Virginia Community Energy Resilience

Workbook and Scoring Tool

pilot version for cities and incorporated towns

This version of the resilience workbook and tool is designed for Virginia's independent cities and incorporated towns with populations less than 100,000 people. Cities and incorporated towns both have municipal governments and boundaries. The two types of "communities" that you can evaluate with this particular tool are (1) the entire city or town, and (2) a Census tract within the city or town.

If you are an unincorporated community, please use the *pilot version for unincorporated communities*. We have a slightly different version of the workbook and tool for unincorporated communities because they do not have a municipal government.

This tool could possibly be used by counties wishing to evaluate a Census tract within their county. If you are a county and want to pilot test the *Community Energy Resilience Workbook and Scoring Tool*, please contact the project study team. We will explore what you are hoping to accomplish and provide guidance on how to adapt the tool to fit your needs.

We are developing a different community energy resilience tool for neighborhoods within large metro areas like Richmond, Norfolk, Suffolk, and Northern Virginia. This will happen in Phase II of our study in 2025.

VIRGINIA ENERGY RESILIENCE STUDY

VIRGINIA DEPARTMENT OF ENERGY

PROJECT PARTNERS

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The Purpose and Value of the Community Energy Resilience Tool

The purpose of the *Community Energy Resilience Scoring Tool* is to help communities understand their strengths and vulnerabilities when the electricity goes out for longer than a few hours. As extreme weather becomes more common, the threat of a major disruption to a community's energy supply increases. Without energy, critical services cannot be provided and vital needs in a community cannot be met.

By using the tool, you will better understand your community's current energy resilience and vulnerability in four key outage impact areas: (1) *public health and safety*, (2) *emergency management*, (3) *community necessities*, and (4) *residential vulnerabilities*. These four areas represent the vital types of energy needs that must be met when the electricity goes out where we live. Figure 1 shows these main impact areas and highlights critical community energy needs for each. Once you have a deeper sense of your community's capabilities and vulnerabilities to a long-term power outage, you can strategically identify areas for improving your energy resilience.

How the energy resilience assessment tool works

The community energy resilience assessment tool uses a set of worksheets that you will complete with a small team of 2-4 community members. The worksheets give you a methodical way to organize information about energy needs and back-up capabilities during a power outage in your community. Instructions are provided in this workbook along with the worksheets.

There are three worksheets for evaluating community energy resilience and vulnerability. You complete all three for each of the four impact areas—public health and safety, emergency management, community necessities, and household vulnerability. The assessment tool will score your community's current energy resilience for each impact area on a scale of 0 to 4. The scale is standardized and interpreted the same way for all of the impact areas. Basically, the score tells you how prepared your community is for power outages of different lengths of time with respect to that particular impact area. Interpretation of the score is provided as part of the scoring worksheet.

When you are done evaluating and scoring your current energy capabilities (which is also your current level of energy resilience), you will use that information to identify the energy vulnerabilities in your community. From there, you will target the vulnerabilities that are most important to your community and that you want to address in order to make them more energy resilient.
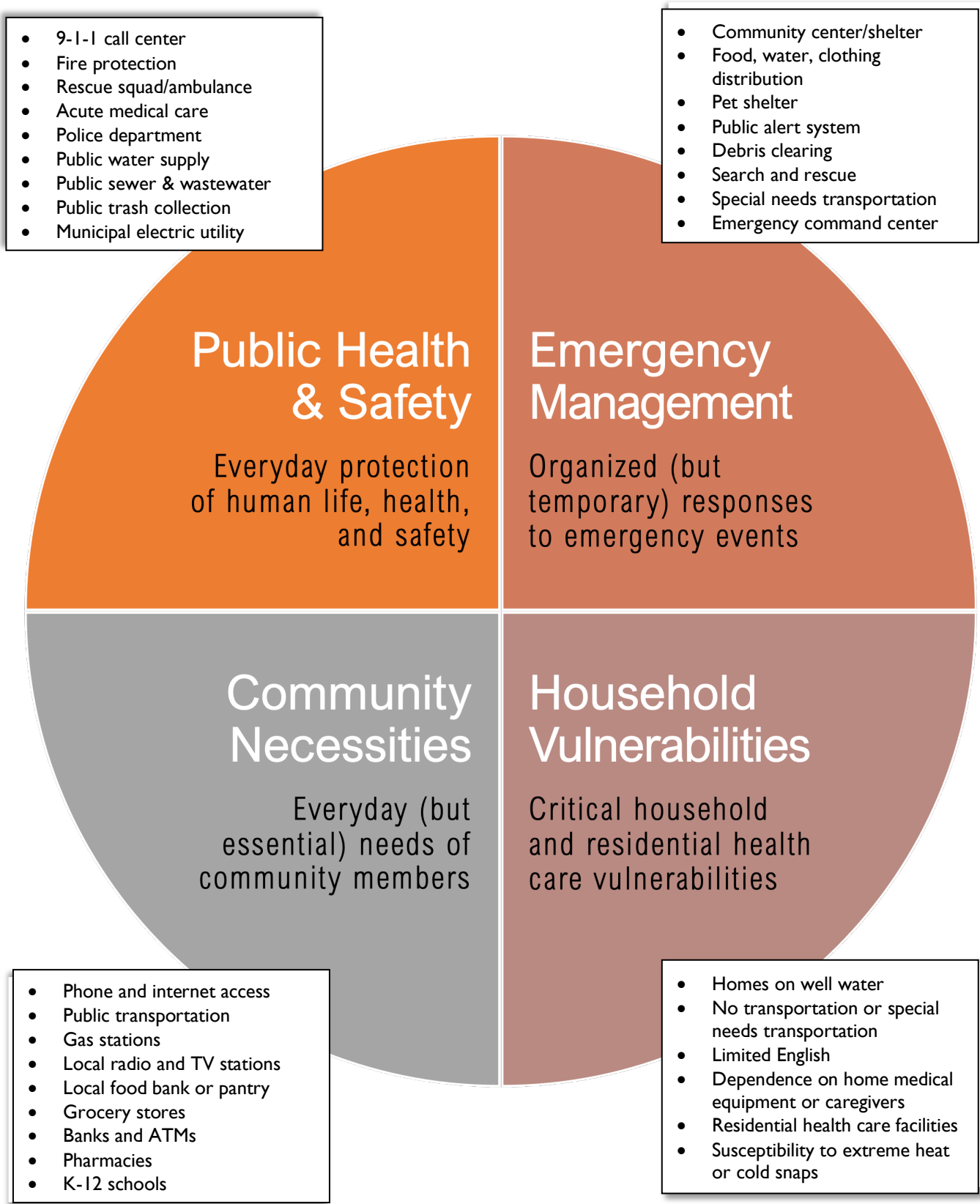
Public Health & Safety

Everyday protection of human life, health, and safety

- 9-1-1 call center
- Fire protection
- Rescue squad/ambulance
- Acute medical care
- Police department
- Public water supply
- Public sewer & wastewater
- Public trash collection
- Municipal electric utility

Emergency Management

Organized (but temporary) responses to emergency events

- Community center/shelter
- Food, water, clothing distribution
- Pet shelter
- Public alert system
- Debris clearing
- Search and rescue
- Special needs transportation
- Emergency command center

Community Necessities

Everyday (but essential) needs of community members

- Phone and internet access
- Public transportation
- Gas stations
- Local radio and TV stations
- Local food bank or pantry
- Grocery stores
- Banks and ATMs
- Pharmacies
- K-12 schools

Household Vulnerabilities

Critical household and residential health care vulnerabilities

- Homes on well water
- No transportation or special needs transportation
- Limited English
- Dependence on home medical equipment or caregivers
- Residential health care facilities
- Susceptibility to extreme heat or cold snaps

Figure 1. Community energy needs are impacted by a long-term power outage in four key areas

Your assessment team

A small team of community members is needed to conduct the community energy resiliency evaluation. The size of your team depends on how big of a community you are evaluating. The larger your city or town is, the more people you should have. This will save time and help you gather information more efficiently. The size of your team should probably not be larger than four people because it gets difficult to coordinate among the members. A very small town of less than 500 people could manage with a 2-person team. A city or town with fewer than about 3000 residents could get by with 3 people. If you are evaluating a Census tract within a city or town, 3 people should be fine. Otherwise, aim for four.

If you are completing the assessment for a city or incorporated town, or a census tract within one, it is very important that you have one of the following people on your team. Their expertise is needed to answer the worksheets related to public health and safety and to emergency management. They won't necessarily know the answers, but they will know who to ask and how to find out.

- The town manager
- The mayor
- Someone in facilities or public works
- Someone in public safety (police department, rescue squad, fire department)
- The emergency manager or coordinator

Cities and towns have different kinds of municipal staff. While your community may not have all the representatives listed above, they will at least have two of them. Other types of people who could be good team members include:

- Folks who are in the business community or members of a Chamber of Commerce.
- Charitable organizations like the United Way or other non-profits that support a food pantry, family and household assistance, or other kinds of social services.
- Anyone who has a good, basic understanding of your community and its vulnerable residents.
- Neighborhood leaders from neighborhood associations (these folks are very important if you are evaluating a Census tract within a city or town).

People with the kinds of backgrounds described above are especially valuable for helping with the community necessities and household vulnerability worksheets.

Generally, you want to select team members based on the insights and networks that they might already have regarding one or more of the four outage impact areas. People who know who to talk to and can "open doors" for you will be helpful team members.

How much time it will take

This is a hard question right now because we just don't know for certain. This is something we expect to understand better from your experience trying out the tool for us. It depends on:

- Who is on your team and how many team members there are. This affects how you might efficiently "divide up" the work, what stakeholders you need to talk to, how many schedules you have to coordinate, and how much time you need to talk through the information that you have gathered.

- How many different services and needs are present in your community, and how many people you might need to talk to in order to get the information for the worksheets. Most communities won't have all of the energy needs identified in Figure 1, and many communities will only have a few of them. The smaller you are, the less you will probably need to evaluate, and the faster the process will be.

It is entirely possible that a very small town—with two knowledgeable and well-connected team members—could complete the whole evaluation in a couple of hours total. If you divide up the impact areas and their worksheets among team members, it will also take less time, perhaps 2-4 hours total for each team member spread out over 3-4 weeks (this also includes the time you are working together as a team). Time estimates for each worksheet are provided in the instructions, and you will hopefully be able to judge the effort you need when you review the range of questions and activities.

