication – skating around an issue is rarely productive. The Skidmore team opened at least one meeting by noting that they were not intending to sell the energy to the grid, they would simply be getting credits for the energy

produced. While the Skidmore team probably intended this statement to support its position, instead it added to a lack of trust between Skidmore and the neighbors. Developers should also make efforts to mitigate the impacts of new development and/or compensate affected parties.

### *Recommendations to Educational Institutions*

When educational institutions are engaging in projects with for-profit developers and the educational institution is likely to benefit financially, they should voluntarily agree to share some of the benefits with the communities affected, and especially with the residents most at risk. One of the ways to do this would be to negotiate a PILOT agreement with the Town.

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