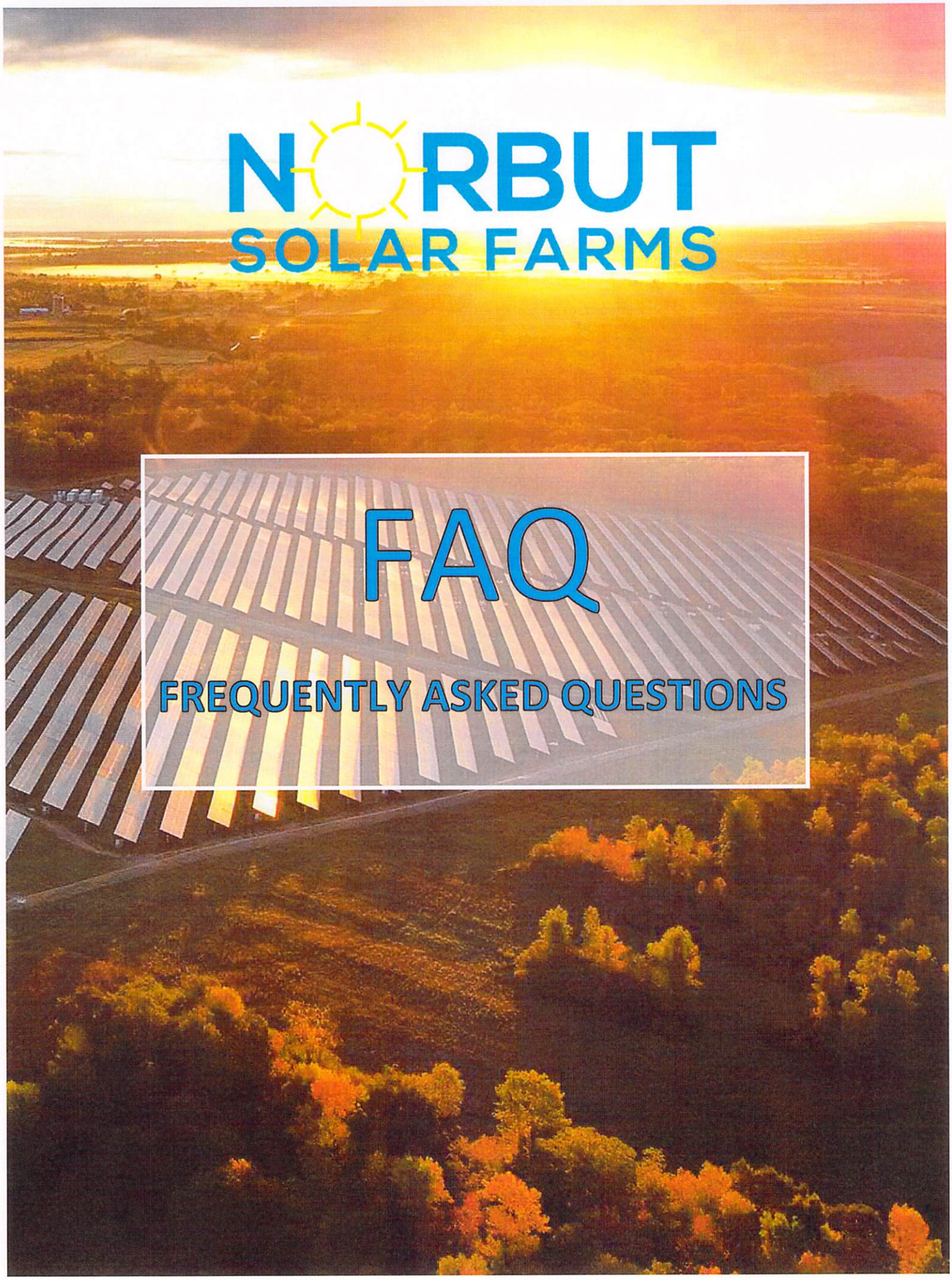
NORBUT
SOLAR FARMS
FAQ
FREQUENTLY ASKED QUESTIONS

Norbut Solar Farms FAQ*

CONTENTS

Introduction

The following guide is a comprehensive collection of questions that Norbut Solar Farms has received from communities across New York State. As a part of our community outreach program, we have compiled this FAQ to help address some of the most common concerns expressed by the towns and communities we partner with. If you have any additional questions or would like more detail about some of the subjects contained in this guide, please feel free to visit our website at www.norbutsolarfarms.com.

