



**Town of New Castle**  
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## Agenda

**New Castle Climate and Environment Commission Virtual Meeting**  
**Thursday, November 18, 2021, 6:30 PM**

**Due to concerns related to COVID-19, this meeting will be open to the public as a virtual meeting only.**

**[To join by computer, smart phone or tablet click HERE](#)**

**If you prefer to telephone in:**

**Please call: 1-346-248-7799**

**Meeting ID: 709 658 8400**

**Follow the prompts as directed. Be sure to set your phone to mute until called on.**

**Call to Order**

**Roll Call**

**Meeting Notice**

**Conflicts of Interest**

**Citizen Comments on Items NOT on the Agenda**

### Items for Consideration

- A. Discussion: Composting in New Castle: Alyssa Reindel of Evergreen Zero Waste**
- B. Review Pollinator Plantings at Rollie Gordon Park and Alder Park Drainage and Example Sign**
- C. Discussion: Identifying 3 or 4 Projects for Possible Citizen Involvement**

### Information Items

- A. Business cards are in and can be picked up at Town Hall**
- B. Kid's Fire Safety books are in**
- C. Pollinator Gardens have begun - Thank you Tom**
- D. Garfield Clean Energy (GCE) & Clean Energy Economy for the Region (CLEER) report to Council**

**Adjourn**



# Welcome to EverGreen ZeroWaste

We're excited to help you responsibly manage your waste

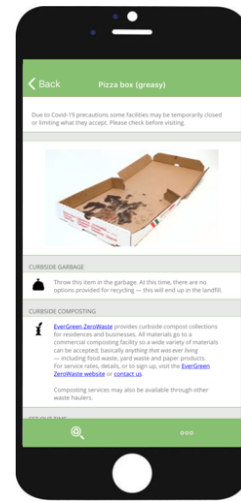
To keep up to date on service notifications, green events and waste diversion education we recommend following our Facebook page ([www.facebook.com/evergreenzerowaste](https://www.facebook.com/evergreenzerowaste)) and reading our monthly e-newsletters.

Next, to keep your bucket as clean and odor-free as possible, you'll either want to purchase compostable bags or line the bottom of your bucket with some form of compostable paper (newspapers, paper bags or cereal boxes work great.)

You'll also want to familiarize yourself with what can and cannot be put in your bucket. As a general rule, you can compost *anything that was ever living*. This includes all food scraps, most paper products (so long as they aren't coated in plastic) and yard waste. Food items must be kept in the bucket, but non-odorous compostables can be collected in a compostable bag, paper bag, cardboard box or durable container. There's no extra charge for extra materials set alongside your bucket.

## Download the Love Zero Waste App

By using this app or visiting [LoveZeroWaste.com](https://LoveZeroWaste.com), you can find answers to all your reuse, recycling and composting questions. Like whether that greasy pizza box should be recycled or composted (hint: compost!), as well as how to locally and responsibly dispose of other materials. If you're wondering about an item you don't see listed, just submit a suggestion to have it added.



The app is live and updated regularly to ensure its accuracy. Share the news with your friends and neighbors, as it's a free resource for everyone in our community. It's available in both Google and Apple app stores (just search "Love Zero Waste") and translates to Spanish with the push of a button!

## Thanks again for choosing EverGreen ZeroWaste

We are a locally-owned, family-operated Public Benefit Corporation with the mission of making waste diversion more accessible and understandable to our surrounding communities. Please don't hesitate to reach out with any questions, comments or concerns. Happy Composting!



# Compost Collection Guidelines

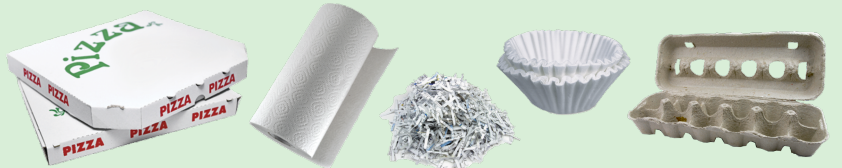
Visit [LoveZeroWaste.com](http://LoveZeroWaste.com) for more regional info about waste diversion.

## Compostable Materials:

All food scraps including meat, bones, dairy, fruits, veggies & coffee grounds.



Paper without a plastic lining such as pizza boxes, cereal boxes, paper towels, construction paper & shredded paper.



Yard waste and plants like lawn clippings, leaves, twigs, potted plants & flowers.



No branches > 1" in diameter.

Natural materials like fur, hair, cotton balls & swabs, fireplace ash, toothpicks, chopsticks & wine corks.



Certified compostable to-go products. Any bags, dinnerware or to-go items must be clearly labeled "compostable."



## CERTIFIED COMPOSTABLE!

Look for the following logos or symbols.



## Common Compost Contaminants:

Frozen food containers



Plastic-lined disposable cups



Plastic-lined takeout containers



Dairy & soup cartons



Plastic bags



Disinfecting wipes



These labels **DO NOT** indicate compostable and should be landfilled:  
"earth-friendly" "made from plant starch"  
"biodegradable" "green" "oxodegradable"  
"eco-friendly" "bio" "made from plants"

# EverGreen ZeroWaste Services

## Compost Collection for Homes

Participants are given an animal-resistant collection bin, that is emptied every week. No fees for collection of additional bins or yard waste bags. Sign up today!

\$18 monthly | \$50 quarterly | \$198 annually

## Commercial Compost Collections

Our comprehensive program serves schools, HOAs, businesses & municipalities. Our custom collection bins, educational materials & experienced workforce ensure success. Weekly & multi-day service schedules offered.

## Roll-Off Services

Order our roll-off, dumpster and hauling services to make large-scale waste diversion easy. We can complement your Materials Management Plan with well labeled bins, participant education & accurate record keeping. Partner with us to meet waste-diversion goals & work to achieve cost savings for material disposal.

## Zero Waste Events

Our award-winning zero waste event program conveys a respect for the environment & engages attendees.

We provide pre-event coordination, event bins, staff, hauling & reporting to ensure your event is a sustainable success. Nearly all waste will be composted & recycled.

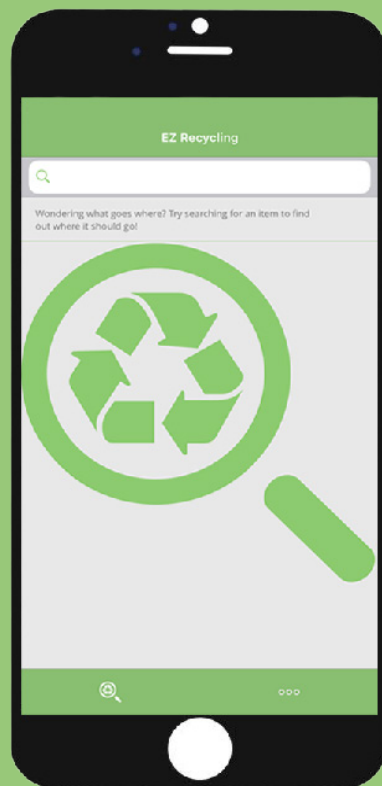
## Compostable Products

Offering certified compostable dinnerware & bags to our participants makes green dining easy and compost collections clean. Free delivery for EGZW customers!

## Education

We offer waste diversion education & resources to our community! Our website, bilingual Love Zero Waste app, printed materials & presentations make waste diversion more accessible & understandable.

Download the  
**Love Zero Waste app**  
or visit **LoveZeroWaste.com**



**Love Zero Waste** is a free resource that puts waste diversion at your finger tips. With this tool you can look up whether that greasy pizza box should be recycled or composted (hint: compost!) as well as how to locally and responsibly dispose of many other household materials.

Find it on both Google & Apple app stores.

¡Sí disponible en Español!

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**Compost Collections  
&  
Waste Diversion  
Services**

**EverGreenZeroWaste.com**

970-930-7900

info@evergreenzerowaste.com



# COMPOSTING RULES!

## Why Compost?

Compostable, natural material makes up the majority of trash. The anaerobic decay of this material in landfills generates methane; a greenhouse gas 80 times more potent than CO<sub>2</sub> in its heat-trapping ability.

Composting is an easy & effective way to reduce greenhouse gas emissions.



Create Healthy Soil



Combat Climate Change



Reduce Trash Volume



Protect Land & Water

## The Composting Process

We deliver your compostables to a nearby industrial compost facility where they are mixed with other organics & arranged in large piles. High temperatures, microbes & aeration facilitate the decomposition process, resulting in a nutrient-rich soil amendment. Finished compost is sold year-round & annual compost give-backs are coordinated for customers!

## What is Compostable?

Anything once living can be composted. This includes all **food scraps**, most **paper products** & **yard waste**. It also includes natural materials like cotton balls, corks, hair, fur, chopsticks & certified compostable dinnerware – which must be labeled “compostable.”

## Common Compost Contaminants

We cannot accept plastic-lined paper containers, plastic bags or non-compostable disposables.