How to Think About Power Outages

Power outages are not all the same. The two main considerations are their *frequency* and *impact*. Frequency represents how often outages occur at a location. *Impact* represents how much harm they cause. Longer outages have greater impact, as do more widespread outages (those affecting a larger geographic area). Consequently, outages are often classified along a continuum that ranges from high-frequency, low-impact occurrences to lower-probability but higher-impact events. Figure 2 shows this continuum in the context of our everyday language about power outages and bad weather.

"Ordinary" outages are the most common. They usually last just seconds or minutes and typically affect only a few homes or neighborhoods. Ordinary outages are most often caused by a technical problem within the electrical grid, such as a transformer failing or a critter getting into something.

Longer outages—perhaps a couple of hours—are also not unusual and easy to fix. For example, a car hits a utility pole or a storm causes tree limbs to fall on a few power lines. Ordinary outages are high frequency but low impact occurrences. They might happen several times a year in a community, but they don't last long and generally cause little to no real harm. For most homes and businesses, ordinary outages are simply a nuisance and an inconvenience.

However, when outages last longer than a few hours, they have the potential to be harmful to the people that experience them. When entire communities lose their electricity for more than a couple of hours, it has the potential to be life threatening. Figure 2 reflects the growing harm of power outages as they last longer, cover a wider area, and result from increasingly severe weather: the impacts of power outages progress from ordinary to major, extreme, and catastrophic.

It is important not to underestimate the impacts of a power outage. Other kinds of energy systems also depend on electricity. When the power goes out, it's not just about lights, electrical equipment, and things that plug in. For example:

- Heating systems also require electricity, even if they use natural gas, propane, or heating oil. These systems have electric pumps, motors, and fans that require electricity to help make and circulate heat in a building. No electricity means no heat in most circumstances.

- Rechargeable batteries are a terrific source of back-up electricity. But after they are run down, they can't be recharged without electricity. This is an issue for phones, computers, Internet access, and the ability to communicate during an outage.

- Gas stations can't pump gasoline or diesel. In a long-term power outage, vehicles can run out of fuel, and it may not be possible for them to fill up.

- Many homes, businesses, and critical public services rely on diesel-powered generators to provide back-up power during an outage. Generators will eventually run out of fuel, possibly very quickly. These have the same issue as vehicles; once a generator's supply of reserve fuel is used up, it may not be possible to refuel it.

- Because of this interdependence between electricity and other sources of energy, it is important to think about the impacts of power outages in terms of (1) how long they last, (2) other energy sources that need electricity in order to be accessible, and (3) when back-up power might stop operating. *The loss of back-up power, or having none at all, is the point in time when any community energy resilience generally ends and vulnerability begins.* The worksheets and their guidance give you a structured way to address these three considerations.
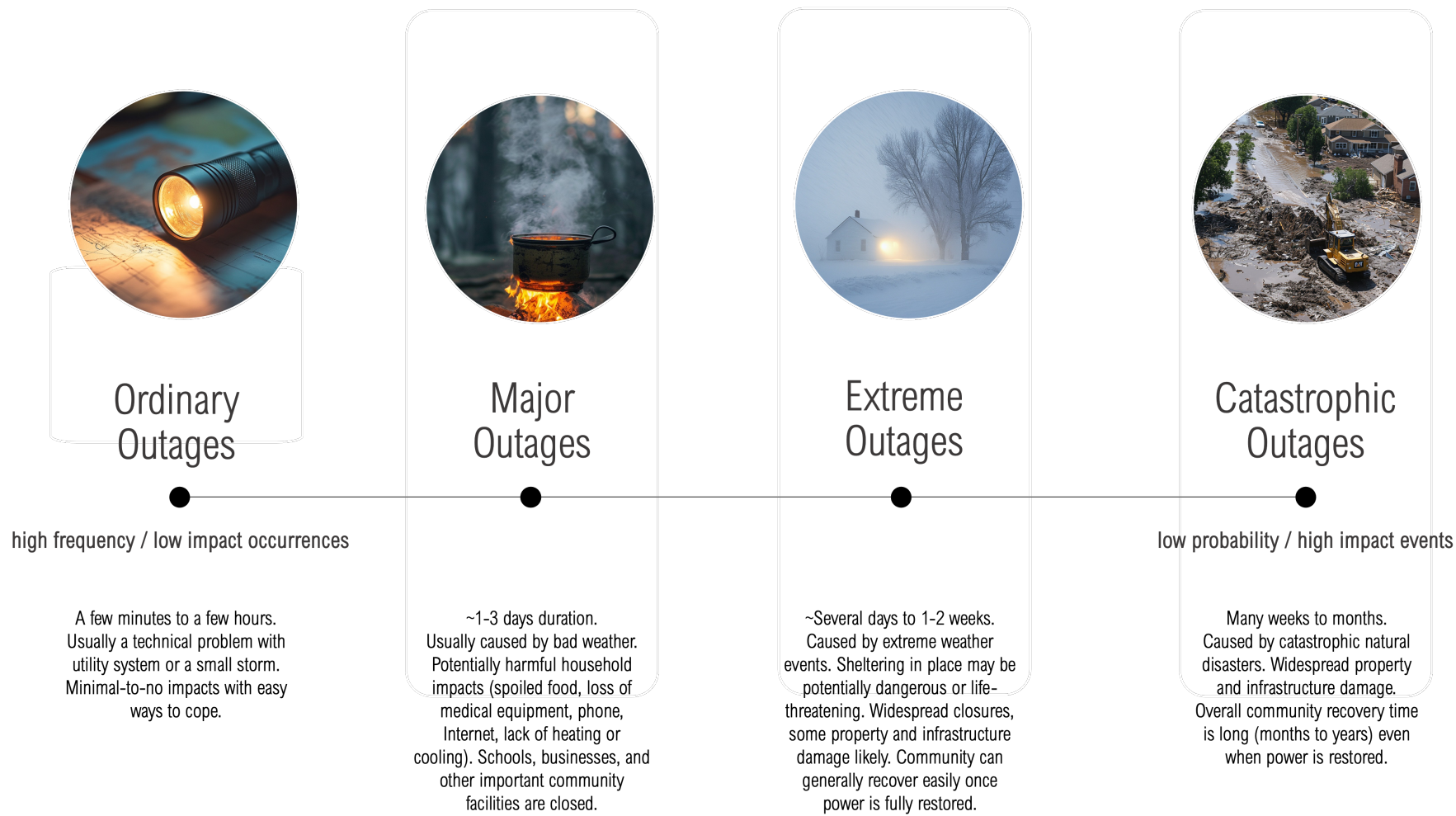
Ordinary Outages

high frequency / low impact occurrences

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 easily once power is fully restored.

Catastrophic Outages

low probability / high impact events

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.

Figure 2. Power outages range from ordinary, high frequency (but low impact) occurrences to more devastating yet less frequent outage events

The *Community Energy Resilience Workbook and Scoring Tool* is organized into three parts:

→ In Part 1 we explain the steps of the assessment process and how to get ready.

→ Part 2 provides the worksheets and instructions. A complete set of worksheets is provided for each of the four outage impact areas.

→ In Part 3 you will identify the specific energy vulnerabilities in your community that seem most important to you and that you would like to improve. The workbook then explains your next steps for exploring how to become more energy resilient.

Part 1. The Assessment Process
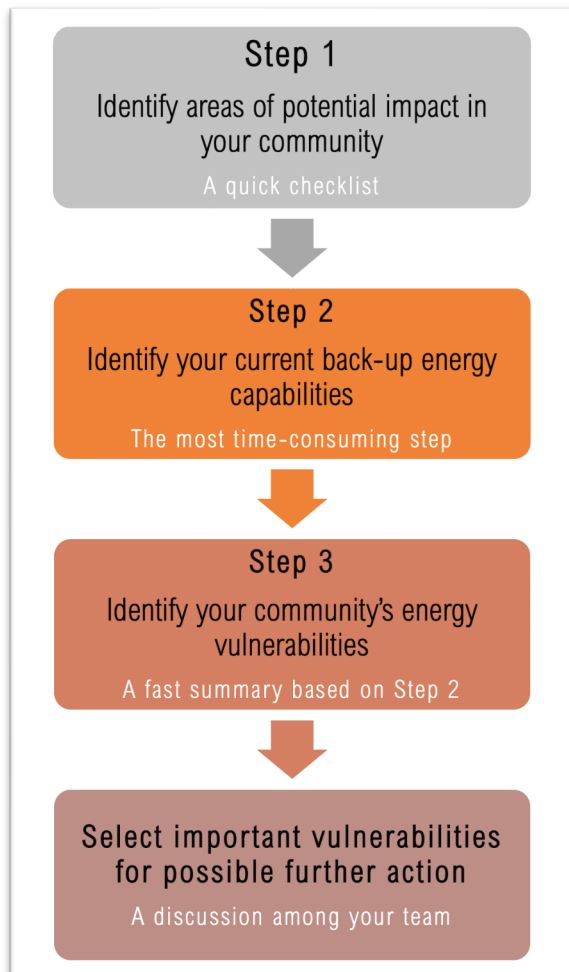
Overview of the process

The community energy resilience assessment is a 3-step process. Each step has its own worksheet. You will complete all three steps for each of the four power outage impact areas (*public health and safety, emergency management, community necessities, and residential vulnerabilities*). When you have finished your energy resilience assessment, you will then do the last part of your analysis: sort out which energy vulnerabilities in your community seem most important and need better energy resilience. Each of these tasks is summarized below, with an explanation of how much time it could take.

Step 1: Identify Areas of Potential Impact

In this step you will identify the vital services and needs that are present in your community. This is a simple and quick checklist. Your team should be able to tick through it in just a few minutes. A quick phone call, email, or text message to someone who would know should take care of anything you are unsure about.

You will only need to assess the services and needs that are actually in your community For example, if your town relies on the county's 9-1-1 call center and it is located somewhere else, you won't evaluate that.

Step 2: Identify Your Current Back-up Energy Capabilities

Step 2 is where you determine your community's current energy capabilities in an impact area and score its resilience. You are summarizing what kind of back-up power is available in your community and how long it might last during a power outage for each of the services you identified in Step 1.

Step 2 requires that you chat with stakeholders to better understand the context and capabilities of any back-up sources of power that are available. This is why it is the most time-consuming step. Unless you are a tiny community with few critical services to offer or needs to be met, expect it to take 2-4 hours per team member, but not all in one sitting. It can be spread out over 2-3 weeks. You will need

to contact folks, explain what information you need, and sort out how to best get that information. How big your team is, who is on it, and how many things you might need to evaluate all affect how much time will be involved in this step.