What is a solar farm?

A solar farm is a large collection of photovoltaic (PV) solar panels that operate as a power plant, absorbing energy directly from the sun and converting it into electricity. This electricity is then sent out to the power grid for distribution and consumption. Solar panels are mounted directly to the ground using a racking system that does not rely on concrete-based supports. Norbut Solar Farms develops Community Solar, also known as Community Distributed Generation (CDG) facilities.

What is Community Distributed Generation?

Commercial Solar developments can hook into either the transmission or distribution side of the utility power grid. Community Distributed Generation is a designation for smaller-scale solar facilities that can generate up to 5MW (AC) per site and connect into the distribution side of the utility grid. They are able to provide electricity to homes within close range, serving the community in which the facility is located, often at a discount for eligible subscribers. In addition, due to the close proximity of the generation facility, these customers are less likely to lose power.

The transmission side of the utility grid is better equipped to transport electricity over long distances. As a result of this, power generated at large-scale transmission level projects often travel for many miles before reaching its destination. These destinations are often larger metropolitan areas such as New York City.

Who is Norbut Solar Farms?

Norbut Solar Farms is a solar development company located in Rochester, New York. We have more than 25 years' experience developing, constructing, operating, and maintaining assets for both local shops and businesses as well as Fortune 500 companies. We are an upstate and western New York company, locally owned and operated.

Instead of leasing land for our facilities, we purchase the land outright. In this way, we become a fully vested member of the community in a way that differs from most other solar developers in New York State.

The land for our first facility, NSF Parma, was purchased in 2017. At the time it became operational, it was the second largest solar facility in New York State. A second site with 15 MWh of energy storage was energized in 2022. Today we have more than 320 MW (DC) of approved solar generation and 6 operational energy storage facilities on over 3,500 acres of land across New York State.

How will farmland be protected?

The New York State Department of Agriculture and Markets has strict guidelines to which our projects must comply for their entire lifespans. The specific strategies that are used to protect topsoil and repair soil compaction are laid out in the Stormwater Pollution and Prevention Plans (SWPPPs) that are submitted as part of our project applications.

Our projects also undergo comprehensive State Environmental Quality Review (SEQR) to ensure that there will be little to no environmental impacts. Part 1 of the Full Environmental Assessment Form is submitted as part of our project applications.

Beyond these state requirements, Norbut Solar Farms is an industry leader in exploring the benefits of agri-voltaics. Agricultural operations are co-located with photovoltaic facilities on our solar farms across New York State. Our NSF Parma solar farm has 202 acres on site used for farmland, an orchard, honey production, greenhouses, firewood processing, maple syrup production, and composting. Thirty (30) acres are being utilized at our NSF Angelica facility for cattle grazing. Oats, corn, and other crops are grown and harvested at our solar farm in Torrey.

We anticipate that technological advances in photovoltaics will allow us to repower our facilities with a smaller overall footprint in the future and this will allow us to take advantage of additional agricultural opportunities on our sites.

Also, it is worth noting that solar developments are friendly to long-term agricultural productivity. Fields that are not farmed during the lifespan of the project can be put back into agricultural production immediately upon decommissioning, having suffered no long-term impacts from the project.

How will the town benefit?

Our projects contribute significant new investments to the communities in which they are located. When appropriate, and following granting of approvals by the Town, Norbut Solar Farms negotiates PILOT agreements with the Town, County, and/or School District. PILOT agreements provide for structured annual payments in lieu of the property tax revenue a project would have otherwise generated. These payments amount to appreciably more revenue than is received for the parcels today. The currently assessed property tax will continue to be paid on top of this.

As an example, under the PILOT agreement that was reached for our project in the Town of Angelica, NY, the Town, County, and School District received an 847% increase over the tax revenue they were receiving before our project was constructed.

