



# Solar for Safety, Security, and Resilience Toolkit

There is a growing interest in using renewable energy options like solar to improve community resiliency. During extreme weather events, solar can help prevent power outages by providing emergency energy to critical facilities and recovery efforts. Solar can provide electricity to remote or less accessible areas, and is flexible enough to be a mobile or temporary power source. In addition to resiliency planning, there are efforts to promote new safety education and guidelines for solar installation, especially related to fire prevention. Also, there is rising interest in how solar can influence homeland security. Not only does greater solar deployment reduce dependence on foreign sources of energy, a large network of distributed energy generation like solar can mitigate energy security concerns by reducing reliance on a single regional power source.

The *Solar for Safety, Security, and Resilience Toolkit* demonstrates the different ways of thinking about and incorporating solar energy into ongoing public safety, homeland security, and resiliency initiatives. The toolkit is designed to walk a regional council through each of the necessary decisions and actions to solar energy integration in the region. It presents basic information about the benefits of adopting solar energy to increase regional resiliency and preparedness, and then explores different ways a regional council can finance, plan, and implement solar energy in their community.

The *Solar for Safety, Security, and Resilience Toolkit* is broken down into four main categories, all focused on the overarching strategy of solar for public safety, resilience, and security: The Case for Solar, Financing, Planning, and Implementing. Each category contains several resources in the form of case studies, workshop presentations and materials, fact sheets, and reports. The examples included in the toolkit can be easily modified and replicated by any regional council to meet its specific needs.

For more generalized background information about the role of regional councils in deploying solar, see the National Association of Regional Councils' [Regional Solar Deployment Handbook](#). Together, the handbook and toolkit provide the necessary foundation to understand the more complex components of solar energy development for public safety, security, and resiliency.



# THE CASE FOR SOLAR

Regional councils nationwide are increasing their focus on issues of resiliency and energy planning. Communities are now looking at solar as a viable option to achieve their goals for safety, security, and resilience. Integrating solar energy into your region can help prevent outages during extreme weather, protect critical facilities, provide energy in remote areas, and reduce energy security concerns. The first step a regional council can take to include solar energy in its safety, security, and resiliency initiatives is to make the case and garner support for solar. The following resources serve as an introductory guide to solar energy's role in those initiatives, including guides, webinars, and websites that highlight the benefits of solar in protecting services and critical facilities, mitigating hazards, providing energy in remote areas, and moderating concerns about national energy security.

## **[Solar Energy and Resilience Planning: A Practical Guide for Local Governments](#)**

*Resilient Communities for America*

This guide provides a comprehensive look at the benefits of solar in planning for resiliency, including prevention, response, and recovery.

## **[Using Solar Energy to Enhance Community Resilience](#)**

*American Planning Association*

This webinar provides an overview of the connections between solar energy use and community resilience, along with a series of recommendations for local governments, including planning and financing steps.

## **[Distributed Solar PV for Electricity System Resiliency](#)**

*National Renewable Energy Laboratory*

This research paper highlights the potential for solar to supply electricity during grid outages resulting from extreme weather and other emergency situations.

## **[Disasters and Energy Security Management](#)**

*Florida Solar Energy Center*

This research paper explains how solar photovoltaic (PV) systems can provide power for emergency response activities following natural and man-made disasters.

## **[Solar PV Emergency & Resilience Planning](#)**

*Meister Consultants Group*

This brief provides a summary of solar PV applications for emergency planning, followed by an evaluation of criteria for choosing the right type of solar application for resilience.



### **Enlisting the Sun: Powering the U.S. Military with Solar Energy**

*Solar Energy Industry Association*

This factsheet provides concise information about the extent the U.S. Military uses solar both domestically and abroad. [\[Full report.\]](#)

### **Distributed Power Generation for Homeland Security**

*Clean Energy Group*

This white paper demonstrates the vulnerability of the United States' current electricity system and makes recommendations for moving toward more distributed power generation for security benefits.