**Plastic-Lined Paper Cartons**

**Plastic Bags**

**Plastic-Lined Disposables**



## FOOD



## PAPER



## PLANTS



## COMPOSTABLE DISPOSABLES



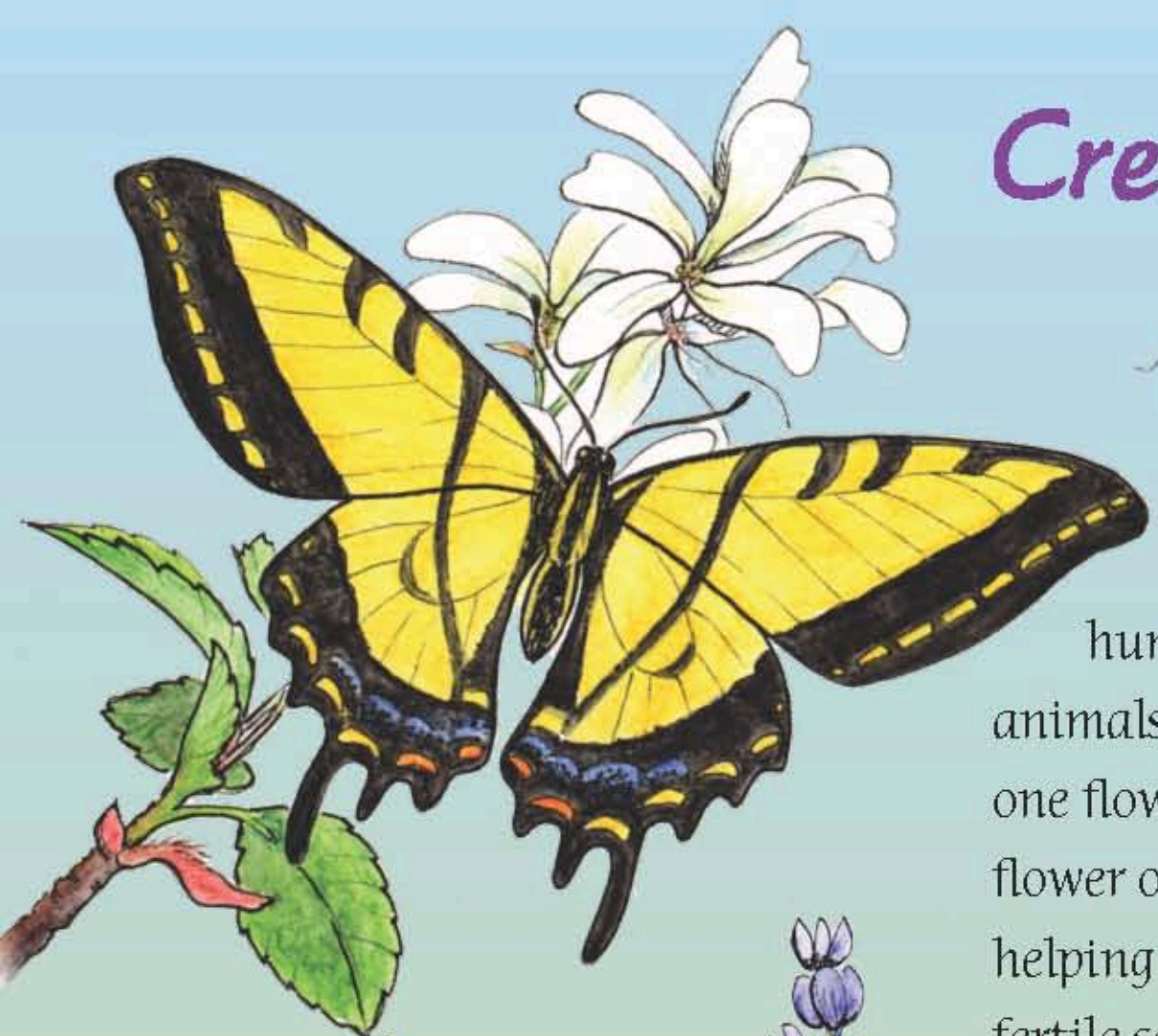
**Compostable disposables must be labeled “compostable”**



**Put paper with tape & staples in traditional recycling**

**No Plastic • No Glass • No Metal**

# Creating Pollinator & Native Plant Gardens: The Little Things Run the World



Every time you walk into your garden to enjoy a beautiful flower or pick a fruit, you might thank a bee, butterfly or hummingbird. These and other kinds of animals are pollinators – they move pollen from one flower to another flower of the same species, helping plants to produce fertile seeds.

Eighty percent of the world's crop species and most native plants rely on animals for pollination. However, biologists fear several butterfly and bumblebee species have disappeared from parts of their range because of habitat loss, introduced diseases, pollution and pesticide poisoning.

## How can you help pollinators?

- Grow native plants in your garden.
- Plant a diversity of flowering species.
- Don't use pesticides or herbicides.
- Provide sunny, bare soil areas for ground-nesting bees.

See if you can spot these pollinators in this garden.



## **Climate and Environment Commission Plan for Future Actions**

### **History of the Climate Action Plan**

On April 3, 2007, Mayor Frank Breslin signed the U.S. Mayors Climate Protection Agreement as the Town Council fully committed to developing and implementing strategies to reduce greenhouse gas emissions. The Climate Action Advisory Commission, later named the Climate and Environment Commission (CEC), was created to help the town pursue the goals of this agreement. The goals included inventorying greenhouse gas emissions in city operations; adopting land-use policies that reduce sprawl, preserve open space; promote greener transportation options, such as bicycle trails and incentives for public transit or carpooling; making energy efficiency a priority through building code improvements, upgrades to water and wastewater treatment facilities, and purchases of vehicles and equipment; promoting tree planting for shading and carbon dioxide absorption; educating the public, schools, businesses, and the community about reducing greenhouse gasses.

Over the next thirteen years, the town made strides in addressing these goals, by installing roof-top solar on municipal buildings, installing electric vehicle charging stations, adopting efficient building codes, planting trees, gaining efficiencies at wastewater and water treatment facilities, and more. In 2020, the CEC decided to update and build upon these goals, as shown in the next section.

### **CLIMATE AND ENVIRONMENT GOALS**

In 2020, the CEC determined that the most important long-term goals were to:

1. Advise the council and educate the community about environmental issues as well as climate change and its effects.
2. Provide guidance on individual and community activities that serve to reduce greenhouse gas emissions and protect the environment.
3. Advise and assist the town and community in transitioning to a more renewable and energy efficient future.
4. Advise the town in planning for and mitigating climate change impacts.

### **FOUR KEY STRATEGIES TO ACHIEVE THESE GOALS**

1. Leading by example. Municipal government will continue to make its buildings and operations a model of energy efficiency and renewable energy while reducing energy costs.
2. Strengthening communication and education efforts of the CEC. The CEC should provide accurate and helpful information regarding climate change and environmental protection to stakeholders.
3. Networking with local and regional partners to remove barriers, to provide incentives for wiser energy use, and to increase local renewable energy supplies. The Town will work with Xcel Energy, Garfield Clean Energy (GCE), the Roaring Fork Transit Authority (RFTA), the Community Office for Resource Efficiency (CORE), the Clean Energy Economy for the Region (CLEER), the Governor's Energy Office (GEO), Colorado Mountain College (CMC), and others to accelerate the transition to a clean energy future, offering programs to households and businesses that combine financing, technical assistance, and education.

4. Collaborating to acquire funding. The CEC and the Town Council will collaborate to seek funding to carry out environmental protection and climate mitigation goals.

## **MEASURABLE ACTION STEPS TO MEET THE LONG-TERM GOALS**

### **1. Providing educational programs and outreach**

- a. Create and implement educational programs for the public

Measurement of progress: Development of an educational program about climate change and environmental protection that can be shared with community groups

- b. Serve as a resource for individuals seeking more information about the topics of climate change, environmental protection, energy conservation.

### **2. Creating opportunities for individual and collective action**

- a. Explore opportunities for planting of appropriate tree and vegetation species, with guidance on use of water-saving mulches and soil amendments

Measurement of progress: Providing list of native trees and vegetation, as well soil amendments, irrigation techniques, and proper planting procedures to reduce water consumption

Measurement of progress: Encouraging and helping the town plant trees/vegetation

Measurement of progress: Networking with the Garden Club and other organizations

- b. Fine-tune use of water and other environmental resources by town and community

Measurement of progress: Communicate with residents regarding most effective and efficient watering strategies through the CEC website and other communication avenues including building permits

Measurement of progress: Work with the town in monitoring irrigation in parks and other spaces

### **3. Transitioning to a more renewable and energy efficient future**

- a. Encouraging energy efficiency activities and audits by homeowners

Measurement of progress: Encourage homeowners to have an energy audit and inform homeowners of free or low-cost energy audits

Measurement of progress: Connect and coordinate with regional partners such as GCE, CLEER, CORE and inform the public through various communication avenues, including the CEC website

- b. Encouraging energy efficiency audits by businesses

Measurement of progress: Encourage business owners to have an energy audit and inform business owners of access to free or low-cost energy audits, incentives, and rebates

Measurement of progress: Connect and coordinate with regional partners such as GCE, CLEER, CORE regarding effective ways to work with local businesses



c. Communicating with stakeholders regarding incentives for renewable energy, addition of insulations, storm windows, electric vehicles, roof-top solar panels, lighting, air conditioners, and other ways to save costs

Measurement of progress: CEC creates a listing of what is available for assisting in renewable or energy efficient changes and develops a strategy for implementation

Measurement of progress: Communicate information in town newsletter, website, and other appropriate media

#### **4. Planning for and mitigating climate change and environmental impacts**

a. Understanding the increased risk of wildfires and how to mitigate and respond

Measurement of progress: Meet with appropriate town and fire officials to learn how to prepare and to improve fire-mitigation/prevention around homes and businesses

Measurement of progress: Communicate and offer guidance to residents. Consult with fire officials on how to best provide information to the community regarding fire dangers and how to minimize fire risk. Offer at least one outreach and educational program.

b. Understanding the increased risk of drought and how to mitigate and respond

Measurement of progress: Meet with appropriate town officials and water conservationists to learn about how to prepare and minimize water usage among the public and the town

Measurement of progress: Communicate and offer guidance for residents.



Town of Parachute | City of Rifle | Town of Silt  
Town of New Castle | City of Glenwood Springs  
Town of Carbondale | Garfield County  
Roaring Fork Transportation Authority  
Colorado Mountain College

To: Mayor Riddile and Town of New Castle Council Members  
From: Garfield Clean Energy Collaborative Board and CLEER staff  
Date: October 19, 2021  
Re: **Garfield Clean Energy update**

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**On behalf of Garfield Clean Energy Collaborative, we want to thank you** for your ongoing participation as a member. We appreciate that the Town of New Castle continues to be a leader in supporting regional collaboration to solve our biggest problems.

Garfield Clean Energy has created a way for our rural region to make significant, measurable progress on energy efficiency, renewable energy, and clean energy transportation targets while creating economic benefits over the last decade. The rest of this memo highlights successes achieved so far in 2021 with a summary of what to expect in 2022.

