Imagining Solar

How Saratoga Springs Can Best Embrace Solar

A Report from the City of Saratoga Springs Solar Committee

Prepared January 2016

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Executive Summary

The Saratoga Springs Solar Committee was formed in the summer of 2015 by Saratoga Springs' Commissioner of Finance, Michele Madigan, to conduct a detailed review of the solar energy landscape. The committee was selected by City Council members and represents a cross-section of individuals from the community.

The Solar Committee looked at the local solar landscape from three main perspectives: **environmental, technological, and financial**. From all three perspectives, it was concluded that solar has a very favorable outlook and that our community has an opportunity to benefit from solar in several different ways.

From an environmental perspective, the science of global warming will require a major transition to renewable energy over the next several decades. Solar will play a major role in this transition due to extremely favorable technological advancements in materials science and efficiency gains along with plummeting costs and numerous financing options.

Our committee concluded that our community can play a pivotal role in helping this transition to solar energy occur, as quickly and efficiently as possible, so that our community can derive maximum benefits from the outcome. To best support this transition, the Solar Committee offers the following recommendations:

1. Replace the current Solar Access 0rdinance 6.4.8 with the New York State Unified Solar Permit or a variation of that permitting process which meets the needs of the City. (See Appendix B as sample permitting approach for the City)
2. Ensure that consideration for solar will be pervasive across all of the City's decision making bodies, including City Council, and its Land Use Boards.
3. Encourage the City to offer "incentives" (monetary or otherwise) to encourage the inclusion of solar and other clean energy options within proposed development projects. Such incentives could be above and beyond what is available at the state and federal level.
4. The City should implement a Property Assessed Clean Energy (PACE) program to finance energy efficiency and renewable energy upgrades to buildings.
5. Encourage builders to include a solar component within all new development proposals. Such encouragement should be included at all process gateways to ensure that at least adequate consideration be given to solar and/or other renewable energy or energy efficiency options.
6. Pursue community solar as an alternative option, especially when the installation of solar directly on a consumer's property creates a negative impact for adjacent properties or to the community as a whole.
7. The City should adopt policies and promote actions which recognize and are sensitive to balancing the growth of solar with competing interests within the community. For example, under most circumstances it is self-defeating to advance solar installations by removal of the tree canopy.

1 Introduction

1.1 Purpose of Report

This report was produced by the Saratoga Springs Solar Committee. The committee was formed by Saratoga Springs' Commissioner of Finance, Michele Madigan, in early summer 2015 to conduct a detailed review of the solar energy landscape as it relates to our community.

Representation on the committee was determined by City Council member selection. Committee members include:

- Larry Toole (Committee Chairperson)
- Dennis Bouchard
- Marilyn Rivers
- Charley Brown
- Julie Rodgers
- Tina Carton
- Cara Pabis
- Pete D'Aloia

Additional resources from the City of Saratoga Springs who regularly attended committee meetings and provided ongoing support, included:

- Tony Izzo (City Attorney)
- Lynn Bachner (Deputy Commissioner of Finance)

The report is meant to be an expansive and visionary overview of how solar energy can benefit our community both in the near term and over the next several decades. It examines solar energy from many angles, including environmental and financial benefits, financing options, zoning, implementation models both current and future, and competing interests.

Best estimates of how solar energy might evolve in our community over the next several decades are also made. While we recognize that any future projections are highly uncertain, this exercise can serve to highlight major trends and to spur strategic planning from our rich pool of community resources.

1.2 Intended Audience

We encourage members of our City Council to review the report and use it to imagine and legislate a bright future for solar energy in ways that best benefit our community. We encourage our land use boards to review the report to gain useful information about solar energy and how it can best be deployed throughout our community. We ask the builder community to review the report to gain ideas on how they can integrate solar energy into future building projects in ways the substantively add clean energy resources to our city. Finally, we hope all within our community read the report to spur and hold accountable the aforementioned groups to lead our community forward in ways that promote environmental, economic, and social sustainability.

2. Solar Moves Center Stage

The convergence of several factors virtually ensures solar technology will experience explosive growth during the remainder of this century. Those factors include:

2.1 Global Warming

The science behind global warming is very clear. Greenhouse gas emissions resulting from human activities, such as the burning of fossil fuels, are causing the average global temperature to rise. Within the scientific community there is no debate on this issue. In fact, 97% of scientists who have published peer-reviewed papers on climate change and global warming agree that human activity is contributing significantly to our warming climate[1].

The urgency for global action is growing. Climate models consistently show that if we continue to burn fossil fuels in a "business-as-usual" manner, the consequences could be dire. A just released paper found that the drought now being experienced in California is up to 27% worse because of global warming[2]. While natural climate change is certainly the main cause of the California drought, man-made global warming is making the event more intense and more disruptive.

Another recently released paper co-authored by James Hansen, one of our country's most prominent experts on global warming, raises the real potential that global sea level rise from melting glaciers could be much more significant this century than previously thought. Hansen's paper posits that if global temperatures rise more than 2°C (3.6°F), then, in a worst case scenario, sea levels could rise up to ten feet in the next 50 to 100 years[3].

To bring this scenario closer to home, such a sea level rise would inundate New York City and many parts of Long Island. This would undoubtedly cause the relocation of thousands upon thousands of households away from our State's shorelines. While it is impossible to predict exactly how our State would adjust to such a scenario, it seems very likely that Saratoga Springs would at least be indirectly impacted by such a large relocation of families.

Given the science of global warming, there is a growing urgency to reduce greenhouse gas emissions and our use of fossil fuels by moving towards clean and renewable energy, such as solar. Most recently,

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[1] J. Cook, et al, "Quantifying the consensus on anthropogenic global warming in the scientific literature "*Environmental Research Letters* Vol. 8 No. 2, *(June 2013)*; DOI:10.1088/1748-9326/8/2/024024

Quotation from page 3: "Among abstracts that expressed a position on AGW [Anthropogenic, or human-cause, Global Warming], 97.1% endorsed the scientific consensus. Among scientists who expressed a position on AGW in their abstract, 98.4% endorsed the consensus."

W. R. L. Anderegg, "Expert Credibility in Climate Change," *Proceedings of the National Academy of Sciences* Vol. 107 No. 27, 12107-12109 (21 June 2010); DOI: 10.1073/pnas.1003187107.

P. T. Doran & M. K. Zimmerman, "Examining the Scientific Consensus on Climate Change," *Eos Transactions American Geophysical Union* Vol. 90 Issue 3 (2009), 22; DOI: 10.1029/2009EO030002.

N. Oreskes, "Beyond the Ivory Tower: The Scientific Consensus on Climate Change," *Science* Vol. 306 no. 5702, p. 1686 (3 December 2004); DOI: 10.1126/science.1103618.

