State Action Guide for Energy Resilience Projects Under FEMA's Building Resilient Infrastructure and Communities (BRIC) Program and Other Hazard Mitigation Assistance (HMA) Programs

Technical Guide

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1. Introduction

1.1. Purpose and Audience

The purpose of the State Action Guide for Energy Resilience Projects under the Federal Emergency Management Agency's (FEMA) Building Resilient Infrastructure and Communities (BRIC) Program and Other Hazard Mitigation Programs ("BRIC Energy Action Guide") is to support State Energy Offices, Emergency Management Agencies, key local officials, and private sector entities to identify solutions to mitigate hazards to the energy sector, including critical end-use facilities and operations. BRIC represents an unprecedented opportunity for the energy sector to leverage public and private resources to mitigate hazards that affect energy infrastructure, sources, and supply chains. Partnerships among State Energy Offices, Emergency Management Agencies, local officials, utilities, and non-profit entities can use this BRIC Energy Action Guide, to develop and submit project subapplications that are competitive with the evaluation criteria under BRIC and other hazard mitigation assistance programs.

Our Key Message

It is critical that potential BRIC subapplicants for energy resilience be able to develop high-quality, eligible subapplications. This requires partnership between hazard mitigation and energy subject matter experts in hazard mitigation planning and subapplication development, buy-in and support from state emergency management officials, and engagement with local governments. The combination of state energy offices, state emergency management agencies, and private sector entities are best suited to jointly apply for and leverage BRIC funds to support local energy resilience. Their roles in BRIC funding pursuits are as follows:

- **State Energy Offices:**
  Serve as energy subject matter experts and form partnerships with emergency management agencies to enhance energy resilience; participate in the FEMA hazard mitigation planning process to ensure energy vulnerabilities, priorities, and mitigation strategies are identified.
- **State Emergency Management Agencies:**
  Under the direction of the State Hazard Mitigation Officer (SHMO), they lead the development of the state Hazard Mitigation Plan and the development of BRIC applications by collecting, reviewing, prioritizing, and selecting project subapplications to be included in the final application to FEMA.
- **Utilities and private energy sector entities:**
  Developers, engineering firms, and private and public energy service providers can serve as critical partners for BRIC project design, development, and funding. As technical experts, these entities can significantly improve the quality of a BRIC subapplication by providing benefit-cost metrics and engineering assessments and contributing cost-share. They should be involved in the local hazard mitigation planning process to ensure local level energy vulnerability, priorities, and mitigation strategies are identified.

1.2. Importance of Hazard Mitigation for the Energy Sector

In recent years, the United States has experienced some of the most devastating disasters in its history, which has led to impacts to the nation's energy security at unprecedented levels. In 2021, Winter Storm Uri, one of the costliest winter storms on record, disrupted power for millions of people, and resulted in at least 23 fatalities.[1] In 2017, Hurricane Irma caused one of the worst power outages in US history, leaving nearly 7 million Floridians in the dark and 13,000 in shelters.[2] In 2018, the deadliest and most destructive wildfire season in California history resulted in 24,000 structures damaged or destroyed and 103 fatalities, 84 of which have been attributed to failed electrical equipment.[3]

Despite the growing frequency and magnitude of natural disasters, including a growing number of billion-dollar disasters per year,[4] the energy sector can make decisions today to ensure a safer and more resilient future. Hazard mitigation is a proven, cost-effective method to minimize the impacts of natural disasters in hazard-prone areas. The 2019 National Institute of Building Sciences (NIBS) Mitigation Saves report found that retrofits to lifelines (i.e., services that enable continuous operation of essential services), save an average of $4 per every $1 spent and Federal Mitigation Grants saves $6 per every $1 spent.[5]

Mitigation has become an essential pillar of energy security and resilience planning writ large. The U.S. Department of Energy's Office of Cybersecurity, Energy Security, and Emergency Response (US DOE CESER), serves as executor for DOE as the Sector Risk Management Agency for the energy sector. Hazard mitigation activities are a key component of CESER's mission to enhance the security and resilience of U.S. critical energy infrastructure to all hazards, mitigate the impacts of disruptive events and risk to the sector overall through preparedness and innovation, and respond to and facilitate recovery from energy disruptions in collaboration with other Federal agencies, the private sector, and State, local, tribal, and territory governments.

CESER's State, Local, Tribal, and Territorial (SLTT) program supports State Energy Offices and State Emergency Management agencies with energy systems risk mitigation by serving as an advocate and liaison to FEMA for the energy sector, providing technical assistance and resources to states, and serving as a federal repository for technical expertise.

1.3. Organization and Maintenance of this Guide

The BRIC Energy Action Guide consists of information on hazard mitigation for the energy sector, application best practices, and resources on a variety of subjects including cost-share, benefit-cost analysis, and project eligibility.

There is also a supporting Quick Guide to this document, referenced in Section 7. NASEO intends to update this BRIC Energy Action Guide on an annual basis to reflect the most current program guidance and information regarding BRIC. Future iterations will incorporate lessons learned from BRIC-funded energy projects as they are implemented and completed.

This document is organized across the following sections:

2 **The Hazard Mitigation Assistance Programs**
Provides a foundation of knowledge for HMA and BRIC, including its authorizing legislation, program principles and priorities, key roles and responsibilities, and more

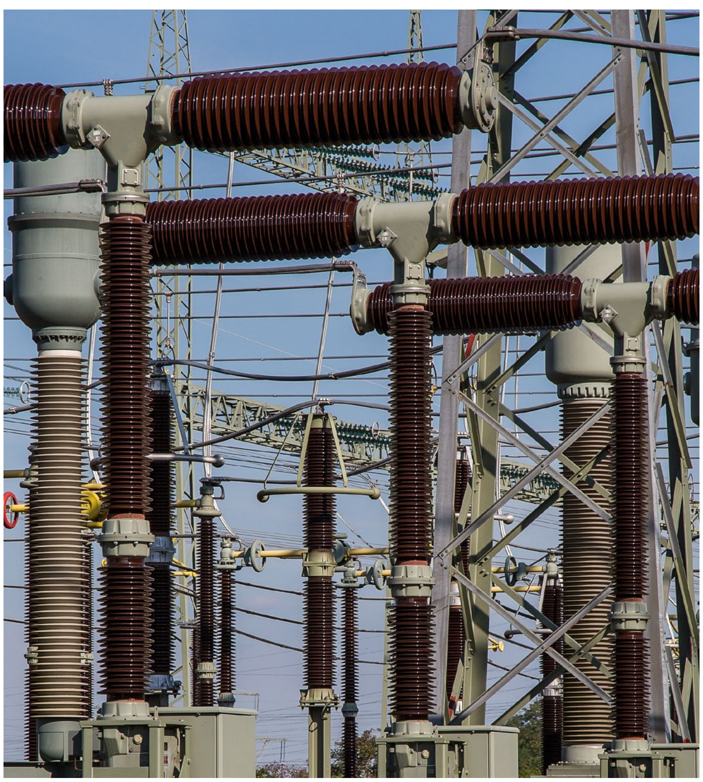
3 **BRIC Program Eligibility**
Outlines the specific criteria to determine if your organization and your project are eligible for BRIC

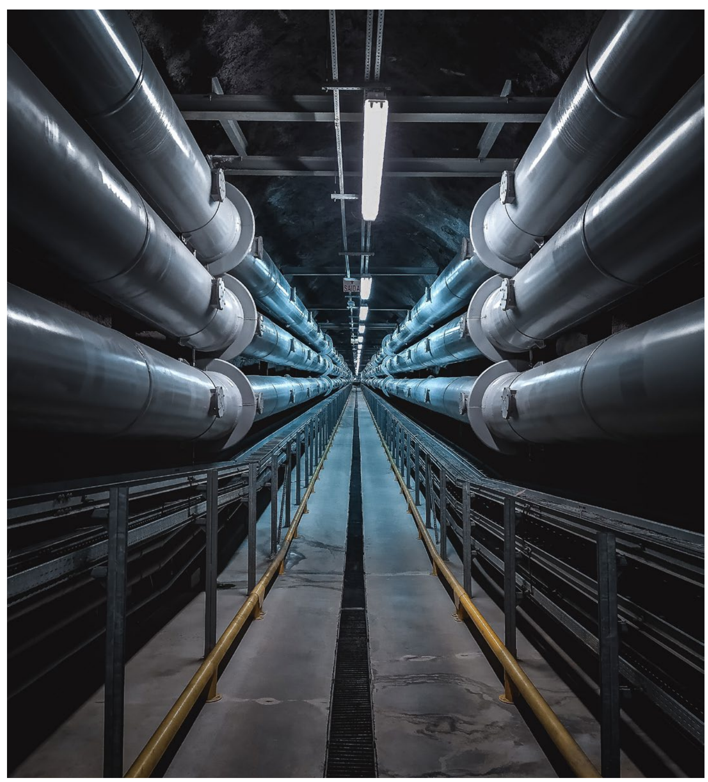
4 **Determining if BRIC is the Right Program for your Project**
After determining eligibility, evaluation of competitiveness, and cost effectiveness, this section provides questions to consider when determining if BRIC is the best suited grant program for your project

5 **Application Requirements**
Dives deep into the BRIC evaluation criteria and approved approaches for determining cost effectiveness through the FEMA benefit cost analysis process

6 **Assessment and Planning**
Describes how traditional energy sector planning and assessment processes can be used to supplement and inform a hazard mitigation plan

7 **Additional Support**
Provides information on the “Quick Guide”, the supporting document to this Technical Guide





2. FEMA Hazard Mitigation Assistance Programs

FEMA's Hazard Mitigation Assistance (HMA) programs provide funding to reduce disaster losses through eligible mitigation activities. HMA is made up of three programs – the Building Resilient Infrastructure and Communities (BRIC) program, Flood Mitigation Assistance (FMA), and the Hazard Mitigation Grant Program (HMGP). BRIC and FMA are offered annually, while funding under HMGP is available following a presidentially declared disaster. This BRIC Energy Action Guide will be primarily focused on BRIC due to its innovative, proactive approach for implementing mitigation activities. Additionally, energy infrastructure is explicitly named as a FEMA Community Lifeline in the BRIC guidance and priorities. Items covered in this BRIC Energy Action Guide might also be applicable to other federal resilience grant programs.