### **The Potential Benefits of Distributed Generation**

*U.S. Department of Energy*

This report highlights the homeland security and resiliency benefits of distributed rooftop solar PV power generation.

### **Solar + Storage 101: An Introductory Guide to Resilient Solar Power Systems**

*Clean Energy Group*

This publication gives an overview of how solar combined with energy storage can provide power indefinitely when the grid is unavailable, in a versatile and affordable way.



Once your regional council has gained interest in bringing solar to its communities, the next step is to determine the best way for the region to finance the proposed projects. Although solar projects can carry a high upfront cost, there are a variety of financing strategies that can make them cost-effective. The [\*Regional Solar Deployment Handbook\*](#) provides general solar financing strategies, while the resources found in this section of the toolkit focus primarily on financing solar for public safety, homeland security, and resilience. These types of solar projects have the opportunity to tap into different funding sources.

## **Resilient Power: Evolution of a New Clean Energy Strategy to Meet Severe Weather Threats**

*Clean Energy Group and Meridian Institute*

This report identifies key financing tools for investing in solar and other clean energies for resiliency.

## **Financing Resilient Power**

*Clean Energy Group and Meridian Institute*

This webinar identifies financing options for clean, resilient power solutions.

## **Reduce Risk, Increase Clean Energy**

*Clean Energy Group and Meridian Institute*

This report examines how states and cities are using traditional finance tools to invest in clean energy for emergency preparation.

## **Financing Options and Funding Opportunities to Support Local Government Energy Assurance Planning**

*California Local Energy Assurance Planning*

This guide identifies the financing options and funding opportunities that can underwrite energy assurance capital projects and actions.

## **Solar Energy and Resilience Planning: A Practical Guide for Local Governments**

*Resilient Communities for America*

This guide provides a comprehensive look at the benefits of solar in planning for resiliency, including prevention, response, and recovery. It includes a section on financing strategies.

## **Clean Energy for Resilient Communities**

*Clean Energy Group*

This analysis of the City of Baltimore, Maryland's efforts to expand solar generation focuses on vulnerable populations and highlights financing options for local governments.

When planning solar energy for public safety, homeland security, or resilience, it is often more practical to integrate solar strategies into existing planning efforts rather than to create new plans. These resources address planning for solar more expansively, as well as how to integrate it into hazard mitigation plans, comprehensive plans, and emergency preparedness plans.

## **Solar Energy and Resilience Planning: A Practical Guide for Local Governments**

*Resilient Communities for America*

This guide includes methods and examples for integrating solar into current, resiliency planning efforts.

## **Role of Solar in Emergency Planning**

*Metropolitan Energy Policy Coalition*

This section of the Coalition's solar toolkit highlights how solar on public buildings can be an asset for resiliency.

## **Solar PV Emergency & Resilience Planning**

*Meister Consultants Group*

This brief provides a summary of solar PV applications for emergency planning and an analysis of the criteria for choosing the right type of solar application for resiliency.

## **Integration of Solar Energy into Emergency Planning**

*CH2M HILL*

This study explores how to integrate solar technology into New York City's emergency preparedness activities.

## **What Cities Should Do: A Guide to Resilient Power Planning**

*Clean Energy Group*

This series of guidelines and best practices will help communities prepare for severe weather impacts and subsequent power outages. It calls for a systematic approach to protect critical facilities with smarter resilient power solutions.

There are multiple ways a regional council can implement solar energy into its safety and resiliency efforts, whether the focus is on using solar to provide reliable energy to remote areas, firefighter safety when installing solar, or promoting disaster resiliency by integrating solar into evacuation routes and on critical facilities. This section of the toolkit provides several examples of how to successfully integrate solar into these types of initiatives.

## **FIRST RESPONDER SAFETY**

Guidelines for solar installations and online trainings for firefighters are examples of how regional councils can promote safer solar deployment.

### **Solar and Fire Safety**

*San Jose, California Fire Department*

This two-part video series offers an overview of how solar energy systems work and tips for first responders to stay safe.

