



Hillsborough County Clear Sky Assessment Process: Prioritizing Solar + Storage for Resilient Facilities & Communities

Sheila McNamara, Bart Weiss, Troy Salisbury, and Eric Pyzowski

Hillsborough County

NREL Technical Monitor: Sara Farrar

**NREL is a national laboratory of the U.S. Department of Energy
Office of Energy Efficiency & Renewable Energy
Operated by the Alliance for Sustainable Energy, LLC**

This report is available at no cost from the National Renewable Energy Laboratory (NREL) at www.nrel.gov/publications.

Contract No. DE-AC36-08GO28308

Subcontract Report
NREL/SR-7A40-90001
June 2024



Hillsborough County Clear Sky Assessment Process: Prioritizing Solar + Storage for Resilient Facilities & Communities

Sheila McNamara, Bart Weiss, Troy Salisbury, and Eric Pyzowski

Hillsborough County

NREL Technical Monitor: Sara Farrar

Suggested Citation

McNamara, Sheila, Bart Weiss, Troy Salisbury, and Eric Pyzowski. 2024. *Hillsborough County Clear Sky Assessment Process: Prioritizing Solar + Storage for Resilient Facilities & Communities*. Golden, CO: National Renewable Energy Laboratory. NREL/SR-7A40-90001. <https://www.nrel.gov/docs/fy24osti/90001.pdf>.

**NREL is a national laboratory of the U.S. Department of Energy
Office of Energy Efficiency & Renewable Energy
Operated by the Alliance for Sustainable Energy, LLC**

This report is available at no cost from the National Renewable Energy Laboratory (NREL) at www.nrel.gov/publications.

Contract No. DE-AC36-08GO28308

Subcontract Report
NREL/SR-7A40-90001
June 2024

National Renewable Energy Laboratory
15013 Denver West Parkway
Golden, CO 80401
303-275-3000 • www.nrel.gov

This publication was reproduced from the best available copy submitted by the subcontractor and received no editorial review at NREL.

This publication was part of a larger project. The full project can be found at <https://tbrpc.org/clearsky/>.

NOTICE

This work was authored in part by the National Renewable Energy Laboratory, operated by Alliance for Sustainable Energy, LLC, for the U.S. Department of Energy (DOE) under Contract No. DE-AC36-08GO28308. Funding provided by U.S. Department of Energy Office of Energy Efficiency and Renewable Energy Solar Energy Technologies Office. The views expressed herein do not necessarily represent the views of the DOE or the U.S. Government.

This report is available at no cost from the National Renewable Energy Laboratory (NREL) at www.nrel.gov/publications.

U.S. Department of Energy (DOE) reports produced after 1991 and a growing number of pre-1991 documents are available free via www.osti.gov.

Cover Photos by Dennis Schroeder: (clockwise, left to right) NREL 51934, NREL 45897, NREL 42160, NREL 45891, NREL 48097, NREL 46526.

NREL prints on paper that contains recycled content.



The Brandon Support Operations Complex (BSOC) in Hillsborough County. [Credit: Hillsborough County]

Hillsborough County Clear Sky Assessment Process

Prioritizing Solar + Storage for Resilient Facilities & Communities

October 2021

Project Summary

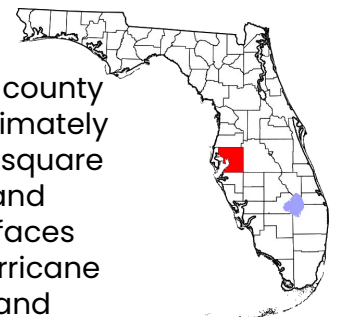
The Clear Sky Tampa Bay project was a 15-month collaborative research effort to support solar + storage deployment for community resilience in Florida. The Clear Sky Decision Support Toolkit is a collection of resources designed to support users in conducting solar + storage prioritization and feasibility 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

Hillsborough County used the Clear Sky Decision Support Toolkit to analyze solar + storage as an additional resiliency feature at its Brandon Support Operation Complex (BSOC). During normal operations, the BSOC houses water utility administration services and workspaces for water and wastewater engineers, facilities maintenance, and environmental management staff. During emergency management activation, the BSOC serves as an emergency hub for Emergency Support Function 3 (ESF-3), which includes public utilities, public works, and engineering staff support members. The BSOC is designated as a critical facility by the County.

Geographic Context

Hillsborough County is the fourth largest county by population in Florida, home to approximately 1.47 million residents and spanning 1,266 square miles. The County operates 550 staffed and unstaffed facilities. Hillsborough County faces numerous hazards, including tropical hurricane 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 Hillsborough County, Florida

Hillsborough County is pursuing multiple initiatives to improve the sustainability and resilience of county operations, including modernizing technologies across its facilities and maintaining requirements for energy monitoring and savings. Hillsborough County installed its first solar projects in 2010, which included a 195 kilowatt (kW) rooftop system at the Hillsborough County Courthouse and a 98 kW system at All People's Life Center Gym. Solar projects in Hillsborough County have been driven by energy conservation and greenhouse gas emissions reduction goals, "lead-by-example" initiatives, and workforce development efforts. Solar siting decisions in the County have historically been based on the age and type of roof structures, building function and orientation, user groups served, and funding availability.