[2] http://www.ldeo.columbia.edu/news-events/warming-climate-deepening-california-drought
[3] http://www.atmos-chem-phys-discuss.net/15/20059/2015/acpd-15-20059-2015.html

in December 2015 the world community gathered in Paris to work out an international agreement on reducing greenhouse gas emissions to keep global temperature rises below 2°C (3.6°F). With this agreement now in place, it is becoming more and more likely that at all levels- global, national, and local- there will be a concerted effort to combat global warming. At the local level, Saratoga Springs can do its part to meet this challenge.

2.2 Technological Advancement

Today, on average, the efficiency of commercially available silicon-based solar panels is around 15%. This means that about 85% of the sunlight reaching a solar panel is wasted and not converted into electricity. While the efficiency of these standard panels will improve in the future, they have a theoretical maximum efficiency of 31 percent because of the electronic properties of the silicon material used.

There is, however, an abundance of research ongoing with new materials, manufacturing processes, and techniques leading to even higher efficiency gains. Already, experimental solar cells have exceeded 40 percent efficiency gains.

Research in energy storage capacity is also quickly moving forward and is crucial to the widespread deployment of solar technology. Combining solar with energy storage bridges the temporal and geographic gap between power supply and demand, making solar a viable widespread energy source to replace our current fossil fuel dependent assets.

Advancements in solar and energy storage technology will continue into the foreseeable future. This should position solar to provide an ever increasing percentage of our energy needs this century.

2.3 Favorable Financials

Along with solar and energy storage technological advancements, the finances of solar compared to conventional options, such as electricity produced from coal-fired power plants, looks more and more favorable.

From 1998 through 2013, the National Renewable Energy Lab states that the reported system prices of residential and commercial solar systems declined 6% - 7% per year, on average, and between 2012 and 2013 system prices dropped 12% - 17%. Stated another way, the average price of installing a Watt of solar has dropped from around $12/Watt in 1998 to around $4.50/Watt in 2013. For larger utility scale solar projects, like the Spa Solar Park on Wiebel Avenue, the potential cost of installed solar per Watt is even lower than $4.50/Watt mark reached in 2013. Market analysts currently expect system prices to continue to fall, but module prices (the solar panels themselves) to stabilize in the near term.

In many parts of the country, solar has reached or is approaching “grid parity” which is when the cost of producing solar energy is equal to or lower than the cost of purchasing power from the conventional electricity grid. A report in early 2015 found that grid parity had been reached in 42 out of the U.S.’s 50 largest cities with New York and Boston topping the list. While the high cost of conventional electricity in New York helped the city reach this milestone, the widespread occurrence across the country of grid parity shows just how cost competitive solar has become.

Longer term trends suggest grid parity will only accelerate, not only due to technological advances such as efficiency gains, but also due to national and international government policies designed to decrease greenhouse gas emissions. For example, President Obama’s recently announced Clean Power Plan is

aimed at reducing greenhouse gas pollution from our nation's power plants. The goal is to cut carbon pollution from these power plants by 32% below 2005 levels by the year 2030.

While each state will have the responsibility of designing their own strategic plan to achieve these reductions, there will be a strong and consistent market signal favoring the deployment of clean energy, such as solar, over the continued use of fossil fuel energy. It is expected that power plant owners and utilities will increase their investment in clean energy, such as solar, to meet the requirements of the Clean Power Plan. In New York State, the Public Service Commission was directed by Governor Cuomo to establish the Clean Energy Standard by June of 2016. The Clean Energy Standard will render decisions and policies to ensure that the State meets the long term goal to provide 50% of electricity from renewable resources by 2030 (50 by 30) goal.

3. Solar Implementation and Financing Models

With the maturity of the solar industry comes expanded implementation and financing options. More than ever before, consumers have choices as to how and where solar can be installed and how it can be financed.

This section provides an overview of potential choices and how consumers are taking advantage of the different options. Expanded consumer choice needs to be considered as our community crafts a long term strategy to best maximize the potential of solar.

3.1 Implementation Models

There are four primary implementation models for solar as summarized in the list below:

1. Residential Rooftop
2. Commercial Rooftop
3. Utility-Scale
4. Community

A description of each implementation model follows.

3.1.1 Residential Rooftop

Rooftop solar (also known as rooftop photovoltaic power station, or rooftop PV system), is a solar energy system with electricity-generating solar panels mounted on the rooftop of a residential building. The various components of such a system include photovoltaic modules, mounting systems, cables, solar inverters and other electrical accessories.

Rooftop mounted systems are small compared to ground-mounted photovoltaic power stations with capacities in the megawatt range. Rooftop solar on residential buildings typically have a capacity of about 5 to 20 kilowatts (kW).

Rooftop systems can be connected to the energy grid or be off-grid. In New York State, grid connected solar, “Net Metering” allows PV owners to receive credit for the excess power their panels produce at the same rate the utility charges per kW. Owners of solar arrays only pay for the net amount their home uses as provided from the utility grid.

This arrangement provides payback for the investment by the system owner. Another option is a hybrid approach, where the rooftop solar is used in conjunction with other power sources like diesel generators, wind turbine, battery storage, etc. Hybrid systems are capable of providing a continuous source of power.

Pros

- Net metering and feed-in tariff (FIT) options allow homeowners to “sell” excess electricity, or receive bill credits, during times when they produce more electricity than what they actually consume.
- There are considerable tax incentives for homeowners who invest in solar. In the future, however, it is anticipated that incentives will diminish as solar reaches grid parity.
- Many municipalities and states have implemented streamlined permitting processes which accelerate system implementation.

Cons

- Residential solar is expensive, so is not economically feasible for everyone.
- The solar energy source is intermittent.
- Energy storage is still imperfect and expensive at a localized level.
- Solar panel production produces wastes that are toxic, and production utilizes rare materials.
- Rooftop solar is not available to all homeowners, so it creates socioeconomic inequalities to energy access. (This negative will be reduced, however, as community solar systems expand.)
- Some city ordinances or permitting processes may make installation difficult.

3.1.2 Commercial Rooftop Solar

The commercial rooftop market segment includes one- to two-story warehouses and big-box stores, office buildings with more than two stories, skyscrapers, and architecturally unique buildings like churches. Commercial rooftops are most often low or no slope and use bitumen, standing-seamed metal, or ballasted-membrane surfaces. Typically, commercial rooftop systems have power generating capacities of 20 kW or more.

