



## QUESTIONS REMAINING FROM FOVL-OTSEGO 2000 10/15 PANEL DISCUSSION:

### NY ENERGY PLAN: WHAT IT MEANS FOR OUR COMMUNITY

#### RESPONSES FROM: [DANNY LAPIN, AICP; KEITH SCHUE, MSEE]

1. How important are a town's planning documents in protecting community assets/resources in the face of large solar development, such as a comprehensive plan, farmland protection plans, etc.?

DANNY LAPIN: Honestly, it varies. Well thought-out Comprehensive Plans supported by effective public engagement, replicable analyses, and clear recommendations will be much more useful than an outdated document with nebulous recommendations like "we want to protect open space." With respect to a zoning ordinance, there will need to be a strong supporting record showing that the municipality gave due consideration to balancing the need for open space preservation with the prospect of renewable energy development. If a community merely copy-pastes a code from one place to another without giving thorough consideration to the development implications of doing so, it will be much easier for a developer to assert that your community's zoning code is unfairly burdensome.

Agricultural and Farmland Protection Plans will need geospatial analyses that are replicable highlighting the lands that are in need of protection. Applicants will comply with Ag & Markets' guidance on siting solar on agricultural land. However, this guidance is intended to supplement more granular, local farmland protection plans. For an example of geospatial analysis being used to prioritize farmland protection, please reference Otsego County's 2017 Ag & Farmland Protection Plan.

2. Is there any discussion of using Biogas from anaerobic digestion?

KEITH SCHUE: Yes, the state's Climate Action Council has discussed biogas, also referred to as "renewable natural gas" (RNG). Since biogas is not included in the CLCPA's definition of "renewable", it does not qualify as a contributor toward meeting the legislation's goal of 70% renewable-sourced electricity in 2030. However, it could potentially contribute to the CLCPA's broader goal of 100% carbon-free electricity by 2040. Like natural gas from fossil fuels, RNG is methane (CH<sub>4</sub>), so it produces carbon emissions upon combustion. However, advocates argue that burning methane, which may otherwise still be produced by ag operations, has less environmental impact than letting it leak into the atmosphere. Others point out that the amount of retrievable RNG from farm operations and landfills is quite small, asserting that any proposal to inject RNG into today's existing natural gas pipeline network would accomplish little other than to create an excuse for perpetuating fossil fuel infrastructure.

Although final recommendations of the Climate Action Council have not been completed, one concept that has been discussed to address this would be to limit RNG use to “on-site” applications, such as small-scale combustion or electricity generation where RNG is actually produced.

3. Do solar farms cause harm to the land they are on such that they cannot be used again? How difficult is it to reclaim the land?

KEITH SCHUE: Photovoltaic solar panels can contain heavy metals like lead, cadmium, and arsenic. For this reason, some are classified as hazardous waste. But there are many different kinds of panels, some having greater potential to leach into the environment than others. See the following EPA link for more information: <https://www.epa.gov/hw/end-life-solar-panels-regulations-and-management>.

Perhaps the most relevant concern is whether a solar developer will clean up the site at the end of a facility’s useful life. Eventually, an abandoned solar farm could possibly become a contamination concern. However, the sheer volume of material to be removed and properly disposed of if a site is abandoned may be the greatest impediment to farming or uses. We certainly don’t want to see large swaths of upstate New York become future brownfields of broken glass and metal. Strict rules are currently lacking at the federal level and within New York regarding the disposal of industrial solar waste, and requiring developers to address this could make solar more expensive. However, as discussed in the link above, some states have enacted laws and regulations which begin to do so. The American Farmland Trust recommends that solar developers be required to secure decommissioning bonds “to fully cover the costs of removing solar installations from farmland and return the land to its previous state.” AFT further states: “Developers should be required to fully cover the costs of remediating soils to re-establish the baseline levels of organic matter, compaction, and other soil health determinants.” I agree that these measures ought to be required.

4. What coordination exists between planned development and availability of grid connection, and energy efficiency or hard caps on emissions?

KEITH SCHUE: This appears to be three different questions.

Before a new generator can be approved, the local electric utility or transmission line owner, in conjunction with the New York Independent System Operator (NYISO), must confirm that sufficient transmission carrying capacity exists to support the project, or if not, what transmission improvements are needed. Likewise, any development project that draws from the grid must request a connection from the electric utility, and depending on the demand load presented, improvements to the transmission and distribution network may be needed.