2.1. Authorizing Legislation for BRIC

Section 203 of the Robert T. Stafford Disaster Relief and Emergency Assistance Act (Stafford Act) authorized FEMA to provide financial assistance to applicants for pre-disaster hazard mitigation projects, provided they are cost-effective, and "reduce injuries, loss of life, and damage and destruction of property, including damage to critical services and facilities."[6] From this legislation, FEMA established the Pre-Disaster Mitigation (PDM) grant program, the precursor to BRIC, funded through the annual congressional appropriations process.

In 2018, The Disaster Recovery Reform Act of 2018 (DRRA) amended Section 203 of the Stafford Act to supersede the legacy PDM program and stand up the National Public Infrastructure Pre-Disaster Hazard Mitigation Fund, the funding mechanism for BRIC. FEMA funds BRIC from a six-percent set-aside of federal post-disaster grant funding. The creation of this annually available resource reduces the dependence on congressional action and instead relies on a calculated formula to fund mitigation projects in non-disaster conditions.

2.2. Guiding Principles and Priorities

BRIC seeks to fund projects that mitigate risks to critical infrastructure posed by natural hazards with a particular emphasis on projects that benefit disadvantaged communities. BRIC prioritizes innovative projects that protect critical energy assets and systems and strengthen end-use energy security, especially at critical facilities. BRIC also promotes partnerships with such entities as non-governmental organizations (NGOs), universities, private organizations, or other government entities to foster a culture of preparedness and inform community-wide resiliency. Due to the complex nature of the energy sector, these partnerships often play an important role in project implementation. Find the full list of BRIC's guiding principles and priorities below:

BRIC Guiding Principles

1. Support communities through capability and capacity building to enable them to identify mitigation actions and implement projects that reduce risks posed by natural hazards
2. Encourage and enable innovation
3. Promote partnerships and high-impact investments with a focus on critical services and facilities, public safety, public health, and communities
4. Provide opportunity to reduce future losses
5. Promote equity by prioritizing 40-percent of program benefits to disadvantaged communities
6. Support adoption and enforcement of building codes, standards, and policies that account for the effects of climate change and long-term risk reduction

Priorities

1. Infrastructure projects
2. Projects that benefit disadvantaged communities as referenced in EO 14008[7]
3. Projects that incorporate nature-based solutions including those designed to reduce carbon emissions
4. Climate change adaptation and resilience projects
5. Projects proposed by applicants who adopt and enforce mandatory Tribal-, territory-, or state-wide building codes based on the latest published editions of building codes

2.2.1. System-Based Mitigation

In past funding cycles, FEMA prioritized projects that mitigated risk to seven Community Lifelines.[8] Many jurisdictions applied for and were awarded asset-focused hazard mitigation activities that benefit a single Community Lifeline, such as a generator that provides a redundant power source for a single facility or asset. These hazard mitigation activities remain valuable; however, FEMA has recognized the importance of prioritizing projects that promote **system-based mitigation.**

FEMA Community Lifelines

FEMA Community Lifelines are the most fundamental services in the community that, when stabilized, enable all other aspects of society. They include:

- Safety and Security
- Food, Water, and Shelter
- Health and Medical
- Energy (Power & Fuel)
- Communications
- Transportation
- Hazardous Materials

A system-based approach to hazard mitigation acknowledges that Community Lifelines do not function independently; they are integral pieces of a larger, interrelated critical system with "upstream" and "downstream" impacts. Thus, system-based mitigation involves projects that mitigate risk to as many Community Lifelines as possible, thus minimizing the cascading impacts of loss and maximizing benefits to the broadest population. For example, potable water and energy systems are interdependent to maintain the health and safety of communities. Consistent energy supply is critical for potable water systems to function. If an energy asset is impacted by a disaster, residents could also lose access to safe drinking water, exposing them to potential health risks. The Saint Elizabeths Microgrid project in the District of Columbia, awarded under Fiscal Year (FY) 2020 BRIC, will mitigate power loss to a hospital, 911 response center, homeless shelter, and public buildings.[9] Thus, a project that mitigates power loss to critical infrastructure will inherently address multiple Community Lifelines, demonstrating a system-based approach. This shift in FEMA's focus to system-based mitigation is reflected in the FY 2022 BRIC evaluation criteria. Mitigating risk to Community Lifelines is no longer an individual evaluation criterion since it is now FEMA's baseline expectation that BRIC funded projects will accomplish this.[10]

2.2.2. Equity and Supporting Disadvantaged Populations

Presidential Executive Order 14008 and the Justice40 initiative have shaped BRIC program priorities and requirements to benefit disadvantaged communities. For example, equity is now embedded within the program's evaluation criteria. One technical criterion and four qualitative criteria require subapplications to demonstrate or describe how the proposed project will benefit disadvantaged communities. This commitment to equity acknowledges a history of structural inequality in regional planning and disparities in the built environment that have resulted in disadvantaged communities currently living with infrastructure systems that are aging, inadequate, and particularly vulnerable to natural hazards and climate risks.

Within the energy sector, socioeconomic factors are a notable predictor of energy insecurity.[11] Households at or near the Federal Poverty Level (FPL) are significantly more burdened by energy insecurity than other socioeconomic groups.[12] When a disaster strikes, low-income, African American and Latino households, households with children, renters, and people living in older and poorly insulated homes are more likely to receive service interruptions leading to life-threatening consequences. BRIC, along with other HMA programs, presents an opportunity to address inequities in energy infrastructure and build long-term resilience in disadvantaged communities.

Project Spotlight

Lane County, Oregon (subapplicant) and the Blachly-Lane Electric Cooperative (BLEC) (subapplicant partner) developed an application for a critical infrastructure protection project submitted under the BRIC FY 2021 grant cycle, pioneering how public–private partnerships can look within energy resiliency planning.

The proposed project will build redundancy and increase reliability to the BLEC power grid by constructing a new electric transmission line to interconnect with neighboring Emerald People's Utility District (EPUD) system. Currently, there is a single transmission feed to Blachly-Lane's service territory from Bonneville Power Administration (BPA). This project will provide an alternate transmission feed so residents can maintain power in the event of a failure of BPA's line.

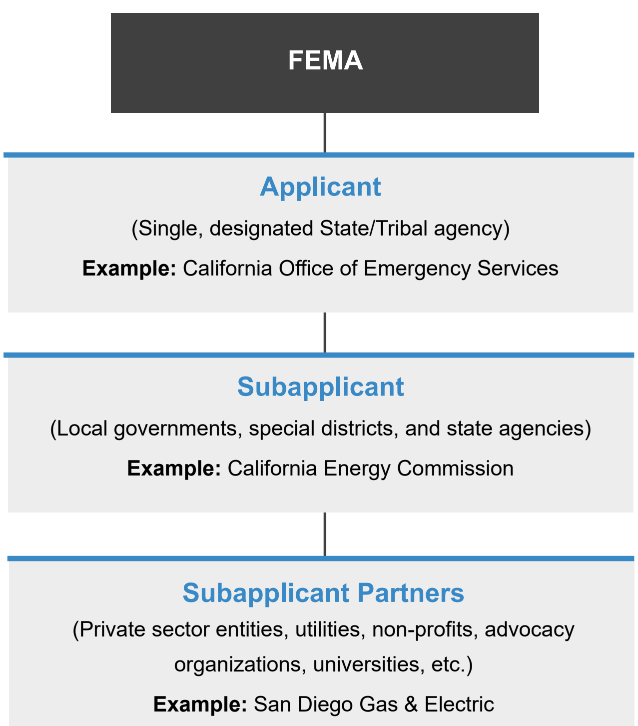
As critical stakeholders, EPUD and BPA were instrumental in the development of the project and will continue to be engaged in aspects of the project's development and implementation.

Learn more about this partnership model in the case studies in the Quick Guide.

2.3. Roles and Responsibilities

BRIC applications are comprised of multiple layers of roles and responsibilities, including Applicants, Subapplicants, and Subapplication Partners. See Figure 1 for the hierarchy of BRIC players.

Figure 1: Hierarchy of Roles in a FEMA BRIC Grant Application



2.3.1.1. APPLICANTS

BRIC Applicants, including States, Territories, and federally recognized Tribal governments, apply directly to FEMA. State Energy Offices cannot apply directly to FEMA for BRIC funding, as each state designates one agency (typically the state emergency management agency) to serve as the **applicant** for BRIC funding. Each applicant may submit only one BRIC grant application to FEMA using the FEMA Grants Outcomes (FEMA GO) management system. However, the application can be made up of an unlimited number of subapplications.

2.3.1.2. SUBAPPLICANTS

Local governments, including cities, townships, counties, special district governments, state agencies, and federally recognized tribal governments, are considered **eligible subapplicants**. **State Energy Offices and public/municipal utilities are also eligible subapplicants**, which means they can develop subapplications and submit them to the state designated applicant agency for review and submission.

2.3.1.3. SUBAPPLICATION PARTNERS

Subapplicants are not the only entities that can be involved with developing a subapplication. For example, a facility, structure, or asset being mitigated by the project could be owned or managed by a private utility or local energy cooperative (co-op). These entities, **private or investor-owned utilities and energy co-ops, are not eligible subapplicants** and must apply as **subapplication partners** through an eligible subapplicant.

As an example, a private or investor-owned utility company in California sought to partner with a city in its service area to reduce the risk from sea level rise at an electrical substation.[13] The city's local government is the subapplicant that coordinates with the applicant (in this case, the California Office of Emergency Services) to submit the project subapplication. The investor-owned utility would be considered a subapplication partner that would help develop the project design, provide planning documents and data for the subapplication, and potentially offer a portion of the non-federal share match. There are many ways partners can provide support through subapplication development and project implementation, including through project advice or technical assistance, promoting or supporting the proposed project publicly, and helping to build community awareness for the risks identified.