You don't have to figure out what kinds of questions to ask in Step 2. The workbook suggests relevant stakeholders to talk to for each of the outage impact areas. It also gives you "prompting" (interview) questions to guide your conversations with them and get the information you need. The Step 2 worksheet has a set of "check the box" options and a place to record the type of back-up power that is available. This worksheet also helps you calculate the resilience score (just arithmetic) and provides the scoring interpretation.

Step 3: Identify Your Community's Energy Vulnerabilities

In Step 3 you identify your community's existing vulnerabilities to power outages for an impact area. A vulnerability is a specific community service or need that is not getting met during an outage. Vulnerabilities are defined by when they occur and who they affect. ***A vulnerability begins when the energy required to support community services and meet needs is no longer available.*** For example, say a hospital has an emergency diesel generator that can run for 3 days. If the electricity still hasn't been restored after 3 days, the generator runs out of fuel on the third day, and diesel isn't available to resupply the generator, then the vulnerability begins when the generator runs out of fuel. The people who are vulnerable are anyone in the hospital at that point as well as people who might need the hospital for urgent medical care. If no back-up power is available, then the vulnerability begins almost immediately.

Completing the energy vulnerabilities worksheet should take no more than 15-20 minutes. You will use the information from the worksheet in Step 2 to quickly identify your community energy vulnerabilities. You then identify the people in your community who are affected by that vulnerability.

The Final Step: Select Your Community's Energy Vulnerabilities

Once you have completed all three steps, you are almost done! The last thing to do is select vulnerabilities that seem especially important in your community and for which you would like to have greater energy resilience. The workbook provides a set of guiding questions to help you do this. After you select your key vulnerabilities, our project team will take all of your results and create a customized report for you. This report will provide a summary and holistic interpretation of your community's energy capabilities, resilience, and vulnerabilities. Most importantly, it will provide options for becoming more energy resilient in the key areas of vulnerability that you selected. The report will also highlight any special considerations for energy resilience that you might want to think about and which might not have been obvious to you as you completed the assessment.

The community energy resilience score

The assessment tool and process results in a score for your community's current energy resilience in each impact area. The scale is 0 to 4 and represents the resilience of that impact area overall: 0 is least resilient and 4 is most resilient. Your community energy resilience is relative to the continuum of outages shown in Figure 2.

Your energy resilience score is created only for the services and needs that are actually located in your community. Our tool does not give you a sense of your energy resilience and vulnerability for essential services that you rely on but that are outside of your community's boundary and control. Examples of that include public safety provided by the county or a gas station located in another town.

The community energy resilience scale and its interpretation is standardized across all four impact areas. The scores are interpreted in the context of your community's energy resilience when faced with increasingly severe impacts of power outages. Its general interpretation is as follows:

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

Getting ready for the evaluation

The basic ways to prepare and get ready for your community energy resilience assessment are to:

1. Read through this workbook.

2. Talk to your facilitator from the Virginia Energy Resilience Study about any support or help you might need or want for the process. And ask as many questions as you need to! (*Once you "officially" volunteer to pilot test this tool, we will let you know who your facilitator is and how to contact them.*)

3. Gather your team and sort out how you want to manage your group process, how you want to complete the evaluation worksheets, and the time you are willing to put into it.

Because you volunteered to help us pilot test this assessment tool, our project team is giving you important background information that you will need for context and to answer some of the worksheet questions. This background is organized as fact sheets and simple summaries. It includes:

- Key data about vulnerable groups and households in your community.

- Information about the likely frequency and length of power outages for the county[1] in which your community is located, with an explanation of what these statistics represent.

- A historical summary of natural disasters in your county.

- Simple-to-understand risk estimates for future severe weather events and disasters in your county.

Before you start Step 2 in the evaluation process, you should review this background information. It will help you interpret and make sense of what you are finding in this step. Reviewing this information will also be essential for helping you identify key energy vulnerabilities where you want to be more resilient.

A suggested timeline of work

Ideally, we would like you to complete your pilot test of our scoring workbook and tool in 4 weeks and receive your workbook results no later than February 1, 2025. Below is a suggested timeline of your workflow and tasks. Small communities with limited community services could probably complete the process in 2 to 3 weeks.

Week 1	- Read through the workbook before team meeting - Hold launch meeting with team members and project facilitator (if desired) - Decide how to manage process, answer worksheets, etc. - Complete the Step 1 checklist for all four outage impact areas - Identify important stakeholders to consult in Step 2
Weeks 1-3	Complete Steps 2 and 3 for all four outage impact areas and share results with all team members
Week 4	Team meeting to discuss results and select energy vulnerabilities for further exploration

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[1] Power outage data are only available at the county level. Some cities and towns with their own municipal utilities will also have outage data.

City, town, or Census tract?

To complete the community energy resilience assessment, your team needs to be clear about the "community" it is evaluating. This version of the workbook is designed for Virginia's independent cities and incorporated towns with populations less than 100,000 people. If you are an unincorporated community, please use the *pilot version for unincorporated communities*. We have a slightly different version of the workbook for you because your community does not have a municipal government.

Cities and incorporated towns both have municipal governments and boundaries. The two types of communities that you can evaluate with this workbook are (1) an entire city or town, and (2) a Census tract within the city or town. For cities that have populations between 50,000 and 100,000, we suggest one of these two approaches:

Census tract only   Select a Census tract within your city for a focused energy resilience assessment. Use the workbook and scoring tool exactly as it is presented for the tract that you pick. We strongly encourage you to choose a Census tract with a significant proportion of historically or economically disadvantaged community members. They are far more vulnerable during a power outage than other residents for many reasons. Improving their energy resilience is essential. (We provide a web link below to easily identify these Census tracts.)

Split city/ Census tract   Evaluate *public health and safety* and *emergency management* outage impact areas for the entire city. These are public services designed to be delivered to the city as a whole. In addition, the core energy resilience information for these impact areas (Step 2) requires local knowledge.

For the *community necessities* and *residential vulnerabilities* outage impact areas, focus on one Census tract at a time. It will be more manageable to gather information, interpret it, and make sense of community energy resilience and vulnerability at this scale. As with the Census tract only approach, we strongly encourage you to pick a tract with a significant proportion of historically or economically disadvantaged community members.

Cities larger than 100,000 people have a degree of complexity that is not easily captured with our workbook. Other tools exist that address holistic community resilience for cities of this scale and may be of interest to you.[2] We will have a workbook for neighborhoods generally and for Census tracts in large cities in Phase II.

The Virginia Energy Resilience Study is especially interested in the energy resilience of historically and economically disadvantaged communities. The Virginia Department of Energy supports a mapping tool to locate Census tracts within cities, towns, and counties that have a disadvantaged community designation: https://www.energy.virginia.gov/webmaps/disadvantagedcommunities/.

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[2] See, for example: National Institute for Standards and Technology, *Community Resilience Planning Guide* (https://www.nist.gov/community-resilience/planning-guide) and the *US Climate Resilience Toolkit* (https://toolkit.climate.gov/).

What the community energy resilience tool will and won't do for you

1.

Our tool is not an emergency planning tool. It does not represent or substitute for official community emergency management planning or hazard mitigation. While it does consider the energy needs for some emergency responses, the tool does not address your preparedness for, protection from, or prevention of the physical and life-threatening dangers of natural disasters. *However*, it does give you great insight into your energy needs and capabilities for the critical community services and emergency responses you want to support during a power outage.

2.

The tool will not tell you what the most important energy vulnerabilities are in your community. This is a judgment only your team can make. The tool *does* identify critical energy needs for keeping a community going during a long-term power outage, it organizes those needs into different impact areas, and it helps you understand when and how your energy needs are—or are not—getting met. But it doesn't weight them or say which ones are most important. Each community will prioritize its vulnerabilities based on local values and circumstances.

3.

The tool WILL help you think about time and the impacts of a power outage without having to be an expert in risk analysis! Power outages are unpredictable, they last for different lengths of time, and their potential impacts on a community will change the longer they go on. The tool is designed to help you easily connect information about your energy preparedness to various "probabilities" of outages and weather events. It does this in several ways. It uses a common-sense approach to different kinds of power outages. It gives you information about your community's experience with disasters in the past. And it provides you with current estimates about how severe weather is likely to change in your region in the future.

Part 2. The Worksheets

You will go through the 3-step process of the community energy resilience assessment for each of the four community outage impact areas illustrated in Figure 1 and shown again below. There is a complete set of worksheets for each. This allows you to divide up the four assessments among team members if that is what you decide to do. It also makes it easier to share a worksheet with a stakeholder who might be helping you collect information. (This is most likely for Step 2 on back-up energy capabilities.)

Each impact area has its own set of instructions. The guidance suggests who to talk to, what kinds of questions to ask, and things to consider as you gather information and complete the worksheets.

Ask questions at any time! Once you are in the process itself, we expect you will have questions. *We want and need to hear them*. You might not be sure what something in the worksheet means, or you may like advice about how to handle information and insights that you have been given, or there is a circumstance in your community that a worksheet does not capture at all. If questions come up during your assessment, please do not hesitate to contact your facilitator on the project.

- 9-1-1 call center
- Fire protection
- Rescue squad/ambulance
- Acute medical care
- Police department
- Public water supply
- Public sewer & wastewater
- Public trash collection
- Municipal electric utility

- Community center/shelter
- Food, water, clothing distribution
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- Public alert system
- Debris clearing
- Search and rescue
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Everyday protection of human life, health, and safety

Emergency Management
Organized (but temporary) responses to emergency events

Community Necessities
Everyday (but essential) needs of community members

Household Vulnerabilities
Critical household and residential health care vulnerabilities

- Phone and internet access
- Public transportation
- Gas stations
- Local radio and TV stations
- Local food bank or pantry
- Grocery stores
- Banks and ATMs
- Pharmacies
- K-12 schools

- Homes on well water
- No transportation or special needs transportation
- Limited English
- Dependence on home medical equipment or caregivers
- Residential health care facilities
- Susceptibility to extreme heat or cold snaps

Public Health
& Safety Resilience

The public health and safety outage impact area represents the **everyday public services** in a community that are fundamental to protecting human health, life, and safety. Examples include 9-1-1 emergency calling, fire, ambulance, police, and acute medical care. These services also include public water, sewer, and waste collection as well as municipal electric utilities. The community energy resilience tool evaluates the following public health and safety services:

- 9-1-1 call center
- Fire protection
- Rescue squad/ambulance
- Acute medical care
- Police department

- Public water supply
- Public sewer & wastewater
- Public trash collection
- Municipal electric utility

Virginia's cities and incorporated towns are legally authorized by the Commonwealth to offer most public health and safety services. The exception is acute medical care, which is provided by hospitals and medical clinics. *However*, cities and incorporated towns are not *obligated* to operate these services. Your community may operate some of them or none at all. Your community is also probably relying on the county for some public health and safety services.