New York has set statewide energy efficiency targets in the past that were not fully attained. Having said this, NYSERDA does offer a number of incentives to individuals and businesses for efficiency improvements, which can be found on NYSERDA’s website. The state Public Service Commission has also adopted energy efficiency targets for utilities. However, it is important to understand that increasing energy efficiency does not necessarily translate to a reduction in electricity consumption,

since some energy improvements (like heat pumps) avoid inefficient fossil-fuel combustion by the end-user, but increase electricity demand.

The CLCPA sets a goal of reducing statewide greenhouse gas emissions 85% compared to 1990 levels by 2050, and it requires the state Department of Environmental Conservation (DEC) to promulgate regulations by 2024 that are intended to achieve this. This could include emission reduction mandates on individual sources (although the CLCPA does not specifically require this). New York also participates in a cap-and-trade program with several other states known as the Regional Greenhouse Gas Initiative (RGGI) for generators of electricity with a capacity of 25MW or greater. This program establishes a total combined cap on CO<sub>2</sub> emissions from such sources within the region and auctions off emission allowances up to that cap which may then be bought and sold. This has created a revenue source to states that could be applied to advancing climate programs, although funds have not always been used for this purpose. Critics also assert that the assigned emission caps are not low enough to affect a meaningful change in how electricity is produced. The Climate Action Council is considering a similar program to meet more stringent greenhouse gas reduction goals of the CLCPA, and how such a program might interact with RGGI. Other emissions affecting air quality are subject to federal and state regulations and individual permit conditions.

5. What are the long-term effects of solar on grazing animals/humans over time? What are the effects on soil, water, and health?
6. Does battery storage require much land? How far can solar be from a transmission line?

KEITH SCHUE: It depends on the size of the project, but a general rule of thumb is that a thousand square feet is needed per MWh of battery storage. Note that the relevant unit of measurement here is MWh (megawatt-hour), which corresponds to the total amount of energy that can be stored. A battery system is also characterized by its maximum power output (in megawatts), but this alone is inadequate to determine the battery's size. Typically, battery systems for the grid are configured to provide 1-8 hours of storage. The land requirements associated with material mining is much larger

To limit cost, a solar developer will seek a location that minimizes the amount of additional interconnect infrastructure needed to attach to the existing network. Distance will involve many factors including terrain, method of installation, and other government incentives or development assistance that may exist. However, generally a distributed generation (small scale) project could be sited within a thousand feet of a three-phase power line and a large utility-scale project could be sited within a mile of a suitable high-voltage transmission line.

7. Please comment on problems of connecting clean energy to the existing (and planned) grid.

KEITH SCHUE: The difficulty associated with connecting carbon-free sources of energy to the grid depends on characteristics of the generating source and the grid to which it is being connected. Baseload or dispatchable sources of carbon-free generation such as hydropower or nuclear power function within the grid similar to other fuel-based generators that produce electricity

serving demand in real-time. At low levels of penetration, the electricity produced by intermittent renewables (solar and wind) serves real-time demand, too—meaning when demand is present and sunshine or wind are also available. In this case, storage or other additional system-level support is unnecessary because “firm” generators (dirty or clean) produce electricity when intermittent sources cannot. However, this changes as intermittent generators are called upon to serve a larger portion of demand, including when they are unable to produce electricity.

At moderate penetration of intermittent generation, large-scale storage becomes essential, along with transmission improvements to avoid bottlenecks which may otherwise cause curtailment. Demand-response management can help reduce load during times of low output from renewables, but system-level impacts nevertheless become more pronounced, ultimately translating to greater complexity and expense. At higher penetration, batteries are inadequate and long-term inter-seasonal storage or some form of “firm” carbon-free dispatchable generation becomes necessary as backup. However, with this comes the need for an entire additional layer of facilities and infrastructure to make, store, and transport energy. A grid that relies upon the extensive use of solar and wind also requires substantially more transmission infrastructure due to the inherent low-capacity factor of solar and wind, as well as the need to potentially deliver electricity to locations far from where it is produced along paths that dynamically change.

In the real-world, these impacts are not limited to effects encountered only when trying to accommodate the last few percentage points of generation. As seen in Europe and California, the technical challenges and related expense of integrating intermittent renewables into the grid have become apparent at penetrations far below 50%. This also underscores the danger of making decisions based on the Levelized Cost of Electricity (LCOE) for individual sources, a metric that does not take into account system-level factors. The draft plan prepared by the state Climate Action Council proposes that solar and wind provide nearly 80% of New York’s electricity in 2050.

8. NY State has climate goals for 2030 and beyond. New nukes [nuclear plants] will take 10 years at best. What specific actions are you willing to support? I do not hear much specific to bridge those ten years. New licenses for plants will not create any change in NY energy production until the 2030s.