Under BRIC, FEMA will accept a private or investor-owned utility or energy co-op the as the subapplicant partner as long as the subapplicant has identified this type of energy project as a prioritized need through its planning process and can demonstrate the vulnerability and benefit to the community. For example, if hardening an electrical utility is consistent with goals and priorities of a local hazard mitigation plan and it fits within FEMA's scoring criteria and objectives (e.g., Infrastructure Project, Risk Reduction and Resiliency, Population Impacted, Leveraging Partners, etc.), then it is an eligible and competitive project. The key priority in FEMA's review is the demonstration of beneficial impact to the community.

Based on the project, other private sector stakeholders may include:

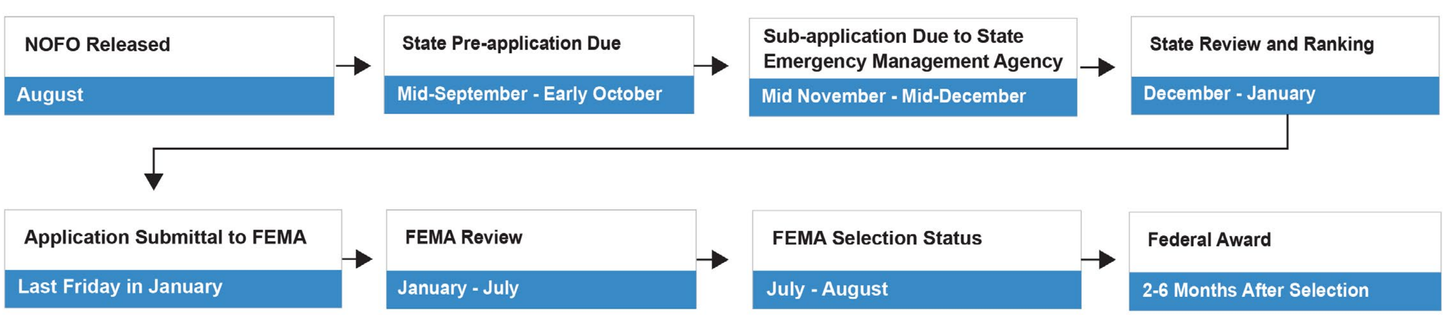
- **Nonprofits, grassroots organizations, or other non-governmental organizations (NGOs).** The Nature Conservancy, a global environmental nonprofit, helped fund the Lubberland Creek Restoration and Coastal Flood Risk Mitigation project while funding from Scenic Galveston, Inc., contributed to the Virginia Point Wetland Protection Project.[34]
- **Industry associations of stakeholders in the energy resilience sector, such as utilities, regulators, contractors, builders, and code officials, that aim to represent their stakeholders' interests.** This includes both private, co-op, and municipal utilities that provide energy service to a significant portion of the population that may include disadvantaged communities.
- **Corporations seeking to make charitable contributions or meet environmental, social, and governance or sustainability goals.** For example, the businessman Ronald O. Perelman provided the non-federal funding for the NYU Langone Medical Center Flood Resilience Project.[34]
- **National labs and university research centers that may have the skills and interest to develop an innovative project.** For example, the Idaho National Laboratory provided the testing and simulation for the Blue Lake Rancheria Tribe Microgrid project.
- **Other state and local offices such as water, housing, and emergency management, who may be interested in the project.**

2.4. Application Process Overview

Each state's application process is different, so it is imperative that subapplicants coordinate with their designated SHMO to understand their state's priorities and deadline. Notably, the application deadlines specified by FEMA are for the applicants only. The application period has historically opened on September 30th each year and closes on the last Friday in January of the following year. **Subapplicants should consult with their state, tribal, or territorial agency to set up their FEMA GO accounts and confirm deadlines to submit subapplications for consideration**. The key milestones in the application process include:

1. **Notice of Funding Opportunity (NOFO) –** August. Each year, typically in August, the BRIC NOFO is released by FEMA. Once the NOFO is released, each state establishes its own timeline for sub-application submittal and communicates that timeline through the state applicant entity
2. **Pre-application –** mid-September to early October. Most states require subapplicants to submit a pre-application (also known as a Letter of Interest or Notice of Interest). This is typically a brief executive summary with some basic information about the project, including the estimated cost, a description of the project scope, hazard mitigation plan information, and subapplicant contact information. The State Emergency Management Agency will review the pre-applications and invite selected subapplicants in early October to begin working on the full subapplication in FEMA GO.
3. **Subapplication –** mid-November to early December. Full subapplications are due to the designated State Emergency Management Agency in FEMA GO. The State then reviews each subapplication and approves or denies it.
4. **Application –** end of January. The State submits its singular application (comprised of multiple subapplications) to FEMA for review on the last Friday in January of the following year.
5. **Selection status –** July or August. FEMA releases selection status if the project has been "identified for further review", "does not meet HMA requirements", or "not selected". If projects are "identified for further review," FEMA performs additional review and may issue requests for information. While selection for further review is extremely promising, it is not a guarantee of award. Further definitions of these selection statuses are available on FEMA.gov.[14]
6. **Federal award –** variable. Provided that the subapplicant satisfies all requests for information and FEMA successfully completes its reviews, Federal awards are then made later that year or early the following year.

Figure 2: BRIC Application Process



3. BRIC Program Eligibility

To be eligible to apply for BRIC, all applications and subapplications must:

- Be technically feasible and cost effective
- Contain eligible activities
- Provide at least 25-percent non-federal cost share (in most cases)
- Be submitted by an eligible entity with an adopted FEMA-approved Hazard Mitigation Plan (in most cases)
- Come from a State or Territory that has experienced a major disaster declaration under the Stafford Act in the last seven years.[15] Due to the COVID-19 disaster declaration in 2020, all States and Territories are eligible to apply to BRIC through 2027.

More details on these requirements and exceptions are included in the subsequent sections below.

> If you are unsure about your project's eligibility, keep reading. If you confirmed your project's eligibility with your State Emergency Management Agency, State Hazard Mitigation Officer, and/or FEMA, please proceed to **Section 4 Is BRIC the Right Program for My Energy Project?** for additional considerations.

3.1. Mitigation Plan Requirement

To be eligible for BRIC funding, **subapplicants must have a current FEMA-approved local, tribal, or multi-jurisdictional hazard mitigation plan** at the time of application and award. Subapplicants must also have a current FEMA-approved state hazard mitigation plan (HMP) at the time of application and award if they are applying for hazard mitigation **projects** and **project scoping** subapplications. State Energy Officials can check the status of a community's hazard mitigation plan by visiting FEMA's website.[16]

Subapplicants do not need an approved **local HMP** for the following Capability and Capacity Building (C&CB) activities[17]: hazard mitigation planning and planning related activities, partnerships, and building codes activities. **Subapplication partners**, such as private utilities, investor-owned co-ops, and community groups **do not need** an approved HMP. Figure 3 below provides a decision tree on the hazard mitigation plan requirement.

While applicants and some subapplicants must have an HMP, projects or activities do not need to be explicitly identified in the HMP to be eligible for BRIC funding. Subapplicants only need to demonstrate how their proposed project or activity is consistent with the goals and priorities outlined in the HMP.[18] However, to maximize points for Outreach Activities, applicants/subapplicants should provide additional context for how their relevant HMP mitigation goals or strategies align with BRIC evaluation criteria, such as using nature-based solutions to mitigate risk to critical infrastructure. See Section 5.1 for more information on the evaluation criteria.

Figure 3: Hazard Mitigation Plan Requirement Decision Tree

3.2. Eligible Activities

FEMA provides financial assistance to eligible BRIC applications for three types of activities: Capability and Capacity Building (C&CB), Hazard Mitigation Projects (i.e., capital projects), and Management Costs. Ninety percent of the available BRIC funding is allocated under the National Competition for hazard mitigation projects that result in construction and 10 percent is allocated for C&CB activities under the State/Territory Allocation and Tribal Set-Aside. See the table below for more information on each of the three eligible activities.

New in FY 2022, when subapplications include an information technology or operational technology component as part of a larger project, **FEMA will allow activities that enable greater community resilience through cybersecurity** as eligible costs when those activities are performed in accordance with the cybersecurity performance goals for critical infrastructure and control systems directed by the National Security Presidential Memorandum on Improving Cybersecurity for Critical Infrastructure Control Systems.[20]

Eligible Activities		
Capability- and Capacity-Building Activities[19]	**Hazard Mitigation Project Examples (Non-exhaustive)**	**Management Costs**
• Energy Building Code Activities • Partnerships • Project Scoping • Hazard Mitigation Planning and other planning related activities	• Hazard Mitigation Planning and other planning related activities • Flood Protection • Microgrids • Electrical Grid Hardening • Seismic & Wind Retrofits • Utility Line Undergrounding • Hazardous Fuel Reduction	• States may submit subapplications for management costs to administer and manage the grant if awarded • Subapplicants can request up to 5 percent of the total project cost to manage the grant if awarded • Management costs are 100 percent federally funded

For applicants and subapplicants that only have preliminary or conceptual designs to submit with their BRIC application, phasing your project may be a good solution. Phasing allows BRIC funding to be available across the entire lifecycle of the project – from design to through construction.[33]

3.2.1. Eligible C&CB Activities for the Energy Sector

C&CB projects can take one of four forms: building codes, partnerships, project scoping, and hazard mitigation planning and other planning related activities. State Energy Offices can use C&CB funding to evaluate, enhance, or develop their building code adoption and enforcement capabilities through the following eligible activities:

- Evaluate which building, electrical, and/or energy conservation code to adopt to reduce risk and improve energy efficiency
- Adopt, modify, or improve building codes or develop code requirements that make a community more resilient to power outages
- Train inspectors and/or other code officials on energy conservation code
- Conduct outreach around updated electrical or energy codes

The International Energy Conservation Codes contribute to the resilience of a community's energy system by ensuring that new buildings are as energy efficient as possible.[21, 22] More energy efficient buildings reduce demand pressures often experienced during temperature extremes. In addition, some states have included requirements for solar photovoltaic systems in building codes while other states are considering requirements for energy storage (batteries) in new buildings. DOE's Building Technologies Office (BTO) supports development and implementation of building energy codes, including technical assistance and publicly available resources.[23] Innovative codes can reduce the energy demand from the grid and support community resilience.

