VIRGINIA ENERGY RESILIENCE STUDY (VER)

Informational Session 10/22/2024

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VIRGINIA Energy

OUR TEAM

PARTNERS

Virginia Department of Energy
- Resilient Virginia
  - Launch! Consulting
  - Leslie King Consulting
- Solar Workgroup of SWVA
- CASE/James Madison Univ.
- Virginia Clean Cities
- Clean Energy States Alliance

Funded by the U.S. Department of Energy – Solar Energy Technology Office (SETO).

ENERGY RESILIENCE

What is the Virginia Energy Resilience Study?

The Virginia Energy Resilience Study (VER) is working with economically impacted communities across the state to measure their energy resilience and identify practical long-term solutions to reduce vulnerabilities.

Energy resilience aims to prevent energy (including electricity) disruptions and keep our lives running smoothly.

WHAT ARE YOUR NEEDS?

How will energy resilience be measured?

To measure community energy resilience, we'll answer these key questions:

- What weaknesses exist in your local power sources?
- How do power outages affect essential services and household needs?
- What is the financial cost of power outages to your community?

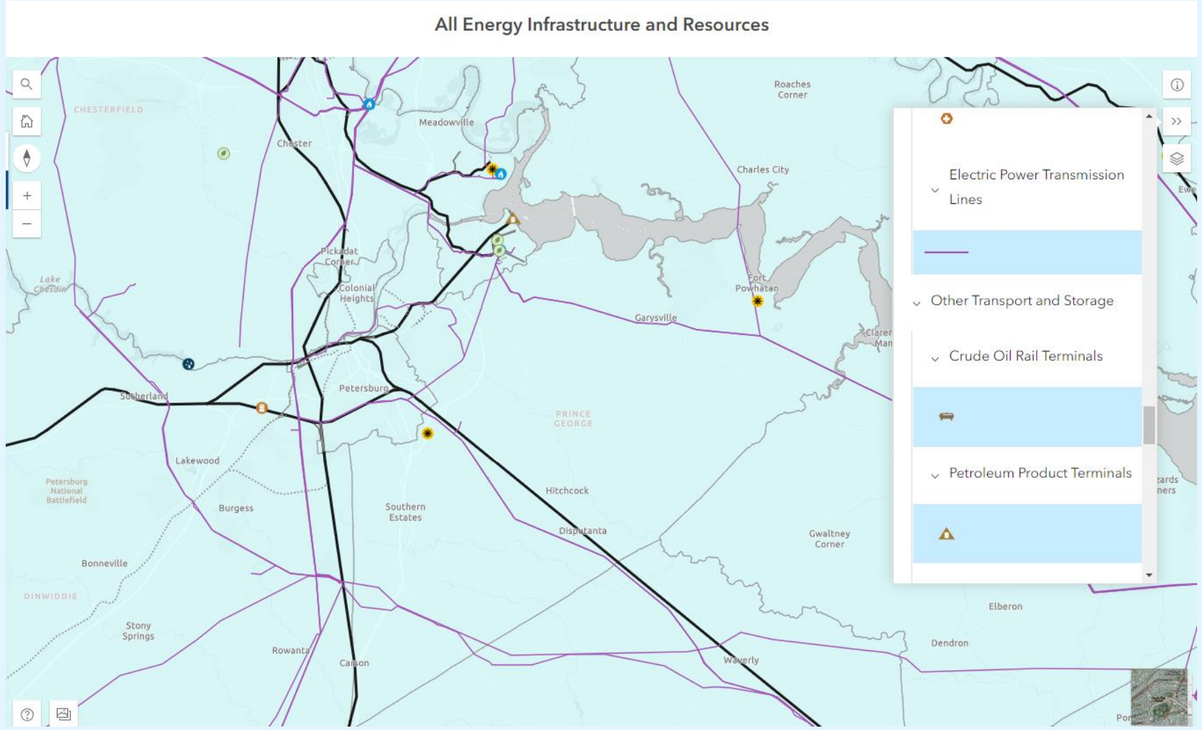
Following the remnants of Hurricane Helene, the Virginia Department of Transportation's (VDOT) Bristol District has worked diligently to re-open roads and remove debris. https://www.vdot.virginia.gov/news-events/news/bristol-district/hurricane-helene-roadway-recovery-efforts-continue-in-southwest-virginia.html

STRATEGIC PLANNING

What will you learn?

