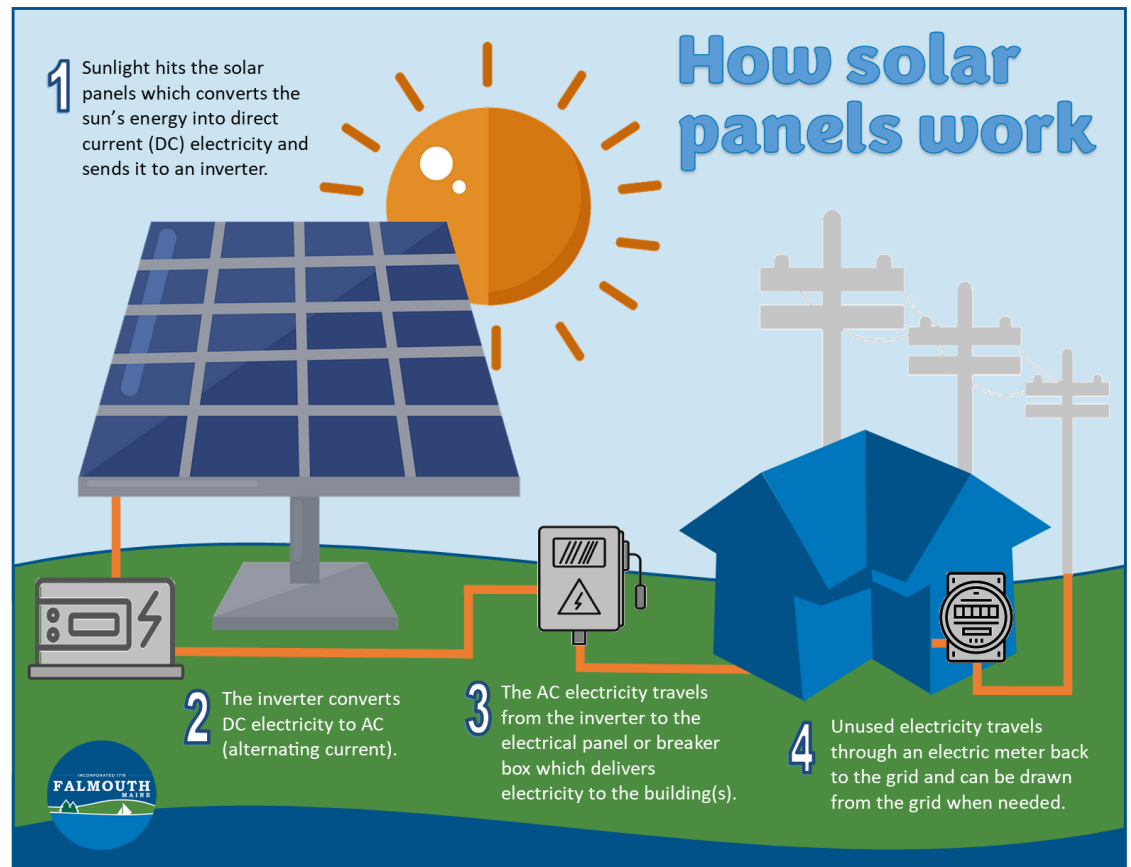


Falmouth's Landfill Solar Array

Falmouth's solar array sits on the 4.2 acre capped landfill at the Transfer Station on Woods Road. This 875 kW AC array has an expected annual output of 1,500,000 kWh and will produce enough renewable energy to offset ~70-75% of municipal electric use. Over its 20-year lifespan, the array is estimated to save the Town of Falmouth \$1.995 million in energy costs.

History

In 2007, the Town of Falmouth signed the "Mayor's Climate Agreement," which holds the Town accountable to meet an annual emission reduction goal of 2%. Several years later, the Town contracted with TRC, an engineering firm, to conduct a geotechnical and preliminary electrical analysis for the capped landfill on Woods Road. The firm determined the site to be suitable for a solar system, however, legislation set size limits on solar projects reducing their potential return on investment. Attempts at regulatory reform that would expand



Electricity Basics

1,000 watts = 1 kilowatt

1,000 kilowatts = 1MW

Kilowatt hour = the product of a certain amount of electricity times a period of time.