C&CB projects can also focus on identifying and brokering partnerships among stakeholders that will be necessary for the successful planning and implementation of an energy project. For example, a State Energy Office could apply as a subapplicant for C&CB-partnership funding to involve private/investor-backed utilities in the hazard mitigation planning process or to conduct a gap analysis to determine where partnerships could be helpful for funding match opportunities. When appropriate, partnerships should be documented with a Memorandum of Understanding/Agreement (MOU/MOA), letter of commitment, or similar that can be used in a future BRIC grant application. FEMA provides a non-exhaustive list of eligible partnership activities on FEMA.gov.[24]

C&CB funding can also be used to develop project scoping subapplications. Project scoping is intended to support the development of mitigation strategies and critical data for prioritizing, selecting, and developing BRIC applications. For example, there may be a known recurring energy continuity issue during heavy storms and hurricanes that impacts a critical facility. Project scoping can be used to study the power disruption issue in more detail, conduct a feasibility assessment of constructing a microgrid versus installing a back-up generator, and then develop preliminary or full designs for the selection mitigation strategy. FEMA provides a non-exhaustive list of eligible partnership activities on FEMA.gov.[25]

Finally, C&CB funding can be used for planning activities. Hazard mitigation planning is specifically discussed more in Section 6.1 of this BRIC Energy Action Guide. Planning activities can take many forms to help guide mitigation goal setting and investments within a community. Planning funds can be used to integrate hazard mitigation planning with existing planning efforts, such as energy security plans. For example, a State Energy Office or local municipal utility could apply for a BRIC planning grant to update specific sections of a FEMA-approved hazard mitigation plan with energy specific vulnerability assessment information and energy mitigation actions to address those vulnerabilities. FEMA provides a non-exhaustive list of eligible planning activities on FEMA.gov.[26]

Example C&CB activities could include:

- Energy building code enforcement training
- Partnership building between local governments and private/investor-backed utilities
- Feasibility assessment for microgrids at a wastewater treatment facility
- Integrating a State energy security plan and hazard mitigation plan

3.2.2. Eligible Hazard Mitigation Project Types for the Energy Sector

BRIC presents an opportunity to fund innovative energy resilience projects both at the critical system-wide and end-user scale. System-wide interventions include resilience measures implemented at the energy generation or distribution level, such as transmission line redundancy, flexible joints for liquid fuel, and remote-operated natural gas valves. These activities serve to mitigate impacts to the energy lifeline as well as downstream cascading impacts to homes, business, and critical facilities that rely on these energy sources.

End-user energy mitigation measures reduce energy disruption and loss of function to one or more facilities or assets, such as by installing emergency power generators, microgrids, battery storage, other distributed energy resources. While the benefits of these interventions may not be as vast as those performed at the system scale, they tend to be cost-effective and easier to implement. FEMA encourages the use of multiple mitigation measures to promote system redundancy and to prevent the reliance on a single point of failure, so it may be appropriate to mitigate energy systems at both the system and end-user levels.

The image below provides mitigation measures involving construction that may be appropriate across the energy industry as well as measures specific to individual sectors, including electricity, liquid fuel, and natural gas. The mitigation measures presented below are meant to serve as options for consideration and do not represent an exhaustive list. Each should be further reviewed for more specific eligibility, technical feasibility, and cost-effectiveness. Other project examples can be found in DOE's State Energy Security Plan Optional Drop-In: Energy Sector Risk Mitigation Measures from May 2022 and Grid Modernization Lab Consortium for Security and Resilience.

3.3. Cost Effectiveness

FEMA BRIC's authorizing statue, 42 USC 5133, requires that each funded project provide "meaningful and definable outcomes" and be cost-effective.[28] Cost-effectiveness can be determined in a variety of ways, but the most notable and accepted method is by performing a benefit-cost analysis (BCA). A BCA compares the anticipated benefits and costs of a given project to compute a **benefit-cost ratio (BCR)**. Typically, if a project's benefits exceed its costs, yielding a BCR greater than 1.0, it is deemed cost-effective.[29]

To perform the BCA, FEMA provides a BCA Toolkit with standard values and methodologies approved by FEMA and Office of Management and Budget (OMB).[30] The toolkit generates an Excel file and Zip outputs that should be submitted along with the subapplication. More information on the BCA process is provided in Section 5.2.

3.4. Non-Federal Cost Share

Before applying, subapplicants must understand that federal funding will typically cover no more than 75 percent of the total project cost. The subrecipient will be required to commit the remaining 25 percent of the total project cost as the non-federal "match" or share. This formal process calls for the submission of a non-federal match commitment letter. In cases where applicants require supplemental funding to reach the required 25 percent cost-share, applicable state and local grants may be used to help offset those costs.[31]

Specific to the energy sector, there are a multitude of potential partners that can help meet the cost share obligation, including utility companies, nonprofits, private-sector corporations, State Energy Offices, and emergency management offices. A few of these potential funding sources are mentioned below.

3.4.1. State Energy Offices

Where dedicated state funding is available, State Energy Offices may be able to provide a portion of the cost-share for a BRIC application. For example, Connecticut created a Microgrid Grant and Loan Program with $15 million to help municipalities and utilities build microgrids near critical facilities. This program also allows the State Energy Office to develop new financing mechanisms designed to leverage additional funding – like BRIC funding – for microgrid projects. These state funds could readily provide the required match for BRIC grants and provide opportunities for the state to pursue projects that could be supplemented by BRIC.[32]

Figure 4: Mitigation measures involving construction that may be appropriate across the energy industry.

Project Types		
All Energy		
Backup generators	Submersible equipment	Hazardous fuels reduction
Building retrofits for community resilience hubs	Flood walls/gates	Ignition resistant construction
Relocation of assets	Stormwater pumps	Definsible space
Elevation of equipment	Culverts	Thermal encolsures
Electricity	**Natural Gas**	**Liquid Fuel**
Battery storage	Ties between gas pipelines	Flexible joints
Microgrids	Remote-operated valves	Pipeline insulation and trace heating
Base isolation transformer platform	Pipeline insulation and trace heating	Water line management
Breakaway service connectors	Water line management	Remote-operated valves
Dead-end towers	Flexible joints	
Fire-resistant poles	Submersible equipment	
Line-break protection systems	Vent line protectors	
Advanced water-cooling technologies		
Dry cooling		
Vented manhole covers		
Covered conductors		
Transmission /distribution line redundancy		
Load shed hardening		
Undergrounding of power lines		

Key
Energy System-Wide Mitigation Measure
Critical Facility / End-User Mitigation Measure
Varies by Asset

4. Is BRIC the Right Program for My Energy Project?

BRIC seeks to fund innovative projects that reduce risks and future losses to critical infrastructure posed by natural hazards, focusing predominantly on benefitting disadvantaged communities. After using the previous section to determine eligibility to apply for BRIC, each entity should consider if BRIC is the most optimal or suitable choice for its project by considering the following questions:

BRIC Considerations	
Question	**Reasoning**
Does the BRIC timeline align with my project and community needs?	The BRIC application, review, and award process can take many months to complete before project work can begin. From the time the NOFO is released, it takes approximately one year for C&CB activities to be awarded and approximately 18 months for construction projects to be awarded. Thus, BRIC applications are best suited for non-urgent mitigation projects that are approximately one to two years away from being implemented. Once the project is awarded and can start, the standard period of performance (POP) is three years. Two, one-year extensions are possible, for a total of five years, with written justification. Additional extension may be granted in extenuating circumstances for highly complex projects. See Figure 5 below for more information on the timeline for BRIC application development, project implementation, and grant closeout.

4 MONTHS		6-9 MONTHS		3+ YEARS	1-2 MONTHS
1 Application Development	**2 Application Submission**	**3 Agency Technical Review**	**4 Selection and Notification of Award**	**5 Project Implementation**	**6 Grant Closeout**
BRIC NOFO released Work with partners and stakeholders to develop applications	Pre-applications typically required Application typically requires a scope of work, BCA, EHP verification, agreements, and forms Final applications from State to FEMA due in late January	FEMA and National Technical Review (NTR) panel review applications May receive a Request for Information (RFI)	Selection status released approx. 7 months after applications submitted Awards expected late that year or early the following year (e.g. applications submitted in the FY22 cycle typically awarded in late 2023 or early 2024)	Quarterly reporting Requests for reimbursement Budget and scope modifications require written justification Period of performance extensions possible with written justification	Final invoicing Inspection and site visits Certification of completeness Record maintenance for 3+ years Audits possible

Figure 5: Timeline for BRIC Applications, Implementation, and Close-out.

BRIC Considerations, Continued	
Question	**Reasoning**
Does my organization have the resources to invest in BRIC subapplication development?	Developing a grant application takes significant time, effort, and resources. Even before the development of a grant application can begin, there is extensive coordination required to ensure that sufficient information is collected, partners and stakeholders are identified, and the project details and scope have been well defined. Choosing the right opportunity to pursue is critical, particularly with unprecedented funding available for energy infrastructure and hazard mitigation projects.
Does my project score well against the technical and qualitative evaluation criteria?	Go through each criterion and make a scoring sheet for your project. Do you meet the technical evaluation criteria? Could you, with ample preparation and coordination, capture some or all of the points in each qualitative criterion? Go through a scoring exercise for your project to see how competitive it could be. See Section 5.1 for more information on the evaluation criteria.
Is my project likely to be cost-effective?	Likelihood of cost effectiveness, without having to do a full BCA, can be estimated based on identifying if the project benefits critical facilities and services (hospitals, police stations, fire stations, water and wastewater service, electrical service), the service population benefitting from the project, and existence of historical loss/outage information. Mitigating these critical services typically generates significant benefits in the FEMA BCA Toolkit. For example, multiply the service population by the FEMA standard values for electrical service per person, per day ($174) to calculate a high-level BCR. Compare the total project cost to the preliminary benefit calculation.
Does my organization have the required cost share?	Ensure your organization can account for the non-federal cost share amount in its fiscal planning starting one to two years in the future. Historically, most BRIC projects are funded by approximately 18 months after applications and sub-applications are submitted (slightly less for C&CB projects) and period of performance runs for three years, so multi-year planning is required. **Moreover, BRIC is a reimbursement-based program, so organizations must have the financial capacity to front project expenditures.**[33]