### **Residential and Commercial Program Highlights**

In addition to continuing to provide energy coaching services for homeowners and businesses interested in efficiency, beneficial electrification and/or solar, here are some highlights of our work in the residential and commercial sector.

#### **Solarize Garfield County**

GCE launched and implemented a very successful bulk buy solar program called Solarize Garfield County. The program launched on March 1<sup>st</sup> with local company Active Energies Solar as the solar installer (selected through a competitive RFP process). We partnered with Solar Energy International to utilize their Solarize tool kit to provide us with the tools and materials to help launch a program (saving in start-up costs). We set a goal to spur 40 new solar installations in Garfield County through this program, a goal based on other counties' success in implementing the program. We far exceeded those goals, as detailed in the tables below and in this article

<b>Total Enrollments</b>	Xcel customers (eligible for GCE rebate)	Holy Cross customers	Glenwood Springs Electric	Total enrollments
Carbondale	83	51		134
Glenwood Springs	17	34	81	131
New Castle	44	3		47
Silt	16	6		22
Rifle	18	1		19
Parachute/Battlement Mesa	1	6		7
Unknown location / outside of Garfield County / duplicates				48
				<b>408</b>

<b>Systems Sold</b>	Xcel customers (eligible for GCE rebate)	Holy Cross customers	Glenwood Springs Electric	Total Systems sold	Total PV Sold (kW)	Project Costs
Carbondale	23	20	-	43	368.33	\$1,122,863
Glenwood Springs	4	10	28	42	320.3	\$1,092,181
New Castle	12	-	-	12	86.72	\$262,953
Silt	5	-	-	5	50.83	\$159,355
Rifle	4	-	-	4	18.08	\$57,318
Parachute/ Battlement Mesa	1	3	-	4	27.21	\$84,175
<b>Totals</b>	<b>49</b>	<b>33</b>	<b>28</b>	<b>110</b>	<b>854.975</b>	<b>\$2,840,383</b>

<b>Rebates Provided</b>	Total Systems sold	Total rebate amount
Garfield Clean Energy	49	<b>\$67,500</b>
Holy Cross Energy	33	<b>\$112,251</b>
Glenwood Springs Electric	28	<b>\$40,500</b>
Active Energies Solar	110	<b>\$38,325</b>
<b>Total</b>	<b>110</b>	<b>\$258,576</b>

## Educational Webinars

<b>Garfield Clean Energy events and trainings 2021</b>		
<b>Webinar name</b>	<b>Date</b>	<b>Participants</b>
Money Saving Seminar for Homeowners with Electric Heating Systems	1/12/21	88
Money Saving Seminar for Homeowners with Propane Heating Systems	1/19/21	41

Replacing your natural gas furnace or AC – consider a Cold Climate Heat Pump	1/26/21	67
	1/30/21	18
Solar + Storage: Is battery backup right for your home?	4/1/21	70
ASHP New Build – for contractors	5/4/21	39
ASHP New Build – for consumers	6/15/21	38
Ductless Mini-split Heat Pumps	8/31/21	57
Heat Pumps for existing homes with electric baseboard heating	9/7/21	42
Heat Pumps for existing homes with ducted furnace systems	9/14/21	26

### **Commercial Coaching**

Staff continued to do outreach and provide coaching to businesses, but have found that businesses continue to have limited capacity to pursue projects. With many facing staffing shortages following the pandemic, they have not been able to prioritize tackling efficiency projects. While the numbers have not been close to our goals, here is a list of entities we've provided energy coaching and rebate assistance to in 2021:

- Charcoal Burger - Glenwood Springs
- Colorado River Fire and Rescue - New Castle, Silt and Rifle
- YouthZone - Glenwood Springs
- Our School - Glenwood Springs
- ECOS Enviro and Disaster Restoration - Glenwood Springs
- Honey Butter - Carbondale
- Glenwood Adventure Park and Caverns - Glenwood Springs

### **Multi-family Design Assistance**

With many new construction projects happening, we've provided varying levels of design assistance to help project owners and managers understand the opportunities and benefits of incorporating efficiency and electrification technologies. These include:

- Wipiti Commons, a Habitat for Humanity project in Rifle. Staff have been heavily involved in providing design input throughout the process and are very excited about this low-income, clean energy project.
- Painted Pastures, a multi-family project in Silt
- Sopris Apartments in Carbondale
- Rifle Tiny Homes
- Red Hill Lofts in Carbondale
- Sopris Storage and Apartments in Carbondale

### **Renewable Energy**

The staff for GCE have achieved some significant accomplishments in 2021 related to solar energy. The Post Independent summarized the activity in this article:

<https://www.postindependent.com/news/solar-power-projects-flaring-up-all-over-garfield-county/>

## **DOLA Renewable Energy Challenge Grant**

In partnership with CORE and Walking Mountains Science Center, we completed all components of the DOLA grant which includes:

- Three County Solar +Storage Study: Meeting local, state and utility clean energy targets while maximizing regional benefits in Eagle, Garfield and Pitkin Counties. We'll provide more details of the findings of this report during the presentation and we've provided the Executive Summary in this packet. The full study can be found at: <http://wccleanenergy.org/3-county-solar-study/>
- Solar Development Resources for local governments and landowners, along with a dynamic solar map available to solar developers and also useful for planning staff and local utilities.
  - <http://wccleanenergy.org/local-government-resources/>
  - <http://wccleanenergy.org/landowner-resources/>
  - <http://wccleanenergy.org/solar-map/>
- Economic Transition Assessment: A preliminary look at the level of dependence of Garfield County and governmental entities in the county on revenue derived from the oil and gas industry, such as property taxes, severance taxes and federal mineral lease funding.

## **CMC/Holy Cross Community Scale Solar Project**

- Staff worked closely with CMC to identify a solar developer to work with while also working with Holy Cross Energy to put together a tariff program to ensure that the project created wins for all entities involved. This project has taken a few years to put together and here is a great summary article published in the spring: <https://www.solarpowerworldonline.com/2021/04/amesco-plans-solar-storage-project-on-colorado-university-land/>

## **Transportation**

Our transportation programs focus on promoting transit and biking/walking and increasing availability of charging stations and electric vehicles.

### **Electric Vehicle and Charging Station Work**

- Grant application submitted on behalf of the Town of Parachute for a new charger at a highway rest area.
- Helped Garfield County submit an application for its administration offices in Rifle.
- Assisted Ecos Environmental in submitting grant applications for EV charging at its offices in Glenwood Springs and Parachute and for an electric box truck.
- Released a short video showing new [Electric SUVs for Mountain Driving](#).
- Hosted an [Electric Truck Webinar with Lordstown Motors](#).
- Connected Glenwood Springs area dealerships with Xcel Energy's new [Preferred Dealership program](#).

## **#BikeThere**

- Created the first #BikeThere series of programs - held events in each community throughout the month of June:
  - <https://www.postindependent.com/news/local/garfield-county-is-getting-ready-to-ride-for-colorado-bike-month/>

## **Outlook and Planning for 2022**

The GCE Board worked on the 2022 Strategic Plan at their September Board meeting, which will be approved at the November meeting. In addition to the continued work in all program areas, key elements to the 2022 Strategic Plan will include the following:

- Focused coaching services and rebates for low- to middle-income households to help bring savings to more families;
- Implementing components identified in the Solar+Storage Study Action Plan;
- Working with Grid Alternatives, Energy Outreach Colorado, and Xcel Energy to target outreach to income-qualified residents to highlight special electric vehicle rebates and programs available to them; and
- Strengthening the structure of GCE and adding affiliate member requirements.

**To continue strong regional collaboration and success**, GCE is requesting that its nine member governments include funding for the Garfield Clean Energy Collaborative in their 2022 budgets. Thank you for your continued participation, support and consideration of this 2022 request.

Attached to this brief memo are the following reports and documents:

- a) Solar plus Storage Executive Summary

# THREE-COUNTY SOLAR + STORAGE STUDY:

MEETING LOCAL, STATE AND UTILITY CLEAN ENERGY TARGETS  
WHILE MAXIMIZING REGIONAL BENEFITS IN EAGLE, GARFIELD &  
PITKIN COUNTIES

## EXECUTIVE SUMMARY



# THREE-COUNTY SOLAR + STORAGE STUDY

OCTOBER 2021

Meeting local, state and utility clean energy targets while maximizing regional benefits in Eagle, Garfield and Pitkin counties.

## PROJECT TEAM

### Primary Author:

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Mona Newton, Executive Director, CORE

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Proofreading: Dave Reed, Zach Benevento-Zahner, Claire Kantor

## STUDY FUNDING PARTNERS



COLORADO  
Department of Local Affairs



The **Colorado Department of Local Affairs Renewable Energy Challenge Grant** included a package of five projects related to energy use and development in the region:

1. A regional energy inventory to measure energy use, costs and emissions.
2. A study of the potential for further development of solar energy coupled with battery storage, along with a dynamic solar map that identifies all viable land parcels.
3. An online toolbox of resources to inform landowners and local governments about successful solar plus storage project development.
4. Consultation with local governments to streamline the permitting processes for solar energy projects.
5. An economic transition study to assess the local economic implications of shifting from fossil fuels to 100% clean energy.

The online toolbox (3) is hosted on the Western Colorado Clean Energy Network website, and on the CORE and Walking Mountains Science Center websites. The toolbox offers landowners, solar developers and local government officials helpful user-oriented information about community-scale solar projects.

Consultation with local governments (4) is under way with seven municipal and county governments in the region, using the U.S. Department of Energy's SolSmart program<sup>1</sup> for communities as a guide. To date, four local governments in the region have achieved SolSmart designations as communities that are "open for business" for solar energy development.

The economic transition study (5) explains the taxing framework for the oil and gas industry in Colorado, tallies the tax revenues received by local governments, reports on the fiscal impacts that would result from a transition away from fossil energy to renewable energy, and begins to strategize ways to make that transition less disruptive for local governments, workers and businesses.

1. SolSmart Designee Map: <https://solsmart.org/our-communities/designee-map/>



# EXECUTIVE SUMMARY

The state of Colorado, local governments in Eagle, Garfield and Pitkin counties, and the electric utilities serving the three-county region have all set goals to shift the region's electricity supply to renewable energy.

