



The City of Largo Wastewater Treatment Facility [Credit: City of Largo]

City of Largo Clear Sky Assessment Process

Prioritizing Solar + Storage for Resilient Facilities & Communities

October 2021

Project Summary

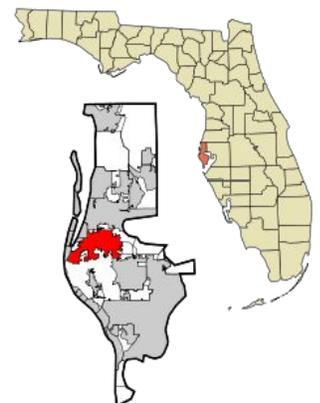
The Clear Sky Tampa Bay project was a 15-month collaborative research effort to support solar + storage deployment for community resilience in Florida. The Clear Sky Decision Support Toolkit is a collection of resources designed to support users in conducting solar + storage prioritization and feasibility screening assessments at critical facilities. The Tampa Bay Regional Planning Council worked with four local governments in the region to test and apply the Toolkit. This case study series describes how each partner government used the Toolkit and highlights key insights and lessons learned that other users can follow to replicate the process. To download the Toolkit visit www.tbrpc.org/clearsky.

Background

The City of Largo used the Clear Sky Decision Support Toolkit to advance community solar + storage resilience goals by collaborating with staff across departments and disciplines, and engaging with utility stakeholders. The City of Largo conducted an analysis of its Wastewater Treatment Facility (WWTF), which processes an average of 43 million gallons of wastewater daily. Water treatment operations are both critical and energy intensive, requiring sustained energy throughout the day.

Geographic Context

Located in Pinellas County, the City of Largo is the fourth largest city in the Tampa Bay Metropolitan Statistical Area, with approximately 84,000 residents and spanning 18.72 square miles. The city government owns and operates over 20 facilities. The City faces natural hazards including tropical cyclone winds and storm surge, tidal influences, and tornadoes.



About the Clear Sky Decision Support Toolkit:

The Toolkit includes a guide and Microsoft Excel-based Decision Support Template organized across five modules to help users assess solar and storage at critical facilities.

Quick Screening Module:

Narrow the scope of analysis from multiple facilities to no more than three. Helps users more quickly eliminate facilities that have limited need for a resilient energy solution or do not meet basic solar siting criteria from further data collection efforts.

Prioritization Module:

Determine the highest priority facility for analysis. Provides a structure for assessing the relative criticality of community functions performed by three facilities based on the facilities' role in supporting FEMA Community Lifelines and other aspects of community resilience.

PV Siting Module:

Helps users evaluate whether the site meets essential installation requirements for PV technology and whether essential power needs could be met by the installation of the PV system.

Critical Load Module:

Establishes criteria for understanding which entities rate the facility as critical and considers the facility's critical functions and associated power requirements.

Utility Engagement Module:

Helps users engage with local utility providers to identify sites for priority restoration and consider surrounding electricity infrastructure and its relationship to the facility in making solar and storage decisions.

Energy and Resilience in the City of Largo, Florida

The City of Largo became the 75th city in the nation, and 4th in Florida, to commit to transition to 100 percent renewable energy, for both government operations (by 2035) and the broader community (by 2050). The City aims to maximize energy efficiency and renewable energy generation on all new city-owned facilities.

Prior to deploying the Clear Sky Decision Support Toolkit, Largo did not have a defined energy evaluation process that considered the benefits of solar + storage in the context of community resilience and public safety. The City pursued solar + storage projects based on available funding and internal commitments as opportunities arose. Public support for solar typically drove project assessments.

Clear Sky Toolkit Stakeholders

The Clear Sky Toolkit is designed to facilitate dialogue, data collection, and decision-making across multiple stakeholder entities.

- **Toolkit Lead:** The City of Largo's Sustainability Program Administrator (Laura Thomas)
- **Additional Stakeholders:** City's Emergency Management and Engineering Departments, City Administration, Wastewater Treatment Facility Management, and Duke Energy

Facility Prioritization

Sustainability staff at the City of Largo began the Clear Sky assessment process by reviewing the Decision Support Guide and Template. Stakeholders discussed potential sites for analysis based on organizational knowledge, critical infrastructure status, and post-disaster operational experiences. The Prioritization Module helped to build objective buy-in from internal stakeholders to further support the exploration of solar + storage on city facilities.

Stakeholders selected two sites representing vastly different emergency management functions to evaluate using the Clear Sky Toolkit: traffic infrastructure at a signalized intersection in Largo and the City of Largo Wastewater Treatment Facility (WWTF). Assessing the comparative impact that a power disruption at either of the two sites would have on the surrounding community led City staff to prioritize further solar + storage evaluation at the WWTF. Although the signalized intersection plays an important role in road safety, it scored lower than the WWTF in the Prioritization Module.