KEITH SCHUE: There are advanced nuclear power projects under development with completion dates this decade. One of these is TerraPower’s Natrium reactor in Wyoming which will be built at the site of a former coal plant, employing passively-safe technology and incorporating thermal storage to respond to rapid changes in load (<https://natriumpower.com/>). However, I agree that a new nuclear plant is unlikely to go online within New York in the next ten years. Having said this, deep decarbonization of our energy system will take more than a decade. It will also require about twice as much electricity to accommodate the beneficial electrification of vehicles, heating systems, and industry. So, in my opinion it makes sense to start planning for the next generation of nuclear plants now. This is already happening in other states and around the world (including most recently

Ontario, <https://www.newswire.ca/news-releases/cib-commits-970-million-towards-canada-s-first-small-modular-reactor-888306153.html>). As previously mentioned, the difficulties of integrating intermittent renewables into the grid also increase as more are added. Thus, new nuclear a decade from now will become important from a system-level standpoint—both for reliability and to ensure that deep decarbonization efforts do not stall out, but succeed. Moreover, including energy-dense nuclear power in our electricity mix will allow New York to conserve more farmland and nature.

In the meantime, I believe we need to deploy a diverse renewable energy portfolio with attention to minimizing ecological, agricultural, and community impacts. I also believe that our upstate nuclear plants should be relicensed, and if necessary refurbished, so that they can continue providing reliable carbon-free electricity in the future. Energy efficiency, energy conservation, and demand management should be pursued as well. Although not a magic bullet, there are opportunities for more effective storage as well. All tools in the toolbox are needed.

9. In the discussion about covering good ag land with solar you don't look at the economics. Less than 5% of Otsego County's economic output is from Ag. Putting ag land out of use has already happened due to economics.

DANNY LAPIN: This is a multi-faceted question. There are several approaches to addressing this problem long-term. One approach can be through succession planning. The average age of principal farm operators in Otsego County is upwards of 50 years old. According to the American Farmland Trust, a majority of farmers do not have an identified successor to take over their farm operations. Assisting farmers with proper succession planning can act as a potential stop-gap with respect to the loss of farmland. Another path needs to be through the cultivation of markets for locally-produced goods. Otsego County's Agricultural and Farmland Protection Plan Implementation Committee has undertaken several initiatives to address this since its inception in 2017. Finally, there needs to be a more effective way to market land to prospective farmers outside of the area. There are several online tools that can allow prospective farmers to find land available to purchase, and it is time that Otsego County considers adopting this technology.

10. State laws that overturn Home Rule are onerous. That's a political issue. But I don't hear much about a political strategy to change the laws. Or are you not willing to fight that as we fought it during fracking?

KEITH SCHUE: Several bills have been proposed in the state Senate and/or Assembly relating to the 94-C process, although it is unclear if any will become law. For example, S7677/A9109 would provide for greater protection of farmland by prioritizing impacted lands, limit the conversion of no more than 5% of prime farmland to solar within a regional economic development council region, and require a surety bond or other insurance to cover a part of decommissioning cost if prime ag land is taken; S6591 would establish a farmland identification program and protection fund; S7122/A7696 would prevent viable agricultural land from being considered "build-ready" under the 94-C expedited process; S8889A/A9328 would require that funds collected by NYSERDA when viable farmland is converted to solar development be deposited into an agricultural and farmland viability protection fund; and S9546 would repeal 94-C completely. It should be noted, however, that none

of these except the last one address the subject of home rule. It is also important to understand that the former Article X siting process (applicable to electricity generation projects 25MW or larger) restricted home rule as well, although arguably to a lesser extent and with greater allowance for public involvement than 94-C.

11. Is there any coherent state plan that stipulates maximum land tolerance + total MWs etc.?

KEITH SCHUE: I assume that the question of “maximum land tolerance” relates to the amount of impact that a piece of land can tolerate without causing environmental harm. This is a complex question and one that cannot be fully answered without understanding the context with which a piece of land relates to its surroundings (not only its immediate surroundings, but also the integrity of connective ecosystems and environmental processes). Unfortunately, New York does not have a statewide comprehensive plan for growth management. So, as with quintessential “sprawl” elsewhere, the danger is that piecemeal conversion of parcels—each of which might not have much impact individually—can nevertheless cause significant harm in the aggregate. Having said this, under normal circumstances, the State Environmental Quality Review (SEQR) process allows for a municipality or agency like DEC to review impacts for projects deemed significant, and in principle that review is supposed to consider cumulative impacts. However, 94-C supersedes SEQR such that any environmental review occurs by the ORES siting board in an expedited fashion, with emphasis given to achieving CLCPA renewable targets. It has been argued that this undermines the state’s overarching mandate to protect the environment and communities.