Most of the commercial installations currently in place are with large corporations versus small and mid-sized buildings. Large retailers such as Walmart, Kohl's and Ikea who have enormous energy needs have installed solar as a way to lower costs and add a level of predictability to their ongoing energy expense which has increased over 20% in the past 10 years.[4]

While large retailers have led the way, many companies in industries such as auto manufacturing, pharmaceuticals, food service and others are finding that solar power positively affects their bottom lines. The continued decrease in costs to install solar has allowed commercial users to recoup their investments faster than ever before. Finally, the states that have the largest commercial users are states that have put into place effective policies to enable and provide incentives for businesses to invest in solar which streamline and expedite the permitting process. Two such notable states are California and New Jersey which rank #1 and #2 respectively for commercial solar.[5]

While the future is bright for large Fortune 500 companies, getting access to solar power is more challenging for the small and mid-sized business. They key deterrent in this market is difficulty accessing capital to finance solar installations. The large commercial users are either self-financed or have the creditworthiness to access capital. Solar Installers are reluctant to finance smaller commercial users as the perceived financial risk over time is high. However, it is well understood that the small and mid-sized commercial market has huge potential if obstacles can be removed. 75% of the 5.6 million commercial buildings in the U.S. are 10,000 square feet or less.[6]

Comparing the paperwork and financing process to the residential market, the benefits of developing a standardized process are clear. For installers, being able to financially qualify a homeowner can be done in a matter of minutes by acquiring the homeowners FICO score. In addition, many municipalities have streamlined their permitting process and in many places, cities and towns have adopted processes already developed at the State level to ensure uniformity and expedience. Installers have been trying to figure out ways to take what works for the residential market and apply those principals to the small and

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[4] http://www.seia.org/research-resources/solar-means-business-2014-top-us-commercial-solar-users pp 3,7

[5] Ibid. pp 10

[6] http://www.greentechmedia.com/articles/read/Commercial-Solar-How-to-Unlock-an-Underserved-Market

mid-sized commercial market which is estimated to be worth $10 billion per year.[7] With this potential, figuring out a way to tap into this market is on every installer's radar screen.

In July 2015, Solar City, the largest installer in the U.S., announced that they may have figured out a way. Solar City is trying to take advantage of a financing program called PACE (Property Assessed Clean Energy) which is available in about 31 States. Essentially PACE is a program whereby the solar panels are paid for through municipal financing such as a bond issuance. Property owners who participate in the program pay back monies advanced for solar initiatives over a period of years through their property taxes. The additional amount added to the property tax bill is secured by the property itself. The default risk to the installer is reduced because property owners must pay their taxes in order to keep ownership of the property or face foreclosure. It is predicted that other installers will quickly follow Solar City's lead and try to capitalize on this program.[8] It is important to note that a PACE program is a voluntary program and if initiated is not something that all property owners are required to participate. For more information on the specifics of how a PACE program works, the following links below for the Office of Energy and Efficiency and SEIA provide that information.

http://energy.gov/eere/slsc/property-assessed-clean-energy-programs

http://www.seia.org/policy/distributed-solar/property-assessed-clean-energy

3.1.3 Utility-Scale/Utility-Like Solar

During the past three years, some 80% of the global solar additions were either "utility-scale" (large ground installations) or "utility-like" (medium sized installations either ground or building located, developed by businesses and governments). The size of utility solar projects range from a few MWs for utility-like systems to greater than 50 MWs for utility-scale systems. Saratoga Springs' Spa Solar Park project at the Weibel Avenue landfill, which is a 2 MW array, is an example of a utility-like solar system.

In the U.S, there continues to be an ambitious pipeline of utility sized solar projects with most trying to complete construction before the ITC (incentive tax credit) is reduced to 10% from the current 30% at the end of 2016. The increase in utility solar since the ITC was enacted (2006), has resulted in a 64% price decrease for utility-scale solar power since 2010.[9] It should be noted, however, more solar will be installed in one week during 2015 than was installed in all of 2006.[10] It is expected that if the 30% ITC is allowed to expire or is not replaced with a new, high rate ITC at the end of 2016, there will be a dramatic decrease in new utility scale PV and its momentum will be threatened. It is important to note that an ITC will still be in effect beginning in 2017, but at 10% and not the current 30% initial rate.

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[7] http://www.usnews.com/news/articles/2015/07/28/small-businesses-once-off-limits-to-solar-get-greenlight-from-solarcity pp 1

[8] http://www.usnews.com/news/articles/2015/07/28/small-businesses-once-off-limits-to-solar-get-greenlight-from-solarcity pp 2

[9] http://www.seia.org/blog/new-report-america-s-solar-energy-margin-surging pp2

[10] Ibid pp2

Utility solar on a cost per Watt basis is significantly cheaper than residential solar. Much of this cost differential is due to the "economies of scale" that can be realized when large, ground mounted installations are implemented compared to small residential rooftop projects. In a study released in July 2015, the Brattle Group, together with the Edison Electric Institute compared utility-scale PV systems in the U.S. and residential scale rooftop PV systems.[11] The study's main conclusions follow[12]:

- The cost of generating energy for 300 MW of utility-scale PV solar is roughly one half (½) - the cost per kWh produced by the residential scale system. The main reason for the high disparity in cost is mainly due to economies of scale and greater solar output because utility-scale panels can be optimally placed whereas residential PV placement are limited by the existing structure orientation.
- 300 MW of utility-scale solar avoids approximately 50% more carbon emissions than the equivalent residential PV system.
- Utility-scale PV can allow everyone access to solar which then becomes a crucial resource.
- Rooftop solar does not necessitate finding and using additional space.
- Rooftop solar does not require installation of additional transmission lines and hookups.
- Rooftop solar is truly distributed while utility scale is not

Utility solar does not necessarily mean it is owned and/or operated by a utility company. In fact, New York's new energy strategy, Reforming the Energy Vision (REV), prohibits utilities from owning distributed energy systems. Instead, many utility solar systems are built by businesses to lower their own electricity costs. Other implementation models include solar development companies which build and own the systems and then sell the generated electricity to businesses and government entities via what it is called a Power Purchase Agreement (PPA). This latter model was adopted for the Saratoga Springs' Spa Solar Park at the Weibel Avenue landfall. This 2 MW solar array will be built and financed by Sun Edison. The electricity generated by the landfill solar system will be purchased from Sun Edison by the City of Saratoga Springs over a 20 year period under the terms of a PPA.

[11] http://www.forbes.com/sites/jamesconca/2015/07/30/which-is-cheaper-rooftop-solar-or-utility-scale-solar/ pp1

[12] Ibid pp 1-3

3.1.4 Community Solar

Community solar is a relatively new implementation model that is gaining interest throughout the country. With community solar, the solar array or panels are shared by a group of people, such as the inhabitants of a community or an apartment building, much the same way community gardens work. Most importantly, this type of physical system can be centrally located at an optimal community site, yet generate electricity that is allocated to the community solar project participants. For many homeowners and businesses who have building structures and properties sub-optimal for solar, community solar can be an attractive alternative. It can also be appealing to renters who are looking for a clean energy source for their electricity.