You will only evaluate energy resilience for those services that are actually located within your community. It is okay if the county or another organization operates these facilities.

You should have at least one team member from your local government. See our previous suggestions for who this should be. This team member will be very important for knowing who to talk to about public health and safety resources and how to get the information you need in Step 2.

Step 1: Identify Areas of Potential Impact

The *Public Health and Safety Checklist* identifies the vital facilities and services that are affected by a power outage. Your team should be able to tick through the checklist in just a few minutes. A quick phone call, email, or text message to someone who would know will take care of anything you are unsure about. If your community has **more than one** facility or service—like a rescue squad station—simply make a note of that.

Step 1. Public Health & Safety Checklist

✓ Check the box if the service or facility *is physically present* in your town, city, or Census tract.	
Facility or Service	**Explanation**
☐ 9-1-1 call center	A 9-1-1 call center is operated in your town, city, or Census tract.
☐ Fire protection	A fire station and fire protection are located in your town, city, or Census tract.
☐ Rescue squad or ambulance	A rescue squad or ambulance service is located in your town, city, or Census tract.
☐ Police department	A police department or a police station is located in your town, city, or Census tract.
☐ Acute medical care facility	An acute medical care facility is located in your town, city, or 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. (Does not apply to a Census tract assessment.)
☐ Public sewer and wastewater treatment	Your city or town operates a public sewer and wastewater treatment system. (Does not apply to a Census tract assessment.)
☐ Public trash collection	Your city or town operates a public waste management system. (Does not apply to a Census tract assessment.)
☐ Municipal electric utility or electric department	If your city or town has its own electric utility or electric department, you will not evaluate its resilience here. We will work with you on that.

Interpretation of Your Results

- Your community might not have many of public health and safety services or facilities within its boundaries. You will not evaluate those you don't have. Your energy resilience score is created only for those that you **do** have. If a public health and safety facility or service in your community is operated by the county or another organization, you will still try to evaluate its resilience.

- Our tool does not give you a sense of your energy resilience for public health and safety services that you rely on but are located outside of your community. To better understand what could happen during a long-term power outage, you might want to explore the relevant workbook questions with those service providers. We suggest ways to do this in Part 3 of the workbook, *Vulnerabilities and Next Steps.*

Step 2: Identify Your Current Energy Back-up Capabilities

Your current capabilities represent how long a public health and safety service can operate in your community if the power goes out. These capabilities also represent your current energy resilience for that service. Before starting Step 2, please review the background information that we provided on power outages, past disasters, and future risks in your community. This will give you important context for interpreting and understanding your energy capabilities and vulnerabilities.

Complete the *Public Health and Safety Capabilities Worksheet*. You only need to answer it for the services that you identified in Step 1. Step 2 is the most time consuming. It involves reaching out to the relevant stakeholders and explaining what you are doing and the kind of information you need. Some stakeholders can immediately answer your questions. Others will need time to get back to you with the details.

Detailed guidance on what kinds of questions to ask stakeholders is in the box on the next page. Depending on how much you need to evaluate and who you need to talk to, this could take just an hour or so. If you have several stakeholders to connect with, it could take 2-3 hours. Understanding your energy capabilities requires a bit of discussion with them because you also want to know *how* they are able to operate in an outage. This will help you better understand constraints on becoming more energy resilient and may spark ideas for opportunities to explore.

The *Public Health and Safety Capabilities Worksheet* also includes the community energy resilience scoring for this impact area. The worksheet explains each step of the calculation. If you are not sure about it, please ask.

Be Conservative in Your Time Estimates

The *Public Health and Safety Capabilities Worksheet* asks you to check the box that best represents how long a specific service can continue to operate if the power goes out. Your discussions with stakeholders may result in very clear-cut answers.

Often there will be a "fudge factor" about how long they can continue. For example, an acute medical care facility says that they might be able to make their generator last for up to 5 days depending on the circumstances, but their planning intended only 3 days. You should be conservative in your evaluation and estimate. You should mark their capacity as 2-3 days.

How long can this service continue to operate if the power goes out, assuming there is no damage				
1 day or less	2-3 days	4-7 days	1-2 weeks	More than 2 weeks
❏	❏	❏	❏	❏

What Kinds of Questions
Should You Ask Stakeholders in Step 2?

The key question to ask stakeholders is:

> *"Assuming that equipment and buildings have not been damaged, how long can this service continue to operate if the power goes out?"*

Depending on their answers, you might want to ask some of these as a follow up:

- What is their source of back-up power, if they have one?

- How would a longer-term outage affect their ability to use this back-up power source? (For example, a diesel generator will need to be refueled once the reserve supply is used up. In an extended power outage, it may not be possible to refuel if local diesel suppliers don't have electricity either.)

- Does the service provider rely on battery-powered equipment? Are they able to recharge it during an outage? How?

- Do the service providers need fuel for vehicles? How long is the reserve fuel supply expected to last in an outage?

- If equipment and buildings *were* damaged, do they still have an ability to provide their service? How?

- Why don't the service providers have the ability to operate in a longer-term outage? Do they want to? What prevents them from achieving that?

When ending your conversation with a stakeholder, it is useful to wrap up with something like:

> *"Is there anything you think I should know about your energy needs or resilience that I haven't already asked?"*

Some of the best information in interviews often comes from this "*what do you think I should know but haven't asked?*" closing question!

What If You Have More Than One Facility?

Your community might have **more than one** of the same kind of facility—like a rescue squad or fire station. If so, just ask the relevant stakeholder if each facility has the same kind of back-up power capability and energy needs, or if each location is different. If they are the same, treat them as one. If they are different, evaluate each one separately. There are blank lines on the worksheet to add more.

Interpretation of Your Results

You will calculate your community energy resilience score in the Step 2 worksheet. The interpretation of your score is provided below. The report that we provide you will have additional insights and interpretations.

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

After your assessment, your community will still have an incomplete picture of its energy resilience during a long-term power outage if it relies on public health and safety services that are offered outside of its boundaries by the county or another organization. While you cannot score those facilities and services, you *can* better understand how they are affected by a power outage. We will suggest how you can do this in Part 3 of this workbook on *Vulnerabilities and Next Steps.*

Step 2. Public Health & Safety Capabilities Worksheet

Service	How long can this service continue to operate if the power goes out, assuming there is no damage					What type of back-up power is used (if any)
	1 day or less	2-3 days	4-7 days	1-2 weeks	More than 2 weeks	
9-1-1	❏	❏	❏	❏	❏	
Fire Protection	❏	❏	❏	❏	❏	
Rescue Squad / Ambulance	❏	❏	❏	❏	❏	
Police	❏	❏	❏	❏	❏	
Acute medical care	❏	❏	❏	❏	❏	
Public water	❏	❏	❏	❏	❏	
Trash collection	❏	❏	❏	❏	❏	
Public sewer	❏	❏	❏	❏	❏	
	❏	❏	❏	❏	❏	
	❏	❏	❏	❏	❏	
	❏	❏	❏	❏	❏	
	❏	❏	❏	❏	❏	
	❏	❏	❏	❏	❏	
						Count the number of checked boxes in each column and enter the total for each column.
X	0	I	2	3	4	Multiply the column total by this number.
=						Add up (sum) this row of five numbers. Divide the row total by 4. The number you get should be between 0-4. Write the result in the shaded box below.

Check the box *that best matches* the back-up power capability for the service or facility.

This is your community's energy resilience score for public health & safety ➜

Step 3: Identify Your Vulnerabilities

Complete the *Public Health and Safety Vulnerabilities Worksheet* to identify your vulnerabilities. A vulnerability is a specific service that is not available—or a need that is not met—because the power is out. Vulnerabilities begin at the point in time when the service or need cannot be delivered because of a lack of energy. For example, an acute medical care facility may have 3 days of back-up power with a diesel generator. The facility has a 3-day energy capability. Once the generator cannot operate, the facility and the people it cares for are vulnerable to an outage.

You should be able to complete this worksheet fairly quickly, in 15-20 minutes or so. Most of what you are doing is copying over your results from Step 2 and marking the spreadsheet. The only new information is about **who** within the community is affected when this service is no longer available. These folks are the vulnerable community members for that specific public health and safety service. As you reflect on who is vulnerable at a particular point in time, keep in mind two things. First, vulnerabilities will change over time as a power outage continues. Second, some members of your community may be especially vulnerable because they are socially or geographically isolated. This is explained below.

The Social Context of Vulnerabilities

One of most important things that affects the vulnerability of a community during a long-term power outage is mobility. Many people can cope and make do for a day or so, but after that they ***just leave***. They might go to family, friends, or hotels where power is available until their community recovers. However, many community members cannot do this. They might not have any place to go because they can't afford it or because they don't have other people they can rely on. Your community might be geographically isolated and there isn't anywhere else people could easily get to.

As you think about who is vulnerable in Step 3, also think about how that might change over time. For example, on the 2nd or 3rd day of a power outage, everyone in your community might be impacted by it. But after a week or more, only those who are still present will be affected. These residents could be experiencing exceptional hardship because of their inability to go somewhere safer. So, another way of thinking about "who is vulnerable" is by reflecting on who will be hit the hardest by an outage because of limited resources for managing its impacts or leaving.

Step 3. Public Health and Safety Vulnerabilities Worksheet

For the service or facility:

1. Check the same box that you marked on the Capabilities Worksheet in Step 2.

2. Then CIRCLE all of the boxes to the right of the one that you checked. This is the period of time your community is vulnerable to a power outage for that particular service.

3. Identify who in your community is vulnerable once the service can no longer be provided. Please see the instructions for Step 3, because vulnerable community members can change the longer an outage lasts.

Service	Our current capability for an outage is…					Who in our community is vulnerable when this service can no longer be provided?
	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	❏	❏	❏	❏	❏	
Acute medical care facility	❏	❏	❏	❏	❏	
Public water	❏	❏	❏	❏	❏	
Trash collection	❏	❏	❏	❏	❏	
Public sewer	❏	❏	❏	❏	❏	

Emergency Management Resilience

Emergency management services are vital but temporary responses to protect the community during an emergency event and its immediate aftermath. Examples of emergencies include extreme weather events and natural disasters.