By answering these questions, you'll gain insights into:

- Where energy improvements are needed
- Practical solutions to reduce or eliminate weaknesses
- Long-term solutions to meet your energy needs



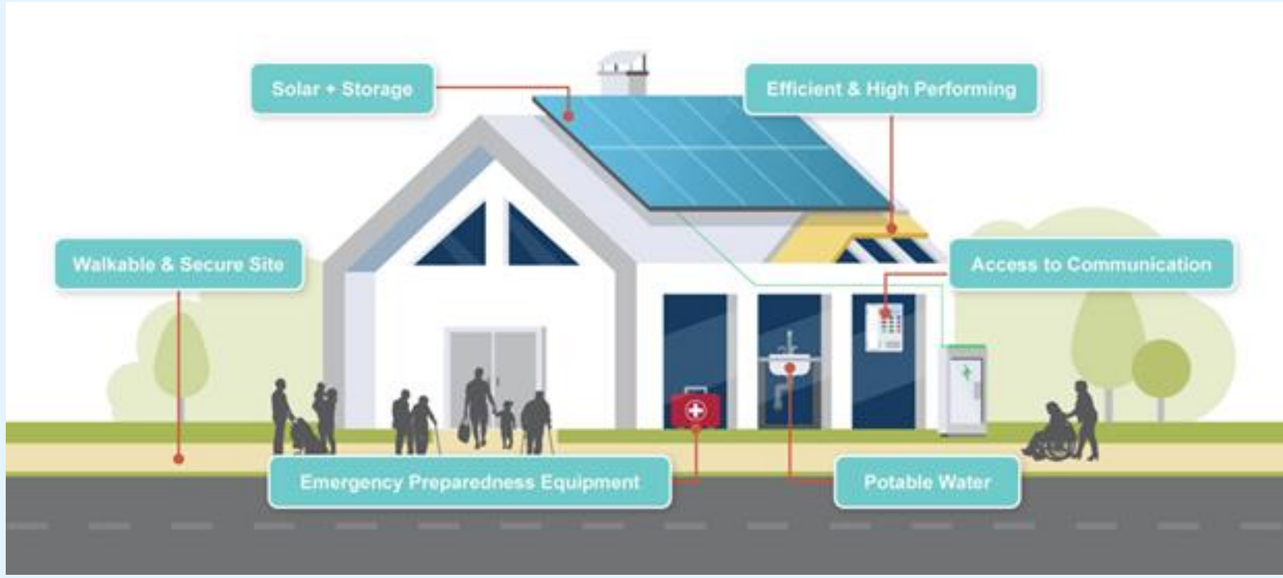
Example U.S. Energy Information Administration map indicating transmission lines, power plants, railroad lines, and petroleum terminals.

BENEFITS

How will your community benefit?

Your community will:

- Receive an energy resilience profile to help you understand your specific vulnerabilities and ways to reduce them
- Be invited to apply for one of ten solar plus storage design projects where you will receive a customized engineering design for an **energy resilience hub**.



Source: https://rmi.org/community-resilience-hubs/

RESILIENCE HUBS

An Energy Resilience Hub is a community-serving facility that provides reliable access to power.