In New York, the Public Service Commission (PSC) recently released the new rules defining how community solar can be implemented in the state and, in particular, the rules for shared ownership. Each proposed community solar system will have a project sponsor that can be an energy services company, a municipal entity, or any type of business, non-profit, or civic association. The sponsor will be responsible for building, interconnecting, owning, and operating the behind-the-meter generation. Ownership shares will be sold to utility customer members. In return, each member's electricity account will be credited with the output of the generation at full retail rate credit through remote metering. Members may have either residential or commercial accounts.

In New York, the total size of a community solar project cannot exceed 2 MW. Generation must be in the same utility territory as the customers it serves, and the generation projects must have at least ten (10) members. Ownership portions of over 25 kW can be no more than 40% of the project's output. Members can own no more of the output than their own yearly use.

The concept of net metering, which is a billing mechanism that credits solar energy system owners for the electricity they add to the grid, is expanded through community solar. Community solar essentially de-couples net metering from the past constraint which required the solar system to be directly located at the site of a building owner or renter. This decoupling greatly expands consumer choice and how solar usage can be expanded within a community.

3.2 Solar Financial Options

Just as consumers have choice when it comes to solar implementation models, there are also a variety of solar financing options, including various government incentives both at the state and federal level.

3.2.1 Solar Financing Fundamentals

The cost of solar systems vary by whether residential, commercial, and not-for-profits want to own, lease, or simply purchase the power produced by the system (power purchase agreement or PPA) as well as the ability of the owner's ability to take advantage of federal and state tax credits.

The final cost of installing a solar electric system is dependent on many factors, including the size of the system, the type of solar electric panels and other equipment, the cost of permits and inspections in the community, whether the system will be mounted on the roof or on the ground, as well as the financing, tax credits, and incentives available to the homeowner, business or not-for-profit.

3.2.1.1 State and Federal Tax Credits

Residential Tax Credit

Homeowners may qualify for up to 30 percent federal (expiring in December 31, 2016) and 25 percent (up to $5,000) New York State tax credits (for primary residences only). To qualify for the New York State Solar Energy System Equipment Tax Credit, customers must do one of the following:

- purchase solar energy system equipment,
- enter into a written agreement for the lease of solar energy system equipment, or
- or enter into a written agreement that spans at least ten (10) years for the purchase of power generated by solar energy system equipment not owned by the homeowner.

Residential customers may also be eligible for federal tax credits. Established by the Energy Policy Act of 2005, the federal tax credit applies to residential solar-electric systems, solar water heating systems, small wind-energy systems, geothermal heat pumps, and fuel cells. A taxpayer may claim a credit of 30% of qualified expenditures for a system that serves a dwelling unit located in the United States that is owned and used as a residence by the taxpayer. Expenditures with respect to the equipment are treated as made when the installation is completed. If the installation is at a new home, the "placed in service" date is the date of occupancy by the homeowner.

Commercial Tax Credits

Businesses are currently eligible for 30% federal tax credits but not state tax credits. The federal business energy investment tax credit applies to solar equipment that uses solar energy to generate electricity, to heat or cool (or provide hot water for use in) a structure, or to provide solar process heat. Hybrid solar lighting systems, which use solar energy to illuminate the inside of a structure using fiber-optic distributed sunlight, are eligible. Passive solar systems and solar pool-heating systems are not eligible.

To gain the credit, the original use of the equipment must begin with the taxpayer, or the system must be constructed by the taxpayer. The energy property must be operational within the year in which the credit is first taken. The credit is equal to 30% of expenditures, with no maximum credit. The solar credit is available for eligible solar systems placed in service on or before December 31, 2016. Businesses are advised to consult with a tax professional regarding how to calculate this federal tax credit.

A number of changes to this credit are scheduled to take effect for systems placed in service after December 31, 2016. The solar credit is currently slated to decrease from 30% to 10%. The credit for geothermal heat pumps, hybrid solar lighting, small wind, fuel cells, microturbines, and combined heat and power systems will expire. The credit amount for equipment which uses geothermal energy to produce electricity will remain at 10%.

3.2.1.2 State Incentives

In New York State, NY-Sun offers incentives to help reduce the installation costs associated with solar electric systems up to 25 kilowatt (kW) for residential customers, and up to 200 kW for nonresidential applications (larger multi-unit buildings, schools, not-for-profit, and government) in most of New York State. NY-Sun is structured around customized Megawatt (MW) Blocks targeted to specific regions of the state. The block structure provides allocations based on historical demand, market penetration, installed cost per watt, and equity on a regional basis. As more systems are installed with the block

structure, incentives are reduced. The Megawatt (MW) Block Dashboard provides **real time** information on the status of block and current incentive levels by sector and region. Block status is updated as applications are submitted. Current incentive levels can be viewed on: http://ny-sun.ny.gov/For-Installers/Megawatt-Block-Incentive-Dashboard

3.2.2 Purchase or Lease?

As the cost of solar technology drops, more and more homeowners and businesses are considering buying or leasing rooftop solar panels. A solar photovoltaic system properly sized can reduce energy costs by 50 percent or more, and a recent study conducted for the Department Of Energy found that some home buyers are willing to pay a premium for a house with a solar system.[13]

Consumers are often confused when making the decision to lease or purchase a solar energy system. A solar lease involves third-party financing where the solar company pays the cost of a solar system on your home or business in exchange for a monthly payment, usually with no money down. Some offer an option to make a small down payment in exchange for lower monthly payments. A second option is a prepaid lease that compresses the yearly payments into one discounted upfront payment. Another option is something called a "leasing escalator" where the lease payment escalates (increases) over time. These lease payments may be wholly or partially balanced by lower electric utility bills. Additionally, there may be a minimum credit score requirement to be eligible for a lease. The lease term typically is twenty (20) years.

Homeowners or businesses who choose to lease do not need to invest capital up front for the solar electric system, and they still benefit from lower electricity costs as well as from knowing that they have reduced their carbon footprint and supported the growth of the clean energy industry. They are not responsible for maintenance, and contracts may include a production guarantee. However, Power Purchase Agreements (PPAs) and leases usually involve long-term contracts, typically twenty (20) years, and may or may not include special contractual terms regarding the sale of the home. In New York State, tax payers can take advantage of the state tax credit on their primary residence when leasing their system, but the leasing company is entitled to the federal tax credit as well as all other incentives.

The main advantage to purchasing a solar energy system is that it is owned by the homeowner or business. The main expense is upfront, so purchasers may need to get a loan to finance it. A big advantage of ownership is that once your electric bill savings recoup the initial cost, the remaining electric bill savings are all "profit" (return on your investment). Owners may be able to take full advantage of the tax credits, depending on their tax situations, as well as utilizing the NY-Sun incentives. In addition, the system owner has full control over the disposition of the solar electric system if the building is sold. However, the system owner is also then responsible for the cost of any maintenance that might be needed, if it is not covered under warranty.

