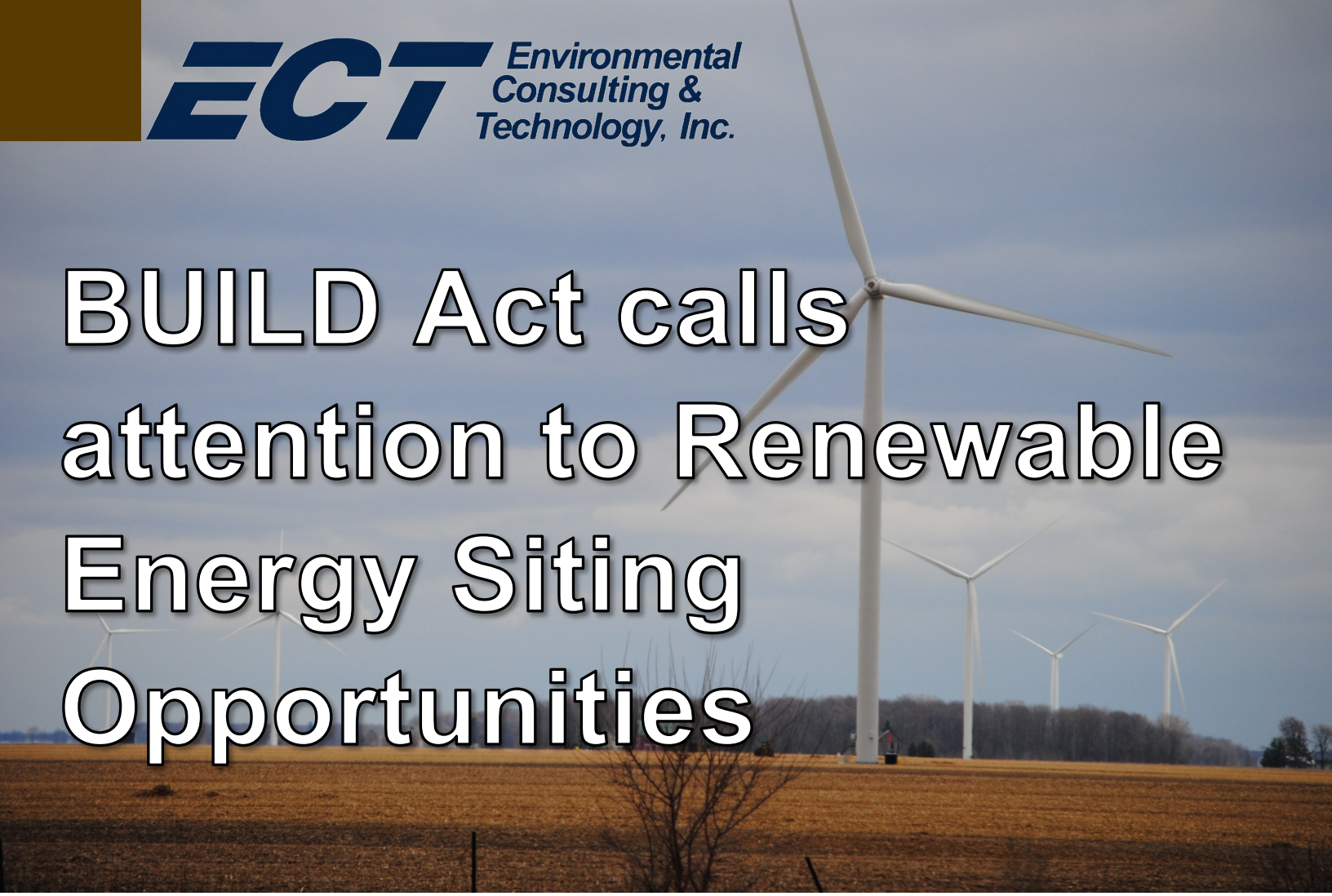

BUILD Act calls attention to Renewable Energy Siting Opportunities

By Marc Florian, Vice President, Site Assessment and Remediation

President Donald Trump signed the Brownfields Utilization, Investment, and Local Development Act of 2018 (the BUILD Act) on March 23, 2018. It contains preferences for two categories of projects within the Environmental Protection Agency's (EPA's) Brownfield Assessment, Cleanup and Revolving Loan Fund program—waterfront sites and projects that contemplate clean energy generation or energy efficiency improvement. These projects will receive specific scoring advantages over other brownfield sites during future funding cycles.[1] While there is much to be said about waterfront sites, this white paper focuses on the later—clean energy generation through the development of brightfields and windfields.

BRIGHTFIELDS

According to the U.S. Department of Energy (DOE), a brightfield is an abandoned or contaminated property redeveloped through the incorporation of solar energy, which can involve many different types of solar applications, including photovoltaic arrays.[2] Brightfield development leads to economic development, environmental cleanup, and improved air quality by bringing pollution-free solar energy and high-tech manufacturing jobs to brownfield sites.[3]

WINDFIELDS

Windfield is an emerging term used to describe sites where the current use is for wind power generation or sites considered suitable for use as a wind power location. Ready windfields have some, if not all, utility infrastructure already in place or nearby.

As a redevelopment strategy, brightfields and windfields offer a range of opportunities to link energy to brownfield reuse and thereby transform community hazards and eyesores into productive, green, and increasingly profitable ventures. Both uses offer unprecedented opportunities to lift thousands of brownfield sites back into productive use, while improving air quality and reducing greenhouse gas emissions.

