<table>
<thead>
<tr>
<th>TIME*</th>
<th>ITEM</th>
<th>DESIRED OUTCOME</th>
</tr>
</thead>
<tbody>
<tr>
<td>6:00</td>
<td>1. Chamber of Commerce Annual Update</td>
<td>ATTACHMENT A Discussion</td>
</tr>
<tr>
<td>7:00</td>
<td>2. On Site and Off Site Solar Options Recommendations</td>
<td>ATTACHMENT B Discussion</td>
</tr>
<tr>
<td>8:00</td>
<td>3. Drone Discussion</td>
<td>ATTACHMENT C Discussion</td>
</tr>
<tr>
<td>9:00</td>
<td>5. Adjourn</td>
<td></td>
</tr>
</tbody>
</table>

* Please Note Times Are Approximate
Mid-Year Recap | Jan-June, 2019

The Colorado Creative Corridor is a 531-mile trail that links the mountain towns of Carbondale, Crested Butte, Paonia, Ridgway and Salida. Together, we work to create and promote visitor experiences which include event programming and activities. This is year two of our partnership. Below is a snapshot of our efforts to-date in 2019.

BROCHURES
- Updated 2019 content
- Ordered and Distributed 5,000+ to Corridor Partners as well as 10 Colorado Welcome Centers

BRAND CHANNEL
- Brand Channel Page
  - 14,156 Page Views
  - Articles
  - 6,522 Total Article Page Views
  - Banner Ads
  - 559,663 Impressions
  - 2,339 Clicks

PRINT ADS
- 5280 (Printing in August)
  - 85,000 Print Distribution
- Colorado Country Life
  - 675,000 Readers
- Love, Colorado Winter 18/19
  - 171,000 Subscribers
- Summer in Aspen
  - 17,500 Distribution

MEDIA MENTIONS/PR
- Field Guide YouTube video, sponsored by CTO
- ‘Take an art-themed trip through Colorado’s Creative Corridor’ Colorado County Life, print & web
- ‘Ride your bike on these Colorado railroad routes without fear of being run over by a train.’ The Know, Denver Post, web

SOCIAL
- Instagram:
  - 364 followers
  - Increase of 196 Since January, 2019
  - Top Performing Hashtags: #CCC #coloradocreatives #optoutside
- Facebook
  - 337 Followers
  - Increase of 51 Since January, 2019
  - Top traffic: Carbondale, Paonia, Denver
2019 YEAR-TO-DATE HIGHLIGHTS

- First Friday
- Membership
  - eCommunications
  - Current Membership Numbers
  - Retention Rate
  - Tiered Membership
- Partnerships
- Programming & Education
- Ride the Rockies
- Tourism Council of Carbondale
  - Colorado Creative Corridor
  - Requests & Relocation

ON THE HORIZON

- Business Relocation
- Chamber Healthcare Task-Force
- Colorado Creative Corridor FY20
- Membership ROI
- Roaring Fork & Farm Map
TO: Town of Carbondale, CORE, CLEER & EBOARD  
FR: Jeff Dickinson  
DT: August 14, 2019  
RE: On Site and Off Site Solar Options Recommendations.

The factors below are meant to give some flexibility in the way that a homeowner obtains the required renewable energy. The market and ways to obtain off-site renewable are rapidly changing and this factors are designed to allow for change. They are based on Architecture 2030’s Zero Code.

Current Code Requirement: 1.5 watts renewables per sf for houses 5000 to 8000 sf, 2.0 watts per sf >8000 sf. Proposed code requires all houses less than 8,000 sf to have 1.5 watts renewables per sf. Current code is only houses over 5,000 sf.

The current Commercial code (IGCC 2012) requires renewable energy production as part of the project. 10% Onsite, 15% Offsite via RECs or similar, which translates to a Factor of .67.