Official emergency response is provided by the government—cities, towns, the county, the Commonwealth, or FEMA. Other organized emergency responses could be initiated by institutions within the community, like churches and charitable organizations.

You will not be evaluating the energy resilience of emergency management services provided by the county, state, or FEMA. It is simply not practical for you to do that. You will assess only the capabilities of your local community. However, the workbook *does* include suggestions in Part 3, *Vulnerabilities and Next Steps*, for talking to your county about its emergency management coordination. This will help you understand how that process works and affects you.

You can (and should) include local, non-governmental organizations in your assessment if they provide emergency responses in your community. The community energy resilience tool evaluates the following emergency services:

- Emergency command center
- Community center/shelter
- Food, water, clothing distribution
- Pet shelter

- Public alert system
- Debris clearing
- Search and rescue
- Special needs transportation

You should have at least one team member from your local government. See our previous suggestions for who this should be. This team member will be very important for knowing who to talk to about emergency response coordination and resources and how to get the information you need in Step 2.

Step 1: Identify Areas of Potential Impact

The *Emergency Management Checklist* identifies emergency responses that are often provided during an emergency event, disaster, or significant power outage.

Your team should be able to go through the checklist in fairly quickly. A brief phone call, email, or text message to someone who would know will take care of anything you are unsure about. If your community operates **more than one** emergency response service—like shelters or distribution centers for necessities—make a note of each.

Step 1. Emergency Management Checklist

✓ Check the box if an emergency response is provided by and within your community. You are not limited to local *government* capabilities. If local non-governmental organizations your community have planned emergency responses, you should include them.

Facility or Service	Explanation
☐ Emergency command center	Your city or town sets up a command center for its emergency management and coordination. (Does not apply to a Census tract assessment.)
☐ Community centers or shelters	Your city or town has designated community shelters that are open to the public during an emergency. Or, a center/shelter is provided in your Census tract.
☐ Distribution of necessities—food, water, clothing, etc.	Your city or town offers groceries, prepared meals, water, clothing, personal hygiene products, baby products, or other basic provisions during an emergency. Or, there is distribution point for these necessities in your Census tract.
☐ Animal shelter	Your city or town provides an emergency shelter for household pets. Or, an emergency animal shelter is provided within your Census tract. (Some folks will not relocate during an emergency if they are concerned about their pets.)
☐ Public communication and alerts (texts, social media, etc.)	Your city or town provides information about the emergency through public communication such as phone and text alerts or social media. (Does not apply to a Census tract assessment.)
☐ Public works department (debris clearing)	Your city or town has a public works department that helps clear debris created by an emergency event. (Does not apply to a Census tract assessment.)
☐ Search and rescue operations	Your city or town mobilizes search and rescue in an emergency. (Does not apply to a Census tract assessment.)
☐ Special needs transportation	Your city or town provides transportation to people who need assistance relocating to a safer place during an emergency. Or, such transportation is provided in your Census tract. Examples include people with physical disabilities, households without personal vehicles, and the homeless.

Interpretation of Your Results

- Your community might not operate many emergency responses and rely on others to provide those that are necessary. You will not evaluate services that aren't operated by your community. Your energy resilience score is created only for those that you **do** handle.

- Our tool does not give you a sense of your energy resilience for emergency management services that you rely on but are located outside of your community. To better understand what could happen during a long-term power outage, you might want to explore the workbook questions with those service providers. We suggest ways to do this in Part 3 of the workbook, *Vulnerabilities and Next Steps.*

Step 2: Identify Your Current Energy Back-up Capabilities

Your current capabilities represent how long an emergency management service can operate in your community if the power goes out. These capabilities also represent your current energy resilience for that service. Before starting Step 2, please review the background information that we provided on power outages, past disasters, and future risks in your community. This will give you important context for interpreting and understanding your energy capabilities and vulnerabilities.

Complete the *Emergency Management Capabilities Worksheet.* You only need to answer it for the services that you identified in Step 1. Step 2 is the most time consuming. It involves reaching out to the relevant stakeholders and explaining what you are doing and the kind of information you need. Some stakeholders can immediately answer your questions. Others will need time to get back to you with the details.

Detailed guidance on what kinds of questions to ask stakeholders is in the box on the next page. Depending on how much you need to evaluate and who you need to talk to, this could take just an hour or so. If you have several stakeholders to connect with, it could take 2-3 hours. Understanding your energy capabilities requires a bit of discussion with them because you also want to know *how* they are able to operate in an outage. This will help you better understand constraints on becoming more energy resilient and may spark ideas for opportunities to explore.

If your community operates more than one of the same kind of emergency response or facility—like shelters or distribution centers for necessities—you can evaluate them separately. There are blank lines on the worksheet to include additional facilities.

The *Emergency Management Capabilities Worksheet* also includes the community energy resilience scoring for this impact area. The worksheet explains each step of the calculation. If you are not sure about it, please ask.

What Kinds of Questions
Should You Ask Stakeholders in Step 2?

The key question to ask stakeholders is:

> *"Assuming that equipment and buildings have not been damaged, how long can this service continue to operate if the power goes out?"*

Depending on their answers, you might want to ask some of these as a follow up:

- What is their source of back-up power, if they have one?

- How would a longer-term outage affect their ability to use this back-up power source? (For example, a diesel generator will need to be refueled once the reserve supply is used up. In an extended power outage, it may not be possible to refuel if local diesel suppliers don't have electricity either.)

- Does the service provider rely on battery-powered equipment? Are they able to recharge it during an outage? How?

- Do the service providers need fuel for vehicles? How long is the reserve fuel supply expected to last in an outage?

- If equipment and buildings *were* damaged, do they still have an ability to provide their service? How?

- Why don't the service providers have the ability to operate in a longer-term outage? Do they want to? What prevents them from achieving that?

When ending your conversation with a stakeholder, it is useful to wrap up with something like:

> *"Is there anything you think I should know about your energy needs or resilience that I haven't already asked?"*

Some of the best information in interviews often comes from this "*what do you think I should know but haven't asked?*" closing question!

Be Conservative in Your Time Estimates

The *Emergency Management Capabilities Worksheet* asks you to check the box that best represents how long a specific service can continue to operate if the power goes out. Your discussions with stakeholders may result in very clear-cut answers.

How long can this service continue to operate if the power goes out, assuming there is no damage				
1 day or less	2-3 days	4-7 days	1-2 weeks	More than 2 weeks
❏	❏	❏	❏	❏

Often there will be a "fudge factor" about how long they can continue. For example, a pet shelter says that they might be able to make their generator last for up to 3 days depending on the circumstances, but their planning intended only 1 days. You should be conservative in your evaluation and estimate. You should mark their capacity as 1 day or less.

Interpretation of Your Results

You will calculate your community energy resilience score in the Step 2 worksheet. The interpretation of your score is provided below. The report that we provide you will have additional insights and interpretations.

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

After your assessment, your community will still have an incomplete picture of its emergency response energy resilience during a long-term power outage because it relies on emergency services offered by the county, the Commonwealth of Virginia, and FEMA. While you cannot score their energy resilience, you *can* better understand how they affect you during an outage. We will suggest how you can do this in Part 3 of this workbook on *Vulnerabilities and Next Steps*.

Step 2. Emergency Management Capabilities Worksheet

	How long can this service continue to operate if the power goes out, assuming there is no damage					
Service	1 day or less	2-3 days	4-7 days	1-2 weeks	More than 2 weeks	**What type of back-up power is used (if any)**
Command center	❏	❏	❏	❏	❏	
Community shelter	❏	❏	❏	❏	❏	
Social services	❏	❏	❏	❏	❏	
Animal shelter	❏	❏	❏	❏	❏	
Public communications	❏	❏	❏	❏	❏	
Debris clearing	❏	❏	❏	❏	❏	
Search and rescue	❏	❏	❏	❏	❏	
Special needs transport	❏	❏	❏	❏	❏	
	❏	❏	❏	❏	❏	
	❏	❏	❏	❏	❏	
	❏	❏	❏	❏	❏	
	❏	❏	❏	❏	❏	
	❏	❏	❏	❏	❏	
						Count the number of checked boxes in each column and enter the total for each column.
X	0	1	2	3	4	Multiply the column total by this number.
=						Add up (sum) this row of five numbers. Divide the row total by 4. The number you get should be between 0-4. Write the result in the shaded box below.

This is your community's energy resilience score for emergency management ➔

Step 3: Identify Your Vulnerabilities

Complete the *Emergency Management Vulnerabilities Worksheet* to identify your vulnerabilities. A vulnerability is a specific service that is not available—or a need that is not met—because the power is out. ***Vulnerabilities begin at the point in time when the service or need cannot be delivered because of a lack of energy.*** For example, a pet shelter may have 1 day of back-up power with a diesel generator. Their facility has a 1-day energy capability. Once the generator cannot operate, the facility and the pets it cares for are vulnerable to an outage.

You should be able to complete this worksheet fairly quickly, 15-20 minutes or so. Most of what you are doing is just copying over your results from Step 2 and marking the spreadsheet. The only new information is about ***who*** within the community is affected when this service is no longer available. These folks are the vulnerable community members for that specific emergency response. As you reflect on who is vulnerable at a particular point in time, keep in mind two things. First, vulnerabilities will change over time as a power outage continues. Second, some members of your community may be especially vulnerable because they are socially or geographically isolated. This is explained below.

The Social Context of Vulnerabilities

One of most important things that affects the vulnerability of a community during a long-term power outage is mobility. Many people can cope and make do for a day or so, but after that they ***just leave***. They might go to family, friends, or hotels where power is available until their community recovers. However, many community members cannot do this. They might not have any place to go because they can't afford it or because they don't have other people they can rely on. Your community might be geographically isolated and there isn't anywhere else people can get to.

As you think about who is vulnerable in Step 3, also consider how that might change over time. For example, on the 2nd or 3rd day of a power outage, everyone in your community might be impacted by it. But after a week or more, only those who are still present will be affected. These residents could be experiencing exceptional hardship because of their inability to go somewhere safer. So, another way of thinking about "who is vulnerable" is by reflecting on who will be hit the hardest by an outage because of limited resources for managing its impacts or leaving.

Step 3. Emergency Management Vulnerability Worksheet

1. Check the same box that you checked on the Step 2 Capabilities Worksheet.

2. Then CIRCLE all the boxes to the right of the one that you checked. This is the period of time in which your community is vulnerable to a power outage for that service.

3. Identify who in your community is vulnerable once the service can no longer be provided. Please see the instructions for Step 3, because vulnerable community members can change the longer an outage lasts.

