SMPA Annual Update Electrical Power Resiliency for the Town of Rico

January 23, 2023







Exclusion: Energy*Cooperatives

Update to SMPA power supply situation

- SMPA is currently operating under an All Requirements contract with Tri State G&T
- Pursuing Partial and Full Buy-out options through FERC process (litigation pending)
 - Until resolution we are stalled in proceeding with large scale supply recommendations
 - However, we continue to explore <u>alternative</u> power supply agreements
- Final path may dictate <u>future capacity</u> to develop more large-scale renewables.
- Meanwhile, we continue to explore up to 2 MW of local Community Solar Gardens (CSGs) that can fit within our current 5% carve out (based on annual kW and KWh use)
 - Seeking parcels in Ouray and San Miguel Counties (have explored 9 sites to date)
 - Offer good solar exposure near a SMPA 3-phase point of interconnect
 - Low to no cost land lease options
 - A 2 MW CSG would provide enough solar energy to power between 250-300 homes





Rico is at the end of an SMPA radial feeder



The line feeding Rico traverses heavily vegetated, difficult to access terrain, and is susceptible to frequent faults

Rico has had 21 outages since June of 2020 lasting > 108 hrs

- Radial feeder means power is only delivered from one direction
- When an outage occurs on the line there is no way to re-route power from another line
- Outage remains until fault is cleared
- Vegetation management is on going and costly on an annual basis

Power Outage last Wednesday 1/18/2023 Canceled Rico Board of Trustee meeting



How can SMPA provide Power delivery resiliency?

- 1. Extremely costly line extension from another source out of our territory not feasible
- 2. Purchase and install a fossil fuel internal combustion generator
 - 1. Requires source of fuel Natural Gas or Diesel
 - 2. Very costly to operate and maintain
 - 3. Becomes a <u>pure expense</u> to SMPA creating potential rate pressure
- 3. Install a large battery system- back up time based on battery size- target 4 hours
- 4. Install a co- located solar array to charge batteries to extend back up time during extended outages.
- 5. Install a microgrid that combines solar Large capacity batteries
 - 1. Solar can extend outage coverage by daily recharge of batteries
 - 2. Solar can provide renewable energy in high demand for our full-service territory
 - 3. Extra capacity battery can take solar output and deliver at night during SMPA peak providing additional revenue stream, lowering operating costs to SMPA, leave 4 hr coverage
 - 4. Extra capacity battery bank with solar could double or triple outage coverage time depending on circumstance





Proposed Microgrid for Town of Rico

Example System Characteristics

- 4-hour battery bank = approximately 1.2 MWh
- 300 kW Solar system will provide 1.2 MWh of daily battery recharge
- Double battery bank 2.4 MWh can provide 2x battery back up to Rico loads
- Discharge daily solar of 1.2 MWh at night and generate significant Demand Charge savings from Tri-State. Savings help reduce SMPA operating costs helping to fund the increased Resiliency - <u>Backup solution no longer just an</u> <u>expense</u>
- Solar plus larger battery now provides <u>double or more</u> <u>backup</u> coverage to Rico while buying down the cost of the battery-only backup resiliency solution





President Biden's Inflation Reduction Act (IRA) and Infrastructure Investment and Jobs Act (IIJA)

Unprecedented opportunity for grant funding – "once in a lifetime"

IIJA Smart Grid & Energy Funding





Clean Energy Programs



"Although we have announced the flight schedules- we are still building the planes"

Anonymous Government Representative

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Federal Grant Funding Opportunities

Infrastructure and Investment and Jobs Act Funding Bill (IIJA)

• Have participated in multiple GRIP concept paper submittals before the end of 2022

Inflation Reduction Act (IRA)

- Direct Pay (former ITC) guidelines and requirements? Allows Non-profits like SMPA to take advantage of the tax credit (CSG – 5%, land ?)
- We will look to take advantage of the USDA's \$9.7 billion to Rural Utility Service (RUS), for cooperative energy transition to renewables
- Guidelines are not yet published- evaluating the full scope of opportunities in next few months
- FEMA and Colorado Division of Homeland Security opportunities? Had initial meeting may present near term submittal opportunities for microgrids like DOLA?
- DOE Grid Resilience and Innovation Partnership (GRIP) Funding current concept papers submitted

Colorado State

Grant Funding Opportunities

Microgrids for Community Resilience

Funding under HB22-1013



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COLORADO Department of Local Affairs Division of Local Government



COLORADO Energy Office COLORADO Department of

Regulatory Agencies

- This is SMPA's most immediate grant funding opportunity
- Cooperative electric associations and municipally-owned utilities are eligible to apply.