This memo clarifies the calculation of off-site renewable energy for residential construction. The off site renewable energy (RE)requirement may be calculated thusly:

\[
RE \text{ off site needed} = (RE \text{ Onsite Required} - RE \text{ Onsite Installed})/\text{Off Site Factor}
\]

1. Onsite Renewable factor: 1.0

Offsite Options:

2. Community Solar Factor: 0.75  
REIF (Renewable Energy Investment Fund)  
Entity must be managed to prevent fraud or misuse of funds.  
OR

Virtual PPA (Power Purchase Agreement - A type of contract that allows consumers, typically large commercial entities, to form an agreement with a specific energy generating unit. These types of contracts, typically secure a long-term stream of revenue for an energy project by providing the energy consumer a steady cost of electricity)
In the case of a virtual PPA, Renewable energy project and buyer do not need to be in same grid region.

OR

Self-Owned / Off-Site

Provisions shall prevent the power generation from being sold separately from the building.

3. Green Retail Tariffs Factor: 0.55

A green tariff means that some or all of the electricity you buy is ‘matched’ by purchases of renewable energy that your energy supplier makes on your behalf. These could come from a variety of renewable energy sources such as wind farms and hydroelectric power stations.

The offering shall not include the purchase of unbundled RECs (REC is a Renewable Energy Certificate. A Renewable Energy Certificate (REC) is a market-based instrument that certifies the bearer owns one megawatt-hour (MWh) of electricity generated from a renewable energy resource).

The offering shall not include the purchase of unbundled RECs.

4. Unbundled RECs Factor: 0.20

The vintage of the RECs shall align with building energy use.

These factors come from Zero Code, Architecture 2030 Building Energy Standard.
To: Mayor Richardson and Carbondale Trustees

From: Mona Newton, Phi Filerman, CORE, Carbondale Environmental Board, Energy Subcommittee, and Jeff Dickinson, Biospaces, Inc.

Re: Carbondale's Residential Efficient Building Program (REBP)
Proposed changes to "Section 9: On-site Renewable Energy and Exterior Use" & HERS and Efficiency modifications from original

Date: August 14, 2019

Background

The Town of Carbondale has adopted multiple efficient building and energy codes as steps towards meeting the Town’s climate action goal of being carbon neutral by 2050. In addition to the 2015 IECC (International Energy Conservation Code), Carbondale also has a Residential Efficient Building Program (REBP), the latest version of which was adopted in 2011. As a further step towards meeting the Town’s climate action goals, CORE, Biospaces, and the E-Board Subcommittee on Codes recommended revising Section 9: On-site Renewable Energy and Exterior Use of the Residential Efficient Building Program (REBP) to eliminate the house size limit and require all new residential construction and additions greater than 2000 square feet to comply with the on-site solar requirements. At the April 16, 2019 work session with the Environmental Board, the Trustees requested additional information about the cost effectiveness of residential PV systems. The information is provided below.

Cost Effectiveness Analysis

To illustrate the cost effectiveness of the proposed PV requirements we worked with Katharine Rushton with CLEER to model the PV system cost and break even point of solar on homes. Following are the sample payback scenarios for a 5,000 sq ft home and 2,500 sq ft home, and we have attached cash flow analysis for each at the end of this memo.

Both scenarios take into consideration the declining federal tax credit and are calculated without incentives from Holy Cross Energy or CORE. You can see that even without these incentives the proposed PV requirements are cost effective, with the break even on a system in year seven, and payback on the system in year 15. In addition to being imperative to meeting the Town of Carbondale’s Climate Action Plan these financials clearly illustrate that solar, which many still consider to be ‘optional’, is financially defensible. *The 'fee in lieu'
program will provide flexibility for homes where solar is not feasible due to orientation or solar shading.

