Bipartisan Infrastructure Law - Section 40101(d)

Preventing Outages and Enhancing the Resilience of the Electric Grid

State of Colorado

January 2023

DRAFT Program Narrative

Introduction and Overview

The Grid Resilience Grant Program, funded through Section 40101(d) of the Infrastructure Investment and Jobs Act (IIJA), will be administered through the Colorado Energy Office (CEO) and Colorado Department of Local Affairs (DOLA). This program provides $2.5 billion in formula grants to states and tribes for the purpose of improving the all-hazards resilience of electric grids. Under this U.S. Department of Energy (DOE) formula program, Colorado is estimated to receive approximately $8.6 million annually for the next five years, or approximately $43 million over the next five years. This application is for years 1 and 2 of the program, for approximately $17.2 million.

The state's Greenhouse Gas Pollution Reduction Roadmap identified reducing emissions from electric utilities by at least 80% by 2030 (from a 2005 baseline) and reducing emissions from buildings as key strategies to meet Colorado's greenhouse gas emissions targets. Microgrids and the technologies that expand the use of smart appliances and grid interactive buildings will help meet both of these goals. In addition, the State of Colorado has experienced significant, recent climate related extreme weather events including wildfires (including Cameron Peak and East Troublesome fires in 2020, and the Marshall fire in 2021), extreme heat, winter storm Uri (2021), and flooding (2013) that have tested the resilience and reliability of the state's energy infrastructure. The State intends to use the Grid Resilience Grant Program federal funding, matched with state and utility funding to support the microgrids grant program created by House Bill 22-1013, invest in microgrids, grid hardening projects, advanced system monitoring, and the creation of a grid reliability and resilience study.

Objectives and Metrics

The State of Colorado has been designated to receive $8,635,068 for the first year of funding from IIJA 40101(d) formula funding, and approximately the same amount for the second year. The State of Colorado is pursuing this funding to work with eligible entities- including utilities, storage operators, and

others- to support investments in solutions that can provide reliable energy through the climate related extreme impacts including potentially:

A. Microgrids for Community Resilience: Construction of distributed energy resources for enhancing system adaptive capacity during disruptive events, including microgrids and battery-storage subcomponents
B. Development of grid hardening projects that advance the state's goal of an equitable transition to a low-carbon economy and meeting state energy needs with 100% renewable energy by 2040.
C. Implementation of advanced system monitoring for use in smart grids and microgrids.
D. Creation of a grid resiliency and reliability roadmap and technical assistance

The Colorado Energy Office and Department of Local Affairs plan to use a competitive process to award grant funding, based on the criteria and metrics described in this document, with the planned allocation and matching funds following the budget below for the first two years of the program, 2023 and 2024.

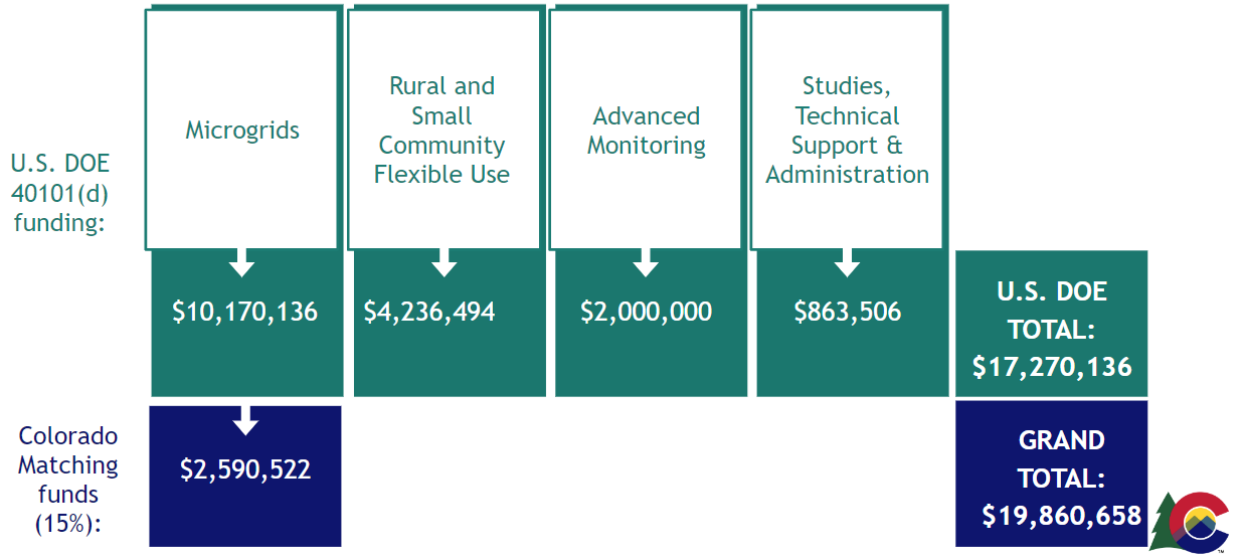
New electric generation sources that are not part of a system for increasing adaptive capacity during disruptive events, such as a microgrid, are not allowed.