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[13] http://www.consumerreports.org/cro/news/2015/02/when-going-solar-should-you-lease-or-buy/index.htm

In New York State, NYSERDA offers low-interest rate financing options through Green Jobs - Green New York. For residential customers, loans are available for up to $13,000, or up to $25,000 with higher cost-effectiveness standards, with repayment periods of five (5), ten (10), or fifteen (15) years. For small business and not-for-profit organizations, Participation Loans of up to $100,000 at below the market interest rate and On-Bill Recovery Loans of up to $50,000 at 2.5% interest are available, with repayment periods of up to ten (10) years. In October of 2015, NYSERDA announced the interest rate increases for residential "market rate" consumers, those with household incomes exceeding 120% of the Area Median Income (AMI), and "moderate income" households, those with household incomes between 81% and 120% AMI. These increases will apply to loan applications received on or after February 1, 2016. In addition, NYSERDA has proposed ending the small commercial financing product in March of 2016.

3.2.3 Commercial Financing

Property-Assessed Clean Energy (PACE) Financing of Renewables and Efficiency

Property Assessed Clean Energy (PACE) is an innovative way to finance energy efficiency and renewable energy upgrades to buildings. Under PACE programs, municipalities and counties form special tax districts to help property owners finance energy retrofits by allowing a property owner to place an additional tax assessment on his or her property.[14] Property owners who invest in energy efficiency (EE) measures and renewable energy (RE) systems repay these assessments over fifteen (15) to twenty (20) years via additional annual payments on their property tax bills.

The assessment mechanism has been used nationwide for decades to allow access to low-cost long-term capital to finance improvements to private property that meet a public purpose. By eliminating upfront costs, providing low-cost long-term financing, and making it easy for building owners to transfer repayment obligations to a new owner upon sale, PACE overcomes challenges that have hindered adoption of energy efficiency and related projects in our nation's buildings.

In New York State, the Energy Improvement Corporation (EIC) administers Energize NY financing. EIC is a non-profit Local Development Corporation chartered under Article 5-L of the NYS General Municipal Law. The EIC administers the PACE (Property Assessed Clean Energy) Finance program (Energize NY Financing) and provides financing for eligible clean energy projects at competitive rates, for terms up to twenty (20) years. Any New York State municipality with a bond rating A or higher may join the Energy Improvement Corporation (EIC) by completing the following:

- Confirm that the local jurisdiction has the authority to foreclose on property
- Pass a Local Law establishing a sustainable energy loan program, entitled "Energize NY Benefit Financing Program"
- Sign the EIC/Municipal Agreement
- Send a letter to the EIC Board formally requesting membership

[14] Assessments are similar to loans in that they allow a property owner to pay off debt in installations over a long period of time. However, PACE assessments are not legally considered as loans.

To date, twenty three (23) municipalities have passed the law to offer this opportunity to their commercial property owners, including Dutchess County, Orange County, Tompkins County, Ulster County and most of Westchester County. The City of Saratoga Springs meets the criteria of having the authority to foreclose on property and should consider the adoption of PACE financing to increase the adoption of solar energy by commercial customers. PACE is a local government/community initiative that creates permanent private sector jobs, strengthening our national and local economies. Local participation in PACE financing is voluntary. Property owners, acting in their own self-interest, implement renewable power projects and/or building upgrades that can save them money, thereby increasing the value of their property. PACE programs add value, and have gained bi-partisan support nationwide at federal, state and local levels.

Additionally, PACE financing will most likely be available for community distributed generation (community solar) projects in the near future. NYSERDA is now in discussion with the EIC on how Energize NY financing could be utilized for community solar projects.

4. Supporting Solar in Saratoga Springs

Sections 2 and 3 of this report provided a broad overview of solar technology, implementation models, and financing options. In this section, we will explore how solar can best be supported in Saratoga Springs.

4.1 Saratoga Springs Solar Access Ordinance

The current Saratoga Springs Solar Access Ordinance reads as follows:

Except <u>for properties located in a Transect-6 Zoning District or</u> as otherwise provided by this chapter, no property owner may erect a structure or allow a tree or other flora to cast a shadow upon a solar collector greater than the shadow cast by a hypothetical wall six feet high located along the property line between 8:00 a.m. and 4:00 p.m. Eastern Standard Time from September 21 to March 21.

4.1.1 Possible Refinements to the Current Saratoga Spring Solar Access Ordinance

Given the T6 zone of the City has been recently excluded from the Saratoga Springs Solar Access Ordinance, alternatives to or further refinement of the ordinance should be considered.

For example, Sustainable Saratoga with assistance from the Pace Law Center has suggested that the following three additional clauses be added to the ordinance:

> *Where an area variance is sought from this regulation, in addition to the area variance requirements set forth in Article 8.0, the following should be considered:*
>
> > ***Clause a.*** *Demonstration that the applicant has explored alternative configurations for building massing, building placement on the property or landscaping plans and that such alternatives are not feasible.*
> >
> > ***Clause b.*** *If the applicant cannot show that such alternative configurations are feasible, then the applicant shall show that it has worked with the protected property owner to negotiate a solution agreeable with that owner that accommodate the investment the owner has made in the solar collector. The applicant shall submit an affidavit to the Zoning Board of Appeals from the protected owner indicating that it has no objection to the granting of the area variance in light of this accommodation.*
> >
> > ***Clause c.*** *Where no such agreement can be arrived at through the unassisted negotiations of the applicant and the owner, the parties are encouraged to retain a mediator to assist their negotiations and to arrive as a mutually suitable agreement.*

The Pace Law Center also suggested that instead of rewording the Solar Access Ordinance, the City could move to a solar access permitting process. Their suggested template for such a permit is provided in Appendix A. Alternatively, New York State has a Unified Solar Permit template which could be adopted and modified by the City as a replacement for the current Solar Access Ordinance approach (see Appendix B).

4.1.2 Adopting the New York State Unified Solar Permit

The City of Saratoga Springs can incorporate the New York Unified Solar Permit into a city specific permitting process to support the expansion of solar energy within the community. The NYS Unified

Solar Permit was based upon the Long Island Unified Solar Permit Initiative (LIUSPI) as well as the Solar America Board for Codes and Standards' national best practices.[15] As of 1/1/2016, one hundred and nine municipalities in New York State adopted the Unified Solar Permit.