BRIC Considerations, Continued	
Question	**Reasoning**
Does my office have a relationship with the state BRIC applicant (e.g., Emergency Management Agency)?	If the answer to this question is “No”, it should not necessarily deter a potential subapplicant from pursuing BRIC. However, opening the line of communication with your State Emergency Management Agency, specifically the SHMO, as early as possible in the project planning process can be advantageous to build awareness for the project, confirm consistency with the State or Local hazard mitigation plan, and identify resources, partners, or support that may be required to submit the subapplication in the upcoming BRIC cycle.
If awarded, does my organization have the capacity to manage the BRIC grant?	Successful subapplicants will be responsible for understanding the requirements of the BRIC grant award, including reporting, requests for reimbursement, and closeout procedures. Resources, including staff, time, and subject matter expertise, are required to navigate the stipulations of the grant.
Is there a different funding source that is a better fit for my project?	Details about other funding sources for energy projects, including eligibility, cost-share, and criteria, can be found found in the Quick Guide

5. Application Requirements

A well-written subapplication must demonstrate the project's value, technical feasibility, and cost-effectiveness to be competitive for BRIC. Subapplicants must also consider the technical and qualitative evaluation criteria to capture the highest evaluation score possible. This section steps through each of the evaluation criteria as they relate to energy projects and explains FEMA-accepted methodologies for energy project BCAs. A guide on completing a subapplication or application in FEMA GO is provided in the Quick Guide.

5.1. Evaluation Criteria

FEMA's decision-making process for awards will be comprised of three basic review tiers: (1) Eligibility and Completeness, (2) Technical Evaluation, and (3) Qualitative Evaluation.

After determining eligibility, projects are reviewed against FEMA's seven technical criteria and six qualitative criteria. Both sets of criteria are worth 115 points for a maximum of 230 total points possible for each subapplication. The cumulative score is used to determine the project's priority order for the national competition. See all criteria in Figure 7.

Figure 6: Tips for FEMA's 3 Basic Review Tiers

3 Qualitative evaluation

Scoring factors continue to place priority on equity and climate resilience, with new emphasis on reduction of carbon emissions, support of cybersecurity, and strong labor standards.

Strategic tip:

Make sure that you have the expertise on your team to fully quantify the costs and multi-faceted benefits of your project for the full project life while considering how your project may impact disadvantaged communities.

2 Technical evaluation

Scoring factors were updated this year to reflect an emphasis on equity and system-based mitigation.

Strategic tip:

Consider where your state or community currently stands on:
1) IBC/IRC adoption,
2) BCEGS score, and
3) Status as an Economically Disadvantaged Rural Community and/r Social Vulnerability Index score.

1 Eligibility and Completeness

Is dependent on the results of a Benefit-Cost Analysis. Use date and FEMA BCA methodology to demonstrate cost effectiveness of the project.

Scoring Criteria

Technical
115 Points

Mitigates Risk to **Critical Infrastructure**	20 pts
Designation as **EDRC, Tribal government, or Underserved/Disadvantaged**	15 or 30 pts
Incorporation of **Nature-Based Solutions**	10 pts
Subapplicant **Building Code Effectiveness Grade** between 1-5	20 pts
Applicant Adopted **Mandatory Building Code** Adoption Requirement IBC/IRC	10 or 20 pts
Project Generated from **Previous Federal Award**	10 pts
Non-federal **Cost Share is ≥ 30%**	5 pts

Qualitative
115 Points

Reduces Risk & Improves Resiliency through Project Benefits and Innovation	35 pts
Integrates **Climate Change and Future Conditions** into Design	20 pts
Leveraging Partnerships who support and promote the proposed project	15 pts
Proportion of the **Population Impacted –** especially disadvantaged communities	25 pts
Implementation Measures – how the costs, labor, and schedule will be managed	15 pts
Community Engagement and Outreach Activities – how stakeholders contributed to project planning	5 pts

Figure 7: BRIC Evaluation Criteria

5.1.1 Technical Evaluation Criteria

The **technical** evaluation criteria are intended to incentivize components of mitigation activities that are valued by FEMA and/or required by statute. The criteria are used as a screening tool to determine which subapplications will go to the National Review Panel for further qualitative review. **The seven BRIC technical evaluation criteria are earned on an all-or-nothing basis, based on whether conditions are met for each category**. To achieve the points in each category, subapplicants must clearly address the above criteria.[33]

5.1.1.1 INFRASTRUCTURE PROJECT

FEMA defines infrastructure as, "critical physical structures, facilities, and systems that provide support to a community, its population, and economy," including natural systems. Energy projects meets this criterion since virtually every Community Lifeline and critical facility, either directly or indirectly, depends on reliable sources of energy to function properly. Subapplicants should clearly articulate why the specific asset being mitigated meets the definition of critical infrastructure or how the energy project supports other critical infrastructure.

5.1.1.2. NATURE BASED SOLUTIONS

FEMA defines Nature-Based Solutions as those "sustainable planning, design, environmental management and engineering practices that weave natural features or processes into the built environment to promote adaptation and resilience.[34] In addition to the risk reduction benefits associated with all hazard mitigation projects, nature-based solutions offer significant alternative benefits such as air and water quality, economic growth, emissions reduction, green jobs, increased property values, improved public health, and more. Projects that mitigate risk to energy infrastructure can incorporate these nature-based solutions as a portion of the project scope to obtain these 10 points. While it is not a requirement of the project, **in FY 2020, 80 percent of the projects competitively selected by FEMA incorporated a nature-based solution component**.

For the first time in FY 2022, FEMA specifically prioritized nature-based solutions that reduce carbon emissions and promote sustainability. This can include microgrids that incorporate renewable/clean energy resources for power generation, allowing the microgrid to "island" critical facilities from the broader grid during a power outage. Other examples include projects that retrofit, relocate, elevate, or floodproof electrical infrastructure near a stream and incorporate stream restoration to inhibit erosion and encroachment on electrical assets. Other examples of nature-based solutions include:[35]

1. Incorporation of clean energy components that reduce carbon emissions[36]
2. Greenways/green streets
3. Daylighting
4. Stormwater parks
5. Horizontal levees
6. Floodplain restoration
7. Dam removal
8. Green roofs
9. Permeable pavers
10. Bioswales
11. Living shorelines
12. Ignition resistant construction materials
13. Soil stabilization

Nature-Based Solution for Energy Resilience

FEMA highlighted the FY 2021 Duhart's Creek Critical Infrastructure Restoration and Stream Protection project in Gastonia, NC as a model for applying natural and natural-based solutions within energy projects. The project will restore the stream to its natural and beneficial functions, reduce erosion and encroachment from future flood events, and stabilize the creek bank to prevent damage to adjacent water, sewer, and electrical utility infrastructure. The design approach emphasizes nature-based solutions and materials by including bank regrading, natural-fiber erosion control matting, and native plantings. See more information about this project in the Quick Guide.

5.1.1.3. BUILDING CODE ADOPTION

FEMA is directed by law to prioritize states that have adopted one of the three most recent editions of the International Residential Code (IRC) and the International Building Code (IBC). The IRC is the building code for residential buildings up to three stories tall and the IBC is the building code for buildings taller than four stories, including commercial, residential, institutional, and public buildings. The IRC and IBC are updated every three years. As of 2022, the three most recent editions are the 2015 IRC/IBC, the 2018 IRC/IBC, and the 2021 IRC/IBC. In the 2021 evaluations, FEMA's scoring rubric assigned to points to states that had adopted the 2015 IRC/IBC, while states that had adopted the 2018 or 2021 codes received 20 points. In addition to the code edition adopted in a state, FEMA evaluates the effectiveness of a state's building code adoption using a 1 (best) to 10 scale.

5.1.1.4. BUILDING CODE EFFECTIVENESS GRADING SCHEDULE (BCEGS) RATING

BRIC awards 20 points to subapplicants with BCEGS score from 1 to 5. BCEGS independently assesses community residential and commercial building code adoption and enforcement activities and computes a score from 1 to 5, with 1 being the best. To receive the point allotment for this criterion, subapplicant must have a BCEGS rating between 1 and 5 at the time of subapplication submittal. To receive the point allotment for this criterion, a state or territory acting as a subapplicant. Subapplicants or State Energy Offices can contact their state or local building departments or ISO to learn more about BCEGS.[37]

5.1.1.5. GENERATED FROM PREVIOUS FEDERAL AWARD

To incentivize and build a pipeline of mitigation projects, FEMA offers 10 points for projects developed using a previous HMA award (i.e., project scoping, advance assistance), another federal grant award (including DOE grants), or if subapplicant is a prior recipient of BRIC non-financial Direct Technical Assistance. For example, a public utility could apply for a project scoping award to conduct a microgrid feasibility analysis that mitigates power outages at several critical facilities, including a hospital, police station, and fire station. That feasibility analysis could then lead to the development of a microgrid preliminary design, scope of work, BCA, and eventual BRIC project application for full design and construction of the microgrid. The public utility could provide documentation to demonstrate the work completed under the previous HMA award to obtain this category of points. This can also be relevant for broader energy system projects that may be funded by DOE. If there is a functional component of that project that solves a hazard mitigation problem independently (i.e., it is not dependent on the overall system to be effective or feasible[38]), that component could be eligible for BRIC funding and capture the points for this criterion.

5.1.1.6. NON-FEDERAL COST SHARE OF AT LEAST 30 PERCENT

Applicants and subapplicants that can fund 30 percent or more of the project cost through the non-federal match can obtain five additional points. This highlights an opportunity to cultivate partnerships before project application and subapplication development since partners could be motivated to offer a portion of the non-federal match.