Matching funds:

The 15% state match requirements for year 1 and 2 of the IIJA 40101d funds is estimated to be $2,590,522. This match will be met through funding from the Microgrids for Community Resilience Grant Program, which has a total appropriation of $3,520,713 from House Bill 22-1013, which was passed by the Colorado General Assembly in the 2022 legislative session.

The matching funds from the State of Colorado are particularly focused on the Microgrids for Community Resilience Program, which is intended for rural communities. Therefore, these $2,590,522 will be reserved for cooperative electric associations and municipal utilities from rural communities in Colorado that are interested in developing microgrids that increase electrical resilience.

Proposed 2 year Budget - Fiscal year 2023 & 2024



Proposed Objectives for Colorado's Grid Resilience

Objective A: Microgrids for Community Resilience (cooperative/municipal utilities only), Proposed 2-year Budget: $5,181,044

The State of Colorado has a large and diverse geography, with rural communities located in remote canyons and widely dispersed along the eastern plains. These rural communities are vulnerable to electric interruptions, as they are often located far along the electricity distribution lines from the generation sources and transmission lines. The Colorado Microgrids for Community Resilience Act (HB22-1013) states: "The use of microgrids can help increase a community's resilience regarding severe or natural disaster events that can affect the electric grid by providing the community with an alternative, reliable source of electricity that is not dependent on the electric grid". Therefore, the HB22-1013 funding will be tied to essential infrastructure and support strengthening community resilience. The funding for this program will be a total of $5,1881,044, which comprises $2,590,522 of matching state funds for the 40101d formula grant, as well $2,590,522 of 40101d formula funds. This Objective A program is closely aligned with the Objective B program, with the exception that Objective A funding is reserved for cooperative and municipal utilities that serve rural areas. Rural is defined as being in a county that has less than 50,000 people **or** a town that has less than 25,000 residents.

Metrics for Awarding Grants Under Objective A:

1. Demonstrates the greatest community need, benefit, and collaboration
    a. The project realizes and outlines mutual community benefits as demonstrated by signed letters of support from community-based partners, including anchor institutions, local governments, and/or partner agencies.
2. Reduces vulnerabilities and increases grid reliability and resiliency
    a. Data and narrative is provided to support the degree of exposure to climate related severe weather or natural disaster events for a rural community or communities that are part of a proposed project.
    b. Data is provided to show infrastructure vulnerability, including but not limited to utility-provided or FEMA data (e.g., standard Key Performance Indicators: MTBF (mean time before failure), MTTR (mean time to recovery, repair, respond, or resolve), MTTF (mean time to failure), and MTTA (mean time to acknowledge)
    c. Evidence of social vulnerability is demonstrated through the Justice40 and Colorado EnviroScreen mapping tools.
3. Local commitment and readiness
    a. Applicant has a strong track record of actions and planning towards energy efficiency, demand-side management, incentive programs, or other initiatives that demonstrate commitment to local energy resiliency and reliability. For example:
        i. Proposed microgrid has a higher reliance on non-fossil-fuel-based generation
        ii. The utility has (or is proposing to) take the opportunity to promote energy efficiency and demand-side management programs
        iii. The utility has (or is proposing to develop) an incentive program that saves partners money when they use energy storage to reduce electricity use during peak electricity use periods.
        iv. Other programs that demonstrate a commitment to local energy resiliency, reliability, and "microgrid readiness"
    b. demonstrate readiness through financial resources being committed and aligned with risk mitigation and community goals
    c. aligns with regional and/or local plans
    d. timeline is feasible
    e. demonstrates eligibility through local effort and match