Additionally, unlike larger transmission scale projects, the electricity generated at our facility will be available for local consumption. This power can be provided at a tangible discount to eligible subscribers.

Are solar panels recyclable?

Solar panel recycling and disposal is not yet a major consideration in New York State, as most installations are newly operational and have a minimum 25-year expected useful life. It is, however, important to plan for the disposal of solar systems at the end of their useful life. Currently, there are no regulations requiring the recycling of solar panels in New York State, but it is best practice to reuse or recycle system components whenever possible. Solar panels are classified as "general waste" and they can be placed in a landfill. Some solar energy system components, such as metal racking, can readily be reused or salvaged. Solar PV recycling is still in its infancy, though the ultimate goal is to recycle solar panels and recover any materials that may be reused or sold.

A 2016 study by the International Renewable Energy Agency (IRENA) estimates that recyclable materials in old solar modules will be worth $15 billion in recoverable assets by the year 2050.[i] In addition to this, we expect that burgeoning markets in developing countries will be prime locations to redeploy panels that are operating at reduced capacity.

What is decommissioning and who will pay for it?

Decommissioning is the process of removing system components at the end of the facility's lifespan and returning the land to its current state. Decommissioning is paid for by the facility owner and not by the municipality. We provide a decommissioning plan and a draft decommissioning agreement as part of our project applications.

It is worth noting that decommissioned solar panels are not simply thrown away. The monetary value that can be realized by scrapping and selling the various components within the facility that can potentially cover the full cost of decommissioning. However, we typically provide a bond that is 100-125% of the estimated cost to decommission the facility.

What is the project lifespan?

Commercially produced solar panels have an average initial life of 25 years. However, after 25 years panels will still be operating at 80% of their original capacity. At this point there will be three distinct possibilities: 1) the facility will cease operation and be decommissioned; 2) the facility will continue to operate at 80% capacity; or 3) the system will be repowered with new panels to produce the same output at what will likely be a smaller footprint.

Will the solar array be visible?

Whenever possible it is our objective to develop projects with limited visibility from the surrounding community. We often design projects using setback distances well beyond those required by local law. If the solar array is visible from certain public vantage points, we use mitigation strategies such as vegetative screening to reduce any visual impact. When appropriate, professionally prepared visualizations, or simulations, are provided to the town during the application process.

Do solar panels create glare?

Solar panels are designed to be dark colors, usually black or blue, that absorb the sunlight to create electricity. If panels were reflecting the sun, or creating glare, they would not be effective. PV panels are designed with anti-reflective coating to increase panel efficiency and keep the level of reflected light at 2%. This is lower than the reflectivity of water. Airports around the world have been installing PV arrays to provide onsite generation, and studies show that glare from the solar arrays is a negligible issue.[i]

Do solar panels make noise?

The solar panels themselves do not make noise. The inverters will produce a small humming noise that is around 50 decibels (less than the hum of a refrigerator). We locate our inverters far enough within the facility that noise is generally imperceptible outside of the facility itself.

What will happen to neighboring property values?

The Solar Energy Industries Association (SEIA) has conducted studies across the United States that have evaluated the effect of large-scale solar energy facilities on property values. Their study concluded that there is no negative impact to property values resulting from the construction of solar facilities. In fact, in some cases, property values have actually increased. [ii]

It is worth keeping in mind that as solar technology advances and solar generation facilities continue to be built, they will likely be as commonplace as other essential infrastructure, such as cell towers.

How will previously agricultural land be taxed?

Under the Agriculture and Markets Law, when land having an existing agricultural exemption is converted to a different use, such as solar energy production, it is subject to payments equaling five times the taxes saved in the last year in which the land benefited from an agricultural assessment. When this penalty is applicable, it will be paid in full by Norbut Solar Farms. Hosting a solar project will not change the zoning designation of host properties or neighboring properties nor will our project affect the property taxes of neighboring properties.

Will your solar facility create local jobs?