Community Centers

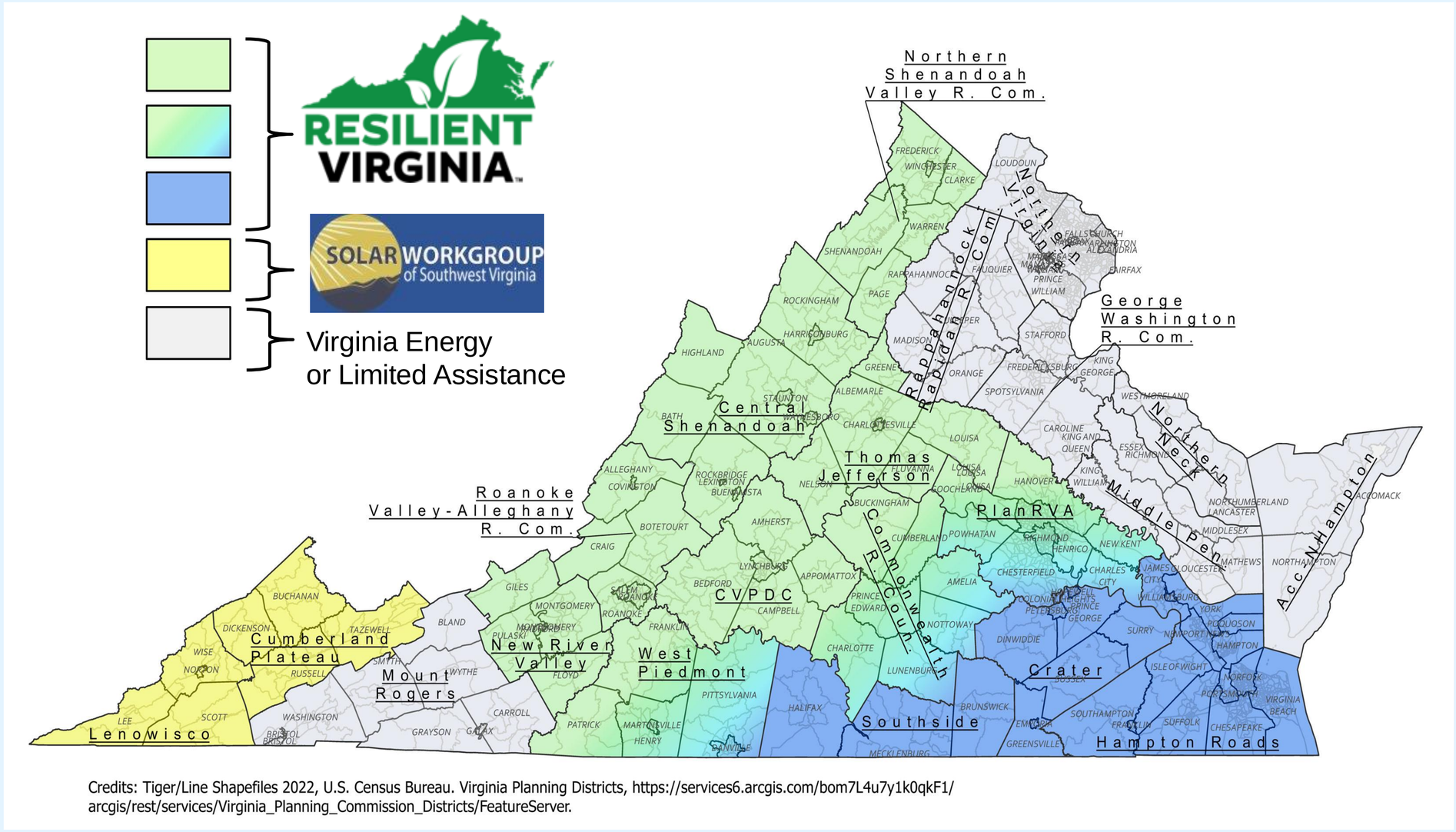
Schools

Churches

Emergency Services Departments

Recreational Centers

PARTNERSHIPS



Credits: Tiger/Line Shapefiles 2022, U.S. Census Bureau. Virginia Planning Districts, https://services6.arcgis.com/bom7L4u7y1k0qkF1/arcgis/rest/services/Virginia_Planning_Commission_Districts/FeatureServer.