Service	Our current capability for an outage is…					Once we have reached the limit of our current energy capability, who in our community is vulnerable to the loss of this service?
	1 day or less	2-3 days	4-7 days	1-2 weeks	More than 2 weeks	
Command center	❏	❏	❏	❏	❏	
Community shelter	❏	❏	❏	❏	❏	
Social services	❏	❏	❏	❏	❏	
Animal shelters	❏	❏	❏	❏	❏	
Public communications	❏	❏	❏	❏	❏	
Debris clearing	❏	❏	❏	❏	❏	
Search and rescue	❏	❏	❏	❏	❏	
Special needs transport	❏	❏	❏	❏	❏	
	❏	❏	❏	❏	❏	
	❏	❏	❏	❏	❏	
	❏	❏	❏	❏	❏	
	❏	❏	❏	❏	❏	
	❏	❏	❏	❏	❏	
	❏	❏	❏	❏	❏	

Community Necessities Resilience

Community necessities represent the goods and services that people rely on to meet their *basic needs*. Necessities are not luxuries. They are required for people to function as individuals, families, and households. Most community necessities are provided by local businesses, but necessities also include schools and as well as assistance from social service organizations.

The longer an outage lasts, the more challenging it becomes for community members to meet their needs because local businesses and organizations are also affected by the same outage. And, depending on where your community is, folks might already have to travel a long distance to get what they need on an everyday basis. Geographic distance consequently adds even more challenges during a long-term power outage. The community energy resilience tool evaluates these vital public health and safety services:

- Phone & Internet access
- Public transportation
- Gas stations
- Local radio, TV station
- Local food bank or pantry

- Grocery stores
- Banks and ATMs
- Pharmacies
- K-12 schools

The stakeholders that you need to connect with for this outage impact area are mostly local businesses. Depending on your community's context, you might need to talk to your school district or local non-profits.

There are a few ways you can connect with business stakeholders in particular. If you are a small town or city, this is less of an issue because folks know one another. For larger communities, you hopefully have a team member that knows the local business networks. Organizations that could help make connections are the Chamber of Commerce, an economic development office, or a tourism office in your area. All of these have strong ties to the business community. Community and fraternal organizations like the Rotary or Elks Club also have a breadth of members. And real estate agents seem to know just about everybody!

Step 1: Identify Areas of Potential Impact

The *Community Necessities Checklist* identifies the critical necessities that are required during a long-term power outage. You will evaluate only what is physically located in your community. You might have many of one kind of establishment, such as several gas stations or grocery stories. The instructions for Step 2 explain how to handle that in your assessment. Your team should be able to tick through the checklist in just a few minutes. A quick phone call, email, or text message to someone who would know will take care of anything you are unsure about.

Step 1. Community Necessities Checklist

✓ Check the box if a facility or service is located within your community.	
Facility or Service	**Explanation**
☐ Phone and Internet access	There is a public space for accessing the Internet and charging phones or other devices in your city, town, or Census tract. Note that having back-up power for a public alert system will not be effective in a long-term outage if people cannot charge their phones or get online.
☐ Public transportation	Your city or town provides public transportation or transportation is provided in your Census tract. This is typically a bus system or transportation services for the elderly and people with disabilities. These services might be offered by the local government or by non-profit organizations.
☐ Local TV or radio station	There is a local TV or radio station in your city, town, or Census tract. Local TV and radio can be critical trusted sources of news and information during a major power outage or emergency event.
☐ Local food bank or food pantry	There is a food bank or food pantry in your city, town, or Census tract. Some residents may regularly depend on a food bank or pantry to meet their basic needs.
☐ Grocery stores	There a grocery store or other source of groceries in your city, town, or Census tract. The longer the power is out, the more likely it is that people will need to buy or replace groceries and other necessities.
☐ Gas stations	There is a gas station in your city, town, or Census tract. The longer the power is out, the more likely it is that people will need to refuel their vehicles. Note that most gas stations typically have a 2-to-4 day supply of gasoline under *normal* circumstances.
☐ Banks and ATMs	There is a bank, credit union, or ATM location in your city, town, or Census tract. The longer the power is out, the more likely it is that people will need cash to pay for basic necessities.
☐ Pharmacies	There is a pharmacy in your city, town, or Census tract. People who rely on prescription medications may need to refill their prescriptions during an extended power outage.
☐ K-12 schools	There is a K-12 school in your city, town, or Census tract. Schools enable children to maintain a sense of routine and normalcy. They may also receive meals during school hours. In an extended power outage, parents may need to be outside the home for many reasons. Access to schools during such a time helps both children and parents.

Interpretation of Your Results

- Your community might not have some of the businesses or services that provide basic community necessities. You will not evaluate ones that are not located your community. Your energy resilience score is created only for those that you **do** have.

- You can think about the community necessities provided elsewhere (or not at all) as "gaps" within your own community. You can reflect on whether your community might want to fill any of these gaps as part of its energy resilience planning. We will suggest how you can do this in Part 3 of this workbook on *Vulnerabilities and Next Steps.*

Step 2: Identify Your Current Energy Back-up Capabilities

Your current capabilities represent how long basic community necessities can be provided in your community if the power goes out. These capabilities also represent your current energy resilience for those necessities. Before starting Step 2, please review the background information that we provided on power outages, past disasters, and future risks in your community. This will give you important context for interpreting and understanding your energy capabilities and vulnerabilities.

Complete the *Community Necessities Capabilities Worksheet.* You only need to answer it for the services that you identified in Step 1. Step 2 is the most time consuming. It involves reaching out to the relevant stakeholders and explaining what you are doing and the kind of information you need. Some stakeholders can immediately answer your questions. Others will need time to get back to you with the details.

Detailed guidance on what kinds of questions to ask stakeholders is in the box on the next two pages. Depending on how much you need to evaluate and who you need to talk to, this could take just an hour or so. If you have several stakeholders to connect with, it could take 2-4 hours. Understanding your energy capabilities requires a bit of discussion with them because you also want to know *how* they are able to operate in an outage. This will help you better understand constraints on becoming more energy resilient and may spark ideas for opportunities to explore.

If your community has more than one of the same type of service or facility—like banks and grocery stores—there are ways you can simplify your energy resilience evaluation. We explain how to do this in the section below on *What to Do if You Have Several Establishments of the Same Kind?*

The *Community Necessities Capabilities Worksheet* also includes the community energy resilience scoring for this impact area. The worksheet explains each step of the calculation. If you are not sure about it, please ask.

What Kinds of Questions
Should You Ask in Step 2?

The key question to ask stakeholders is:

> ***"Assuming that equipment and buildings have not been damaged, how long can this service continue to operate if the power goes out?"***

Depending on their answers, you might want to ask some of these as a follow up:

- What is their source of back-up power, if they have one?

- How would a longer-term outage affect their ability to use this back-up power source? (For example, a diesel generator will need to be refueled once the reserve supply is used up. In an extended power outage, it may not be possible to refuel if local diesel suppliers don't have electricity either.)

- Does the service provider rely on battery-powered equipment? Are they able to recharge it during an outage? How?

- Do the service providers need fuel for vehicles? How long is the reserve fuel supply expected to last in an outage?

- If equipment and buildings *were* damaged, do they still have an ability to provide their service? How?

- Why don't the service providers have the ability to operate in a longer-term outage? Do they want to? What prevents them from achieving that?

When ending your conversation with a stakeholder, it is useful to wrap up with something like:

> ***"Is there anything you think I should know about your energy needs or resilience that I haven't already asked?"***

Some of the best information in interviews often comes from this "*what do you think I should know but haven't asked?*" closing question!

There are also questions you can ask specific businesses or organizations in your community that relate to your community's resilience. Below are some suggestions.

Radio station
- Ask if they are already part of a local or regional emergency management plan (or have considered that role in your community). Radio stations, especially AM radio, were an important lifeline in much of western North Carolina after Hurricane Helene.

Foodbank or pantry
- It is important to know how many people they serve and whether some community members (like the elderly or young families) are especially reliant on their resources. This is related to your vulnerability during a long-term outage.

Schools
- How many children rely on the school for their breakfast or lunch for adequate nutrition? What happens when the school is closed? Is there another way to get meals to the children? (Some schools got very creative on this during the pandemic.)

Public transportation
- For a public transport system like a bus service, you can explore with them in general how their service would be affected by power outages of different lengths of time. You can also explore their ability to refuel during an outage, and whether they have a reserve supply.

Gas stations
- How many days of supply of gasoline/diesel do they normally have in their storage tanks? Even if they have back-up power, they might run out of fuel and not be able to get resupplied easily.

Grocery stores
- During bad weather and extended power outages, stores often run out of common food and supplies (eggs, toilet paper, and so on). Ask what they are most likely to run out of in a long-term outage. This will help you understand where shortages of necessities can occur.

What to Do If You Have Several Establishments of the Same Kind?

Depending on the size of your community, you could have many of the same kinds of businesses—several banks, grocery stores, or gas stations, for example. Clearly it isn't practical to talk to all of them and the information could be more difficult to interpret. We suggest two approaches in this situation.

One is a "typical" establishment approach. Local businesses often know what their peers are doing for certain kinds of things or what is common in their industry. You might be able to talk to just one person to get a sense of what everyone does. A gas station can tell you whether it has back-up power and whether it is common for the others as well. A bank can tell you what it does during an outage and what is common practice for most banks. And so on. If you use this approach, check the box that best matches the general practice for that kind of business.

The other is to use the "dominant" establishment approach. You might have several of one kind of business, but one of them might be big and the most popular. A big retailer like Wal-Mart is an example, or a convenience store that has *many* gas pumps. Member of your community might rely heavily on just one or two businesses for something, and you can focus on those. If you use this approach, check the box that best matches the practice for the dominant business.

You can mix these two approaches when you answer the *Community Necessities Capabilities Worksheet*. For example, one technique may be better for banks, but the other is better fits gas stations. Just make a note of which approach you are using in the worksheet.

Be Conservative in Your Time Estimates

The *Community Necessities Capabilities Worksheet* asks you to check the box that best represents how long a specific service can continue to operate if the power goes out. Your discussions with stakeholders may result in very clear-cut answers.

How long can this service continue to operate if the power goes out, assuming there is no damage				
1 day or less	2-3 days	4-7 days	1-2 weeks	More than 2 weeks
❏	❏	❏	❏	❏

Often there will be a "fudge factor" about how long they can continue. For example, a grocery says that they might be able to make their generator last for up to 3 days depending on the circumstances, but their planning intended only 1 days. You should be conservative in your evaluation and estimate. You should mark their capacity as 1 day or less.