Community Resilience Factors

The Prioritization Module directed sustainability staff to select FEMA Community Lifelines that are associated with the WWTF, revealing the significant role the facility plays in community resilience and public safety (Figure 1). The WWTF operates on a 24/7 basis annually. It serves approximately 123,000 individuals and must always maintain functionality for many of its subsystems in the event of crisis or disaster.

The WWTF currently has eight on-site backup diesel generators, with a combined generating capacity of 8,925 kilowatts. The Prioritization Module prompts users to identify the Social Vulnerability Index score of the census tract where the facility is located. The WWTF is situated in an area with a high SVI score, indicating a high level of vulnerability. Given the importance of this facility in safeguarding the public's health and welfare, and its apparent vulnerabilities, sustainability staff were eager to identify the potential suitability of an on-site solar + storage backup power solution.

PV Siting Specifications

In the PV Siting Module, sustainability staff responded to questions to determine the relevant site-specific information that would impact the suitability of a potential photovoltaic (PV) system, including roof age, roof size, percentage of roof shaded, and the roof's orientation to the sun.

For the City of Largo, the Decision Support Template proved useful for evaluating solar and storage at individual buildings within the WWTF complex. However, structures such as processing tanks, which many not have roofs, will need further analysis to determine the structural support needed for PV systems and equipment.



Figure 1. The FEMA Community Lifelines associated with the City of Largo Wastewater Treatment Facility.

Identifying Critical Loads

The City of Largo collected information regarding back-up generation, building profile, occupancy, and energy consumption from the WWTF facility manager. This data provided a more clear picture of the facility's most important energy needs throughout the year and in potential disaster scenarios. By working with the WWTF facility manager, stakeholders estimated that 96% of the WWTF's load would be required to sustain essential functions, which is significantly higher than an average building.

Utility Engagement

Duke Energy, the City's electric utility service provider, provided information regarding several potential projects constraints, including those related to feeder limits, interconnection agreements, and energy distribution.

City stakeholders gained insights about how Duke Energy prioritizes "critical" in the interconnection process, underscoring the need for emergency management and utility staff to coordinate more effectively moving forward. The City's sustainability staff learned that the utility maintains specific interconnection requirements for solar + storage that largely depend on the site's location. Understanding the utility's priorities prior to project development will help create stronger dialogue for conversations in the future.

Lessons Learned

The City of Largo applied the Clear Sky Toolkit to expand its internal capacity to conduct solar + storage prioritization and evaluation assessments. Through the process, City staff identified that decision making should be shared across municipal departments and functional areas in order to accurately reflect the complexities of solar + storage planning. The Clear Sky Toolkit was a useful resource to support cross-departmental planning.

Next Steps

By using the Decision Support Toolkit, the City of Largo identified opportunities for future stakeholder collaboration in conducting solar + storage siting assessments across the City's portfolio of buildings. Largo staff will apply the Toolkit to help quantify potential future risks and highlight shared goals and critical linkages that should be considered in municipal finance, insurance, and other planning initiatives.

Tips for Toolkit Users

Additional Tips for Success:

1. New users should review the Decision Support Guide before beginning an assessment with the Decision Support Template. Carefully read through questions and identify data needs before responding to questions.
2. Send the Template to team members with tags and notes identifying where specific questions should be answered by each function group or stakeholder type.
3. Clearly communicate the complexity of the process with users and collaborators, and outline what the commitments and involvements will be from each subject matter expert.
4. Engage utilities early in the process to allow for deeper, more meaningful input. Municipalities within the utility service territory should partner to gauge vulnerabilities and resilience needs across the region.
5. A large barrier was identifying the appropriate utility contact to assist in completing the toolkit, which requires someone who has the authority to participate as well as the technical knowledge to complete the questions.
6. Remember that the Clear Sky Toolkit is a research tool which prompts users to seek out information necessary to support decision making. It is not intended to yield definitive answers and should not substitute detailed feasibility and engineering studies.



Clear Sky Tampa Bay

A Regional Framework for Enhancing Resilience through Solar + Storage



This work was authored by The Tampa Bay Regional Planning Council and the City of Largo under Subcontract No. SUB-2020-10331 as part of the Solar Energy Innovation Network, a collaborative research effort administered by the National Renewable Energy Laboratory under Contract No. DE-AC36-08GO28308 funded by the U.S. Department of Energy's (DOE) Office of Energy Efficiency and Renewable Energy Solar Energy Technologies Office. The views expressed herein do not necessarily represent the views of Alliance for Sustainable Energy, LLC, the DOE, or the U.S. Government.



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