At present, renewable energy only fuels a portion of the three-county region's electricity usage. Most of that clean energy comes from large, utility-scale solar and wind facilities located in other areas. Yet the region is blessed with abundant sunshine, and a significant share of the region's electricity demand could be met by generating more solar-powered electricity within the region.

While utility-scale solar projects produce electricity for the lowest unit cost, building such large facilities within the mountainous three-county region isn't feasible. The region is ideally suited, however, for development of mid-sized community-scale and smaller net-metered systems. The incrementally higher generation costs of these systems can be significantly offset by avoiding long-distance transmission costs and by capturing a share of installation and operational costs to benefit the regional economy. Coupling these systems with battery storage delivers further benefits to consumers and utilities.

This report builds on longstanding efforts in the three counties to accelerate locally-produced clean energy. A team of local clean energy advocates and experts, technical advisors and a national real estate mapping firm worked together to quantify and evaluate the region's potential for development of more community-scale and net-metered solar plus battery storage. The project team also examined how solar plus storage could deliver other benefits to the region, developed a map of all of the potential sites for community-scale solar development and created an online toolbox for landowners and local government officials.

The project team noted the high value of customer-owned, net-metered solar plus storage systems. Because there are so many variables associated with smaller net-metered systems, the team concentrated its in-depth analysis on the potential for community-scale solar plus storage.

This study is focused on the development of new resources for energy production. However, energy efficiency plays a critical role in these calculations. Reductions in electricity consumption achieved through efficiency measures will increase the ratio of local energy production to usage.

Through this study, the project team sought to answer a series of questions about the potential scale of solar plus storage development and the benefits such development could deliver. The answers, presented here as key findings, show exceptional promise for using solar plus storage to help meet renewable energy goals.



*Wolcott, Eagle County - Emily Kent photo*

# EXECUTIVE SUMMARY

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## KEY FINDINGS

- *How much electricity is used in the region per year?*  
1.86 million megawatt-hours of electricity, at a cost of \$193 million, in 2019.
- *How much more community-scale solar could feasibly be developed in the region, under current market conditions?*  
232 megawatts, equal to about 420,000 megawatt-hours of production per year.
- *What roles will battery storage play?*  
Help utilities balance supply and demand, maintain a resilient energy supply during emergencies, and make new solar development viable for the local electric grid.
- *How much of the region's electricity consumption could be met by developing more community-scale solar plus storage?*  
If all 232 MW were developed, it could provide 23% of the region's electricity consumption.
- *What benefits and advantages would come from growth in community-scale and net-metered solar plus storage?*  
Cutting carbon emissions, building resilience in the energy supply, and boosting the economy.
- *What are the local economic benefits for developing 232MW solar plus storage?*  
Local purchase of products and services, property tax revenue, land lease revenue, energy savings and jobs.
- *What barriers and restrictions stand in the way of an even higher amount of solar plus storage development?*  
Grid limitations, energy storage costs, and current regulations.
- *What can the region do to realize its full solar plus storage potential?*  
An action plan, Section 8.0, spells out the steps for local governments, utilities, solar developers and landowners.

## DEFINING UTILITY-SCALE, COMMUNITY-SCALE & NET-METERED SOLAR

**Utility-scale solar** is typically 15 megawatts (MW) or more in size, covering 75 or more acres and connected directly to regional transmission lines.

**Community-scale solar (CSS)** is typically 1 MW to 15 MW in size, built on parcels of 5 to 75 acres, and connected to the distribution grid.

**Net-metered (NM) solar**, which can be on rooftops or ground-mounted nearby, is much smaller and usually sized to offset about 100% of the customer's annual energy use. Systems are connected "behind the meter," where they directly offset a customer's electricity



## 1.0

# INTRODUCTION

The Solar-Plus-Storage Study shows that development of more community-scale solar plus storage would meet nearly one quarter of the region's electric consumption, while delivering other benefits. Changes to current regulatory policies and market barriers, coupled with expansion of the electrical transmission grid, could boost that percentage even higher.

In the quest to reach 100 percent clean energy, combining cost-effective utility-scale renewable energy projects with the flexibility and resilience of community-scale solar plus storage will be an essential strategy.

## 2.0

# UNDERSTANDING REGIONAL ENERGY USE & CURRENT SOLAR PRODUCTION

To learn what share of the electricity used in the three-county region could be produced locally, the project team conducted an inventory of energy use for the year 2019. The inventory compiled electricity and natural gas use in buildings and industry, using data from utilities serving the region. The inventory did not quantify transportation energy.

### 2.1 Energy Use & Cost

In 2019, buildings and industry in Garfield, Eagle and Pitkin counties used:

- 1.86 million megawatt-hours of electricity
- 119.5 million therms of natural gas

In 2019, lighting, powering and heating buildings and industry in the three-county region cost:

- \$186.5 million for electricity
- \$72 million for natural gas
- \$258.5 million total for electricity and natural gas

### 2.2 Carbon Emissions & Utility Fuel Mix

Carbon emissions from the four main electric utilities serving the region vary depending on fuel mix. Each utility's current share of renewable energy, predominantly from wind turbines, is:

- Xcel Energy: 30%
- Holy Cross Energy: 42%
- Aspen Municipal Utility: 100%
- Glenwood Springs Electric: 100%

## UNDERSTANDING REGIONAL ENERGY USE & CURRENT SOLAR PRODUCTION

Homeowners, businesses and local governments in the region have been investing in solar energy over the past two decades. The six existing community-scale solar arrays have a total generating capacity of 8.4 megawatts, while hundreds of net-metered arrays have a total generating capacity of 24.1 megawatts.

Utilities typically sell little to no net energy to net-metered customers. Therefore, most of these systems and the renewable energy they produce are not reported in the fuel mix of utilities, nor are they factored into the region's total electricity usage or spending.

Solar developers are currently planning another 31.25 megawatts of new community-scale solar projects in the region. These prospective projects are included in the market potential calculations in Section 3.

### NET-METERED SOLAR CAPACITY IN THE REGION, BY UTILITY, 2020

	Community-scale generating capacity	Community-scale generation per year	Net-metered generating capacity	Net-metered generation per year
Holy Cross Energy	6.4 MW	11,592 MWh	16.7 MW	25,110 MWh
Xcel Energy	2.1 MW	3,600 MWh	6.5 MW	9,687 MWh
Glenwood Springs Electric	0 MW	0 MWh	1 MW	1,404 MWh
<b>TOTAL</b>	<b>8.5 MW</b>	<b>15,192 MWh</b>	<b>24.2 MW</b>	<b>36,201 MWh</b>

## REGIONAL POTENTIAL OF COMMUNITY-SCALE SOLAR + STORAGE (CSS+)

To determine how much solar electricity could be produced in the three-county area by community-scale solar, the project team started with the full solar resource potential. In collaboration with a national mapping firm, the team created a dynamic solar map to show a bird's-eye view of open land in the three counties and identify parcels suitable for solar development. The project team then applied various technical criteria to identify suitable private land parcels, and finally narrowed the list of parcels by market limitations that are in play today.

### REGIONAL SOLAR POTENTIAL FRAMEWORK & PROCESS OF ANALYSIS



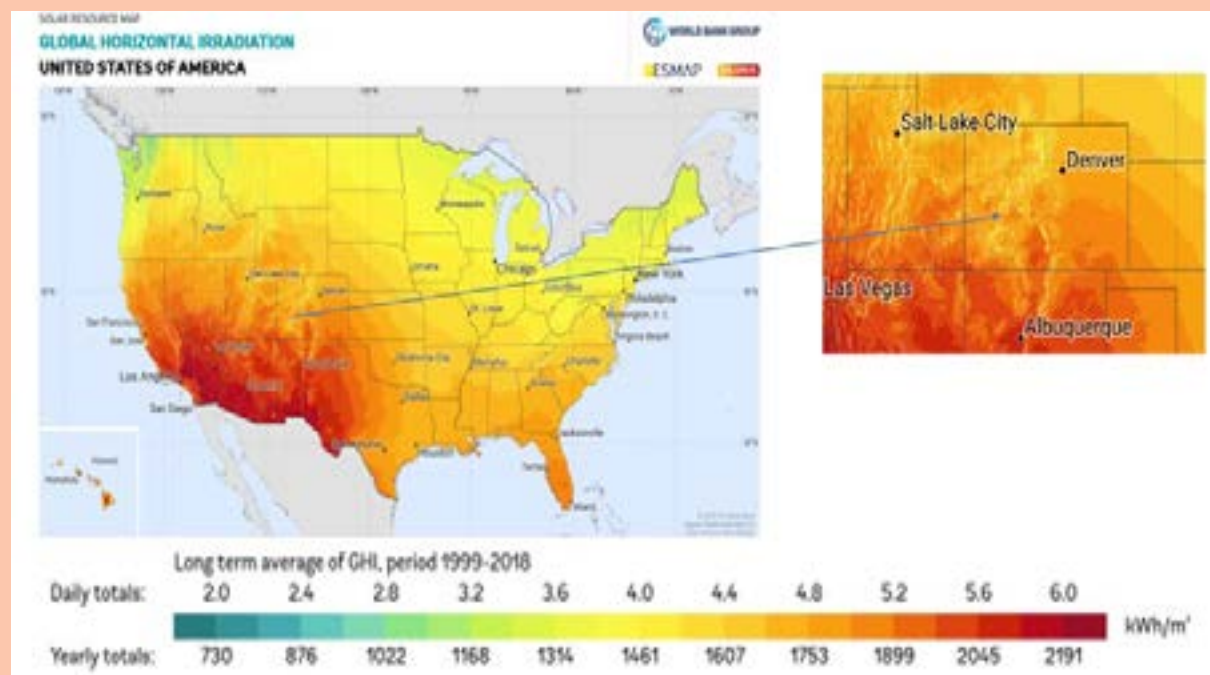
*ADAPTED FROM: National Renewable Energy Laboratory, "Estimating Renewable Energy Economic Potential in the United States: Methodology and Initial Results," Brown et al, 2016, p.8.*

# REGIONAL POTENTIAL OF COMMUNITY-SCALE SOLAR + STORAGE (CSS+)

## 3.2 Resource Potential

With an average Global Horizontal Irradiance (GHI), the theoretical potential of sunshine, of approximately 4.8 kilowatt hours per meter squared, the three-county region benefits from an abundant solar resource.