**Sample Payback/Break Even Scenarios**

<table>
<thead>
<tr>
<th>PV System Examples</th>
<th>2500 sf, 3.75 kw @ $3 per watt</th>
<th>5000 sf, 7.5 kw @ $3 per watt</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total estimated cost</td>
<td>$11,250</td>
<td>$22,500</td>
</tr>
<tr>
<td>Tax Credit @ 26%</td>
<td>$2,925</td>
<td>$5,850</td>
</tr>
<tr>
<td>Cost after Tax credit</td>
<td>$8,325</td>
<td>$16,650</td>
</tr>
<tr>
<td>System Payback (in years)</td>
<td>15.7</td>
<td>15.3</td>
</tr>
<tr>
<td>Energy Break Even (in years)</td>
<td>7.1</td>
<td>7.1</td>
</tr>
</tbody>
</table>

*This analysis includes tax credit at today's rates.*

**Cost to Install Solar PV & Fee Options**

Depending on a host of factors, the average cost to install residential solar PV systems ranges from $2.50 to $4.00/watt.

<table>
<thead>
<tr>
<th>Size of house square feet</th>
<th>On-site Requirement</th>
<th>Estimated PV Installation Costs</th>
<th>Fee Option</th>
</tr>
</thead>
<tbody>
<tr>
<td>1,000</td>
<td>1.5 kW solar PV</td>
<td>$3,750 - 6,000</td>
<td>$7,500</td>
</tr>
<tr>
<td>2,500</td>
<td>3.75 kW solar PV</td>
<td>$9,375 - 15,000</td>
<td>$12,500</td>
</tr>
<tr>
<td>5,000</td>
<td>7.5 kW solar PV</td>
<td>$18,750 - 30,000</td>
<td>$37,500</td>
</tr>
<tr>
<td>7,500</td>
<td>11.25 kW solar PV</td>
<td>$28,125 - 45,000</td>
<td>$56,250</td>
</tr>
<tr>
<td>10,000</td>
<td>20 kW solar PV</td>
<td>$50,000 - 80,000</td>
<td>$100,000</td>
</tr>
</tbody>
</table>

The estimated PV installation costs do not include the federal tax credit or local rebates, but these can potentially add to the savings and shorten the break-even point.
There are a handful of solar financing options to address the upfront costs of installing solar PV.

**Federal solar tax credit**
The current federal solar tax credit allows you to deduct 30 percent of the cost of installing a solar PV system from your federal taxes. In 2020 the federal tax credit will decline to 26%.

**Holy Cross Energy**
Holy Cross Energy offers $0.75 per watt for up to 6 kilowatts; $0.50 per watt for between 6-12 kilowatts; and $0.20 per watt for between 12-25 kilowatts. Under this framework, a 6 kilowatt system is eligible for $4,500 as a cash-back rebate. Additional information is available online: [https://www.holycross.com/renewable-energy-incentives/](https://www.holycross.com/renewable-energy-incentives/).

**Xcel Energy**
Xcel Energy does not provide any support for the upfront project costs. Additional information is available online: [https://www.xcelenergy.com/programs_and_rebates/residential_programs_and_rebates/renewable_energy_options_residential](https://www.xcelenergy.com/programs_and_rebates/residential_programs_and_rebates/renewable_energy_options_residential)

**CORE**
Rebates are not available for systems installed to offset all or part of a building-code mandated installation. However, solar PV systems that are two kilowatts larger than what is required by REBP are eligible for the PV rebate at $0.75 per watt up to 3 kilowatts (or $2,250) for on-site, customer-owned systems. Additional information is available online: [https://aspencore.org/learn/residential-rebates/](https://aspencore.org/learn/residential-rebates/).

**Federal solar tax credit**
The current federal solar tax credit allows you to deduct 30 percent of the cost of installing a solar PV system from your federal taxes. In 2020 the federal tax credit will decline to 26%.

There are a handful of solar financing options to address the upfront costs of installing solar PV.