NYSERDA, the New York Power Authority (NYPA) and City University of New York (CUNY) developed a NYS Unified Solar Permit with the goal of reducing costs for solar projects by streamlining municipal permitting processes. The adoption of a standardized residential/small business solar permit (solar system capacity of 12kW or less) is expected to reduce costs for solar installers by creating a uniform permitting process in municipalities across the state. The NYS Unified Solar Permit is part of Governor Cuomo's NY-Sun "Balance of System " program, which focuses on streamlining the permitting process. "Balance of system" refers to the soft costs of projects, generally all the upfront costs of a solar project except the cost of the solar module itself.

Currently, the City of Saratoga Springs Building Department uses a standard building permit form to review solar applications. While adoption of the NYS Unified Solar Permit is not expected to increase the review time, it is expected that use of the NYS Unified Solar Permit will help reduce the application preparation time for solar installers, as more municipalities adopt the same solar permit form. The permit also contains solar specific requirements such as the requirement to submit an one-line or 3-line electrical diagram, specification sheets for all manufactured components, and details on the manufactured mounting system and modules – elements essential for the permit approval process. Additional language specific to Saratoga Springs can be included in Unified permit such as Historic and Architectural District Design Review requirements and liability insurance coverage.

As a Climate Smart Community (CSC), adoption of the Unified Solar Permit is one of ten pledge focus areas outlined in the CSC 10 Pledge Elements. The CSC Certification program provides local governments with a comprehensive framework to guide climate action and enables high performing communities to achieve recognition for their leadership.

4.2 Balancing Solar Energy Use with Potential Competing Interests

Most communities pursue multiple goals simultaneously through a range of plans, policies, regulations, and programs. The decisions communities make in support of one goal may have a positive, negative, or negligible effect on other goals. When a community considers each goal in isolation, it may miss opportunities to address potential conflicts before they occur. Once a conflict exists, it may be too late to pursue a mutually beneficial solution, and communities may be forced to choose between competing interests.

4.2.1 Solar and Historic Preservation

Historic preservation and solar power generation are often both part of a community's plan to become more sustainable. They have some notable similarities. Both are environmentally friendly. Historic properties were typically built with attention to climate and air circulation and with locally sourced materials, and they are usually located on walkable streets and in relatively central locations. Additionally, the preservation of historic properties is "greener" than tearing down and rebuilding because of the energy and materials savings (WBDB 2012). Similarly, using renewable power from the sun in place of fossil fuels helps reduce carbon emissions that contribute to global warming. Both have economic benefits as well. Designating a property or district as historic increases property values and attracts investment in and around the area. Homes with solar installations sell for more money while

15 http://www.cuny.edu/about/resources/sustainability/nyssolar/NYSolarSmartPermitWorkshops.html

saving owners money on their energy bills (NTHP 2011). However, while solar is part of an energy solution for the future, historic preservation is the key to protecting the community's past. Tension has developed between these two interests as communities struggle with how to both preserve their past and ensure a sustainable future.

4.2.2 Solar and Trees

Maintaining and enhancing the tree canopy is another common sustainability goal. Trees and solar energy systems also share similarities. Both require access to the sun, and both help reduce carbon emissions and curb pollution. When a tree's shade impacts the efficiency of a solar system, however, trees and solar become unlikely adversaries. The conflict has sparked debate about which is the higher local priority.

4.2.3 Solar and Urban Redevelopment

A potential competing interest with solar energy systems that remains largely overlooked is urban redevelopment. Many communities seek to concentrate development in targeted areas like downtowns or transit-oriented developments (TODs) in an attempt to reduce vehicle miles traveled (VMT), provide more efficient services, and to provide transportation and housing alternatives. This often means changes to regulations, including height restrictions, to accommodate future growth. At the same time, these are the same areas where communities are often encouraging solar projects. Just as shade cast by a tree over a solar energy system can reduce the installation's efficiency, so can the shadow of a tall building. As targeted areas redevelop, the possibility for solar conflicts rises.

4.3 Engaging the Builder Community

Saratoga Springs is a vibrant community which has undergone significant growth over the past few decades. Many significant downtown "infill" and outer boundary development projects have been completed with resulting changes in the community. Development will undoubtedly continue in the coming decades and the City will continue to change and transform itself just as it has always done in its historical past.

This development, however, will continue against a backdrop of increasing challenges posed by climate change. As a result, pressure to de-carbonize economic activity will increase in the decades to follow. This will include construction projects, where the impact of energy consumption and the source of energy supply will be increasingly scrutinized as to environmental impact.

At the local level, there is much that the community can do to promote sustainable development which emphasizes energy efficiency and clean energy sources. Suggested approaches include:

- Promoting and conducting "how to" educational events for the builder community, engineers and architects. Such events could be sponsored by the City of Saratoga Springs or its land use board. Training support from NYSERDA may also be available to support this effort (see https://training.ny-sun.ny.gov/resources-5#for-planners-and-policymakers).
- Fully embracing NYSERDA and NY Sun resources and funding programs aimed at promoting green building construction.

- Developing city-initiated "incentives" which spur developers and builders to adopt green building principles.
- Requiring builders and developers to outline considerations given to green building construction design for proposals submitted to the land use boards.
- Provide links to other directories of qualified green contractors/vendors (for example- http://ny-sun.ny.gov/Get-Solar/Find-A-Solar-Electric-Installer.)

4.4 Conclusion

While promoting the installation of solar energy systems, communities are increasing their potential for conflict with other community interests including historic preservation and environmental protection efforts such as reforestation. To date, very few communities recognize and assess their competing community interests involving energy and development. Planners are uniquely positioned to spearhead efforts to determine mutually beneficial solutions to ensure these interests can successfully coexist in the future. They have the wherewithal to lead tough community discussions, bring the appropriate stakeholders to the table, develop relevant guidelines and regulations, and educate residents on all of the angles of an identified interest. Instead of having to choose between competing interests, communities and planners should undertake these efforts to help them obtain the truly sustainable futures they desire.

https://www.planning.org/research/solar/briefingpapers/pdf/potentialcompetinginterests.pdf

North Hampton, Ma-Treatment of Solar Access

Northampton MA is a community with many similarities to Saratoga Springs. They are comparable in size and interests in sustainable development. Northampton was given the first 5 star rating in the country as a sustainable community in 2014. The STAR Community Rating System (STAR) is the first national certification program to recognize sustainable communities. Local leaders use STAR to assess their sustainability, set targets for moving forward, and measure progress along the way.

http://www.starcommunities.org/

The following statements are responses from Northampton officials regarding Solar Access in their community.