Objective B: Microgrids for Community Resilience (open award for all utilities)
Proposed 2-year Budget: $7,579,614

Colorado is already experiencing the impacts of climate change including increased flooding and wildfires. The use of microgrids, including distributed generation and storage, can improve the resilience of the grid and improve the reliability of energy delivery by providing communities with reliable sources of power. This funding will support utility-led microgrid development in vulnerable communities. The objectives and metrics of this program will be the same as those from Objective A: Microgrids for Community Resilience, with the exception of that the applicant utility need not be restricted to small

rural cooperatives and municipal utilities. If the utility is over the threshold of 4 million MWh per year, the match increases from 33% to 100%. The metrics for Objective B are the same as those for Objective A, with the exception that they are not reserved only for small and rural communities.

Metrics for Awarding Grants Under Objective B:

1. Demonstrates the greatest community need, benefit, and collaboration
    a. The project realizes and outlines mutual community benefits as demonstrated by signed letters of support from community-based partners, including anchor institutions, local governments, and/or partner agencies.
2. Reduces vulnerabilities and increases grid reliability and resiliency
    a. Data and narrative is provided to support the degree of exposure to climate related severe weather or natural disaster events for a rural community or communities that are part of a proposed project.
    b. Data is provided to show infrastructure vulnerability, including but not limited to utility-provided or FEMA data (e.g., standard Key Performance Indicators: MTBF (mean time before failure), MTTR (mean time to recovery, repair, respond, or resolve), MTTF (mean time to failure), and MTTA (mean time to acknowledge)
    c. Evidence of social vulnerability is demonstrated through the Justice40 and Colorado EnviroScreen mapping tools.
3. Local commitment and readiness
    a. Applicant has a strong track record of actions and planning towards energy efficiency, demand-side management, incentive programs, or other initiatives that demonstrate commitment to local energy resiliency and reliability. For example:
        i. Proposed microgrid has a higher reliance on non-fossil-fuel-based generation
        ii. The utility has (or is proposing to) take the opportunity to promote energy efficiency and demand-side management programs
        iii. The utility has (or is proposing to develop) an incentive program that saves partners money when they use energy storage to reduce electricity use during peak electricity use periods.
        iv. Other programs that demonstrate a commitment to local energy resiliency, reliability, and "microgrid readiness"
    b. demonstrate readiness through financial resources being committed and aligned with risk mitigation and community goals
    c. aligns with regional and/or local plans
    d. timeline is feasible
    e. demonstrates eligibility through local effort and match

Objective C: Grid Hardening in Small and Remote Communities
Proposed 2 year Budget: $4,236,494

The Grid Hardening Act of 2021 defined grid hardening as " The ability to use technology, equipment, or hardening measures to enable the electric grid to better withstand the effects of extreme weather, a wildfire, or any other natural disaster." Grid hardening projects typically focus on and prioritize options to reduce the impact of these events, make the components of the system more resilient to the impacts, and often use innovative response approaches.[1] This funding will be reserved for rural electricity cooperatives and small municipally-owned utilities.

Some of the uses for this funding include:

- monitoring and control technologies
- the undergrounding of electrical equipment
- utility pole management
- the relocation of power lines or the reconductoring of power lines with low-sag, advanced conductors
- vegetation and fuel-load management
- the replacement of old overhead conductors and underground cables

Metrics for Awarding Grants Under Objective C:

1. Historic frequency and duration of power outages due to natural disasters and extreme weather events.
2. The ability of specific grid hardening activities to mitigate risks of power outages in specific communities.
3. The proportion of historically marginalized community members in the communities served, as measured by area median income (AMI), percentage below AMI, racial, and ethnic composition.
4. The focus of the applying organization on strong labor standards and protections, such as through project labor agreements, training practices, plans to partner with a training provider, and the use of appropriately credentialed workforce.
5. Demonstrated financial need of the cooperative or small municipal utility demonstrating that the identified projects could not be completed without outside grant funding.