Ostensibly, what the BUILD Act provides is funding for clean energy projects on lands where such projects might not otherwise occur.[1] While the preference may provide some of the impetus required to make a solar or wind energy project viable, many believe its real intent is to call attention to a redevelopment opportunity thus far hidden from many participants in the renewable energy market because of uncertainties and preconceived assumptions of risk.

HISTORY

Although the first brightfield program was developed in Chicago, nowhere has there been more such development than in Massachusetts, where because of progressive environmental policies, cities and towns throughout the state have realized significant financial value by retrofitting their landfills with solar arrays. Among the more recent of these was a 2.25-megawatt (MW) project completed in 2017 on a shuttered municipal solid waste landfill in Lexington and a 1.9-MW solar array constructed at the Williamstown Landfill in western Massachusetts. In the latter case, the annual production of clean electricity is expected to offset 1,772 tons of CO_2 and conserve 1,165,340 gallons of water. Equally noteworthy, the project is expected to generate at least $5 million in savings to the town of Williamstown over the next 20 years.

And it's not just landfills. Since its inception in 2008, EPA's RE-Powering America's Land Initiative (for renewable energy) has promoted 213 renewable energy installations on contaminated lands, landfills, and mine sites across roughly 40 states and territories, with a cumulative installed capacity of just over 1,235 MWs.[4]

Included among these is the Elizabeth Mine site in Vermont, an abandoned copper mine that operated in the 19th and 20th centuries, which was later designated as an EPA Superfund site. A 5-MW solar array was installed there in late 2017 and it is expected to offset 6,000 tons of CO_2 annually, providing enough electricity to power 1,200 homes.

Let's not forget wind. The Casselman Wind Power Project in Somerset County, Pennsylvania, is a 34.5-MW wind turbine project located on 165 acres of a former mine site. It is expected to generate approximately $245,000 annually in direct economic benefit to the region in the form of taxes, easement payments, and direct landowner payments.

And, at the former Bethlehem Steel Superfund site on Lake Erie, 14 wind turbines generate a total capacity of 35 MWs—enough clean, green electricity to power more than 15,000 homes in western New York.

A GROWTH MARKET

The U.S. solar industry installed 10,600 MWs of new photovoltaic capacity in 2017, while wind power capacity increased by more than 7,000 MWs. That said, it's understandable these small (1.9- to 34.5-MW) projects didn't garner much national attention. Nevertheless, building multi-million-dollar solar arrays and wind farms across closed landfills, abandoned mine lands, and superfund sites is a great example of one of renewable energy's most exciting applications—one that creates win-win-win options for local governments and property owners, utilities and energy developers, and residents alike.

And, before you decide whether brownfields should or should not be a key growth market for America's renewable energy industry, consider this: EPA has pre-screened more than 80,000 brownfields for renewable energy siting potential, and the National Renewable Energy Laboratory (NREL) estimates landfills and other contaminated sites cover 15 million acres across the country.[5] According to NREL land-use estimates, that's enough land to generate around three million MWs of solar energy alone—meaning solar brightfields can generate roughly as much electricity as the United States consumes in a year.[5,6]

That's a lot of land. Nevertheless, not all those acres are suitable for renewable energy. Is the site close enough to transmission lines to feed the grid? Is it near graded roads so renewable energy installation is feasible? How large is the site, and how sloped is the land? These are just a few of the questions that must be asked when considering the potential feasibility of a brightfield or windfield site.

LOCATION, LOCATION, LOCATION

Capped landfills and brownfields each offer advantages for siting renewable energy projects. Landfills are typically elevated, largely unshaded sites, and are often already connected to the grid through methane generation operations. Brownfields are often former industrial sites, offering flat unshaded expanses, often in proximity to an existing power grid. Further, both sites are typically located within or close to major cities, which means they

can add new clean electricity generation in population centers without adding pollution.

A 2017 Energy Innovation analysis concluded brownfields could help solve some of the siting challenges facing state governments with high renewable energy targets without requiring large tracts of undeveloped lands.[7] According to land-use estimates in the National Renewable Energy Laboratory's Renewable Electricity Futures Study, it would require approximately 270 square miles for wind turbines and 52 square miles for solar arrays to meet New York's 50 percent renewable generation goal by 2030.[7,8] However, most of the state's undeveloped land suitable for such projects is on private or preserved land, and more than half the state is occupied by forest and woodlands, which are generally incompatible with large-scale solar development altogether.

Alternatively, brownfields could help meet this demand by focusing projects on closed landfills and former industrial sites, without causing new environmental concerns.

SEEING GREEN IN BROWN

In Annapolis, Maryland, a 16.8-MW solar energy facility is set to be built on 80 acres of a closed landfill. According to EPA, when completed, it will be the largest non-federal solar project on a closed landfill. The park will have 54,000 solar panels and is expected to create new jobs, support local businesses, offer learning opportunities for local students, and generate more than $5 million for the city over the course of its 20-year lease.

In Waterville, Maine, the city is looking to enter into a partnership with a Falmouth-based renewable energy developer to build what would become the country's largest such project: a 20-MW, $30 million solar array on a capped landfill.

In New Jersey, Public Service Electric and Gas (PSE&G) is developing 158 MWs of capacity and turning landfills and brownfields green by building solar farms on these otherwise unusable sites.

Will these types of projects become the new standard for others to follow? Time will tell. One thing is sure, the preferences for "clean energy" generation and "energy efficiency improvement" called out in the BUILD Act underscore the value these projects can bring to lands having limited development opportunities, and the potential they represent for renewable energy generation.

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