"I do not believe that Northampton has a guaranteed solar access ordinance. I know one was under discussion as part of a larger discussion around sustainable zoning a number of years ago but, as I recall, it turned out to be more complicated than anticipated. For example, in some cases such a law could perpetuate sprawl." Chris Mason, Energy and Sustainability Officer, City of Northampton

"I think Chris covered the issue well. To add a bit more, PV (photovoltaic) is one small piece of the sustainability pie that the City encourages. In order to accomplish greater sustainability as a whole community, the City is addressing multiple goals. The City is encouraging greater infill in the core neighborhoods and commercial areas to meet demand for housing where we have existing walkable and bikeable access to goods and services, schools etc. To that end, we have reduced side and front setbacks in many of the neighborhoods around Florence Center and downtown. These areas historically had neighborhoods where lots tended to be smaller and setbacks were less than in the outlying suburban districts. We believe it would be counter-productive to our overall sustainability goals to create solar access restrictions that might limit our ability to allow for infill in these neighborhoods."

"In the more suburban districts the side yard setbacks as well as the front and rear setback requirements are greater and probably - as a result- have some built-in protection for solar access."
Carolyn Misch, AICP, Senior Land Use Planner/Permits Manager, City of Northampton

http://www.northamptonma.gov/

4.4.1 Future considerations

Although the T-6 zone has been exempt from the current ordinance, the same issues exist within the other zones throughout the city. These potential conflicts should be explored and vetted as the City begins its solar energy awareness programming. The City has been encouraging greater infill in the core neighborhoods and commercial areas. The side and front setbacks in many of the neighborhoods are minimal. Historic neighborhoods, where lots tend to be smaller and setbacks are less than in the outlying more suburban areas, are particularly vulnerable. The efforts to plant and maintain trees throughout the city could be threatened. Many of the trees planted may exceed seventy (70) and eighty (80) feet in height.

The current Solar Ordinance should be reviewed and consideration should be given to eliminating, revising, or replacing the current ordinance to accommodate the following:

- Historic Preservation.
- Maintaining and enhancing the tree canopy.
- Encourage infilling in the core neighborhoods.

Optional ways to provide solar access include the use of:

- Solar Easements: These laws typically allow a landowner to enter into an agreement with an adjacent land owner to ensure that sunlight reaches the property.
- Permit process: New York State Unified Solar Permit, the Pace Law Center Solar Access Permit approach, or a combination of both.
- Zoning: In the more suburban areas the side yard setbacks as well as the front and rear setback requirements are greater and have some built-in protection for solar access.

5. Recommendations

To more effectively promote solar energy within our community, the Saratoga Springs' Solar Committee offers the following final recommendations.

1. Replace the current Solar Access 0rdinance 6.4.8 with the New York State Unified Solar Permit or a variation of that permitting process which meets the needs of the City. (See Appendix B as sample permitting approach for the City)
2. Ensure that consideration for solar will be pervasive across all of the City's decision making bodies, including City Council, and its Land Use Boards.
3. Encourage the City to offer "incentives" (monetary or otherwise) to encourage the inclusion of solar and other clean energy options within proposed development projects. Such incentives could be above and beyond what is available at the state and federal level.
4. The City should implement a Property Assessed Clean Energy (PACE) program to finance energy efficiency and renewable energy upgrades to buildings.
5. Encourage builders to include a solar component within all new development proposals. Such encouragement should be included at all process gateways to ensure that at least adequate consideration be given to solar and/or other renewable energy or energy efficiency options.
6. Pursue community solar as an alternative option, especially when the installation of solar directly on a consumer's property creates a negative impact for adjacent properties or to the community as a whole.
7. The City should adopt policies and promote actions which recognize and are sensitive to balancing the growth of solar with competing interests within the community. For example, under most circumstances it is self-defeating to advance solar installations by removal of the tree canopy.

Appendix A- Pace Law Center Solar Access Permit Language

A solar access easement may be acquired through the issuance of a Solar Access Permit approved by the (*Insert Body Here*) (Planning Board, ZBA, or similar body), in accordance with the requirements set forth in this section.

a. Solar Access Permit Submission

Applicants of Solar Access Permits shall submit the following information:

(1) Purpose and type of easement.

(2) Square footage of solar energy system (excluding non-essential equipment), system type (ground-mounted, roof-mounted, building integrated), system height, and proposed easement dimensions.

(3) Site plans clearly indicating system location.

(4) Permissible obstructions, if any, exempt from easement.

(5) Intended expiration of easement.

(6) The terms or conditions by which the easement may be revised.

(7) The tax lot numbers of properties subject to the easement and a parcel map with the applicant's property and the affected properties clearly indicated.

(8) Current height of structures affected by the Solar Access Permit, and the underlying districts maximum height allowance. *(Allows for reviewers to weigh the potential impact easements will have on property owners affected by the easement.)*

(9) Pictures of the area(s) subject the Solar Access Permit.

b. Solar Access Permit Restrictions

(1) The proposed easement dimensions must be reasonably consistent (*The municipality should decide what is considered to "reasonably consistent")* with the system size square footage of the solar energy system. Only the area specified within the Solar Access Permit is protected under the approved easement.

(2) Solar Access Permits protect against vegetation, structures, and other objects having the capability of impairing or obstructing solar access to the protected area. Permitted obstructions specified by the applicant and obstructions existing at the time of permit application submission shall be excluded from regulation under the Solar Access Permit.

(3) If the (*Insert Body Here*) finds that the application provides insufficient information or would unreasonably restrict the development rights of property owners subject to the Solar Access Permit, the (*Insert Body Here*) shall deny the issuance of the Permit.

(4) The (Insert *Body Here*) has the authority to remove structures or vegetation from the Solar Access Permit application. The (*Insert Body Here*) shall provide reasonable notification of any alterations to the applicant prior to approval.

(5) The Solar Access Permit becomes void after (*Place Timeframe Here*) of consecutive discontinued use, or if the solar energy system has not been installed within (*Place Timeframe Here*) of the issuance of the Solar Access permit.

c. Solar Access Permit Procedure

(6) Notification of the proposed easement shall be sent by certified letter from the municipality to each property owner and registered lessee subject to the Solar Access Permit. The letter shall contain copies of the information specified in section a(1)-(5), clearly explaining the purpose and restrictions posed by the Solar Access Permit. Once notification is received, no one shall plant any vegetation nor construct potential obstructions that would shade the proposed protected area, unless expressly exempt within the submitted Solar Access Permit application, or if the potential obstruction was previously granted by the City.

(7) Objectors of the Solar Access Permit shall file objections within (*Specify Timeframe Here*) of receiving notification, to the City for the (*Insert Body Here*) to review. Objectors shall bear the burden of proof that the proposed collectors would unreasonably restrict the planting of vegetation or building rights.

(8) If granted, the Solar Access Permit shall be filed with the County Clerk. A notice shall be placed on each affected tax parcel that is subject to the Solar Access Permit.

d. Enforcement and Remedies

(1) The City shall not be held liable for damages resulting from the issuance of a solar access waiver.