Yes. Solar facilities require landscape maintenance to control the growth of vegetation around panels. During the winter, access roads to the facility need to be plowed to ensure that the facility remains accessible. Additionally, comprehensive security checks need to be performed periodically to confirm that the facility does not require repairs or maintenance. All of these jobs will be sourced locally. In addition to this, during the construction phase of our project we make a point of using as much local labor as possible.

How much greenhouse gas emission will this project offset?

5MW (AC) of solar energy production will be able to power approximately 1,000 homes. This would be the equivalent of avoiding 3,500 metric tons of CO2 production annually. This would represent the CO2 emissions from over 730 passenger vehicles over the course of a single year. [iii]

How are threatened or endangered species protected?

Endangered species are accounted for and protected throughout the life of a solar facility. First, solar projects must conduct an initial screening with the U.S. Fish and Wildlife Service to identify whether endangered species are present in the area. In consultation with the New York State Department of Environmental Conservation (DEC) and U.S. Fish and Wildlife, developers must identify potential impacts to endangered or threatened species from facility construction, operation, or maintenance, and work with the DEC to mitigate impacts. Issues related to direct and indirect habitat loss, mortality, breeding, and wintering and migration patterns of bird and bats are all addressed during the process through which solar projects obtain their permits to construct and inform the final design of the project and any required mitigation measures.[i]

Do solar panels contribute to bird loss?

In short, no. The misconception that solar projects are a major contributor to bird loss has stemmed from issues with "concentrated solar thermal." This type of solar system, which constitutes a small percentage of US solar capacity and is located almost exclusively in the Southwest, uses mirrors to focus solar energy in order to power a steam generator. Bird loss in this situation occurs when birds fly through concentrated light reflection. Solar projects in New York, which use solar panels to convert sunlight into energy, do not reflect light or act as a mirror. Due to this major design difference, there is a minimal impact on avian species.[i]

Do solar panels affect water runoff at a site?

Federal, state, and local regulations are in place to ensure that solar arrays are installed in ways that protect public water supplies, wetlands, and other water resources. Ground mounted systems will be designed to manage runoff using deep-rooted vegetation such as "pollinator-friendly" grasses and wildflowers, pervious pavement, or topographical features such as berms, swales, or retention ponds, which can provide a net water quality benefit.[i]

How will this project affect the water table?

When rainwater hits the solar panels, it will fall on the ground. The vegetation beneath the solar panels will slow the flow of water, compared to having row cropping, allowing the water to infiltrate. The solar site behaves like a meadow. The solar panels shade the ground, decreasing evaporation and maintaining higher soil moisture. A study in Arizona has shown increased crop yields under solar modules because of higher moisture remaining in the soil:

"We find that shading by the PV panels provides multiple additive and synergistic benefits, including reduced plant drought stress, greater food production and reduced PV panel heat stress."

As observed in past Stormwater Pollution Prevention Plans (SWPPP) for solar projects, the discharge rate of stormwater from a solar facility is less than it was for a row crop site. That means there is more water being retained on site to recharge local aquifers.[iii]

Will wetland laws be followed?

We always adhere to wetland laws, as they need to be followed as a part of the permitting process. Different guidelines must be followed if wetlands are classified as being within the jurisdiction of the Army Corps of Engineers or the NYS DEC. We request jurisdictional determinations from the DEC and the US Army Corps of Engineers as needed. A wetland delineation report is submitted as a central component of our project applications.

It is often cloudy and overcast here. Will solar panels work?

It is a common misconception that solar only works well in climates where there is abundant sunshine. Solar panels do not require perfectly sunny weather to generate electricity, and modern solar resource datasets allow developers to accurately estimate the amount of sunshine at a given location. Solar photovoltaic (PV) technology continues to become more efficient, enabling solar projects to generate in the absence of strong, direct sunlight, and increasing the viability of project locations throughout New York. Additionally, the cooler temperatures in New York actually make panels more efficient. Combined with the strong demand for renewable energy throughout New York, availability of suitable land, and supportive policies, solar makes sense in most areas of New York State.[i]

Are solar panels safe?