SOLAR IRRADIATION FOR THE CONTIGUOUS 48 STATES



SOURCE: <https://globalsolaratlas.info/>  
download accessed April 5, 2021.

## 3.3 Technical Potential

The technical potential step applied various practical constraints such as land use, topography, site suitability, factors obtained from local solar developers, and the existing utility grid system and related infrastructure.

TECHNICAL POTENTIAL OF CSS+ SOLAR DEVELOPMENT FOR IDENTIFIED LAND SITES, BY UTILITY SERVICE AREA

SERVICE TERRITORY	LAND PARCELS IDENTIFIED	LAND USE AT AVERAGE 6 ACRES PER MW	POTENTIAL GENERATION CAPACITY	POTENTIAL GENERATION PER YEAR
HOLY CROSS ENERGY	635	2,274 acres	379 MW	688,643 MWh
XCEL ENERGY	87	312 acres	52 MW	94,484 MWh
TOTAL TECHNICAL POTENTIAL	722	2,586 acres	431 MW	783,127 MWh

## REGIONAL POTENTIAL OF COMMUNITY-SCALE SOLAR + STORAGE (CSS+)

### 3.4 Market Potential

The market potential quantified the maximum amount of solar generation capacity that could be interconnected to the utility grid, taking into account current regulations governing utilities, utility policies and programs in place today, and economic competition from large utility-scale solar projects elsewhere.

#### MARKET POTENTIAL OF CSS+ SOLAR DEVELOPMENT, BY UTILITY SERVICE AREA

SERVICE TERRITORY	LAND USE AT AVERAGE 6 ACRES PER MW	POTENTIAL GENERATION CAPACITY	POTENTIAL GENERATION PER YEAR
HOLY CROSS ENERGY	1,080 acres	180 MW	327,060 MWh
XCEL ENERGY	312 acres	52 MW	94,484 MWh
TOTAL TECHNICAL POTENTIAL	1,392 acres	232 MW	421,544 MWh

#### Estimating Market Potential for Battery Storage

Battery storage can be added to almost any PV system. The project team created an example that models one 5 MW / 15 MWh battery storage system on the 12 three-phase feeder lines in the Holy Cross Energy distribution system. The 12 systems were paired with the 180 megawatts of market potential in Holy Cross territory. No storage was modeled for Xcel Energy because it does not yet offer programs and incentives for paired battery storage. (Section 3.4.3)

### 3.5 Local Development as a Percentage of Actual Consumption

An important reason for this study is to determine how much of the region's current electricity demand could be met by developing more community-scale solar plus storage projects in the region. Is the potential significant enough to make the effort worthwhile? The answer is a definite "Yes."

Community-scale solar plus storage, existing and potential, could meet 23% of the region's present annual electricity consumption.

## 4.0

# REGIONAL POTENTIAL FOR ROOFTOP NET METERED SOLAR + STORAGE (NM+)

The 24 MW of existing net-metered solar in the region is powering residential and commercial buildings, equal to about 3,650 homes. Growth in net-metered solar plus storage (NM+) systems could add substantial local solar generation, further supporting the utility grid and boosting economic benefits.

The project team used a tool developed by NREL (SLOPE) to quantify the potential for rooftop solar at the county level for residential and for commercial electric customers. The tool does not account for utility grid constraints, existing rooftop solar, or utility service territories.

Results are significant. Using the rough estimates generated by the NREL tool, the technical potential for net-metered solar in the region is 487.8 MW. Additional analysis will be needed to quantify the actual market potential for development of more net-metered PV systems in the region, as well as the role and benefits of paired battery storage.

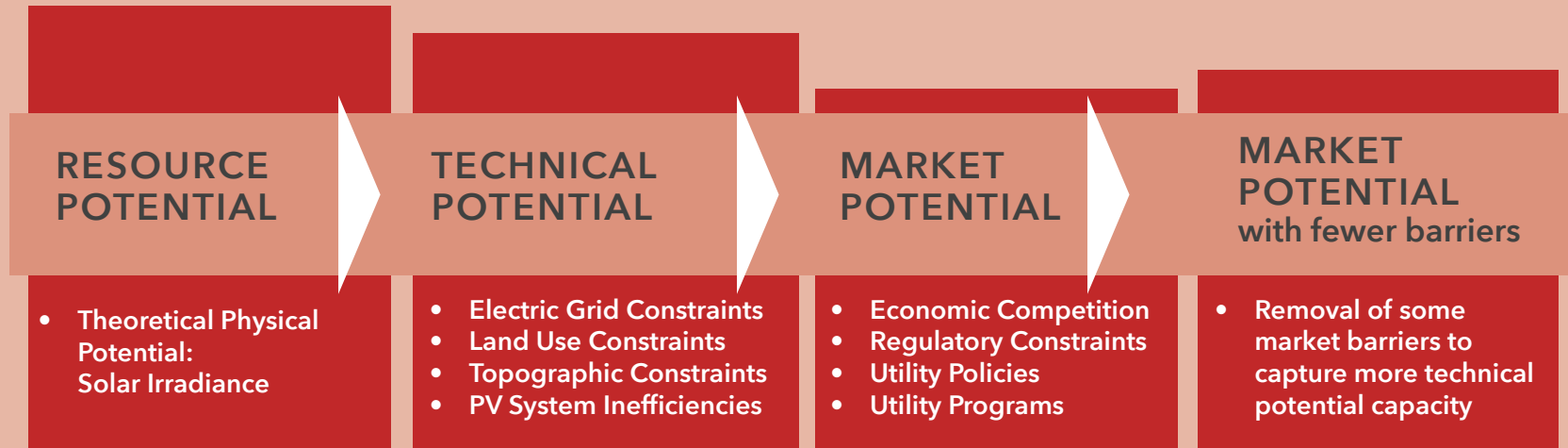
### TECHNICAL POTENTIAL OF ROOFTOP NM+ SOLAR GENERATING CAPACITY, BY COUNTY & SECTOR

	RESIDENTIAL	COMMERCIAL	TOTAL BY COUNTY
GARFIELD COUNTY	66.8 MW	175.4 MW	242.2 MW
EAGLE COUNTY	38.1 MW	128.0 MW	166.1 MW
PITKIN COUNTY	15.8 MW	63.7 MW	79.5 MW
TOTAL BY SECTOR	120.7 MW	367.1 MW	487.8 MW



## UNDERSTANDING THE REGIONAL ELECTRICITY MARKET

Advancing renewable energy in the region depends on more than finding suitable locations for solar projects. Other factors include the region's patchwork of electric utility service territories, physical limits to accessing the local distribution grid, barriers inhibiting development of battery storage, and lack of a regional transmission grid operator. The region's current market potential could increase as barriers are adjusted or removed.



ADAPTED FROM: National Renewable Energy Laboratory, "Estimating Renewable Energy Economic Potential in the United States: Methodology and Initial Results," Brown et al, 2016, p.8.

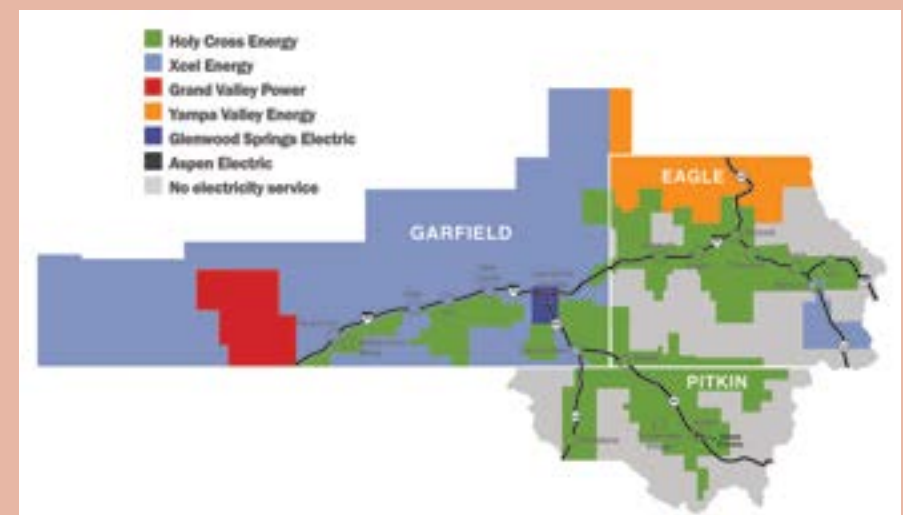
### 5.1 Regional Retail Electric Service

The three-county region is served by six electric utilities that are operated under three different ownership and regulatory systems.

- Holy Cross Energy, Grand Valley Power and Yampa Valley Energy are rural electric cooperatives, which are not-for-profit entities owned by their customers and governed by an elected board.
- Xcel Energy is an investor-owned utility, which is a for-profit, publicly traded corporation governed by a board of directors.
- Glenwood Springs Electric and Aspen Electric are municipal utilities, owned by city governments and governed by city councils.

Service territories within the three-county region for Grand Valley Power and Yampa Valley Energy are very small spillovers from their main service areas. Because they serve such small portions of the three-county market, they were excluded from further study.

FIGURE 12: ELECTRIC UTILITIES SERVING EAGLE, GARFIELD & PITKIN COUNTIES



## UNDERSTANDING THE REGIONAL ELECTRICITY MARKET

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### 5.2 Regional Wholesale Electric Service

Wholesale electricity is provided to the region by two entities.

Xcel Energy generates much of its electricity at its own facilities in Colorado and other states. These include coal-fired and gas-fired power plants, wind farms and large solar arrays. Xcel provides power to its own retail customers and, under a wholesale contract, to Holy Cross Energy. Xcel Energy's business in Colorado is regulated by the Colorado Public Utilities Commission.