Objective D: Advanced system monitoring for use in smart grids and microgrids
Proposed 2-year Budget: $2,000,000

Per statutory requirements, Colorado's electrical utilities are rapidly transitioning from primarily depending on fossil fuels as generation sources to renewable energy sources, particularly wind and solar.

[1] Richard, Jeffery. 2017. "The Keys to Grid Hardening." Leidos.com. retrieved 8/22/22 from: https://www.leidos.com/insights/keys-grid-hardening-how-implement-effective-solution

Smart grids have a higher reliance on distributed generation resources, whereas microgrids have the ability to function independently of the wider grid ("island mode"). The use of wind, solar, and storage as energy sources for smart grids and microgrids requires a more precise understanding of weather conditions as relating to electricity generation, storage, and use. This funding would incentivize communities operating smart grids and microgrids to invest in technologies that would support this advanced system monitoring.

Metrics for Awarding Grants Under Objective D:

1. Share of electricity in impacted communities from renewable and distributed generation sources.
2. Innovative approaches to advanced system monitoring of smart grids and microgrids.
3. Justification of need: Demonstrated financial need of the applying entity to cover the costs of developing or updating an advanced monitoring system.
4. Projected equitable impacts: Degree to which application demonstrates process or projections by which at least 40% of funds will be invested in projects in disproportionately impacted communities, in alignment with the federal Justice40 initiative.
5. Impact on workforce/job creation: Degree to which application demonstrates that project is projected to create new jobs or workforce demand, and inclusion of planning for funding past initial funding as needed.
6. Long-term Community Impact Depth: Degree to which a project uses specific sources or examples to demonstrate projected long-term permanent impact to the health and safety of the community or region through outcomes impact, environmental impact, workforce impact, etc.
7. Shovel-ready status: Clearly defined project scope, partners, secured site, and timeline for project implementation.

Objective E: Grid Resiliency Studies and Technical Support
Proposed 2-year Budget: $863,506

In addition to investing in projects, Colorado intends to use some of the funding to help conduct a study or studies that will help assess outages, especially in communities of color and historically impacted communities. The State will develop a grid resiliency and microgrid roadmap that will address key questions such as what parts of Colorado may face the most severe risk; what locations should be identified as critical facilities; how can microgrids, especially microgrids capable of islanding help ensure resilience; and how can the development of microgrids and other grid resilience investments help reduce GHG emissions and create good paying jobs.

To advance resilience and reliability and to help harden the grid, especially in response to extreme weather events that are stressing the State's energy delivery system, and cyber security

threats, Colorado will use some of the resilience funding to prepare a microgrid roadmap that will identify and describe:

1. Communities that are at highest risk of power outages due to natural disasters or other grid interruptions
2. Assess how microgrids may be able to:
    a. Protect critical facilities and infrastructure
    b. Reduce negative effects of power outages
    c. Dynamically utilize demand-side resources
    d. Improve customer options for cost impacts and benefits
    e. Be included in DER planning
    f. Help customers reduce energy costs, especially in rural areas
    g. Help state meet GHG reduction targets.
3. ID barriers to developing and deploying microgrids
4. Opportunities to foster public-private partnerships

In developing this Roadmap, the State will work with the Public Utilities Commission, the Office of Utility Consumer Advocate, utilities, disproportionately impacted communities, large customers, local governments, labor interests, and other stakeholders.

The Roadmap will serve as a foundational document that local governments and others can use in determining how to implement microgrids and other resilience and reliability solutions at the local level.

In addition, pursuant to recent changes in Colorado statute, the state Public Utilities Commission is also implementing rules addressing environmental justice and equity that will directly impact utility distribution system planning, implementation of microgrid programs, and potentially other resilience investments.

The funding from this objective would largely be used to hire contractors, consultants, researchers, and public engagement experts to support the work of the Colorado Energy Office and the Department of Local Affairs to complete the projects as described in their associated scopes of work.

Metrics for Awarding Grants Under Objective E:

1. Ability and experience of independent contractors to carry out the grid resilience and reliability roadmap research and compile the study.

2. Demonstrated ability to conduct the appropriate projects as outlined in the scopes of work in a timely and professional manner.
3. Clear plan for stakeholder engagement on energy reliability and resiliency throughout the state of Colorado.
4. Working knowledge of issues of equity and ability to effectively communicate with and receive feedback from disadvantaged communities.