From a regulatory standpoint, there is no specific limit on the amount of generation capacity that may be installed on a parcel of land. Physically, however, the amount of suitable upland needed for ground-mounted solar varies from about 4 to 8 acres per MW. Fixed-panel projects may use slightly less land than tracking, but in that case the total amount of energy produced (measured in MWh) is also less. The amount of generation capacity needed statewide will depend on our future portfolio of energy sources, how much electricity is imported, and demand in the future. The CLCPA requires that 70% of electricity demand be met by renewables in 2030 and that 100% of electricity demand be met by carbon-free sources by 2040. Based on NYSERDA’s analysis which contributed to the Climate Action Council’s draft plan, New York would require approximately 60,000 MW of solar by 2050, most of which would be large utility-scale projects. This corresponds to converting an area of land between the sizes of Binghamton and Albany to solar development each year for three decades. This is in addition to several thousand onshore and offshore wind turbines, storage, backup generation, and transmission. Concerns have been raised by NYISO and others relating to NYSERDA’s analysis, as well as the feasibility and reliability of this approach.

12. How can the lay person stay abreast of this very complex and changing field?

DANNY LAPIN: This topic can be quite the rabbit hole. From a simple perspective, I would suggest book-marking [www.ores.ny.gov](http://www.ores.ny.gov). On the website, you can access multiple webinars describing the regulatory process, review pending and permitted applications, and access other resources related to large-scale renewable energy development. From an advocacy perspective, I would use Google Alerts to ping any stories about large-scale solar projects in New York.

13. The Disadvantaged Communities designation (my town is one) enables greater access to state programs. Does it also recognize the negative impacts of industrial scale solar in those same communities or is more state money the only benefit proffered?

KEITH SCHUE: The Climate Justice Working Group and state agencies have not yet finalized their list of Disadvantaged Communities pursuant to the CLCPA. (I believe that will occur by April, 2023.)

According to the CLCPA, the term “Disadvantaged Communities” is defined as “communities that bear burdens of negative public health effects, environmental pollution, impacts of climate change, and possess certain socioeconomic criteria, or comprise high-concentrations of low- and moderate-income households.” The CLCPA further states: “Disadvantaged communities shall be identified based on geographic, public health, environmental hazard, and socioeconomic criteria, which shall include but are not limited to: i. areas burdened by cumulative environmental pollution and other hazards that can lead to negative public health effects; ii. areas with concentrations of people that are of low income, high unemployment, high rent burden, low levels of home ownership, low levels of educational attainment, or members of groups that have historically experienced discrimination on the basis of race or ethnicity; and iii. areas vulnerable to the impacts of climate change such as flooding, storm surges, and urban heat island effects.”

Conceivably, one might argue that communities negatively impacted by industrial scale solar projects should qualify, but that has not been a focus of attention. From an environmental standpoint, much of the CLCPA’s discussion of Disadvantaged Communities relates to the public health impacts of air pollution (referred to as emission “co-pollutants”), often associated with fossil fuel combustion. Regarding benefits, the CLCPA is rather vague, stating only that Disadvantaged Communities must receive a minimum of 35% (with a goal of 40%) of spending for clean energy and energy efficiency programs, projects, or investments. Many have expressed concern about how this requirement will be interpreted and carried out. Since the CLCPA encourages renewable development, construction of a solar farm within a designated Disadvantaged Community may actually be interpreted as a benefit.

14. NYSERDA has drastically reduced the areas identified as high-quality farmland in its Tier 1 awards program. Do you know why this change was made (other than to make more farmland available for solar)?
15. Given the idea that ‘there cannot be too many public hearings,’ what do you think of the public comment process undertaken for ORES’ regulations, which took place over a 2-week period (including Thanksgiving) and, Do you believe it is appropriate that, following the close of the comments, the same consultant who wrote the regulations found that none of the comments received required modifications of the regulations?

DANNY LAPIN: Not being part of the process, I can’t really offer an opinion on what transpired. However, there could be a strong argument for hosting listening sessions on the regulations now

that several applications have been permitted. This will require collaboration with local, county, and state officials.

For projects under consideration, I would recommend never being satisfied with the minimum number of required hearings or comment periods. Figure out an appropriate public engagement strategy that would work for your community and offer it as an alternative approach. Most developers will be amenable to a public engagement process that is iterative rather than oppositional.

KEITH SCHUE: The concern regarding review of public comments by an industry consultant who wrote the regulations for ORES has been raised in a pending court case challenging those regulations:

Town of Copake et al v. NYS ORES et al.

<https://iapps.courts.state.ny.us/nyscef/ViewDocument?docIndex=zCE7ieaJeomMOtZJmsEZsQ==>