SOLAR MYTHS BUSTED

SolUnesco, LLC

1818 Library Street, Suite 500, Reston, VA 20190

February 8th, 2018

SolUnesco White Paper: Solar Myths Busted

Background

This white paper is a companion piece to our two previous blogs on local permitting (Hodsoll and Maughan). In our local permitting blogs we provided our perspectives on best practices for local permitting and how we engage with the local community. We write this white paper to discuss some of the issues and concerns that are raised by the community during this process.

All of us engaged in the industry have heard the naysayer's arguments. From the most bizarre – "solar fries birds" and "it sucks up all the sun" – to the reasonable but still misinformed – "solar is expensive and subsidized," "it will use up all our farmland," "solar doesn't work because it can't provide power at night." As an industry, we must both respect alternative views and provide accurate information to dispel unfounded concerns. In this white paper, we tackle a comprehensive list of fears and myths.

Solar farms will ignite birds

Photovoltaic (PV) panel technology used on the East Coast does not create heat and will not harm birds flying over or even landing on top of the panels. In the desert of certain western states, concentrated solar power (CSP) facilities reflect sunlight onto a small structure that utilizes the generated heat to drive a secondary process creating electricity. These concentrated rays of light do kill birds flying into their path. The Ivanpah facility in California, one of only three CSP facilities in the US, has generated news stories detailing the problem and the challenges faced trying to mitigate. However, the climate conditions in the eastern US render CSP technology uneconomic, and industry experts question the future viability of CSP in the US.

Solar sucks up all the sun in the area

The only sunlight that is "sucked up" is a portion of the light that hits the panels. Unfortunately, in today's instant shareable social media posts, many share – both innocently and with ulterior motives – false or satirical articles and they "go viral." This article suggesting photovoltaic panels are draining the suns energy provides a stark example of these myths.

Solar is expensive

Dominion Energy's 2017 Integrated Resource Plan states that solar will provide the lowest cost of any fuel type, independent of Obama-era environmental regulations. Read our May 12th blog on this topic.

Solar is subsidized

Yes, but so are carbon-based fuels. The federal government provides solar energy systems a 30% investment tax credit which is scheduled to sunset over the next few years. Historically, the federal government has provided various forms of financial assistance to other forms of energy which far outweigh the tax exemption that solar is currently receiving. Even today, the federal government provides significant subsidies to conventional fossil fuels while also finding ways to support to solar and

other renewable energy resources. According to an Oil Change International report from October 2017, "U.S. taxpayers continue to foot the bill for more than $20 billion in fossil fuel subsidies each year" and permanently available tax expenditures for fossil fuels in 2016 was $7.4 billion vs. $1.1 billion for renewable energy. Virginia provides only one energy subsidy, and this subsidy is for coal production. Virginia does not provide a state subsidy to solar, but the state does grant a partial exemption for local taxes. Considering solar systems result in one of the lowest impacts to the local community, we submit that the local net revenue gain from these facilities exceeds any impact to the local community.

It will use up all our forest or farmland

As is the case with all forms of land use, supply, demand, and regulation will determine the amount of land utilized. In our Local Permitting 101 blog, based on utility projections and capacity within the electrical system to *economically* interconnect solar, we clarify why solar will utilize less than 1% of farmland. To the extent, solar converts productive farmland or timberland, the demand for agricultural uses will determine whether farmers convert un-used agrarian land to farming. The bottom line – we are not utilizing a scarce resource which is a big reason these projects make economic sense – low-cost land allows for solar farms to compete.

Solar doesn't work because it can't provide power at night

Yes, solar does not provide power at night, but it does work for its intended purpose. Solar provides an energy resource to the power grid with $0 fuel cost, providing kWh or consumable energy at the least possible marginal cost. As an intermittent source, solar is an excellent companion to traditional carbon-based energy generation. Carbon-based generation provides the capacity to power the grid for peak consumption and at night. Also, Greentech Media and the Interstate Renewable Energy Council projects that "energy storage promises to play a critical role at all levels of the electric system, from traditional utility-scale generation down to residential customer applications." The pairing of storage and solar energy will deliver power on demand as needed.