WHAT WE WILL DO

Nov/Dec (2024):

We will assist participating communities in filling out as much information as is publicly available and then have you answer questions related to your community.

This Winter (2024-25):

We will help with the application process for one of the ten design projects in 2025 which comes with a stipend for the participating community.

Even if you don't participate:
End-of-Project (2025-26):

We will make **Assessment tools** available for state agencies, local governments, community emergency planning services, electric utilities, planning offices and other community stakeholders.

THANK YOU!

Communities interested in participating or that have additional questions may contact Virginia Energy at resilience@energy.virginia.gov

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COMMUNITY ENERGY RESILIENCE SCORING TOOL AND WORKBOOK

JON MILES, CENTER FOR THE ADVANCEMENT OF SUSTAINABLE ENERGY

MARIA PAPADAKIS, SCHOOL OF INTEGRATED SCIENCES

JAMES MADISON UNIVERSITY

VERS COMMUNITY INFORMATION SESSION

OCTOBER 22, 2024

- Our project is not about evaluating the resilience of a physical energy system
- It **is** about how resilient communities are when they lose electric power
- How much does your community provide vital services and meet needs during an extended power outage?
- How disrupted are you? Who is vulnerable to harm? Can you do better to protect your community members?

THE COMMUNITY ENERGY RESILIENCE EVALUATION PROCESS

Your work flow

- Form a team, 3-4 people is good
- Ideally someone from public safety or emergency planning is part of the team
- Complete a set of 3 worksheets for each impact area (for a total of 12 worksheets)
- Talk to stakeholders to gather information for the spreadsheets
- This will take several hours spread out over 3-4 weeks

The evaluation steps

Step 1: Identify areas of potential impact

What vital services and needs are present in your community?

Step 2: Identify and score your current capabilities

What is your community currently capable of doing when faced with different kinds of outages? This is your current energy resilience.

Step 3: Identify your vulnerabilities

Vulnerabilities represent vital services and needs that are not getting met during a power outage, and who this affects.

Step 4: Identify vulnerabilities for improved energy resilience

Prioritize important vulnerabilities to explore options for improved energy resilience.

Ordinary Outages

high frequency / low impact

A few minutes to a few hours. Usually a technical problem with utility system or a small storm. Minimal-to-no impacts with easy ways to cope.

Major Outages

~1-3 days duration. Usually caused by bad weather. Potentially harmful household impacts (spoiled food, loss of medical equipment, phone, Internet, lack of heating or cooling). Schools, businesses, and other important community facilities are closed.

Extreme Outages

~Several days to 1-2 weeks. Caused by extreme weather events. Sheltering in place may be potentially dangerous or life-threatening. Widespread closures, some property and infrastructure damage likely. Community can generally recover once power is fully restored.