Also, if you are using a "typical establishment" approach and find out there is a range of practices in your community, don't report for the best prepared business. This will overstate your resilience. Estimate an average back-up if you can.

Finally, if you are having real trouble coming up with an estimate for a particular business or service, don't force it. Just make a note that it was really hard on the worksheet and don't check any of the boxes.

Interpretation of Your Results

You will calculate your community energy resilience score in the Step 2 worksheet. The interpretation of your score is provided below. The report that we provide you will have additional insights and interpretations.

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

After your assessment, your community might still have an incomplete picture of its energy resilience during a long-term power outage. If your community relies on businesses and public services outside of its boundaries to provide any of the key necessities, you won't have a sense of their energy resilience.

Step 2. Community Necessities Worksheet

	How long can this service continue to operate if the power goes out, assuming there is no damage					**Make note of:** 1. The type of back-up power that is used (if any) 2. If you estimated the business or service using the typical or dominant establishment approach, note which you used. 3. Anything too challenging to estimate reasonably.
Service	1 day or less	2-3 days	4-7 days	1-2 weeks	More than 2 weeks	
Phone and Internet access	❏	❏	❏	❏	❏	
Public transportation	❏	❏	❏	❏	❏	
Local TV or radio station	❏	❏	❏	❏	❏	
Local food bank or food pantry	❏	❏	❏	❏	❏	
Grocery stores	❏	❏	❏	❏	❏	
Gas stations	❏	❏	❏	❏	❏	
Banks and ATMs	❏	❏	❏	❏	❏	
Pharmacies	❏	❏	❏	❏	❏	
K-12 schools	❏	❏	❏	❏	❏	
						Count the number of checked boxes in each column and enter the total for each column.
✗	0	I	2	3	4	Multiply the column total by this number.
=						Add up (sum) this row of five numbers. Divide the row total by 4. The number you get should be between 0-4. Write the result in the shaded box below.

This is your community's energy resilience score for community necessities ➔

☑ Check the box *that best matches* the back-up power capability for the business or service.

Step 3: Identify Your Vulnerabilities

Complete the *Community Necessities Vulnerabilities Worksheet* to identify your vulnerabilities. A vulnerability is a specific service that is not available—or a need that is not met—because the power is out. ***Vulnerabilities begin at the point in time when the service or need cannot be delivered because of a lack of energy.*** For example, a grocery may have 1 day of back-up power with a diesel generator. Their facility has a "1 day or less" energy capability. Once the generator cannot operate, the facility and the pets it cares for are vulnerable to an outage.

You should be able to complete this worksheet fairly quickly, in 15-20 minutes or so. Most of what you are doing is just copying over your results from Step 2 and marking the spreadsheet. The only new information is about *who* within the community is affected when this service is no longer available. These folks are the vulnerable community members for that specific emergency response. As you reflect on who is vulnerable at a particular point in time, keep in mind two things. First, vulnerabilities will change over time as a power outage continues. Second, some members of your community may be especially vulnerable because they are socially or geographically isolated. This is explained below.

The Social Context of Vulnerabilities

One of most important things that affects the vulnerability of a community during a long-term power outage is mobility. Many people can cope and make do for a day or so, but after that they ***just leave***. They might go to family, friends, or hotels where power is available until their community recovers. However, many community members cannot do this. They might not have any place to go because they can't afford it. Your community may be geographically isolated and there isn't anywhere else you can get to.

As you think about who is vulnerable in Step 3, also consider how that might change over time. For example, on the 2nd or 3rd day of a power outage, everyone in your community might be impacted by it. But after a week or more, only those who are still present will be affected. These residents could be experiencing exceptional hardship because of their inability to go somewhere safer. So, another way of thinking about "who is vulnerable" is by reflecting on who will be hit the hardest by an outage because of limited resources for leaving or managing its effects.

Step 3. Community Necessities Vulnerability Worksheet

1. Check the same box that you checked on the Step 2 Capabilities Worksheet.

2. Then CIRCLE all the boxes to the right of the one that you checked. This is the period of time in which your community is vulnerable to a power outage for that service.

3. Identify who in your community is vulnerable once the service can no longer be provided. Please see the instructions for Step 3, because vulnerable community members can change the longer an outage lasts.

Service	Our current capability for an outage is…					Once we have reached the limit of our current energy capability, who in our community is vulnerable to the loss of this service?
	1 day or less	2-3 days	4-7 days	1-2 weeks	More than 2 weeks	
Phone and Internet access	❑	❑	❑	❑	❑	
Public transportation	❑	❑	❑	❑	❑	
Local TV or radio station	❑	❑	❑	❑	❑	
Local food bank or food pantry	❑	❑	❑	❑	❑	
Grocery stores	❑	❑	❑	❑	❑	
Gas stations	❑	❑	❑	❑	❑	
Banks and ATMs	❑	❑	❑	❑	❑	
Pharmacies	❑	❑	❑	❑	❑	
K-12 schools	❑	❑	❑	❑	❑	

Residential
Vulnerabilities and Resilience

During an extended power outage, some households and residential settings are especially vulnerable to the loss of electricity. These vulnerabilities can make it challenging to "shelter in place," can prevent people from leaving or evacuating their homes when they otherwise should, and can have a dangerous impact on health and safety.

Residential vulnerabilities include a variety of circumstances. This covers not just families and households, but also those in residential care of some kind, like healthcare facilities and detention centers. With regard to residential vulnerabilities, the type of building is also relevant. Multi-family housing—such as apartment buildings and complexes—presents important issues for energy vulnerability and resilience.

Our community energy resilience tool only scores certain kinds of residential vulnerabilities. This section of the workbook includes a discussion of residential healthcare facilities and multi-family housing, but you will not formally evaluate and score these. You will be able to get information about their energy resilience and vulnerability as part of this review process, however.

Below is a list of critical residential vulnerabilities during a power outage that you will evaluate and score as part of the tool:

- Inability to leave home
- Dependence on well water
- Limited English capability
- Dependence on home health care equipment
- Dependence on home healthcare attendants or caregivers
- Vulnerability to extreme heat
- Vulnerability to extreme or severe cold weather

The key stakeholders to talk to for this impact area are people involved in social services. This includes your local government departments as well as community non-profit and charitable organizations. As we suggested earlier, having a team member who has good connections and knowledge of this area will be very helpful.

This section of the workbook starts with the residential vulnerabilities that you can evaluate and score. You will go through the same 3-step process as the other impact areas, but the worksheets and scoring approach is slightly different for these vulnerabilities. Residential healthcare facilities and multi-family housing are discussed at the end of the section.

Step 1: Identify Areas of Potential Impact

The *Residential Vulnerabilities Worksheet* is a little different than the checklist you used for Step 1 in the other impact areas. Every community has almost all of these vulnerabilities in some manner. The worksheet identifies and explains what each vulnerability is. It then gives you a place to write down how many people or households in your community are estimated to have this vulnerability. We provide this information to you as part of our background material on your community.

Interpreting Your Results

- Residential vulnerabilities are not just about the number of people or households that are affected. You also have to consider and weigh the relative harms that are associated with a particular vulnerability. For example, there may be very few people in your community who lack transportation. But if the power goes out during severely cold weather, their lives could be at risk.

- Some vulnerabilities are interdependent. For example, the elderly are especially vulnerable to extreme heat, but they also may be dependent on home healthcare or caregiving of some kind. During a power outage, they may be affected by both the absence of a caregiver and the heat. And by implication they also cannot leave home on their own.

Step 1. Residential Vulnerabilities Worksheet

For each vulnerability, indicate how many people or households are affected by it in your community. This information is provided in our background information packet.		
Vulnerability	**Explanation**	**Number affected in our community**
Inability to leave home	People who lack transportation may be forced to stay at home when, for safety's sake, they should go somewhere else.	
Dependence on well water	Households on well-water will lose water when the power goes out because the electric pressure tank and pump will not work.	
Limited English capability	Households with a limited ability to communicate in English might be cut off from communication about an outage, its duration, the dangers of an imminent emergency event and prevented from contacting others about their own needs.	
Dependence on home health care equipment	People who rely on durable medical equipment—like oxygen machines or refrigerators for diabetes medicine—can quickly experience a crisis in a power outage. While some equipment has battery back-up, not everyone can afford it and the battery storage does not last long. In widespread outages that last even a few hours, such folks typically go to emergency rooms and can overwhelm hospitals that are also trying to deal with acute care during an emergency event.	
Dependence on home health care attendants or caregivers	People who rely on outside home health care attendants or caregivers can also be at risk during an extended outage or emergency event. Medication management, meals, bathing, personal hygiene, and other critical health care could be interrupted. These are people who also may not be mobile or able to leave home easily (or at all).	
Vulnerability to extreme heat	Many types of people are especially vulnerable to extreme heat, which can dangerously affect their health. These include the elderly, babies, and people with certain medical conditions.	
Vulnerability to cold weather or extreme cold	Vulnerability to cold weather can happen in two basic ways. A power outage during the winter can cause people to people lose heat. Or a low-income household cannot afford to heat its home adequately and its well-being is compromised. During severely cold weather, this could also be life threatening.	

Step 2: Identify Your Support Capabilities for Residential Vulnerabilities

Step 2 for residential vulnerabilities isn't about back-up power, which was the focus for the other impact areas. Here you will evaluate your community's social support system for helping individuals and households who are vulnerable.

The Step 2 worksheet, *Residential Vulnerabilities Support Worksheet*, contains the questions you need to ask for this part of the evaluation. The response choices represent a progression of capability, from none to existing practice. These form a scale of 1-4 that is fairly comparable to the resilience scoring in the other impact areas.

You should be able to tell from the questions the types of stakeholders that you need to talk to. Your local and county government will have a social service department that can inform you about some vulnerabilities that may be within their responsibilities, like eldercare checks. Some charities, non-profits, and faith-based organizations may offer relevant services, such as support for people with limited English, providing emergency transportation, and so on. For this impact area, you know your community best, and your team should be able to sort out who best to talk to.

Interpreting Your Results

You will calculate your community energy resilience score for household vulnerabilities in the Step 2 worksheet. The interpretation of your score is provided below. The report that we provide you will have additional insights and interpretations.

If your score is—	It means that—
0-1	Your community's current capability and support for vulnerable households in your community is limited to non-existent. This means that people are relying entirely on their own resources and networks to be protected during an extended power outage.
1-2	Your community has a limited ability to assist vulnerable households during an extended outage. Your existing capability relies heavily on volunteer efforts and the informal sector.
2-3	Your community has formal plans and seems prepared to support many types of residential vulnerabilities for an outage that lasts longer than one day. However, it has not yet had the experience of implementing them in practice. And how long you can sustain this support is not clear.
3-4	Your community has both formal plans for and direct experience with supporting many types of household vulnerabilities for a power outage that lasts longer than a day and extreme heat or cold weather events.