Pro Tip

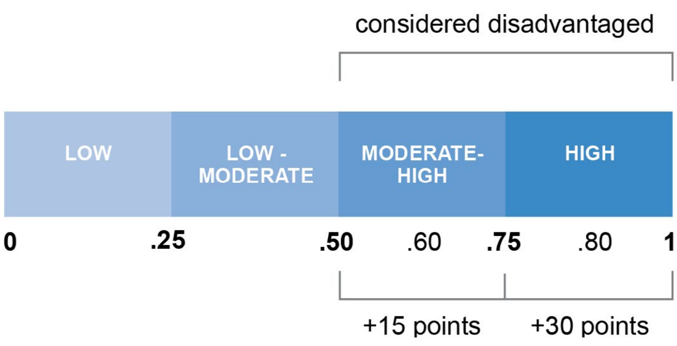
Attach a simple document, organized by subapplication section, in FEMA GO that lists out all the attachments provided in the entire subapplication and provides context for their meaning and significance to the project. For example, a large engineering/technical plan and maps can be valuable attachments for a BRIC subapplication; however, the reviewer will need context to understand what those documents are conveying. Additionally, subapplicants can highlight specific sections in the attachments that will be especially relevant and helpful for reviewers. This helps to ensure reviewers understand the project scope and makes it easier for them to score the project against the evaluation criteria.

5.1.1.7. DESIGNATION AS UNDERSERVED AND/OR DISADVANTAGED

In FY 2022, the BRIC program began using the Centers for Disease Control and Prevention (CDC) CDC/ATSDR Social Vulnerability Index (SVI) as a tool to identify areas as disadvantaged in the technical evaluation criteria. The SVI ranks counties and tracts on 15 social factors, including unemployment, minority status, and disability status, and further groups them into four related themes: Socioeconomic Status, Household Composition & Disability, Minority Status & Language, and Housing Type & Transportation. These indicators help support analysis on the relative vulnerability of a given census tract and help identify communities that will need continued support to recover following an emergency or natural disaster.

For FY 2022, areas with CDC SVI greater than or equal to 0.6, as well as Economically Disadvantaged Rural Communities and geographic areas within Tribal jurisdictions are considered disadvantaged. Any community with a CDC SVI of 0.60 to 0.79 will receive 15 points and any community with a CDC SVI of 0.8 or higher, is designated as an Economically Disadvantaged Rural Community, or is a federally recognized Tribal government will receive 30 points.

Figure 8: Using the Centers for Disease Control and Prevention (CDC) Social Vulnerability Index (SVI) to identify areas as disadvantaged for technical evaulation:



Applicants and subapplicants can export a map from the CDC's SVI tool at the project location or the project's service area (e.g., the service area for an energy asset) to document the SVI score and capture these points. This exported map should be attached to the BRIC application/subapplication.

5.1.2. Qualitative Evaluation Criteria

The six BRIC qualitative evaluation criteria are earned on a sliding scale – applicants and subapplicants can earn partial points in each category. FEMA assigns the qualitative evaluation review to the National Technical Review (NTR) panels, which are comprised of FEMA Regional Office and Headquarters staff, as well as representatives from state, local, tribal, territorial governments, and other federal agencies. **NTR panels will typically not include energy experts, so subapplicants should use plain language and tailor project narratives to non-energy experts**. The subapplication's final qualitative score will be calculated by averaging the qualitative scores from each criterion from each reviewer.[39]

Application Pitfall:

Failure to describe how your project eliminates risk and damage from future natural hazards.

This pitfall stems from a project description that does not clearly state the problem the project is attempting to mitigate. Make sure to outline both the current and future risks your project is addressing and why your proposed project is the best solution in plain language.

5.1.2.1. RISK REDUCTION/RESILIENCE EFFECTIVENESS

Stating that a project reduces risk is not sufficient to meet BRIC criteria. **A subapplication must articulate how and why the energy project effectively mitigates risk and builds long term resiliency.** Clearly stating the problem the project is addressing is a good place to start. Successful applications bring in examples of past occurrences and the projected future risk of hazards to the impacted asset and community. For example, a transmission line hardening project should include documentation about past outage events, the state of the asset, such as the age and condition, and projected risk from severe events, such as severe wind or tropical storms.

Energy resilience innovation can look different among communities.

Microgrids that harness renewable energy, such as solar, are often seen as a more innovative approach to redundant power for a single asset than diesel generators, which only function in emergencies. However, some climates, such as the coastal Pacific Northwest, do not have enough sunlight or space to justify solar microgrids. Rather, combination systems of solar, battery, diesel, or natural gas generators could offer a more reliable, redundant power supply for critical infrastructure. This solar-generator combination system, while still relying on fossil fuels, engages communities in low-carbon technology that otherwise would not have been considered solar-feasible.

In 2017, the Blue Lake Rancheria Tribe (BLR) constructed a low-carbon community microgrid to bolster its resilience to frequent climate-related outages. The BLR microgrid integrates a solar array, battery storage, and 1-megawatt isochronous backup generator to allow the Rancheria campus to operate in tandem with, or islanded from, the main utility grid. While the system prioritizes clean generation, it will bring the backup generator online to support the photovoltaic (PV) array and battery if needed. During a wildfire event in October 2019, the microgrid successfully islanded, keeping the facilities from experiencing a blackout and served 10,000 residents—about 10 percent of the county's population. Although it was not funded under BRIC, the project demonstrates the potential of microgrids for community energy resilience.

5.1.2.2. CLIMATE CHANGE AND OTHER FUTURE CONDITIONS

Competitive subapplications describe how the project anticipates and accounts for changing natural and social conditions. Natural future conditions may include changes in hydraulics and hydrology, sea level rise, and increased intensity and frequency of storm and rainfall events. Subapplicants might consider including reports or projections from research institutions or government agencies such as NOAA or the United Nations Intergovernmental Panel on Climate Change (IPCC) to demonstrate these changes. The subapplication should also describe how the project accounts for and addresses these changing natural conditions, including through the design of the mitigation project components. For instance, the location of back-up power equipment should be designed above current flood levels to account for sea-level rise.

Social future conditions may include land use and development shifts, shifts in income or employment, and/or projected population changes that would impact energy demand. Acceptable documentation might include GIS mapping or demographic information from the US Census Bureau, the Department of Labor, a state or local government planning department, or research institutions. Beyond documenting these projected assumptions, subapplications should reference if and how their findings align with relevant regional long-term planning efforts such as State Energy Security, State hazard mitigation plans, and Climate Action Plans.

5.1.2.3. IMPLEMENTATION MEASURES

Subapplications must describe, in detail, how the project will be implemented and who will be responsible for each task. This can be accomplished by referencing industry design standards, how the implementing partners will adapt to potential challenges, and examples of successfully completed projects. If the subapplicant or subapplication partner does not currently have the technical or managerial resources to implement the project approach, it is critical for the subapplication to address how these gaps will be filled. Successful applications justify that the project costs and schedule are realistic by including preliminary engineering design and HMA-compliant cost estimate documentation.[39]

Subapplication narratives should also demonstrate the project's level of protection and ancillary benefits. This includes assumptions about the hazard's recurrence interval, described below, and the number of people protected. Successful subapplications provide a level of protection that accounts for the future conditions of both the hazard and the impacted population.[40]

Application Pitfall:

Unclear conformance with program requirements

- Project is not compliant with Hazard Mitigation Assistance (HMA) Guidance and Addendum
- Costs are ineligible
- Project does not conform with minimum design standards:
  - American Society of Civil Engineers (ASCE) 24 (structure elevation requirements)
  - FEMA P-361/ICC 500 (properly sized safe room)

5.1.2.4. POPULATION IMPACTED

Subapplicants must identify the proportion of the population that will be impacted by the project. This includes a description of how the project was designed to maximize positive impacts and minimize negative impacts to any disadvantaged populations. This criterion acknowledges the disproportionate effect of disasters on disadvantaged communities. Therefore, when designing a project, stakeholders should consider and document the following in their subapplication:[41]

- **Process:** Have marginalized communities participated meaningfully in the project development process with sufficient support?
- **Restoration:** Does the project aim to remedy prior and present harms faced by communities negatively impacted by the energy system?
- **Decision-making:** Does the project center the decision-making of marginalized communities?
- **Benefits:** Does the project center economic, social, or health benefits for marginalized communities?
- **Access:** Does the project make energy more accessible and affordable to marginalized communities?

Subapplicants can reference the Council on Environmental Quality (CEQ) **Climate and Economic Justice Screening Tool (CEJST)** , the EPA's **Environmental and Justice Screen and Mapping Tool (EJScreen)**, DOE's **Disadvantaged Communities Reporter**, or their own local tools to identify communities that are overburdened by environmental concerns. Strong subapplications include back-up documentation, such as mapping, to support their argument.

5.1.2.5. COMMUNITY ENGAGEMENT AND OTHER OUTREACH ACTIVITIES

Conducting outreach activities is a vital component of the BRIC subapplication. The narrative should describe stakeholder engagement activities such as public meetings, virtual feedback crowdsourcing, and community canvassing that have already occurred or will plan to occur as part of project implementation. It is helpful to describe the input from members of the community on the application planning process.

Keeping track of the various outreach activities the subapplicant engages in and how the community and stakeholders are integrated into the process will help capture the full five points in this category. All activities should be appropriate to the project and the stakeholders involved. Encouraging stakeholders to join their State or Local Hazard Mitigation Planning working groups can further establish stakeholder influence in the application planning process.

5.1.2.6. LEVERAGING PARTNERS

A successful application must show the subapplicant's diligence in seeking project partnerships and ability to capitalize on those relationships. When considering projects within the energy sector, leveraging partnership may require subapplicants to work with both public and private utility and power generation companies. Bridging the public and private sectors, State Energy Offices are in a unique position to foster relationships among energy and emergency management partners at the local level.

A strong subapplication will describe the subapplicant as bringing these energy-based organizations together along with residential and other commercial stakeholders. Further points can be awarded for leveraging partnerships that increase community resiliency. Partnerships should be documented whenever possible through such attachments as a letter of commitment from the partner in the implementation of the project, letter of commitment of funds for the non-Federal match requirement, MOU/MOA, or similar.