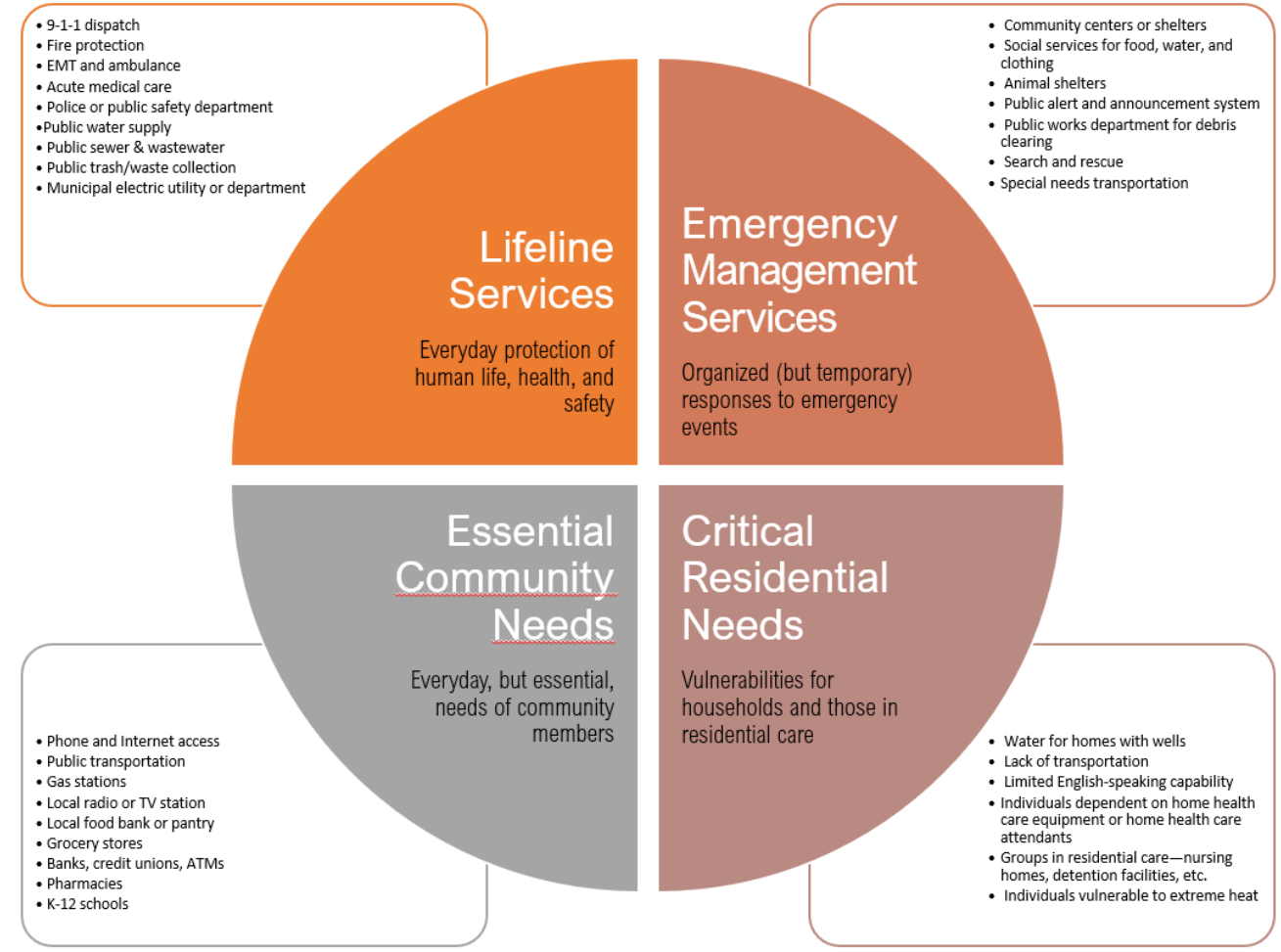
Catastrophic Outages

low frequency / high impact

Many weeks to months. Caused by catastrophic natural disasters. Widespread property and infrastructure damage. Overall community recovery time is long (months to years) even when power is restored.

OUTAGES ARE NOT ALL THE SAME

how resilient do you want or need to be?