**Financing**
Financing is available through the Colorado [Residential Energy Upgrade](https://www.ren.gov/) loan (RENU), [Alpine Bank Green Lending](https://www.alpinebank.com/green-lending/) [Clean Energy Credit Union](https://www.cleanenergycreditunion.org/), Garfield Clean Energy’s [Revolving Loan](https://aspencore.org/learn/residential-rebates/) fund. See summary below.
<table>
<thead>
<tr>
<th>PROGRAM</th>
<th>Secured</th>
<th>Unsecured</th>
<th>Loan Limits</th>
<th>Loan Terms</th>
<th>Interest Rate</th>
<th>Eligible Projects</th>
</tr>
</thead>
<tbody>
<tr>
<td>RENU</td>
<td>X</td>
<td></td>
<td>$500 - $35,000</td>
<td>Up to 180 months</td>
<td>2.75%</td>
<td>Renewable energy, energy efficiency</td>
</tr>
<tr>
<td>Alpine Bank Green Lending</td>
<td>X</td>
<td>Flexible</td>
<td></td>
<td>15 years</td>
<td>Variable</td>
<td>Renewable energy, appliances, automobiles</td>
</tr>
<tr>
<td>Clean Energy Credit Union</td>
<td>X</td>
<td>X</td>
<td>$50,000</td>
<td>Up to 120 months</td>
<td>2.49 to 7.99%</td>
<td>Solar PV, energy efficiency, automobiles</td>
</tr>
<tr>
<td>Garfield Clean Energy’s</td>
<td>X</td>
<td>X</td>
<td>$1,000 - $25,000</td>
<td>Flexible</td>
<td>3.75 to 8.5%</td>
<td>Renewable energy, energy efficiency</td>
</tr>
<tr>
<td>Revolving Loan</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Source: [https://aspencore.org/learn/find-funding/financing/](https://aspencore.org/learn/find-funding/financing/)

**Off-Site Renewables Clarification**

Off-site renewables shall be allowed in cases where it is verified by an approved 3rd party that there is not viable access to solar radiation. The renewable energy requirement shall be adjusted by a factor that takes into account the proximity and reliability of the off-site renewables. See attached memo from Biospaces, Inc., dated 8/14/19 for discussion.

**HERS & Energy Efficiency**

After meeting with local energy raters and reviewing the latest changes to the International Energy Conservation Code, regarding the Energy Rating Index Compliance Alternative, which is related to the HERS index, we are recommending changing the maximum HERS scores to be in line with those guidelines. See below.

The energy efficiency numbers have been modified to be compatible and realistic with changes to the code that have increased the performance of building envelopes over the years. The energy efficiency only relates to building envelope performance. See below.
15.30.120 SECTION 5: ENERGY COMPLIANCE

Compliance with the following minimum efficiencies is mandatory depending on house size. Energy Compliance may be determined by either REScheck or HERS rating. The following minimums are required along with the compliance paths. Code refers to currently adopted version of the energy code. Solar system requirements for homes less than 8000 sf are based upon 3 watts per sf of energy use. Changes highlighted.

Energy Compliance Table

<table>
<thead>
<tr>
<th>CATEGORY</th>
<th>Tier 1</th>
<th>Tier 2</th>
<th>Tier 3</th>
<th>Tier 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>House Size</td>
<td>&lt;3000 SF</td>
<td>3000-4999</td>
<td>5000-8000</td>
<td>&gt;8000</td>
</tr>
<tr>
<td>Points</td>
<td>110</td>
<td>110-180</td>
<td>230-330</td>
<td>430-550</td>
</tr>
<tr>
<td>Percent Better than Code</td>
<td>Code Minimum</td>
<td>20 10%</td>
<td>30 15%</td>
<td>40 20%</td>
</tr>
<tr>
<td>HERS Maximum</td>
<td>7560</td>
<td>70 55</td>
<td>65 50</td>
<td>60 45</td>
</tr>
<tr>
<td>PV Requirement (a)</td>
<td>1.5 watts per sf (b)</td>
<td>1.5 watts per sf</td>
<td>1.5 watts per sf</td>
<td>2.0 watts per sf</td>
</tr>
<tr>
<td>Boiler/Furnace Minimum AFUE</td>
<td>87%/88%</td>
<td>94%/90%</td>
<td>94%/92%</td>
<td>94%/95%</td>
</tr>
<tr>
<td>Air Conditioning Minimum SEER</td>
<td>14</td>
<td>15</td>
<td>16</td>
<td>17</td>
</tr>
</tbody>
</table>

a. Shading: Houses that do not have access to solar energy, as verified by a third party, approved by the AHJ, can provide the renewables offsite by purchasing renewable energy via a method approved by the town.