The Municipal Energy Agency of Nebraska (MEAN) provides wholesale electricity and transmission to 69 communities in Colorado, including Glenwood Springs and Aspen, and in Iowa, Nebraska and Wyoming. MEAN is regulated by the Federal Energy Regulatory Commission. While MEAN provides wind-powered electricity to Glenwood Springs and Aspen, it has placed limits on the amount of renewable energy that can be generated by the municipal utilities and their customers.

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### 5.3 Barriers to Grid Infrastructure Access

Use of the regional energy grid by multiple utilities with different operating structures is a longstanding challenge. As renewable energy producers develop generating facilities, obstacles inhibit their ability to push fluctuating levels of electricity onto regional grids.

In Colorado, these include Xcel Energy's practice of restricting access to regional transmission grids and slow processing of interconnection applications. Lack of joint transmission planning across the larger market region is also slowing the transition to clean energy, and "pancaked" transmission charges make purchasing electricity across long distances more expensive.

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### 5.4 Regulatory Barriers to Stand-Alone Battery Storage

Battery storage allows utilities to store low-cost renewable energy when generation is high and demand is low, and use that stored power when demand rises locally or on the wider electric grid. Modifying the federal Investment Tax Credit and the federal Public Utility Regulatory Policies Act to recognize and accommodate stand-alone battery storage would make investments in storage more feasible, especially for rural utilities.

---

### 5.5 A Regional Transmission Operator (RTO) for the Mountain West

For Colorado's electric utilities to maximize use of the state's rich solar energy resources, joining or forming a regional transmission organization (RTO) or independent system operator (ISO) is essential. Colorado's grid is too small to balance out supply and demand with increased levels of renewable energy.

RTOs and ISOs are independent organizations that operate electric transmission assets and provide wholesale transmission services within a defined region. Joining an RTO or ISO power pool would balance supply and demand and give utilities access to energy markets that could drive investment in new generation resources.

Promising advances are occurring today to bring transmission operators into the West's regional energy market. Utilities in the mountain west are looking to join the California Independent System Operator or the Arkansas-based SouthWest Power Pool, an RTO.

## ECONOMIC IMPACT ANALYSIS OF REGIONAL MARKET POTENTIAL FOR CSS+

Community-scale solar plus storage projects create a project value chain that starts with installation and continues over the life of the project. Regions where projects are developed can reap economic benefits, especially when local businesses and a trained workforce are prepared to work with developers.

### 6.1 Local Capture of Project Installation Costs

The project team closely studied installation costs for community-scale solar, using a local example project and ongoing nationwide cost benchmarking studies done by NREL.

Major solar equipment components, which are produced outside the region, account for 45% of project costs. In the local example project, just 10.8% of project costs were spent locally. Local economic benefits could be increased to as much as 21% by using more local contractors and purchasing all “balance of system” hardware locally.

Battery storage improves local grid reliability and can help utilities reduce peak demand costs. However, battery storage is manufactured elsewhere, and less than 3% of installation costs are spent locally.

Cost benchmarking studies informed the project team’s work in calculating costs for the region’s solar plus storage market potential, identified in Section 3.4. The cost for 232 MW of solar is estimated to be \$335 million, and the cost for 12 units of 5 MW / 15 MWh battery storage would be \$85 million.

The project team then calculated how much of the installation costs could be captured in the regional economy. Installation costs for solar PV could yield \$70.9 million in local spending, and installation of battery storage could yield \$2.2 million.

### LOCAL ECONOMIC BENEFITS OF MARKET POTENTIAL COMMUNITY-SCALE SOLAR PLUS STORAGE DURING INSTALLATION

	INVESTMENT	PERCENT OF TOTAL PROJECT COST	MAXIMUM POTENTIAL FOR LOCAL CAPTURE
Solar PV 232 MW (AC)	\$335.0 million*	21.16%	\$70.9 million
Storage (12 units) 5 MW / 15 MWH	\$85.2 million*	2.63%	\$2.2 million
SOLAR PV PLUS STORAGE TOTAL	\$420.2 million*	17.4%	\$73.1 million

\* These estimates do not account for decreasing equipment and implementation costs over time.

## ECONOMIC IMPACT ANALYSIS OF REGIONAL MARKET POTENTIAL FOR CSS+

### 6.2 Local Capture of Project Operational Costs

Over its operational life of about 30 years, community-scale solar plus storage systems deliver further value that can be captured in the regional economy. Local spending by project owners includes system maintenance, property taxes on equipment, and lease payments to landowners. Payments for other operational costs, such as insurance, management and administration, will likely go to companies outside the region.

#### LOCAL ECONOMIC BENEFITS OF MARKET POTENTIAL COMMUNITY-SCALE SOLAR PLUS STORAGE OVER OPERATIONAL LIFE

	MULTIPLIER	LOCAL CAPTURE PER YEAR	LOCAL CAPTURE OVER 30-YEAR SYSTEM LIFE
Operations & Maintenance	232 MW solar	\$1.3 million	\$37.5 million
Property Taxes	232 MW solar + 12 units of 5 MW / 15 MWH storage	\$0.9 million	\$26.5 million
Land leases	1,392 acres	\$1.0 million	\$31.3 million
<b>TOTAL</b>		<b>\$3.2 million</b>	<b>\$95.3 million</b>

### 6.3 Employment and Energy Savings Estimates

To estimate the potential benefits of energy cost savings and employment growth, the project team contracted with a consultant who used an input-output modeling tool. Such economic modeling uses assumptions about key factors to create an estimate of future economic impacts.

The modeling used results of the regional energy inventory and the regional solar potential research of this study. It assumed costs for supportive community programs, significant electricity cost savings for utilities and consumers, and gains in project affordability from low-cost financing. The model predicts regional savings in energy spending for utilities and customers, which would boost the regional economy and support employment.

The analysis indicated the possibility of achieving regional energy bill savings of \$19 million per year and a sustained average of 260 jobs across the broad regional economy.

### 6.4 Other Economic Benefits

Distribution utilities would receive other economic benefits, such as reduced demand charges paid to wholesale suppliers and deferred infrastructure upgrades. Utilities and their customers would also benefit financially from improved grid resilience.

## ADDITIONAL BENEFITS OF SOLAR PLUS STORAGE DEVELOPMENT

In addition to generating electricity and contributing to the local economy, solar plus storage can deliver other value-added benefits.

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### 7.1 Reduced Carbon and Greenhouse Gas Emissions

Electricity use in the three-county region produced 838,000 metric tons of carbon dioxide-equivalent (CO<sub>2</sub>e) emissions in 2019. Developing the full 232 MW of community-scale solar would reduce emissions by about 298,000 metric tons.

---

### 7.2 Power Supply Resilience

A reliable power supply supports our lives and operates essential facilities. Solar plus storage systems can continue to generate new power during an extended outage and draw on stored backup power. This makes communities more resilient during extreme weather, wildfire, flooding, earthquakes, accidental damage and other emergencies.

---

### 7.3 Low-Impact Development Practices

A low-impact approach to solar development can improve soil health, retain water, nurture native species, produce food and still provide low-cost clean energy. Practices include replanting native vegetation, particularly plants that attract pollinators, and using grazing animals to control vegetation.

# 8.0

## Action Plan

The following Action Plan was developed by the project team and presented to stakeholders who had the opportunity to provide input and comments. Stakeholders included the Garfield Clean Energy Board of Directors (comprising nine government partners), Pitkin County BOCC, Eagle County BOCC, Holy Cross Energy, and staff from the National Renewable Energy Lab and RMI.



*Piney Lake, Eagle County - Emily Kent photo*

### 1. Commitments to develop local solar + storage

A: Adopt a “local renewable energy first” policy and commit to a certain percentage of the total energy used by the community or the utility power mix to be generated from locally sited clean energy resources.

*Local distribution utilities, local governments, businesses*

B: Utilize the map, study and resources to inform planning processes (e.g., comprehensive plans, land use planning, utility resource plans) to make the region ready for local renewable energy.

*Local governments, local distribution utilities*

C: Work together with Municipal Energy Agency of Nebraska (MEAN) to revise contractual clauses that disincentivize rooftop solar production in order to allow higher levels of solar generation on municipal distribution grids.

*Local government and municipal utilities in communities that contract with MEAN for energy services*

D: Develop an inventory/checklist of potential opportunities to advance local solar + storage projects within each jurisdiction’s boundaries, and establish timelines and budgets for implementation.

*Local governments, local distribution utilities, businesses, households*

E: Codify rooftop solar or solar + storage as an onsite requirement for new construction where possible.

*Local governments, Authorities Having Jurisdiction (AHJs)*

F: Explore and develop code mechanisms to incentivize solar + storage for existing buildings.

*Local governments, AHJs*

G: Streamline solar + storage permitting and land use review to remove unintentional barriers and unnecessary cost.

*Local governments, AHJs*

## 2. Funding and low-cost financing sources

A: Make low-cost financing sources, grants and rebates easily accessible to every community, our region and other rural regions in a sustained, reliable manner.

*State government, federal government, utilities*

B: Offer time-limited bulk-buy programs to accelerate rooftop solar + storage implementation with a focus on expanding access to low- and middle-income (LMI) households.

*Energy nonprofits, local distribution utilities*

C: Create financing models that prioritize local funding and ownership of community scale solar developments to support regional economic development.

*Nonprofit/advocacy groups, investors and financial institutions, economic development groups*

D: Participate in joint approaches to accelerate solar + storage implementation on local government facilities to utilize economies of scale to reduce costs.

*Local governments, clean energy collaboratives (GCE, CAC, UvRFCAC)*

E: Make financing, funding and rebate options equitably accessible and inclusive of diverse communities throughout varying utility territories and counties.

*State government, federal government, utilities, policy makers*

F: Develop mechanisms to help cover the costs of adding solar + storage in new construction to help make sure new structures are built as energy-wise as possible while remaining affordable.

*State government, federal government, utilities, policy makers*



### 3. Investment in regional expertise and capacity building to accelerate clean energy progress

A: Invest in regional expertise and capacity building to accelerate and sustain enduring progress within interconnected regions that share a clean energy workforce and utility territories.