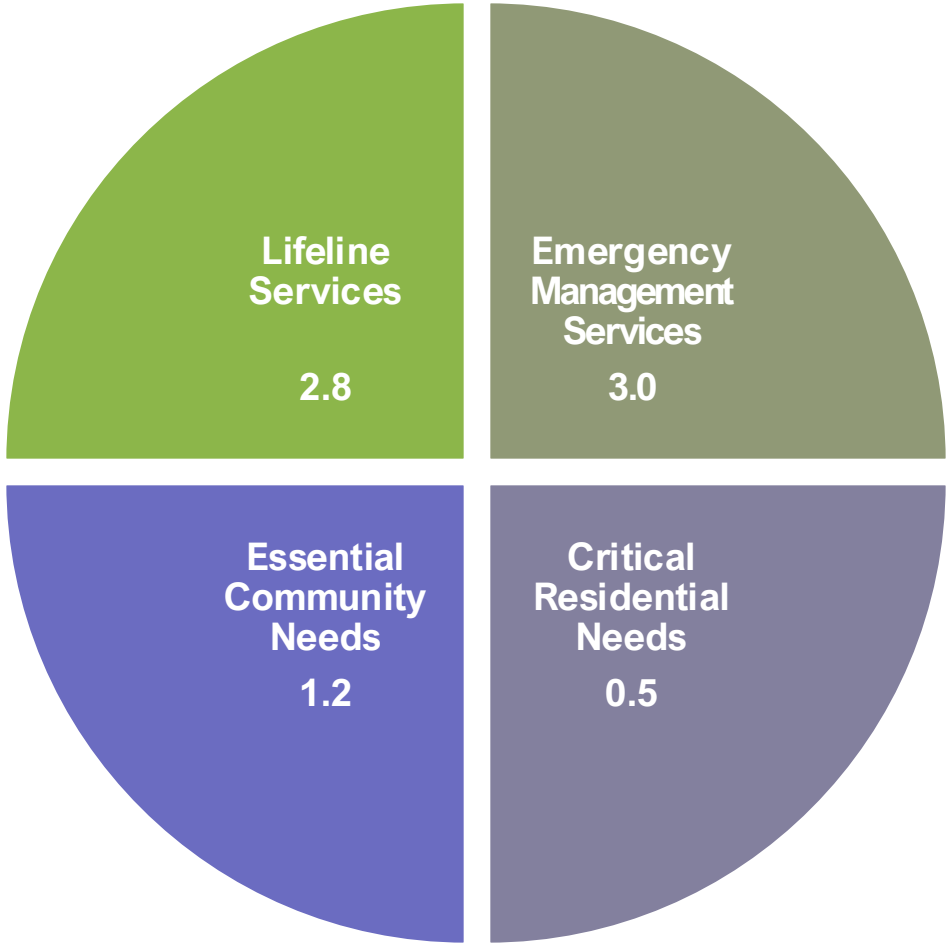


OUTAGES HAVE DIFFERENT TYPES OF IMPACTS

what kinds of resilience do you need or want to have?

COMMUNITY ENERGY RESILIENCE SCORING

If the score is—	It means that—
0-1	Your community's current capability and energy resilience is limited to common ways of coping with ordinary outages. Your community is vulnerable to outages that last longer than a few hours or a day.
1-2	Your community seems fairly resilient to disruptions caused by major outages, which are those that last 1-3 days and do not involve any significant property or infrastructure damage.
2-3	Your community appears prepared for both major and extreme outages, which can last up to about 2 weeks and may involve some property and infrastructure damage.
3-4	Your community seems ready to manage potentially catastrophic natural disasters, which have power outages that last more than two weeks and may involve widespread property and infrastructure damage.



THE WORKSHEETS

- Three worksheets, one each for Steps 1-3
- Each impact area is evaluated using all 3 worksheets
- All worksheets are structured the same way
- The workbook suggests who to talk to, what kinds of questions to ask, and how to interpret your findings

Step 1: Identify areas of potential impact

What you evaluate depends on what kind of community you are.

Two different sets of worksheets:

- For independent cities and incorporated towns
- For unincorporated towns and communities

Lifeline Facilities and Services

Lifeline facilities and services protect human life, health, and physical safety. These are present as everyday community support. Lifeline facilities and services are usually provided by a local or county government.