Step 2. Residential Vulnerabilities Support Worksheet

✓ Check the box *that best matches* the *existing* social capability of your community.

Vulnerability	Energy resilience question	We have nothing like this at all	We have some experience with this through informal and volunteer activity	We have formal plans in place but have not yet needed to use them	We have formal plans in place and have used them in the past
Lack of transportation	For a power outage longer than 1 day, is your community able to identify households without transportation and relocating them to a safer place?	❏	❏	❏	❏
Dependence on well water	For a power outage longer than 1 day, is your community able to provide potable water for homes on wells?	❏	❏	❏	❏
Limited English capability	Does your community have a public alert system that allows people with limited English to understand what is happening during an emergency or that warns people of a possible emergency like a bad storm?	❏	❏	❏	❏
Dependence on home health care equipment	For a power outage longer than 1 day, is your community able to identify households dependent on home health care equipment and provide them with a source of electricity for their equipment?	❏	❏	❏	❏
Dependence on home health caregivers	For a power outage longer than 1 day, is your community able to identify households dependent on home health caregivers, doing a wellness check, and then acting on any needs?	❏	❏	❏	❏
Susceptible to extreme heat	Does your community have a cooling center or other way of providing shelter where people susceptible to extreme heat can relocate during a heat wave?	❏	❏	❏	❏
Loss of home heating	For a power outage during the winter that is longer than 4 hours, does your community have a warming center where people without heat can relocate?	❏	❏	❏	❏
Vulnerability to extreme cold	Does your community have a warming center or other way of providing shelter that people who cannot afford to fully heat their homes can go during extremely cold weather?	❏	❏	❏	❏
Count the number of checked boxes in each column and enter the total for each column.					
Multiply the column total by this number. ✗		0	2	3	4
Add up (sum) this row of five numbers. Divide the row total by 4. The number you get should be between 0-4. Write the result in the shaded box below. =					

This is your community's energy resilience score for residential vulnerabilities ➜

Step 3: Identify Your Residential Support Vulnerabilities

There is no separate worksheet for Step 3 in this impact area. Please review and reflect on your responses in the *Residential Vulnerabilities Support Worksheet*. You will mark directly on this worksheet for Step 3. *Circle everything to the right* of the box that you checked for each listed vulnerability. This indicates the level of support that your community **does not** provide. This is the vulnerability of your community.

The scoring approach for household vulnerabilities is not anchored to different time frames of long-term power outages. The baseline is simply "are you prepared and can you take action for an outage that lasts longer than a day?" This is to assess your ability to meet urgent needs. As you reflect on and prioritize your vulnerabilities in Step 3, you should also consider how long you might want your community to be able to sustain its support of these households during an outage.

Residential Health Care Facilities

Your community might have residential health care facilities. It is likely that these facilities are common knowledge in your community, but we have also identified any that you might have as part of our background material for you.

Residential health care facilities include nursing homes and assisted living facilities. The federal government regulates emergency power requirements for nursing homes through Medicare and Medicaid. The Commonwealth of Virginia regulates emergency power requirements for assisted living facilities. These regulations are very different from one another. And because of these legalities and requirements, you will not be scoring the energy resilience of any residential healthcare facilities in your community.

However, **we strongly suggest** that you ask for an "informational interview" with these facilities to generally explore what they are prepared for in the event of a power outage that lasts longer than an hour. This will help you develop a more complete picture of your community's energy resilience even though this item does not have a scoring element in our tool.

A recent "best practice" report from the National Governor's Association suggested that residential health care facilities should be fully operational within 3 days if a power outage occurs.[3] The report explains that there is a "cascade" of problems that begin to occur after this time when only selected functions within the facility are operational. For example, hot-water laundry is not a function that is usually covered during an emergency outage. But after 3 days, risks develop. Laundry (such as bedding) needs to be done to maintain hygiene and sanitation, otherwise residents can become

[3] National Governor's Association, *Prioritizing Resilience: Best Practices on Energy Resilience for Healthcare Facilities* (May 2023).

vulnerable to infections and other health problems. In Part 3 of this workbook on *Vulnerabilities and Next Steps,* we will ask you to list any facilities that you were able to talk to that could not fully power themselves after 3 days.

Multi-Family Housing

Multi-family housing represents buildings with more than one residential unit, like duplexes, townhouses, and apartment buildings. Because many people are concentrated in these buildings and complexes, it is often desirable for them to "shelter in place" during an extended power outage. For example, a community center in a large apartment complex could be a good site for a resilience hub or a warming/cooling center. Similarly, a multi-unit building that has a single utility meter is a site that could potentially benefit from long-duration battery storage systems for its residents.

Nevertheless, a community could have hundreds of households that live in multi-family buildings. It is not easy to evaluate the existing or potential energy resilience of so many (and very different) locations. It is simply not practical to include them in your community energy resilience scoring, and for most communities this would be a real burden to do. In addition, public data on the number of households that live in multi-family units is only available at the county and Census tract level, and "building counts" are not available. As a consequence, it is hard for us to give some communities a reasonable estimate of multi-family households and buildings.

To sum, the purpose of this discussion about multi-family housing is to do two things. One is to acknowledge that large concentrations of people and households represent a potential major energy vulnerability, and that opportunities exist for strengthening their resilience. The other is to explain why it is not in our scoring tool. However, our customized energy resilience report will contain a variety of energy resilience options for multi-family housing buildings and complexes. We will provide you with any public data that are a good representation of your community's multi-family housing context, and explain how you can get more accurate estimates from your city, town, or county government.

Part 3. Vulnerabilities and Next Steps

This is the final step in your community energy resilience analysis. Now you will reflect on the vulnerabilities that you identified and determine which are the most important for improving their energy resilience. You should do this by discussing your results as a team.

During a long-term power outage, your community will be potentially vulnerable in several different ways, all of which you identified in the worksheets:

1. You have a critical community function physically located in your community, but it has either (a) no back-up power at all, or (b) back-up power is available for less time than you would like.

2. Your community relies on the county or another organization to provide public health and safety services located outside of your community.

3. Your community relies on the county, the Commonwealth of Virginia, or FEMA for emergency responses.

4. Your community has "gaps" in its ability to provide community necessities or support vulnerable households locally during a long-term power outage.

5. There are interdependent energy vulnerabilities in your community. For example, a gas station might have back-up power but could run out of fuel. Or you have a public alert system that can be powered a long time, but most people have no ability to charge batteries on their phones or computers.

We provide guidance about how to reflect on what you found for each of these issues. In terms of process, we suggest that you discuss this as a group, then prioritize the vulnerabilities that seem most important to you. Write down what these are. When you are done with the workbook and scoring tool, our project team will ask you about your important vulnerabilities so that we can develop your customized report.

Vulnerabilities for Facilities and Services Physically Available in Your Community

- Review your results for the Step 3 spreadsheets in each of the four impact areas.
- Look for services with no back-up power at all.
- Look for services that have less back-up power than seems appropriate given the growing risks of extreme weather events and power outages. Reflecting on your community's history of past outages and emergency events can give you insight into how often these occur, what problems

were created, and how long you might want to prepare for. Add to that the changing risks for your community that are expected in the future.

- Reflect on who is vulnerable in each of these circumstances. Look for members of your community who might be particularly affected or harmed by an outage, and when their vulnerability begins. Threats to their life and health or meeting critical basic needs are red flags.

- Identify the highest priorities for you. A list of 6 is a good goal.

Reliance on Others for Public Health and Safety and Emergency Management Responses

- To better understand how you might be energy resilient or vulnerable in these circumstances, we strongly suggest that you talk to your county's emergency management coordinator. You can explore more generally the questions in the workbook with them. That person can tell you how prepared the county is for a long-term outage and how quickly they can respond to your community's needs during an outage. They can also tell you how the disaster declaration process works and the time delay in getting resources to your community if such an event happens.

- In terms of public health and safety, the extent of back-up power in the county and how quickly it can respond to your needs represents your resilience/vulnerability for that service.

- The time delay in getting emergency services to you during a disaster is the period in which your community is vulnerable for that emergency response during a long-term outage.

- Reflect on these vulnerabilities and whether there are any that your community might reasonably try to fix through local solutions. Include these on your vulnerabilities list even if you don't have the resources to do it.

Local Gaps in Providing Community Necessities or Supporting Vulnerable Households

- Review your workbook results for the community necessities and residential vulnerabilities impact areas.

- What gaps in local resources exist? Are there any that your community might reasonably try to fill through local solutions? Include these on your vulnerabilities list even if you don't have the resources to do it.

- Do you have a residential health care facility? Are they able to fully power their facility for an outage that lasts longer than 3 days? If not, add them to your vulnerabilities list.

- Most communities will have multi-family unit residential buildings and complexes. We will include specialized information on energy resilience for these buildings as part of our customized report.

Look for cross over vulnerabilities. Gas stations with back-up power, but no fuel. How much gasoline supply is there?

Interdependent Energy Systems

- You may discover that there are interdependent systems in your community in terms of energy resilience over time. Examples include:
    - Public transportation systems that could run out of reserve fuel.
    - Any back-up generator that relies on diesel or another fuel, which could run out and lack an ability to be resupplied.
    - Gas stations that have back-up power but cannot refill their storage tanks once their fuel has all been sold.
    - A public alert system, which also requires that community members have a way of receiving the alerts on phones or computer devices.
- Add any interdependent systems that you identified to your vulnerabilities list.

The Next Steps

You should now have a list of energy vulnerabilities in your community. You should have:

- About 6 *that you prioritized* based on facilities and services actually in your community.
- Public health, safety, or emergency management services that your community would be interested in fixing, even if it does not have the resources.
- Gaps in providing community necessities or supporting vulnerable households that your community would be interested in filling, even if it does not have the resources.
- Any residential health care facilities that do not have the ability to fully power their facility for longer than 3 days.
- Any interdependent energy systems that you were able to identify.

The project team will talk to you about your list, then provide options for achieving improved energy resilience for the facilities and services that are on it. Our options will address costs and resources, provide low-cost/no-cost insights when possible, explain opportunities that can be created through resilience hubs, and explain different options for electric power (such as fueled generators and solar plus storage). As a reminder, we will also include information that can be used for multi-family residential buildings.