- SMPA presented to State Legislator and helped create this program (using SMC Sherriff Office systems as example)
- Implementation/Construction grants: \$1,005,000 (33% match requirement)
 - SMPA plans to submit proposals for **3 small microgrids** that are shovel ready
 - 2 small microgrids to provide redundant resiliency for SMPA IT servers, radio and phone communications in Ridgway and Nucla
 - Small microgrid for Town of Ridgway Space to Create building community center Resilience Hub
- <u>Planning Grants:</u> \$399,000 is appropriated for this cycle.
 - Planning grants: \$36,000 (25% match requirement)
- Planning grant submittal for a regional investigation for potential for municipal microgrids- likely all behind the meter applications
- Long -term would include grant submittals that result from the planning grant exercise (e.g., Rico and other's TBD)

RESILIENCY AND MICROGRIDS



Program Summary

The Microgrids for Community Resilience (MCR) grant program is designed to build community resilience regarding electric grid disruptions through the development of microgrids. A microgrid is defined as a group of interconnected electric loads and distributed energy resources with clearly defined electrical boundaries that can function as a single, controllable entity with respect to the electric grid. Therefore, a microgrid can be connected to or disconnected from the electric grid to enable it to operate either in "gridconnected mode" or in "island mode".





MCR Planning Grant Submittal



Community Partner Eligibility

- Project has measurable exposure to severe weather or natural disaster.
- Project serves communities that are socially vulnerable.
- Show greatest community need, benefit, and collaboration
 - Project targets community-based institutions with multiple uses
 - Reduces vulnerabilities and increases grid reliability and resiliency
- Community demonstrates readiness through financial resources being committed and aligned with risk mitigation and community goals.
- The project strengthens resilience to community-based anchor institutions.
 - Community anchor institutions are schools, libraries, hospitals, or other health-care facilities, law enforcement, EMS providers, government offices, or community organizations that support marginalized communities.
 - Project demonstrates assessments for socioeconomic, infrastructure, and/or climate/extreme weather vulnerability.
- SMPA seeks to identify, plan, and implement one or more possible locations for resiliency hubs/ microgrids in targeted communities within SMPA's service region. SMPA submits the grant applications with community partners
- The grants will support community-level (behind the meter) resilience to reduce impacts during electric grid disruptions.
- SMPA will look to aggregate the microgrids identified in the planning grant process for a future MCR Construction Gran

What activities will the MCR Planning Grant "Plan" to cover ?

- 1. Seek to Identify one or more possible Resilience Hubs or other Microgrid applications in each interested community
- 2. Define the application:
 - 1. Perform initial analysis of what "emergency or Critical loads" need to be powered in each facility.
 - 2. Quantify the loads to help determine a 4–8-hour battery system requirements
 - 3. Explore possibility of adding solar for battery charging and annual energy offset (Net Metering)
- 3. Explore budgetary costs:
 - Determine feasibility and cost of creating emergency load panels (Electrical Contractor cost to consolidate or relocate Critical/emergency loads into discrete panels in parallel with grid) that will be powered by battery back up
 - 2. Generate high level system solution design.
 - 3. Explore budgetary cost for a microgrid solution (may include solar, IC generators, batteries or all) This cost item geared toward paying local solar designers paid for by planning grant
- 4. Determine the muni/community staff champion that can marshal approval for grant partnering, provide input to grant submittal, and help identify necessary cost sharing with the governing bodies of the target applications

Next Steps to apply for the MCR Planning Grant

- 1. Sean Hart (EAP) will provide contact information for those communities/anchor institutions wishing to participate in the SMPA Planning Grant submission
- 2. SMPA (Sean) will send out a more compressive list of what is required for eligibility and input to the grant submittal, including:
 - 1. More detailed information on <u>community and project</u> eligibility
 - 2. Cost share expectations for both the planning grant and the eventual microgrid system capital cost sharing (e.g., in kind labor for planning process and capital cost sharing for system implementation)
 - 3. Detailed requirements of what would be required of each participant in the follow-on Construction Grant applications
 - 4. Timelines for the various steps indicated in previous slides
 - 5. Timelines for the grant submittal input requirements:
 - 1. Collection of narratives to help define and justify each community request
 - 2. Letters of support
- **3.** Write Grant proposal open for submission Feb 1. closes March 31, 2023

SMPA partnered with San Miguel County (SMC) for two Microgrid projects at their Sheriff Offices

SMPA assisted SMC in applying for a Department of Local Affairs (DOLA) \$1.1M grant that included two Solar PV / Energy Storage Microgrid Systems for two different Sheriff Office locations.

The full project included a total of seven PV systems totaling 264 kW PV, and 190 kW/580kWh battery Energy Storage for "Mission Critical Load" resiliency

SMPA Support included:

- Solar and battery system design support
- Critical load determination
- Grant writing support





- Various beneficial electrification, solar PV, and battery system rebates
- Interconnection and Net Metering agreements

Microgrid System #1 San Miguel County Sheriff Annex Building in Norwood, CO

This microgrid utilizes a grid tied Solar PV System, a full load natural gas generator, and a modest battery system designed to ensure 100% resiliency for select " Mission Critical loads".