b. High Performance Houses that provide calculations showing that their overall energy use is less than 3 watts per sf can reduce the size of the renewable systems to meet 25% of their overall electrical needs.
CML’s 95th Annual Conference
June 20 - 23, 2017
Breckenridge
Drones: A Legal Update

CML Annual Meeting
June 21, 2016

John Putnam, Managing Partner
Kaplan Kirsch & Rockwell, LLP
Denver Donut Delivery
Municipal Interest in UAS

- City use
  - EMS
  - Property management
  - Resource management
  - Code enforcement
  - Utilities
- Regulation of drone use
  - Safety
  - Privacy
  - Protection of critical operations
  - Proprietary interests

Photo credit:
http://increasinghumanpotential.org
FAA’s General Authority

• Sovereignty of airspace
• Aircraft and flight
• General rules on flight
  – No careless or reckless flight (14 C.F.R. § 91.13)
  – Altitudes (14 C.F.R. § 91.119)
• Preempt wide range of local rules
FAA Regulation Focuses on Use and User

Public

Commercial (Civil)

Private/Model

Photo credit: Lakemaid Beer

The contents of this presentation reflect the view of the presenter, not of CML.
# FAA's Four Categories for UAS

<table>
<thead>
<tr>
<th>Framework</th>
<th>Types of Operations</th>
<th>Operating Parameters</th>
</tr>
</thead>
<tbody>
<tr>
<td>Public Aircraft</td>
<td>Only public aircraft meeting specific tests for governmental operation and purpose. See 49 U.S.C. §§ 40102(a)(41) and 40125.</td>
<td>Terms of the public COA, and Federal Aviation Regulations (FARs) applicable to “public aircraft,” as applicable.</td>
</tr>
<tr>
<td>Civil Aircraft (Section 333)</td>
<td>Existing Section 333 exemption holders, or operations outside the parameters of Part 107</td>
<td>Terms of the Section 333 exemption, and the terms of the blanket or individual COA, as applicable.</td>
</tr>
<tr>
<td>Civil Aircraft (Part 107)</td>
<td>Anyone</td>
<td>New Part 107</td>
</tr>
</tbody>
</table>
Part 107

- First comprehensive UAS rules
- Aimed at commercial operations
- Public entities and recreational users can also use
Part 107 Parameters

- Parameters:
  - Less than 55lbs
  - Visual line of sight (VLOS)
  - Daylight hours or civil twilight with lighting
  - Below 100mph
  - Below 400 AGL or 400 feet of structure

- Waivers available
Part 107 Pilot Requirements

- Remote pilot in command:
  - Pass test for remote pilot certificate with small UAS rating
  - At least 16
  - No physical or mental condition
Events/Overflights

- Observe restricted/prohibited flight areas
- May be prohibited for major sporting events
- Prohibited over people who are not "directly participating"
  - Except covered structure or stationary vehicle providing "reasonable protection"
# Airport/Air Traffic Notification Requirements

<table>
<thead>
<tr>
<th></th>
<th>Class B</th>
<th>Class C</th>
<th>Class D</th>
<th>Class E</th>
<th>Class G</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Model Aircraft</strong></td>
<td>Notify airport and ATC facility if operations are within five miles</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Public Aircraft</strong></td>
<td>As provided by Public COA</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Blanket COA</strong></td>
<td>Operations not permitted within:</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>5 Nautical Miles (NM) of airports with Operational Control Tower,</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>3 NM of airports with published instrument procedures,</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>2 NM of airports without published instrument procedure, and</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>2 NM of heliports</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Part 107</strong></td>
<td>ATC Authorization Required</td>
<td></td>
<td></td>
<td></td>
<td>No Auth. Required</td>
</tr>
</tbody>
</table>
FAA Airspace Classes