Partnering with private sector energy providers like electric and natural gas utilities may prove essential to State Energy Offices pursuing BRIC funding and will help capture garner points in the score criteria. For example, the Commonwealth Edison Company (ComEd), which provides electric service to more 70 percent of Illinois,[42] partnered with the Chicago Housing Authority on the Bronzeville Microgrid Project as part of its "Community of the Future" initiative. Similarly, the Camptonville Community Partnership collaborated with the Yuba Water Agency and the utility PG&E for a biomass project to decrease loads on the grid; the project received non-federal funding from the California Energy Commission's EPIC grant program and the Yuba Water Agency.[43]

5.2. Demonstrating Cost-Effectiveness

For many, demonstrating cost-effectiveness through the BCA process is the most onerous part of preparing a BRIC subapplication, as it often requires a full complement of technical and historical information. Almost every State Energy Official interviewed for the BRIC Energy Action Guide indicated that the BCA was the most challenging part of preparing an HMA subapplication. Documenting the history of hazards over the life of a given structure often requires information that may only be known only to individuals who are no longer employed at an organization; required documentation can often be missing or incomplete. Fortunately, as part of its ongoing effort to streamline the grant application process for subapplicants, FEMA allows for several methodologies that simplify the BCA process or obviate the need for one altogether.[44]

Benefits in a FEMA BCA are expressed as **losses avoided** by implementing the project and as **added benefits**, such as economic, environmental, and social benefits. Costs include the total project cost plus maintenance costs over the project useful life (PUL). Methodologies and approaches to the BCA include using historical damages, expected professional damages, other benefits, FEMA Standard Values, and where possible, pre-calculated benefits.

As part of FEMA's effort to lower barriers for BRIC and FMA, FEMA will consider certain FY 2022 BRIC subapplications cost-effective with BCRs of 0.75 or greater generated at the normal 7 percent discount rate if the project meets at least one of the following criteria:

- Benefits disadvantaged communities
- Addresses climate change impacts
- Has hard to quantify benefits
- Subjected to higher costs due to the use of low carbon building materials or compliance with the Federal Flood Risk Management Standard

5.2.1.1. HISTORICAL DAMAGES

Historical damages are based on the **history of hazards** specific to the structure or service being mitigated, such as the emergency work and permanent repair costs incurred, as well as the loss of function to the facility/service. **Loss of function** is based on the total economic loss for the duration of each event. For BCAs based on historical damages, the analyst must specify the damage year, the duration of power loss, and the recurrence interval.

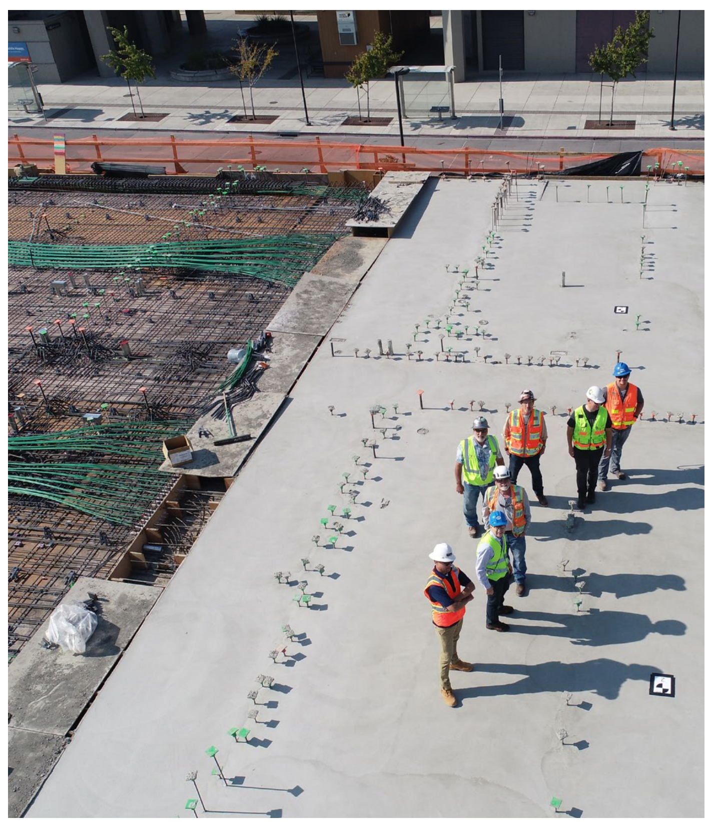
A **recurrence interval**, also known as a return period, is "the average or mean time in years between the expected occurrence of an event of specified intensity.[45] In the BCA Toolkit, the project benefits are annualized over its useful life based on this value with more frequent events yielding greater benefits. There are many ways to determine a recurrence interval depending on the type of hazard. For wind and wildfire events, the BCA Toolkit populates the wind speeds for events of different severities and the burn recurrence intervals, respectively, based on the location input. For riverine or coastal flooding events, analysts can use United States Geological Survey (USGS) surface water data and a FEMA Flood Insurance Study to determine the return period for a given event.

For hazard types where frequency data is not available, recurrence intervals can be estimated using the **unknown frequency calculator** built into the BCA Toolkit. If an analyst has the year and damage values for three or more events, the unknown frequency calculator will automatically calculate the frequency of the events based on the year built or a specified analysis duration. If conditions have changed since the structure was built or if limited historical data is available, analysts may wish to specify a shorter analysis duration (with sufficient justification).

5.2.1.2. PROFESSIONAL EXPECTED DAMAGES

FEMA BCAs can quantify benefits for events that have not happened yet, but could happen in the future. If no historical data is available, analysts can opt to apply a professional expected damages approach. For generator, microgrid, and other emergency power projects that apply this methodology, default recurrence intervals and loss of function days will be automatically populated – there is no need to specify historical damages. These values are based on a statistical analysis performed by FEMA using the average U.S. customer hours of interruption (7.9 for 2017) and the average annual impact duration specified in FEMA hazard mitigation subapplications (greater than 24 hours). Based on this analysis, three probable events will be pre-populated – a high, medium, and low probability event – as well as an after-mitigation scenario. Each event will have a corresponding recurrence interval and number of days for power outage. This methodology is available for all emergency power projects, regardless of the hazard type.

An analyst may override these default values; however, as with all non-standard inputs, credible and well documented justification must be included. For projects that mitigate electrical power loss due to wind, analysts may wish to use American Society of Civil Engineers (ASCE) and/or Advanced Technology Council (ATC) data on wind speed frequencies.[46] For projects that address multiple hazards, such as hardening or undergrounding of electrical infrastructure, it may be appropriate to use industry-standard reliability indices, such as System Average Interruption Frequency Index (SAIFI), Self Assessment Individual Difference Inventory (SAIDI), and Customer Average Interruption Duration Index (CAIDI), to estimate the average outage duration.



5.2.1.3. OTHER BENEFITS

To generate a positive BCR, analysts must describe the benefits in terms of the losses avoided, including permanent repairs and emergency work, as well as environmental and social benefits. The success of a BCA is often determined by the extent to which the analyst can capture and valuate the full complement of benefits that are likely to accrue from a mitigation project. **A summary of losses avoided that can be used in the BCA Toolkit is included in Table 1 below.**

For a utility project, in addition to the economic losses computed by the FEMA BCA Toolkit, additional benefits may include lower costs for meter reading and usage monitoring, social benefits associated with more reliable electric power, business or crop losses avoided, and emergency services disruption avoided. These values can be expressed through the Optional Damages input in the BCA toolkit.

The incorporation of nature-based mitigation solutions or ecosystem services can have a positive impact on a mitigation project's BCR, as FEMA acknowledges in the BCA economic, community, and environmental benefits. If a project results in a change or enhancement to land use, the analyst can take advantage of pre-populated benefits by selecting one or more of the nine habitat types and specifying the number of acres changed or enhanced. Benefits then accrue to the project based on ecosystem services benefits, such as improved air and water quality, adding to the total BCR. **These benefits are summarized in Table 2 below.**

Table 1: Losses Avoided for the FEMA BCA Toolkit Relevant to Energy Projects

Physical Damages Avoided	Emergency Work Avoided	Loss of Function Avoided
• Generating stations • Transformers • Transmission lines • Substations • Poles • Offices • Fuel tanks • Pipelines • Tanks	• Utility staff overtime • Evacuation costs • Police overtime • EMS overtime • Fire service overtime • Debris removal • Cleanup • Emergency Operations Center costs	• Electrical power loss • Water/wastewater service loss • Emergency services disruption • Road closures • Bridge closures • Government building closures • Residential displacement • Loss of business revenue

Table 2: Economic, Social, and Environmental Benefits for Energy Projects in the BCA Toolkit

Economic Benefits	Social Benefits	Environmental Benefits
• Energy cost savings • Operations and maintenance savings • Increased property values	• Mental stress and anxiety avoided • Loss of productivity avoided	• Air quality • Water quality • Recreation • Food provisioning • Erosion control • Habitat creation

5.2.1.4. VALUE OF ELECTRICAL SERVICE

As part of the BCA Toolkit, FEMA has several Standard Values prepopulated for the analyst's use, such as the value per unit of electrical utility service (per person, per day).[46] Projects that seek to mitigate loss of electrical service can utilize the standard value of $174 per person, per day to express the potential benefits of the project[47]. When these standard values are used, no additional documentation is required. In instances where these values are incorrect or do not accurately reflect the benefits of a project, non-standard values may be used with accurate, detailed supporting documentation. For instance, many values can be adjusted for inflation or to reflect regional cost differences using industry standard cost multipliers.

Another method for to capture economic value of electrical service is the Interruption Cost Estimate (ICE) Calculator.[48] Developed by Lawrence Berkeley National Laboratory (LBNL) and Nexant Inc., ICE is a tool designed to estimate electrical interruption costs (with some limitations) based on the state, the numbers of customers served, and two or three reliability inputs (SAIFI, SAIDI, CAIFI). NASEO is part of an advisory group for the ICE calculator, which is currently being updated and it may be accepted for FEMA BCAs in the future.