The **Solar PV** system was designed as a Net Metered, on-sight generator to offset more than half of the annual consumption of the building and provide a source of recharge for the battery energy storage system in the event of an extended outage.

• **48.7 kW** PV array – split between West and East facing roofs





Event Center





Microgrid System #1 San Miguel County Sheriff Annex Building in Norwood, CO

Resiliency : Although the building was to have a back up generator, they realized that there were "Mission Critical loads" they wanted to ensure would never go down. A solar / battery system was designed t ensure 100% reliability in case of generator failure or lack of fuel supply.

- Full building back up via 125 kW NG generator
- 30 kW /78 kWh ~2.5-hour maintenance free battery system
- Batteries can be recharged by solar for extended outages
- " Mission Critical Loads"

Emergency Operations Center (EOC) and Training Center

- Lighting circuits throughout building
- Receptacles throughout building
- Communications / internet





Microgrid System #2 San Miguel County Ilium Sheriff Office near Telluride, CO



As with the first system, this microgrid also utilizes a grid tied Solar PV System, a full load natural gas generator, and a modest battery system designed to ensure 100% resiliency for select "Mission Critical loads".

This **Solar PV** system was designed as a Net Metered, on-sight generator to offset more than half of the annual consumption of the building and provide a source of recharge for the battery energy storage system in the event of an extended outage.



• **78.12 kW** PV array – ground mounted



Microgrid System #2 San Miguel County Ilium Sheriff Office near Telluride, CO

Resiliency : as with system #1 the building had a back up generator but added batteries to ensure "Mission Critical loads" would never go down. This solar / battery system was designed t ensure 100% reliability in case of generator failure or lack of fuel supply.

- Full building back up via 80 kW NG generator
- 125 kW /440 kWh ~4 -hour maintenance free battery system
- Batteries can be recharged by solar for extended outages

" Mission Critical Loads"

- Dayroom Lighting
- Control room
- IT server / radio rooms
- Protective Custody / locks





PENDING MICROGRID PROJECT FOR TELLURIDE SCHOOL DISTRICT

The Telluride School district received a DOLA grant for \$750k to install solar and battery

storage on two school building meters.

Funding was made was made available through HB21-1253 to local government proposed projects to support the development and construction of renewable and clean energy infrastructure in all areas of the state especially in communities in which renewable and clean energy infrastructure is sparse and with consideration to geographical diversity in these awards. This \$5 million Initiative supported infrastructure implementation projects in the renewable and clean energy field to help reach Colorado's 2040 100% renewable energy goal.



376 kW - PV 250 kWh storage

This microgrid project includes solar for load offset and batteries for both resiliency and self-consumption/demand charge reduction. The project economics depends on the savings afforded by the batteries being able to shift delivery of the daytime solar and clip peak demand. The batteries then serve as back up for critical loads during a power outage. This system architecture is becoming quite common, and our policies enable the approach.

HB21-1253 Renewable and Clean Energy Initiative Awards

	Grantee	Award	Match
	City of Fountain Green Power	\$1,350,000	\$2,268,967
	Town of Lyons Solar Farm	\$1,000,000	\$ 400,015
	Telluride R-1 School District	\$ 500,000	\$1,943,889
	Craig Regional Solar Utility	\$ 450,000	\$ 900,000
	Pitkin County Micro Grid	\$1,700,000	\$1,270,000
	TOTAL	\$5,000,000	\$6,782,871

WHAT IS A RESILIENCE HUB

Weathering Climate Disasters with Resilience Hubs

In the face of worsening extreme weather, cities are creating resilience hubs to provide communities with numerous health, economic, and environmental benefits.

Making Communities Safer

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Cities are on the frontlines of many unique challenges in a world with more frequent and severe extreme weather and grid outages. Resilience hubs are one way for cities to tangibly protect all residents with community-focused solutions that support a safer, more sustainable, and more connected future. With these lessons and new federal funding opportunities, communities can proactively plan and deploy resilience hubs to protect their communities before the next disaster strikes.

https://rmi.org/weathering-climate-disasters-with-resiliencehubs/?utm_medium=email&utm_source=spark&utm_content=spark&utm_campaign=2 022_10_27&utm_term=button

What Are Resilience Hubs and What Can They Do?

<u>Resilience hubs</u> are physical, community-serving facilities that support residents, distribute needed resources, reduce carbon pollution, and enhance quality of life. Resilience hubs offer local governments a <u>powerful means of supporting vulnerable populations</u> before, during, and after an extreme weather event or other disasters, while simultaneously empowering and shifting resources directly to those communities. Depending on the needs of the communities where hubs are located, they can support resilience across <u>five foundational areas</u> – ensuring reliable power, coordinating communication, providing dependable facilities, managing operations, and offering valuable services and programming.



THANK YOU.

LET US KNOW WHAT YOU THINK READY SET GO!