As of October 2021, Hillsborough County has 24 facilities equipped with solar arrays and 84 permanent generators installed across County campuses, including at fire stations, libraries, courthouses, and administrative and service center buildings. The County has deployed solar + storage applications to power lighted directional signage and other traffic safety-related measures. However, the County had not evaluated the potential of solar + storage to provide resilience benefits at community buildings or other critical facilities before using the Clear Sky Decision Support Toolkit. As solar energy continues to become more affordable in Florida, the County will consider incorporating solar + storage projects for redundancy as part of its resilience planning strategy.

Clear Sky Toolkit Stakeholders

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

- **Toolkit Leads:** Hillsborough County's Sustainability Manager (Sheila McNamara), Chief Resilience Officer (Bart Weiss), Hazard Mitigation Manager (Troy Salisbury), Energy Manager (Eric Pyzowski)
- **Additional Stakeholders:** Hillsborough County Sustainability, Public Utilities Water Resources, Environmental Services, Innovation and Resiliency, Office of Emergency Management, County Administration, Covanta, and Tampa Electric Company (TECO).

Facility Prioritization

Sustainability and Resiliency staff at Hillsborough County began their solar + storage assessment process by reviewing the Clear Sky Decision Support Guide and Template. Stakeholders discussed potential sites for analysis based on organizational knowledge, critical infrastructure status, and post-disaster operational experiences.

Staff completed the Prioritization Module within the Decision Support Template for two of the County's critical facilities: the Twiggs Street Water Resources Building, which is undergoing renovations and will house administrative offices for public utility staff; and the Brandon Support Operations Complex (BSOC), which serves as an administrative and emergency management rally point during major events. Based on the scoring outputs from the Prioritization Module, staff proceeded with further solar + storage evaluation at the BSOC.

Community Resilience Factors

The Prioritization Module directed staff to identify FEMA Community Lifelines that are associated with the BSOC (Figure 1). This step helped Toolkit users understand the criticality of a facility from multiple viewpoints and recognize which internal and external parties will be affected and should be involved in the decision-making process. The BSOC complex functions on a 24/7 basis throughout the year and provides support for the County's potable and wastewater systems. The BSOC plays an important role related to the following FEMA Community Lifelines in Hillsborough County: Safety and Security; Food, Water, and Shelter; and Communications. A power disruption at the BSOC could potentially risk life, safety, and welfare of Hillsborough citizens and visitors.

Utility Engagement

Hillsborough County owns a Resource Recovery Facility (RRF) plant, operated by Covanta, which functions as a micro-grid serving 100 percent of the BSOC load. Operations staff from Covanta contributed input as part of the Utility Engagement Module. The Covanta plant operates independently from the main regional utility grid. While the BSOC is equipped with a 240-hour diesel generator, stakeholders identified that modernization and redundancy are critical considerations, as there is only one feeder line that delivers power from the Covanta plant to the BSOC. The complex would be required to run solely on generator power under extreme emergency conditions, amplifying the need for a clean, reliable back-up power option. Stakeholders also identified potential constraints that would impact solar and storage system feasibility and design, including feeder limits and interconnection agreements. These considerations are informing next steps between the County and utility provider.



Figure 1. The FEMA Community Lifelines associated with Hillsborough County's Brandon Support Operations Complex (BSOC).

Identifying Critical Loads

County staff worked to collect information related to back-up power generation, building load profiles, occupancy trends, and energy consumption at the BSOC. This information enabled stakeholders to identify and discuss the most important energy requirements at the BSOC during normal operations throughout the year and during potential disaster scenarios. Through this process, stakeholders determined that, under emergency conditions, all loads in this facility would be critical to County operations.

Next Steps

By using the Clear Sky Decision Support Toolkit, Hillsborough County has identified many opportunities for future collaboration and has expanded the dialogue regarding capital infrastructure planning and financing to incorporate solar + storage system applications. The County will continue to evaluate energy usage at the BSOC with particular attention paid to the complex resiliency considerations and long-term planning associated with operating and maintaining this critical facility.

Tips for Clear Sky Toolkit Users

Cross-departmental collaboration was critical to the success of this resilient solar + storage assessment. Hillsborough County sustainability and resiliency staff expressed enthusiasm about the Clear Sky Decision Support Toolkit as a resource for bringing key stakeholders from various departments to the table. Prior to gathering data for the Decision Support Template, staff previewed the questions in the Decision Support Guide and identified key stakeholders, which helped to consolidate their requests.

Additional Tips for Success:

1. Focus on the criticality of facilities and existing redundancy of backup power options to justify costs of systems and to develop a logical comparative analysis.
2. In cases with high critical load percentages, consider additional socio-economic resilience metrics to justify costs of larger systems and to help project advancement.
3. Consider the interdependencies of FEMA Community Lifelines, especially among facilities with electrical interconnection.
4. 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 Hillsborough County 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.



**Hillsborough
County Florida**

Hillsborough County, Florida

Sheila McNamara, Sustainability Manager
Bart Weiss, Chief Resilience Officer
Troy Salisbury, Hazard Mitigation Manager
Eric Pyzowski, Energy Manager