Airspace-at-a-Glance

Class A

FL 600

18,000 msl

Air Safety Institute • 800-USA-AOPA • www.airsafetyinstitute.org

Class B

14,500 msl

Class C

1200 agl

Class D

700 agl

Class G

Class E

The contents of this presentation reflect the view of the presenter, not of CML.
Video: Virginia Tech
UAS Safety Concerns

Photo Credit: The Durango Herald
FAA Recreational Drone Regulations

- Congressional exemption in 2012
- FAA registration rule (Dec. 2015)
- D.C. Circuit invalidated last month
  - *Taylor v. Huerta*
- Future uncertain
- General FAA rules?
- Vacuum for local activity?
Local/State UAS Ordinances

- Wide variety
- Approx. 6 in Colorado
- Limited experience with enforcement
- Scope of preemption not tested
- Generally-applicable laws untested
Possible Local Regulations -- Types

- Bans or moratoria
- Safety
  - Use regulation (traffic, law enforcement, code enforcement)
  - Location regulation (airports, sensitive locations, parks, height)
  - Weaponizing
  - Interference with civic functions (firefighting, police, etc.)
- Protection of privacy from government
  - Ban
  - Requirement for warrant
  - Limits on use
  - Data retention
- Protection of privacy/property rights (private parties) from private parties
  - Height limits
  - Use of images
  - Trespass
  - Prior permission
FAA Position on Preemption

- No express statement in Part 107
- FAA Fact Sheet on State and Local Regulation of UAS (December 2015)
  - Some provisions preempted
  - State/local law may be appropriate for:
    - Privacy
    - Trespass/property rights
    - Intellectual property
Preemption Considerations

• Pervasive federal control of aircraft and flight
  – See Banner Towing v. People of the City of Boulder (Colo. 1984)

• Airspace
  – Potential airspace “gap”
  – See Causby v. U.S.
1000 feet (FAR floor: congested)

500 feet (FAR floor: uncongested)

400 feet: Part 107 ceiling

200 feet (Pollack)

83 feet (Causby)
Preemption (continued)

- Land use and protection from trespass not preempted
- Non-aviation-specific provisions
  - Trespass
  - Careless/reckless behavior
  - Peeping Tom/Stalking
  - Interference with fire, police, etc.
  - Remote control use of weapons
- Enforcement of federal standards?
On the Horizon

- Drone Advisory Committee
- Drone Federalism Act of 2017
- FAA Reauthorization
- Court Decisions
Heightened Preemption Risks

- Regulation of flight differently than FAA
- Restrictions on use in navigable airspace
  - Unlimited ceiling of prior permission
- Restriction of federally-permitted operations
- Regulation of aircraft
- UAS-specific rule

The contents of this presentation reflect the view of the presenter, not of CML.
Colorado Ordinance Examples

- Vail
  - Prohibits UAS in critical areas
- Cherry Hills Village
  - Recreational focus
  - Registration
  - Careless/reckless use
  - Over City/private property
  - Harassment
- Telluride
  - Reckless/careless use
  - Harassment of wildlife
  - Trespass if no prior permission
- Boulder County
  - Open Space
Law Enforcement

- Local police/sheriff will be first line
- FAA does not have resources or ability to respond quickly
- Local law enforcement needs:
  - Clear rules
  - Training/education
  - Resources
  - FAA coordination
- Challenges
  - ID of user
  - Uncertainty about authority
Risk Management Considerations for Municipal Ops

- Own and operate or lease services?
- Scope of insurance
- Mutual aid agreement provisions
- Internal policies regarding use
  - Safety
  - Data retention
  - Use of video/images
- Training and compliance
- 4th Amendment considerations
- Trespass

The contents of this presentation reflect the views of the presenter, not of CML.
Questions?

John Putnam
Kaplan Kirsch & Rockwell LLP
Denver, CO
(303) 825-7000
jputnam@kaplankirsch.com
www.kaplankirsch.com

projects that keep life moving™