*State government, local governments, foundations and philanthropists*

B: Conduct an analysis of Western Slope supply chains to identify and take action on clean energy business and manufacturing opportunities and challenges.

*Economic development groups, Colorado Energy Office, OEDIT, Just Transition office*

C. Invest in annual data collection on a regional basis to track and guide progress on reaching clean energy targets with timely, actionable data.

*Local governments, energy groups, climate and clean energy advocates*

D. Remember that the overall effort is a marathon, not a sprint – find ways to maintain sustained commitment to developing regional knowledge, awareness, community will and widespread collaboration needed to reach challenging 100% renewable goals.

*Local governments, energy groups, climate and clean energy advocates, foundations*

E: Continue/increase investment in programs that implement efficiency measures and reduce demand so that existing renewable resources provide a larger percentage of the total.

*State government, local governments, local distribution utilities, energy groups*

#### 4. Utility regulatory and infrastructure improvements

A: Identify and prioritize grid improvements needed in the three-county region and secure the needed funding to make the improvements.

*Local distribution utilities*

B: Advocate for, help create and join a regional transmission organization (RTO).

*Energy nonprofits and partners, state legislature, Colorado Public Utilities Commission*

C: Incentivize the addition of battery storage to net-metered solar PV systems through utility rebate programs and other compensation mechanisms.

*Local distribution utilities, PUC, energy nonprofits*

D: Advocate that FERC update PURPA regulations to include utility-scale storage as a qualifying facility.

*Local distribution utilities, local governments*

E: Provide education about the importance of infrastructure upgrades and creating an RTO.

*Energy nonprofits*

#### 5. Best land use practices for solar + storage development

A: Review land use application process and policies to ensure utilization of best practices for solar + storage development.

*Local governments*

B: Include performance standards in land use permitting by requiring runoff mitigation planning and site revegetation.

*Local governments*

C: Create a scoring system to assess PV sites as pollinator-friendly using a common statewide methodology.

*State government*

D: Facilitate training opportunities for local government staff to understand PV development best practices, and methodologies for review and enforcement of those best practices.

*Energy nonprofits*

E: Prioritize siting solar + storage on available rooftops wherever possible.

*Local governments*

## 6. Supportive tax policies and improved incentives

A: Advocate for changes to the federal Investment Tax Credit to extend eligibility to standalone storage technologies (those not sited with solar).

*Federal government, state government, local governments, industry groups, nonprofit/advocacy groups*

B: Advance federal legislation that would provide the value of the solar investment tax credit as a cash payment to those unable to monetize the tax credit (e.g., LMI households, nonprofits and governmental entities).

*Federal government, state government, local governments, industry groups, nonprofit/advocacy groups*

C: Create incentive structures for solar + storage that are not based around tax credits and are accessible to nonprofit organizations.

*Federal government, state government*

D. Ensure that large-scale solar developments pay annual taxes that can help replace a portion of the public revenue generated by fossil fuels without discouraging solar development.

*State government*

## 7. Expanded economic development support to rural regions and transition economies

A: To more fully maximize the economic development benefits of meeting the state 100% Renewable Goal, provide more assistance to rural regions throughout the state to tap the economic development benefits of clean energy with the following actions:

- Provide tools to maximize local solar development on rooftops and land sites.
- Identify, map and accelerate local solar + storage in each region of the state.
- Provide funding including low-cost financing, equitable access to funding sources for rebates and grants throughout the state.

B: Increase and strengthen easily accessible expertise at the regional and state agency level to help remove barriers and accelerate the use of solar + storage and other renewable technologies.

*State government, Colorado Energy Office*

C: Focus on equity by providing development incentives to low-income housing and communities that incorporate solar + storage.

*State government, local governments*

D: Focus on equity by providing development incentives to community solar gardens that provide lower-cost energy to LMI households.

*State government, local governments*

E: Support the growth of the clean energy industry with business development grants, technical assistance, innovation grants and incubators.

*Federal and state governments, local economic development organizations*

E. Provide funding and programs to help all regions in getting to 100% renewable energy, realizing that even places that have made progress have a long way to go.

*Federal and state government, foundations*

## 8. Education and training

A: Provide sustained, reliable funding and support to community colleges and community partners to establish/enhance solar + storage comprehensive workforce job training programs, ongoing workshops, and professional development opportunities.

*State government: workforce training department*

B: Create educational apprentice and professional accreditation opportunities for high school and community college students interested in working in the renewable energy and related industries.

*Schools, colleges, nonprofits, professional accreditation organizations*

C: Ensure that pertinent building professionals (engineers, architects, general contractors, trades, etc.) are trained to integrate solar PV + storage systems into traditional building design and construction.

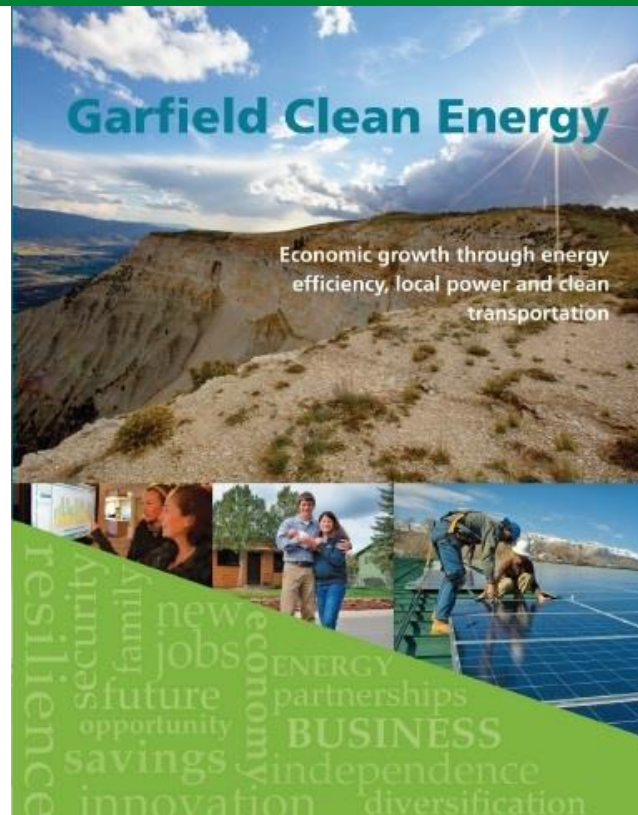
*Colorado Energy Office, nonprofits, industry associations, building departments*

D: Include energy education in K-12 curriculum to prepare and empower all students (no matter what field they go into), to be aware consumers, decision makers on energy issues.

*Schools, colleges, Colorado Energy Office*

# Garfield Clean Energy Update

- Solarize Garfield County
- Residential and Multi-Family
- Transportation/Mobility Programs
- DOLA Renewable Energy Planning Grant
  - Solar plus Storage Study and Action Plan
- Highlights for 2022



# Solarize Garfield County

## New Castle Results:

- 47 enrolled
- 12 purchased solar
- 12 residents received a rebate from GCE



# Residential and Multi-family

## Coaching and design assistance

- Wapiti Commons, a Habitat for Humanity project in Rifle.
- Painted Pastures, a multi-family project in Silt
- Sopris Apartments in Carbondale
- Rifle Tiny Homes
- Red Hill Lofts in Carbondale
- Sopris Storage and Apartments in Carbondale





# Transportation: Electric Vehicles

- Electric Vehicle Promotion
- EV charging infrastructure grant assistance



Experience Electric: Can a Subaru Fan Make the Switch to an EV?

493 views · Apr 20, 2021

👍 18 🗨️ 1 ➦ SHARE ➦ SAVE ...



**CLEER: Clean Energy Economy for the Region**

19 subscribers

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Electric vehicles are going mainstream, with models that fit our mountain lifestyle. In this video, vlogger and longtime Suby owner Naty Olen checks out two of the new crop of affordable electric SUV's that are now available at local dealerships: the Ford Mustang Mach-e

SHOW MORE

# Transportation: #BikeThere

- Repair and safety workshops
- Town rides
- County-wide BikeExpo
- Bike Bingo



# #BIKETHERE GARFIELD COUNTY



**Celebrate Colorado Bike Month  
with these free, fun, family-friendly  
events!**

- ▶ June 5, 12, 19 - Saturday repair/safety workshops & town rides
- ▶ June 26 - County-wide BikeExpo
- ▶ Anytime - BikeBingo & BikeTown Passport

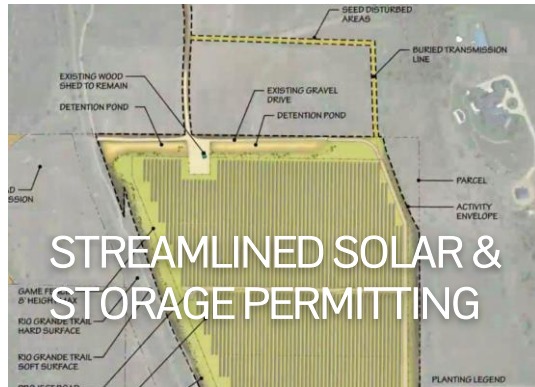
Info & event schedule:  
[GarfieldCleanEnergy.org/BikeThere](http://GarfieldCleanEnergy.org/BikeThere)



## THANKS TO OUR SPONSORS:



# DOLA Renewable Energy Planning Grant



# Three County Solar and Storage Study

How can we meet local, state and utility clean energy targets while maximizing regional benefits in Garfield, Pitkin and Eagle counties?

## Targets and Goals:



State of Colorado : 100% renewable electricity by 2040



Holy Cross Energy : 100% clean energy by 2030



Xcel Energy: 100% carbon free electricity by 2050

1. How much electricity does our region use?
2. How much of the electricity consumption can be met by regional solar development?
3. What role will battery storage play?
4. What benefits would regional Solar +Storage development bring to the region and economy?
5. What barriers stand in the way?
6. What actions can we take to fully realise the potential and benefits to the region?