Direct Current (DC) = An electric charge (current) only flowing in one direction.

Alternating Current = An electric charge that changes direction periodically. The voltage in AC circuits also periodically reverses because the current changes direction.



opportunities for medium and larger-scale solar projects failed in 2016. With new changes in state solar legislation passed in 2018 and 2019, solar became a more popular investment for developers and the construction of an array in Falmouth became a real possibility.

In October 2019, the Town of Falmouth issued a request for proposals (RFP) for a solar array project and received 8 qualified submissions. In February 2020, Town staff presented these proposals to the Town Council and recommended

Tangent Energy Solutions. The Town Council approved this recommendation and signed a 20-year Power Purchase Agreement with Tangent in May 2020.

The pandemic, and accompanying supply chain issues, delayed the installation of the array. Construction began in early 2022, including the creation of an access road to the top of the landfill, the installation of

concrete bases on which the racking systems rest, and finally, the placement of the solar panels and electrical connectivity. Construction concluded in January 2023 and the site was fully operational by April.



Landfill Solar Arrays

Modern landfills require very specific measures and controls to prevent contamination of water supplies, to control odor, and to avoid gas buildup. A landfill “cap” prevents waste from contaminating the environment. The cap is a barrier protecting the surrounding area from the landfill waste. New waste cannot be added to a capped landfill but the landfill must be maintained and monitored for several years. Adding a solar array to an otherwise unusable parcel of property has become an attractive option for municipalities, though it is not without its own complexities. A ground mounted system will not work on a landfill cap. Instead, measures must be taken to ensure that the cap is not damaged, which leads to additional installation expense.

Power Purchase Agreements

The challenges and additional expense of building landfill solar arrays make these installations less attractive to developers. As a result, municipalities often look for creative options to offset these increased costs. A Power Purchasing Agreement (PPA) is one such model in which a developer builds the array and funds all associated construction and permitting costs. The developer owns the equipment for the duration of the contract. The developer then sells the power generated by the array to the utility company in return for credits and then offers those credits to the municipality at a fixed, low-cost rate, offsetting electricity costs and generating immediate savings. This

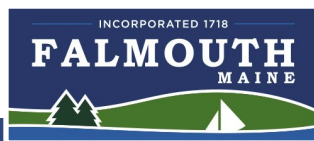
process is called net metering or net energy billing (NEB). The agreement also allows the municipality to purchase the system at a negotiated cost or to extend the contract at the end of its terms. The system owner generally retains all tax credits and other incentives generated from the system including renewable energy credits (RECs), which can be sold on the REC marketplace.

Falmouth’s Power Purchase Agreement with Tangent Energy Solutions is a 20-year contract with the option to purchase after 6 years. Central Maine Power (CMP) will provide an interconnection from the solar array to the power grid. If the array does not produce enough power to meet the Town’s needs, CMP will continue service to the Town at its current rate. Tangent has partnered with Madison Energy Investments to raise debt and equity investment in the project and to serve as the billing interface between the Town of Falmouth and CMP. In addition, the Town has contracted with Competitive Energy Services, which serves as an auditor of sorts, ensuring that the power produced by the grid is credited to the Town correctly.

Benefits

There are significant benefits to Falmouth’s solar project, including:

- Using more renewable energy is good for the environment.
- Installing the array on the landfill cap utilizes undeveloped municipal property, rather than existing open space or other public lands.
- The Town of Falmouth paid nothing for the construction and installation of the solar array.
- Tangent will pay for maintenance of the system for the duration of the PPA.
- A fixed-rate energy cost protects the Town from utility fluctuations over time.
- The Town pays a reduced rate for power, generating immediate savings.
- The array will provide power for around 70-75% of the Town’s electricity use, reducing operating expenses and providing savings to taxpayers.



More Information

Find more information and additional resources on our project page at:

www.falmouthme.org/energy-projects-resources/pages/landfill-solar-project



SCAN ME