Solar panels largely consist of widely used and non-toxic components, including an aluminum frame, tempered glass, and various common plastics. The most common type of solar panel consists of crystalline silicon PV cells which generate electricity when exposed to light. These non-toxic crystalline silicon cells consist almost entirely of silicon, one of the most common elements in the Earth's crust.

Some minor system components, including solder, may contain toxic chemicals at extremely low concentrations. Analysis performed by the *North Carolina Clean Energy Technology Center* did not find a potential toxicity threat from leaching, even in worst case scenarios (hurricane, fire, tornado, etc.), indicating an insignificant threat to human health and the environment.

Release of toxic chemicals from other solar system equipment including inverters, racking, and cabling is also unlikely as solar installations must conform to state fire safety and electric codes, and they pose little or no risk of contaminating the soil or ground water.[i]

What happens when a solar panel breaks?

The most common solar panel failure modes include glass breakage and various failures of internal electrical connections, neither of which would typically result in the release of any materials to the

environment. Solar panels are constructed primarily of silicon, tempered glass, and metals. Similar to a car windshield, when solar panels experience a catastrophic event, the panels typically stay fully intact, thus not releasing any materials into the environment.

Additionally, reputable solar panel manufacturers will ensure that their equipment is certified to applicable performance and safety standards including those established by the International Electrotechnical Commission (IEC) and Underwriters Laboratory (UL).[i]

In the event there is a fire, will the fire department be able to respond?

A manual shutoff for the facility will be located at the point of interconnection (where the facility hooks into the utility grid). In the event of a fire, the fire department will be able to throw a manual shutoff. There will also be access roads as prescribed by town code. Solar panels, however, rarely catch fire and are not combustible. In the unlikely event that a fire did occur, panels would likely just smolder and not spread. Fire control and prevention training specifically for solar facilities is provided by NYSERDA at no cost to the municipality.

Should we be worried about electromagnetic fields (EMF) associated with solar?

There are two kinds of EMF: "ionizing fields," which are high level and harmful, and "non-ionizing," which are low-level and generally harmless. Non-ionizing radiation comes from computers, appliances, cell phones, and wireless routers. Ionizing radiation comes from harmful sources such as UV lights or X-rays. EMFs from solar systems are non-ionizing, similar to that of your household appliances. Studies show that the exposure level within the array or at the fenced boundary of a system falls *well below* recommended exposure limits. This exposure level decreases even more as you move away from the system and is nonexistent at night when the system is not producing energy. Ultimately, EMF from solar systems is extremely insignificant and cannot be associated with any health effects.[i]

Do solar panels create high ambient temperatures in their surroundings?

The theory that a functioning solar PV array increases the ambient temperature of its surroundings is known as the "heat island" effect. The "heat island" effect proposes that solar panels create a darker landscape that reflects less light, and therefore creates a localized area of increased heat. Few studies have been conducted on the subject, but it has been generally concluded that the area surrounding a large-scale solar array is unlikely to experience a net heating change from the panels. It is, however, possible to see some heating occur under the panels themselves. This can be mitigated with proper implementation of vegetative cover instead of gravel. With any PV array, the significance of the heating depends on the location of the array, time of the year, and the surrounding environment.[i]

*The statements contained in this FAQ are for informational purposes only and are based upon the personal experiences and knowledge of our staff. The information provided is intended to educate, and any interested party should undertake their own research and due diligence as to the accuracy of the information. Any reliance placed upon such information is strictly at the risk of the user, and Norbut Solar Farms is not responsible for any loss or damage caused by any information provided.

---

[i] NYSERDA. (2022, May). *New York Solar Guidebook for Local Governments.* nyserda.ny.gov. Retrieved October 7, 2022, from https://www.nyserda.ny.gov/All-Programs/Clean%20Energy%20Siting/Solar%20Guidebook

[ii] Solar Energy Industries Association. (2019, July). *Solar and Property Value.* Solar Property Value Factsheet. Retrieved October 7, 2022, from https://www.seia.org/sites/default/files/2019-09/Solar%20Property%20Value%20FactSheet%202019-PRINT_1.pdf

[iii] EDF Renewables. (n.d.). EDF Renewables Frequently Asked Questions. EDF Renewables.