# Regional Energy Inventory

## How much electricity does our region use?

In 2019, buildings and industry in Garfield, Pitkin and Eagle counties used 1.86 million MWH of electricity at a cost of \$186.5 million

## How much electricity is currently produced by regional solar generation?

- Net metered solar- 24 MW
- Community Scale Solar systems - 8 MW

## What is the regional solar development potential ?

### UTILITY-SCALE, COMMUNITY-SCALE & NET-METERED SOLAR



**Utility-scale solar** is typically 15 megawatts (MW) or more in size, covering 75 or more acres and connected directly to regional transmission lines.



**Community-scale solar (CSS)** is typically 1 MW to 15 MW in size, built on parcels of 5 to 75 acres, and connected to the distribution grid.



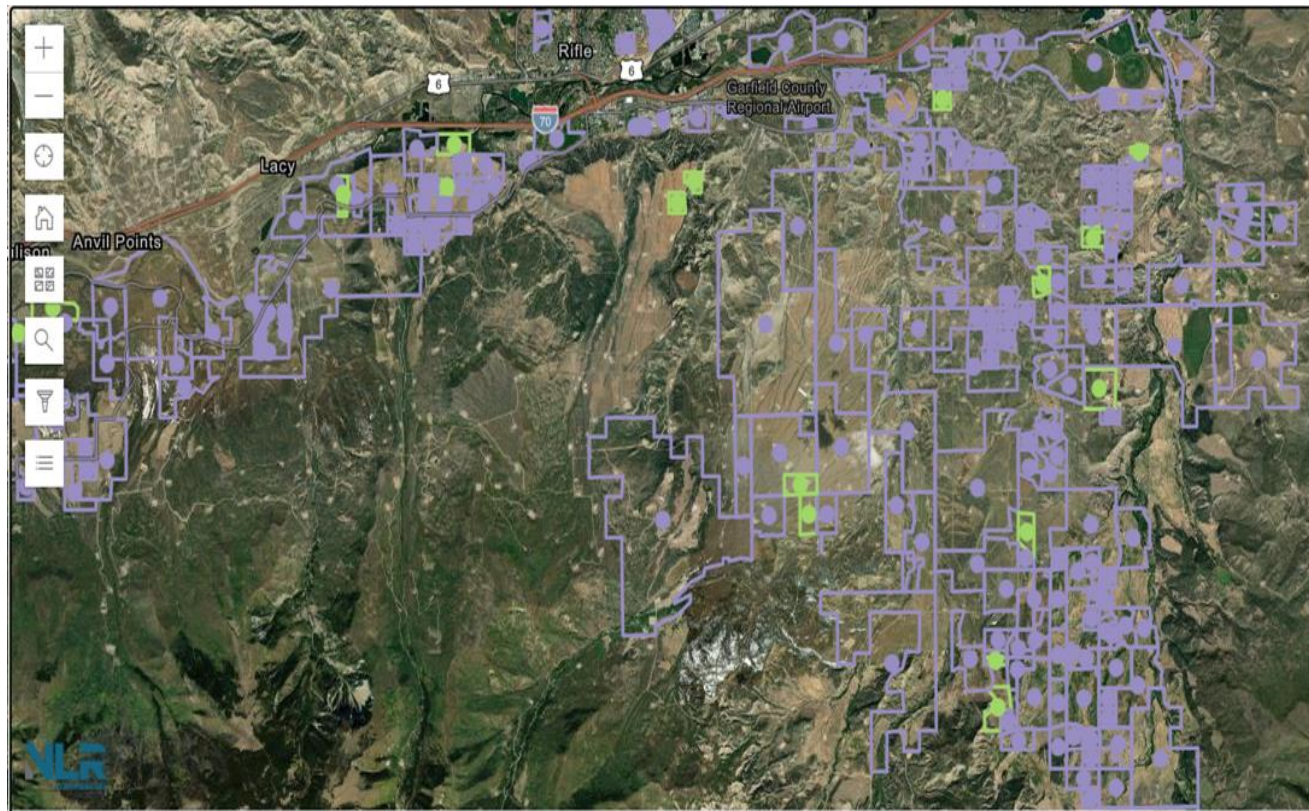
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# Regional Potential of Community Scale Solar + Storage



*ADAPTED FROM: National Renewable Energy Laboratory, "Estimating Renewable Energy Economic Potential in the United States: Methodology and Initial Results," Brown et al, 2016, p.8.*

# Solar Site Map



- Developed Solar Site Map
- Identified 722 feasible parcels
- Technical potential of 431 MW
- Market Potential of 232 MW
  - 23% of total consumption

# Regional and Economic Benefits

Economic Benefits	Market Potential after 20 years
Local capture from project implementation	\$ 73.14 million
Local capture from project operation	\$37.5 million
Property tax revenue	\$26.5 million
Land lease revenue	\$31.3 million
Energy savings	\$ 19 million/year
Jobs	260 per year

## Additional benefits:

- Reduced GHG emissions
- Reduced demand costs for utilities
- Deferred infrastructure upgrades
- Value of resilience
- Economic diversification



# Barriers to expanding RE for 100% Clean Energy Supply

- Balancing supply and demand on the grid
  - Expand demand management
  - Expand storage
- Regulatory issues at state and federal levels
- Lack of joint planning on transmission and lack of access
- Lack of investment in grid infrastructure
- Need more low cost financing/funding sources

# Action Plan

Divided into 8 major categories  
35 suggested actions for a diverse group of stakeholders:

- Local governments
- Utilities companies
- State and federal agencies
- Educational institutions
- Economic development orgs
- Energy partnerships
- Regional collaboratives

## **Policy and regulatory:**

Create supportive tax and incentive policies, regulatory improvements

## **Capacity building:**

Education, training, workforce development

## **Best practises**

Land use and solar development

## **Equity**

solar      Ensuring fair and equal access to benefits of development

## **Funding and Financing**

wealth      Create low cost funding pool, build regional

# Tool Box of Resources



- Solar land use permitting, codes and development considerations
- Solar procurement for local governments
- Understanding the benefits of Solar+Storage
- Planning tools



- Is your property suitable for solar development?
- What might your property be worth?
- The development process
- Co-existing with solar development
- Additional resources



# Streamline Solar Permitting

- **Improving processes** to make them more efficient
- Making it **easier and more affordable** to go solar
- Promoting and sustaining **local solar related jobs**

## **Achieved SolSmart Designation:**

- Garfield County - SolSmart Gold
- Town of Silt - SolSmart Gold
- Town of Carbondale - SolSmart Silver

## **Close to completing designation:**

- City of Glenwood Springs
- Town of Parachute
- Town of Snowmass Village

## **Initiated SolSmart Process:**

- Eagle County
- Town of Eagle
- Town of Vail

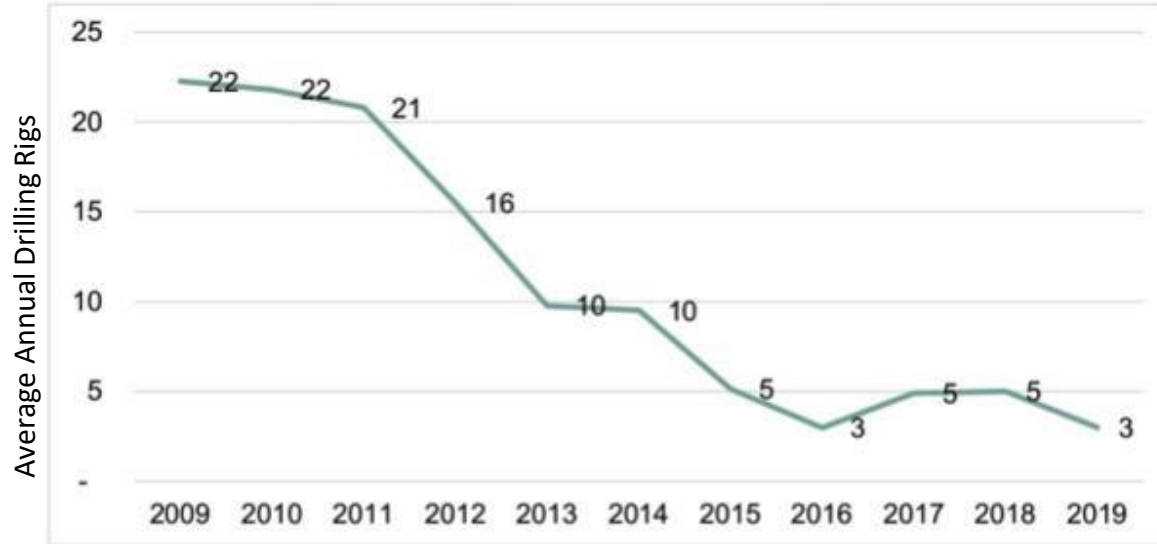
## **Streamlined permitting outside of SolSmart:**

- Town of Gypsum



# Economic Transition Assessment

Figure 6: Average Annual Drilling Rigs, Garfield County (2009-2019)



Source: Colorado Oil and Gas Conservation Commission, as reported in Garfield County's 2021 Budget

- Currently there are **NO** producing O&G wells in the counties of Eagle and Pitkin - only Garfield
- In 2019, O&G in Garfield County supported:
  - **542 jobs**
  - At least **\$77 million** in public revenue
- In 2019, the Garfield County Government:
  - Collected \$22 million from the O&G industry
  - Spent \$23 million on public safety

# Next steps: Implementing the plan

Mobilizing funding for regional initiative to make sure action plan implemented:

*“Accelerating Regional Solar+Storage Development: Protecting the climate, creating resilience and economic diversification”*

Developing proposals to pursue key aspects of the plan:

- regional financing to retain greater community benefits
- workforce and economic development aspects
- ongoing accessible technical assistance for the region

Working for economies of scale to help multiple western slope communities maximize the benefits of solar+storage; utilizing mapping and tools

# Garfield Clean Energy 2022 Workplan

## Low and Middle Income Family Programs and Services

- Rebates for efficiency measures at homes
- Promoting electric vehicle rebates available from Xcel Energy
- Identifying solar opportunities

## Solar plus Storage Action Plan

## Strengthening GCE structure