Distributing Funds

The primary method for distributing funds to eligible sub-awardees will be through a competitive solicitation process that will result in grants to those awardees. An eligible entity that receives a subaward under this program is required to match 100 percent of the amount of the subaward as required by IIJA Section 40101(h)(1). However, if the eligible entity sells not more than 4,000,000 megawatt hours of electricity per year, the required match will be one-third of the amount of the subaward as required by Section 40101(h)(2). "Cost matching" for the non-federal share is calculated as a percentage of the Federal funds only, rather than the Total Project Cost.

Funding Distribution

Colorado intends to fund projects from four broad programmatic areas or objectives including: Microgrids for Community Resilience, Microgrid (open award), Advanced system monitoring for use in smart grids and microgrids, and Grid Resiliency Studies and Technical Support. The Microgrid for Community Resilience will target awards to eligible entities (municipal or cooperative utilities) for projects that serve rural communities as defined by the Department of Local Affairs Microgrids for Community Resilience.

Program Objective	Year 1 Funding Distribution	Year 2 Funding Distribution
Objective A: Microgrids for community resilience	$1,295,261	$1,295,261
Objective B: Microgrid (open award)	$4,908,054	$4,908,054
Objective C: Grid Hardening in Small and Remote Communities	$1,000,000	$1,000,000
Objective D: Advanced Monitoring	$1,000,000	$1,000,000

Objective E: Grid Resiliency Studies and Technical Support	$431,753	$431,753
Total (DOE Grant + State Match)	**$9,930,329**	**$9,930,329**

Equity Approach

Colorado is committed to a just and equitable access to the benefits of clean, renewable energy including reduced air pollution and investing in Colorado's workforce. CEO and DOLA intend to include equity and employment as criteria in determining awards for each of the funding objectives including:

1. Projected equitable impacts: Degree to which application demonstrates process or projections by which at least 40% of funds will be invested in projects in disproportionately impacted communities, in alignment with the federal Justice40 initiative.
2. Impact on workforce/job creation: Degree to which application demonstrates that the project is projected to create new jobs or workforce demand, and inclusion of planning for funding past initial funding as needed.
3. Long-term Community Impact Depth: Degree to which a project uses specific sources or examples to demonstrate projected long-term permanent impact to the health and safety of the community or region through outcomes impact, environmental impact, workforce impact, etc.
4. Shovel-ready status: Clearly defined project scope, partners, secured site, and timeline for project implementation.

Technical Assistance and Administration:

Colorado's goal is to use the resilience funding to support investment in projects and technologies that increase grid resilience, improve reliability, advance equity goals, and create good-paying jobs all while reducing GHG emissions. To meet this goal, the focus of the state's investment through IIJA grants will be to fund projects that increase investment in renewable energy and microgrid technologies. Technical assistance will be provided to sub-grantees through contractors approved by the Department of Energy.

Public Notice and Hearing:

Colorado will posted a draft of its application to its "Infrastructure, Investment and Jobs Act" (IIJA) website as well as to relevant agencies' IIJA websites or main site. The Colorado DOLA and

CEO held an open informational meeting for Thursday, November 17, 2022, 4-6pm via Zoom, which was attended by over 100 interested parties, mostly representing Colorado's electric utilities. The designated State of Colorado staff reached to parties that would be potentially interested in applying for this grant funding, including rural municipal and cooperative utilities, the Colorado Rural Electric Association (CREA), Ute and Southern Ute Tribes. These State staff are also making public announcements via:

- In person and virtual meetings with various utilities, NGOs, and interested groups
- Social media posts

Following the public hearing, a draft of this narrative and the Microgrids for Community Resilience Application Guidelines were posted on State of Colorado websites, including that of the Colorado Energy Office and the Department of Local Affairs. Contact information for the appropriate staff members was provided and the public were encouraged to submit comments on these documents and the proposed use of these funds. The initial deadline for commenting was set for December 5, but was later extended to December 12, 2022. A total of 10 parties submitted comments, which were subsequently posted, and commented on by Colorado state staff members. Additionally, key changes to this narrative were made by staff based on the comments provided by the public.