(2) Properties in violation of a Solar Access Permit have (*Place Timeframe Here*) to come into compliance. Further noncompliance shall result in a fine equivalent to the monetary loss due to noncompliance. Monetary loss shall equal the income lost from reduced energy production. (*This can be calculated by aggregating and averaging the aggrieving property owners energy bills prior to obstruction and subtracting the average from the new monthly bill. If possible, the average should be calculated using bills during the same time of year, in order to provide a more accurate average.*)

Appendix B- New York Unified Solar Permit

The City of Saratoga Springs can incorporate the New York Unified Solar Permit into a city specific permitting process to support the expansion of solar energy within the community.

NY-Sun
Solar Powering New York

New York State Unified Solar Permit

Expedited Solar Permit Process for Small-Scale Roof-Mounted Residential and Commercial Solar Electric

Requirements for Application Submittal – *Part A*

For use in all New York State counties with the exception of Nassau County and Suffolk County.

The expedited solar permitting process uses a unified permit across participating municipalities in New York State.

A combined building and electrical permit for a grid-tied solar electric system will be issued pending proper completion of forms, submission of approved plans and approval by municipality. All applicants must submit:

1. Unified Solar Permit for Small-Scale Solar Electric Systems Eligibility Checklist – PART B

2. _____set of plans that include:

- Site Plan showing location of major components of solar system and other equipment on roof or legal accessory structure. This plan should represent relative location of components at site, including, but not limited to, location of array, existing electrical service location, utility meter, inverter location, system orientation and tilt angle. This plan should show access and pathways that are compliant with New York State Fire Code, if applicable.
- One-Line or 3-Line Electrical Diagram as required by:
- Specification Sheets for all manufactured components. If these sheets are available electronically, a web address will be accepted in place of an attachment, at the discretion of the municipality.
- All diagrams and plans must be prepared by a PE or RA as required by New York State law and include the following: (a) Project address, section, block and lot number of the property; (b) Owner's name, address and phone number; (c) Name, address and phone number of the person preparing the plans; and (d) System capacity in kW-DC.

3. Unified Solar Permit for Small-Scale Solar Electric Systems Application – PART C

4. Permit Fee Amount

Permit Review and Inspection Timeline

Permit determinations will be issued within 14 calendar days upon receipt of complete and accurate applications. The municipality will provide feedback within 7 calendar days of receiving incomplete or inaccurate applications. If an inspection is required, a single inspection should be sufficient and will be provided within 7 calendar days of inspection request.

The NY-Sun Initiative, a dynamic public-private partnership, will drive growth of the solar industry and make solar technology more affordable for all New Yorkers.

Visit ny-sun.ny.gov for more information on the NY-Sun initiative.

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Eligibility Checklist – *Part B*

To determine if you are eligible for the expedited permitting process, answer the questions below.

☐Yes ☐No 1. Solar installation has a rated capacity of 12 kW or less.

☐Yes ☐No 2. Solar installation is not subject to review by an Architectural or Historical Review Board.

☐Yes ☐No 3. Solar installation does not need a zoning variance or special use permit/conditional use permit.

☐Yes ☐No 4. Solar installation is to be mounted on a permitted roof structure of a building, or on a legal accessory structure. If on a legal accessory structure, a diagram showing existing electrical connection to structure is attached.

☐Yes ☐No 5. Solar installation is compliant with all applicable electrical and building codes.

☐Yes ☐No 6. Solar installation is compliant with New York State Fire Code.

☐Yes ☐No 7. The Solar Installation Contractor complies with all licensing and other requirements of the jurisdiction and the State.

☐Yes ☐No 8. The proposed equipment is permitted by code and equipment meets all relevant certification standards.

☐Yes ☐No 9. The solar electric system and all components will be installed per the manufacturer's specifications.

☐Yes ☐No 10. The project will comply with adopted National Electrical Code® requirements.

☐Yes ☐No 11. The roof has no more than a single layer of roof covering (in addition to the solar equipment).

☐Yes ☐No 12. The system is to be mounted parallel to the roof surface, or tilted with no more than an 18 inch gap between the module frame and the roof surface.

☐Yes ☐No 13. The system will have a distributed weight of less than 5 pounds per square foot and less than 45 pounds per attachment point to roof.

If you answered "No" to any of Questions 1-10, you are not eligible to participate in the expedited permitting process and must go through the standard permitting process dictated by the municipality. If you answered "No" to any of Questions 11-13, in order to use this form, in addition to other New York State PE or RA requirements, you must provide a letter from a Professional Engineer or Registered Architect certifying that the existing structure can support the additional weight and wind loads of the solar electric system. If you answered "Yes" to all of the above questions, please sign below to affirm that all answers are correct, and you have met all the conditions and requirements to participate in this expedited process.

Property Owner's Signature _____ Date _____

Solar Installation Contractor Signature _____ Date _____

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Application – *Part C*

1. Property Owner:

Property Owner's Name _____ Phone _____ Email _____

Property Address _____

Section _____ Block _____ Lot Number _____

2. Existing Use:

☐Single Family ☐2-4 Family ☐Commercial ☐Other _____

3. Provide the total system capacity rating (sum of all panels)

Solar Electric System: _____ kW-DC

4. Solar Installation Contractor and Electrician:

Installer Business Name _____

Installer Business Address _____

Installer Contact Name _____ Installer Phone Number _____

Installer License Number(s) _____ Installer Email _____

Electrician Business Name _____ Electrician License Number _____

5. What is the existing roofing material?

_____

6. Provide method and type of weatherproofing for roof penetrations (i.e., flashing, caulk).

_____

7. Is the mounting structure an engineered product designed to mount solar electric modules? ☐Yes ☐No

If no, provide details of structural attachment in a letter certified by a design professional.

continued >

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Application – *Part C (continued)*

8. For manufactured mounting systems, provide the following information about the mounting system:

a. Mounting System Manufacturer _____

b. Product Name and Model Number _____

c. Total Weight of Solar Electric Modules and Rails _____lbs.

d. Total Number of Attachment Points _____

e. Weight per Attachment Point (c ÷ d) _____lbs.

f. Maximum Spacing Between Attachment Points on a Rail _____inches
(see product manual for maximum spacing allowed based on maximum design wind speed)

g. Total Surface Area of Solar Electric Modules (square feet) _____ft^2

h. Distributed Weight of Solar Electric Module on Roof (c ÷ g) _____lbs./ft^2

9. Indicate quantity, brand, make and model of the:

Inverter(s):

Quantity	Make	Model

Modules:

Quantity	Make	Model

Please sign below to affirm that all answers are correct and that you have met all the conditions and requirements to participate in this expedited process.

Property Owner's Signature _____ Date _____

Solar Installation Contractor Signature _____ Date _____

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