5.2.1.5. POPULATION SERVED

In addition to the value per unit of service, the benefits of a utility project are based on the population served. This value should be specified by the utility provider and should be credible and well documented, such as by a letter from the utility on its letterhead, along with supporting documentation, such as a map with connections. If the mitigation project will benefit an entire municipality or service area, the population served should reflect the entire population, not just the number of ratepayers. However, if the mitigation project will only benefit a portion of the population served, the subapplicant should provide a defensible estimate for the number of people and provide supporting documentation if possible. For example, if the project mitigates power loss at an electrical asset that services an entire region, the region's total population would be the population served for the BCA. If the asset only services one or two counties in the region, the population for those counties would be the population served. Documentation could include service area maps or customer population reports from the utility provider. For power loss mitigation projects at hospitals with emergency departments, the population served could be reasonably justified using a community needs assessment report and/or US Census data for the area surrounding the hospital.

5.2.1.6. EXPEDITED COST-EFFECTIVENESS METHODOLOGIES

Some expedited cost-effectiveness methodologies available under BRIC may not apply to energy projects. However, Pre-Calculated Benefits for **Elevations** may apply if, for instance, an energy provider sought to elevate a substation in the Special Flood Hazard Area (SFHA) above the base flood elevation, or the area having special flood, mudflow, or flood-related erosion hazards.[49] In that case, if the elevation project cost was less than $323,000 plus a regional cost multiplier, the project would automatically be deemed cost-effective. To apply this methodology, the subapplicant would need to provide a cost estimate, a copy of an industry-standard source document for the multiplier, and a Flood Insurance Rate Map (FIRM) of the project with the SFHA boundary.

In addition, applying Pre-calculated Benefits for Non-Residential Hurricane **Wind Retrofit Measures** may be appropriate if the subapplicant wishes to retrofit an energy building or facility, including to comply with applicable energy industry standards. Eligible activities under this methodology include opening protection for doors and windows, roof retrofits, securing rooftop equipment, replacing decking and covering, and/or improving the load path from roof to foundation.[50] To be deemed cost-effective under this methodology, projects must be located within a wind-borne debris region, have a useful life of at least 25 years, and cost less than 10 percent of the building replacement value.

FEMA also established a pre-calculated benefit for **emergency power generation projects, such as generators and microgrids, at hospitals** with emergency departments. The benefit is based on the gross square footage of the hospital and its location. The pre-calculated benefit is $6.95 per square foot for hospitals in urban areas and $12.62 per square foot in rural area. US Census Bureau data should be used to demonstrate whether the hospital is in or outside of an urbanized area. All locations in Alaska, Hawaii, Puerto Rico, the U.S. Virgin Islands, and other island territories are considered rural for this pre-calculated benefit. Subapplicants should include the latitude of longitude of the hospital and map depicting its location.

5.2.1.7. COMMON BCA PITFALLS AND RECOMMENDATIONS

Common CBCA Pitfalls and Recommendations	
Common Pitfall	**Recommendation**
Unreasonable or unjustified inputs	All inputs should be documented and reflect the best available data and be from a credible source, such as a design professional or government agency. Examples include an H&H Study, FEMA Flood Insurance Study, USGS surface water data, NOAA precipitation frequency data, US Census Data, and Department of Labor Bureau of Labor Statistics data.
Annual maintenance costs are not commensurate with mitigation project costs	For all project types (other than some acquisitions), technical reviewers expect to see at least some costs associated with annual maintenance.
The population served is not accurate	The population served includes the entire service area, not just that which is being mitigated by the proposed project OR includes only ratepayers, not the total number of residents/customers
Recurrence intervals are too high	While higher recurrence intervals, e.g., “500-year,” are indicative of a catastrophic event, they do not typically support cost-effective BCAs. Historical or expected damage should be based, to the extent possible, on more frequent, less catastrophic events.
No damages after mitigation	For all projects except acquisitions or relocations, it is reasonable to expect at least a small fraction of the residual damages after mitigation.
Lack of justification for the number of impact days	Examples of acceptable documentation include a statement from a building official on letterhead, a statement or outage report from a utility provider, and/or a news article.
Use of alternative methods	Non-FEMA BCA methodologies, e.g., other cost-effectiveness calculators, may only be used if pre-approved by FEMA in writing.[51]
Lack of supporting technical memo	A technical memorandum should accompany the BCA to document the analyst’s cost-effectiveness methodology, explain individual inputs, and provide context for supporting documentation.

6. Assessment and Planning

FEMA requires that all BRIC application projects are consistent with a FEMA approved State or Local hazard mitigation plan. This highlights the critical intersection of energy security and assurance planning and hazard mitigation planning. It is through this intersection that eligible applicants and subapplicants should invest time and resources into building, strengthening, and maintaining the relationship among players in energy, emergency management, utilities, and nonprofits. These relationships form the foundation of preparing to apply for BRIC. Many of the planning and assessment processes that traditionally take place in the energy sector can be used to supplement and inform a hazard mitigation plan. This section describes how those planning and assessment processes can be leveraged in a hazard mitigation plan and/or a BRIC application.

6.1. Hazard Mitigation Planning

Each state and local hazard mitigation plan establishes a hazard mitigation working group that State Energy Office officials and utilities should join and/or engage with to identify energy projects that could be identified for BRIC. Hazard mitigation working groups are responsible for reviewing and updating the plan. Energy players can engage these groups to identify additional mitigation actions related to energy security and provide input on the hazard mitigation goals and objectives to support energy sector resilience goals. This can be accomplished through the hazard mitigation plan update cycle. These working groups meet on a regular cadence and can be engaged with through the jurisdiction's emergency management entity.

Since BRIC does not require projects to be explicitly stated in the hazard mitigation plan (unlike HMGP), it is not required that the project be explicitly listed in the mitigation action table of the hazard mitigation plan. **However, the relationship between energy sector stakeholders and the hazard mitigation plan working group at the state or local level is the most crucial in ensuring readiness and competitiveness for BRIC since the hazard mitigation plan determines eligibility for BRIC**. If your organization has not adopted a hazard mitigation plan, you can adopt the local jurisdiction's plan or pursue BRIC funding to develop a hazard mitigation plan specific to your organization. Representatives from State Energy Offices can reference its state hazard mitigation plan in the BRIC application to meet the requirement.

Through the establishment of working groups with state and local municipalities, State Energy Offices can act as conveners, bringing the energy sector to the table in support of vulnerability assessments and other functions. State Energy Officials have an opportunity to leverage their leadership role and understanding of energy infrastructure vulnerabilities and consequences for state and local hazard mitigation plans. State Energy Offices should work with State Emergency Management Agencies and municipalities who may understand local natural hazard threats but not specific vulnerabilities to their energy system. Combining data driven decision making tools and local knowledge will lead to more effective state and local hazard mitigation plans.

6.2. Hazard Based Risk Assessments

Following is an overview of hazard-based risk assessments that can be used the hazard mitigation planning process required by BRIC and the actual BRIC subapplication.[52]

6.2.1. State Energy Security Plans

State Energy Security Plans (SESPs), which are developed and maintained by State Energy Offices, are the primary tools to assure energy security across unregulated and regulated electricity, natural gas, and petroleum supplies, as well as for mission critical end-use facilities such as water and wastewater, health care, and first responder entities. While an SESP is maintained and executed primarily by State Energy Offices[53] in consultation with Public Utility Commissions, consumer-owned power operators, and petroleum product providers, they are often referenced and utilized by Governors, State Emergency Management Agencies, and State Legislators to guide energy emergency preparedness and response policies and programs, inform regulatory proceedings, and inform energy sector hazard mitigation and resilience planning.

SESPs, required for all states receiving financial assistance through the DOE's State Energy Program (SEP)[54], include hazard-based risk assessments that consider the consequence of an energy asset's loss, the vulnerability of an asset to specific threats, and the likelihood that an asset will be exposed to a specific threat.[55] The consequence of loss estimates may be useful for the BCA process. For example, the 2022 Idaho Energy Security Plan includes estimates of property losses due to various natural hazards, analysis of historic energy disruptions and responses to them, and future steps for building energy resiliency in the state.[56]

Additionally, SESPs are dynamic and continuously evolving to incorporate, leverage, and align with other state resources and plans. SESPs provide detailed information on critical energy systems in the context of consequence and risk management, and outlines roles and responsibilities for preparedness, energy emergency response, critical infrastructure interdependencies, hazard mitigation, and long-term energy resilience. State Emergency Management Agencies are becoming more involved in SESP development nationwide. Thus, future iterations of SESPs are expected to be more formally linked to HMPs and a state's hazard mitigation plan and may serve as the primary strategy document for state energy resilience and hazard mitigation planning.

6.2.2. Threat and Hazard Identification and Risk Assessment (THIRA)

The standard for hazard-based risk assessment is defined by FEMA's Threat and Hazard Identification and Risk Assessment (THIRA) tool. Many state offices must perform regular iterations of a THIRA to receive FEMA funding. A THIRA identifies the threats to a community, their likelihood, their impacts, and the capabilities needed to avoid them. Communities complete the THIRA every three years and use its results to complete FEMA's Stakeholder Preparedness Review (SPR), which is an annual self-assessment of a jurisdiction's current capability levels against the targets identified in the THIRA.

One of the steps of a THIRA involves estimating the impacts and likelihoods of each threat and hazard, and these estimates can be used to quantify the consequence of losses due to these hazards for the BCA. For example, the 2015 THIRA conducted by Allen County, Indiana, quantified potential impacts to the county from various natural, technological, and human-caused hazards.[57]

Project Spotlight

The Kentucky Office of Energy Policy (OEP) is using BRIC C&CB funding to develop an innovative framework for the identification of potential mitigation projects. The framework incorporates hazard mapping, vulnerability assessments, partnership and capacity building, and outreach. The framework utilizes GIS to accurately map, visualize, and assess natural hazard risks for a given community. The framework also supports the establishment of a critical facility working group, which empowers local citizens to evaluate critical facilities in their community. Amanda LeMaster, from Kentucky OEP states that "making connections and partnerships is key, starting with the energy sector." The established framework will greatly assist Kentucky OEP in the identification of critical mitigation projects and the associated development of successful BRIC applications. The system framework is in pilot phase. If successful, it has the potential to be replicated among other State Energy Offices across the Country.

7. Additional Support

Check out the "Quick Guide", the supporting document to this Technical Guide, for information on additional funding resources and where to get help on your BRIC application. Additionally, the Quick Guide provides a more streamlined version of this Technical Guide.

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