Facility or Service	Explanation
☐ 9-1-1 call center and dispatch	A 9-1-1 call center and dispatch is operated by your city or town.
☐ Fire protection	Fire protection is provided by your city or town, or a fire station is present in your Census tract.
☐ Rescue squad or ambulance	Emergency medical response through a rescue squad or ambulance service is provided by your city or town, or a rescue squad station is present in your Census tract.
☐ Police and public safety	Your city or town has a police or public safety department, or a police station is present in your Census tract.
☐ Acute medical care facilities; hospital, urgent care clinics, etc.	An acute medical care facility is in your city or town, or is present in your Census tract. (Acute medical care is when someone receives immediate, short-term treatment for a sudden major injury, illness, or medical condition. This care is usually provided at hospitals or urgent care clinics.)
☐ Public water	Your city or town operates a municipal water supply.
☐ Public sewer and wastewater treatment	Your city or town operates a public sewer and/or wastewater treatment system.
☐ Municipal electric utility or electric department	If your city or town has its own electric utility or electric department, please see part X of the workbook. The resilience of an electric utility is evaluated in a different way.

Step 2: Identify and score your current capabilities

You only evaluate and score the services or needs you checked in Step 1

The scoring is a weighted average. If you don't have some of the listed services/needs, it doesn't affect your score.

Lifeline Services Capabilities Worksheet & Scoring

Service	How long can this service continue to operate if the power goes out, assuming it has not been not damaged					Make note of any key insights from your conversations with the stakeholders here
	1 day or less	2-3 days	4-7 days	1-2 weeks	More than 2 weeks	
9-1-1 call center	❑	❑	❑	❑	❑	
Fire Protection	❑	❑	❑	❑	❑	
Rescue Squad / Ambulance	❑	❑	❑	❑	❑	
Police or Public Safety	❑	❑	❑	❑	❑	
Acute medical care facility	❑	❑	❑	❑	❑	
Public water	❑	❑	❑	❑	❑	
Public sewer	❑	❑	❑	❑	❑	
						Add up the number of checked boxes in each column.
X	0	1	2	3	4	Then multiply the column total by this number.
=						Add up this row of numbers. Then divide the row total by 4. Write the result in the shaded box below. The number you get should be between 0-4.
						This is your community's energy resilience score for lifeline services ➔

Step 3: Identify your vulnerabilities

A vulnerability is a specific vital service that is not available (or a vital need that is not met) because the power is out. Vulnerabilities begin at the point when the service or need cannot be fulfilled.

You will identify the vulnerabilities that you have and estimate how many people or households are affected. You will use your community profile data to estimate that.

If you volunteer to "test" the evaluation tool for us, we will give you your community profile indicators.

Lifeline Services Vulnerability Worksheet

Service	Our current capability for an outage is… (Copy this from the capabilities worksheet in Step 2)					Once we have reached the limit of our current energy capability, who in our community is vulnerable to the loss of this service? About how many are affected by this? **
	1 day or less	2-3 days	4-7 days	1-2 weeks	More than 2 weeks	
9-1-1 call & dispatch	❑	❑	❑	❑	❑	
Fire Protection	❑	❑	❑	❑	❑	
EMT & Ambulance	❑	❑	❑	❑	❑	
Police or Public Safety	❑	❑	❑	❑	❑	
Acute medical care facility	❑	❑	❑	❑	❑	
Public water	❑	❑	❑	❑	❑	
Public sewer	❑	❑	❑	❑	❑	

**: Your estimate of "how many are affected by this?" could be the number of people or number of households affected by the loss of this service. Use the community profile information that you gathered in Part 1 of the workbook to form your answer. If everyone in your community is affected, then you can write down the population or the total number of households.

STEP 4 AND NEXT STEPS

- Decide which vulnerabilities are most important to your community and that you would like to explore to improve their energy resilience
- Part 5 of the workbook helps you match your vulnerabilities potential options for better energy resilience.
- If you volunteer to "test" the evaluation tool for us, we will review your worksheets and target vulnerabilities and make these suggestions for you