Solar farms are fire hazards

The components used in PV solar facilities are non-combustible, and therefore, cannot by themselves be considered fire hazards. The Institute of Electrical and Electronics Engineers (IEEE) provides codes and standards that states and counties incorporate into their regulations. The state and local governments require that the construction of solar energy systems conform to these codes and standards.

Solar farms use more water

Solar photovoltaic generation systems provide one of the least water-intensive electricity generation resources. In the eastern US, rain provides for most of the required panel cleaning. A Harvard Kennedy School study points out that "… solar photovoltaic, which have practically no water consumption … could contribute to reducing water consumption for the energy sector."

Toxic materials used in solar panels pose a danger

Solar panels pose no danger from toxic materials during project construction, operation or post operation. The manufacturing process of crystalline silicon PV cells does require the use of toxic materials. The federal government regulates these manufacturing facilities protecting workers through strict OSHA workplace regulations. Once manufactured, PV solar panels are encapsulated in a glass and metal frame manufactured to withstand severe weather such as hail of up to 1 inch falling at 50 mph and hurricane winds up to 140 mph. In May 2017, a Denver area hail storm struck the National Renewable Energy Laboratory (NREL) with golf ball sized hail. In the storm's aftermath NREL inspected the damage and found only one broken panel out of the 3,000 panels at the site. At the end of the generating systems useful life, state and local government permits and landowner agreements require that the panels be removed from the site and disposed of in accordance with all local, state, and federal regulations.

Animal habitats will be lost

The reality is typically the opposite, and the state permitting process ensures that the solar systems design addresses any potential adverse impacts. The design of these systems avoids areas with certain topography and sensitive environmental areas such as a wetland. Typically, site attributes result in open spaces within the solar system footprint that provide for natural habitats for native wildlife. Further, our designs incorporate the planting of naturally occurring plants. Within the solar facilities footprint, these open spaces with native plant species and habitats will be protected for the operational life of the system. Finally, Virginia's state permitting process requires both desktop and field surveys to determine the potential for significant adverse impacts to plants or wildlife. If these surveys identify potential adverse impacts, the state permitting process governs the development of mitigation plans to minimize impact.

Cultural resources will be lost

The state permitting process described above also ensures that cultural resources are protected. If field surveys discover protected cultural resources, the state requires that the solar system's design avoid the area or mitigate. The state permitting process may require that the system's design avoid the area, or install vegetation and other screening, or perform extensive archaeological data recovery.

There will be noise

During operations, these systems produce no perceptible noise at the fence line. During construction, the local permits will govern the hours and other construction practices to minimize impacts to the local community.

There will be light pollution

These systems do not require lighting during normal operations. We design security lighting to face inward and downward. In the rare instance that the system turns on security lighting, the lights will be facing away from any neighboring properties. Typically, the local permit includes these lighting restrictions.

The project won't create local jobs

The considerable growth of utility-scale solar development in Virginia provides the opportunity for the growth of businesses and a well-trained workforce specialized in solar development, construction, site maintenance and related operations. Independent research by Fletcher Mangum projects that a 60 MW.ac solar facility (roughly 400-500 acres) will provide for approximately 100 full-time-equivalent construction jobs in the local community and seven full-time-equivalent jobs during the life of the project. Further, these projects generate tens of millions in additional economic output for the local community.

Solar will reduce a county or municipality's revenues

As we detailed in a three-part blog series, counties will never receive less tax revenue, as once feared, and typically counties will receive a significant increase in tax revenue. In the counties where our projects are located we calculate the county's net revenues will increase by a factor of ten to fifteen times on a net present value basis. And, again, solar facilities require little from the local government. In our opinion, solar generation facilities as a land use is a good deal for the local governments.