### **Guidelines for Fire Safety Elements of Solar Photovoltaic Systems**

*Orange County Fire Chiefs Association*

These guidelines establish a minimum standard for the layout design, marking, and installation of solar PV systems, and is intended to mitigate fire safety issues.

### **Fundamentals of PV for the Fire Service (Awareness Training) and Fire Operations for PV Emergencies (Operational Training)**

*California State Office of the Fire Marshal*

These two online training modules were developed to train firefighters on how to respond to a building fire with solar panels on the roof, along with essential safety tips and hazard mitigation strategies.

### **Rooftop Solar PV & Firefighter Safety**

*Meister Consultants Group*

This brief is designed to educate and inform decision-makers and fire safety officials about the key considerations regarding safety and solar PV. It includes background information and several practical recommendations.

### **Fire Fighter Safety and Emergency Response for Solar Power Systems**

*National Fire Protection Association*

This report assembles best practice information for fire fighters, fire ground incident commanders, and other emergency first responders to assist in their decision-making process during emergencies involving buildings with solar power systems.



## HOMELAND SECURITY AND RESILIENCE

The following resources are examples of how communities, regions, states, and the military have integrated solar into their security and resiliency efforts.

### [Boston Solar Evacuation Route](#)

*Meister Consultants Group*

This presentation details the City of Boston's work to integrate solar into their emergency response efforts, specifically the construction of a solar evacuation route pilot project.

### [U.S. Department of Defense's Energy Efficiency and Renewable Energy Initiatives](#)

*Environmental and Energy Study Institute*

This factsheet highlights the U.S. Department of Defense's solar and renewable energy initiatives, including links to 28 projects.

### [New Initiatives in Community Resilient Power](#)

*Clean Energy Group*

This webinar includes lessons learned from the development of community resilient power projects in New York City, Washington D.C., and throughout the country.

### [Alternative Energy Generation Opportunities in Critical Infrastructure \(New Jersey\)](#)

*National Renewable Energy Laboratory*

This report is an example of how a state or region can identify where distributed generation of solar PV might work best in an emergency.

### [Florida Solar Energy Center](#)

This website is a resource for basic information about solar options for disaster preparedness.

## ENERGY IN REMOTE AREAS

Rural and remote areas are vulnerable to power outages and response time to restore power can be slow. Solar energy provides a solution to these issues with on-site renewable power generation.

### [Renewable Power Opportunities for Rural Communities](#)

*U.S. Department of Agriculture*

This report highlights solar as an option for rural communities, and how it prevents out-of-state transmission costs and vulnerabilities.

### [Green Technology for Disaster Recovery and Remote Areas](#)

*American Society for Engineering Education*

This report describes all the types of solar technology that can be used after a disaster, and the innovative uses for solar in remote areas.

# ADDITIONAL RESOURCES

Below is a list of resources to help move solar for safety, security, and resiliency forward in your region.

## **[Resilient Communities for America](#)**

A campaign to create more prepared communities that can bounce back from extreme weather, energy, and economic challenges.

## **[Clean Energy Group](#)**

A national, non-profit advocacy organization that works in the U.S. and internationally on innovative technology, finance, and policy programs in the areas of clean energy and climate change.

## **[Department of Homeland Security's Energy Sector](#)**

The U.S. Department of Homeland Security recognizes the need to protect a stable energy supply.

## **[Resource Hub: Using Solar Energy to Enhance Community Resilience](#)**

This Solar Outreach Partnership web page provides summaries and links to online resources for using solar energy to improve energy security and reduce economic uncertainty; emergency preparedness and response; and hazard mitigation and post-disaster recovery.

## **[Solar Technical Assistance Overview and Applications](#)**

This webinar provides an overview of the types of technical assistance available from the National Renewable Energy Laboratory, including the application process and a review of past participants' experiences.

For more information on implementing solar in your region, see the **[Regional Solar Deployment Handbook](#)**. This comprehensive resource provides an overview of solar technology and the solar market. It identifies seven actions regional councils can take to promote solar in their communities.



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