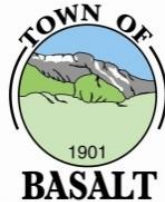


The Green Team Meeting will be held in Town Hall and by Teleconference – The Public may access the meeting by calling the number below and entering the Meeting ID when prompted.

**Phone Number: 1 669 900 6833 US
Meeting ID # 820 7495 6946
Passcode: 653470**



TOWN OF BASALT MEETINGS

Basalt Green Team

Monday, August 9, 2021

Basalt Town Hall

101 Midland Avenue

- 3:30 PM Roll Call**
- 3:32 Approve Minutes from:**
- July 12, 2021
- 3:33 Capital Needs Committee Update (PL & GT)**
- 3:50 Discuss potential Green Team Projects**
- Net Zero Roadmap to help in prioritizing projects
 - Pitkin County Construction & Demo Waste requirements
 - Prepare for Tuesday, August 24th Worksession with Council
- 4:30 Follow up on topics from July meeting**
- 4:40 Member Updates**
- 5:00 Adjourn by this time**

Basalt Green Team
July 12, 2021
3:30 pm – 5:00 pm
Via Zoom and at Town Hall

Attendees included Susan Philp, Sara Nadolny, Catherine Christoff, Martin Bonzi, Gerry Terwilliger, Pranav Lakhina, Doug MacDonald, Katie Schwoerer, Mike Steiner, Amanda Poindexter
Guest: Jeff Dickinson

Meeting started at 3:34 pm.

Agenda Items:

- Approve Minutes from 6/14/2021
- Roadmap to Net Zero Buildings with Jeff Dickinson
- Discuss Potential Green Capital Project
- Update on Capital Needs Committee
- Member/Participant Updates

1. Approval of Minutes

M/S Gerry Terwilliger and Doug Goldsmith to approve the meeting minutes from June 14, 2021. The motion passed 4 to 0.

2. Roadmap to Net Zero Buildings with Jeff Dickinson

Jeff Dickinson introduced himself – he is an architect and has a company called Biospaces, Inc. Jeff has a focus on energy and sustainable designs. He has worked with the Town of Basalt on the Sustainable Building Regulations rewrite, and also does similar work for Carbondale and Summit County among others.

Jeff told the Green Team that he would like input on what codes are missing that the Green Team would like to add. How is the Town meeting its climate action goals? Jeff's focus is to create a roadmap of how to get to meet the Town's climate action goals through building codes.

Jeff shared with the Green Team a presentation. Ways to meet climate action goals for new construction may be achieved through new zero construction techniques, mandating renewables, beneficial electrification, and eliminating natural gas in buildings.

Sara will send Jeff's report to the Green Team which provides residential and commercial recommendations. Jeff said we need to understand what motivates the building community.

The group discussed the issue of leaving a building unfinished with just the core and shell – the thought was that ultimately tenant finishes should be lesser.

Amanda reported that the Town is on-track to adopt the newest building code (2021 International Codes) in 2021, just behind Aspen and Pitkin County which will probably be in 2022.

3. Discussion Potential Green Capital Project

Susan noted the Green Team needs to talk about battery storage. Battery backup equals resiliency.

Mary said the Town should phase out the use of gas, noting that induction is better than gas for cooking.

Catherine wants embodied energy to be built into the conversation.

Heating the outdoors – how to regulate this?

Items for discussion at next Green Team meeting to include:

- Exterior wall fireplaces are inefficient. Should the Town consider adding a penalty?
- Battery – still fairly new. Will it get to a better technology? Will costs come down?
- Discussion of movable solar arrays
- PV solar field at the high school with battery backup – we need to be careful that the project benefits the Town and not just the school district.
- How to use the Net Zero Roadmap to help in prioritizing projects
- Beneficial electrification – issues and opportunities
 - Payment in lieu of solar could be used to contribute to offsetting heat pumps
 - How to retire existing systems?
 - Retrofitting can be significantly expensive.

4. Capital Needs Committee Update

Gerry reported that at the last Capital Needs Committee meeting there was discussion of priority projects and the results of the public survey.

The circulator shuttle has been removed from consideration due to the ongoing costs associated with operations, which would not fit into the bond.

The idea of placing solar panels over parking spaces has been considered as a Green project, but there are issues such as snow removal, and the Town does not own any surface parking lots.

M/S Doug Goldsmith and Gerry Terwilliger to adjourn. Motion passed.
The meeting adjourned at approximately 5:00 pm.

To: Town of Basalt, Green Team
From: Jeff Dickinson, Biospaces Energy Consulting, Inc., Consultant to CORE
Re: Roadmap to Net Zero Buildings
Date: 7/12/21

This roadmap outlines recommendations for achieving local and state climate goals via:

- Net Zero Construction
- Renewable Energy requirements
- Beneficial Electrification for Commercial, Residential, and Town Buildings
- Incentives to go beyond code.

Introduction:

With technology changing quickly it is difficult to predict where we will be regarding energy efficiency and available technologies in the next 3-5 years. The idea with this code/ordinance adoption is to outline a plan for moving forward to meet the goals of a jurisdiction's Climate Plan. The science is clear that we must continue to take significant action, and while many jurisdictions have been on this path for many years, we must step up our efforts to reduce carbon emissions from buildings.

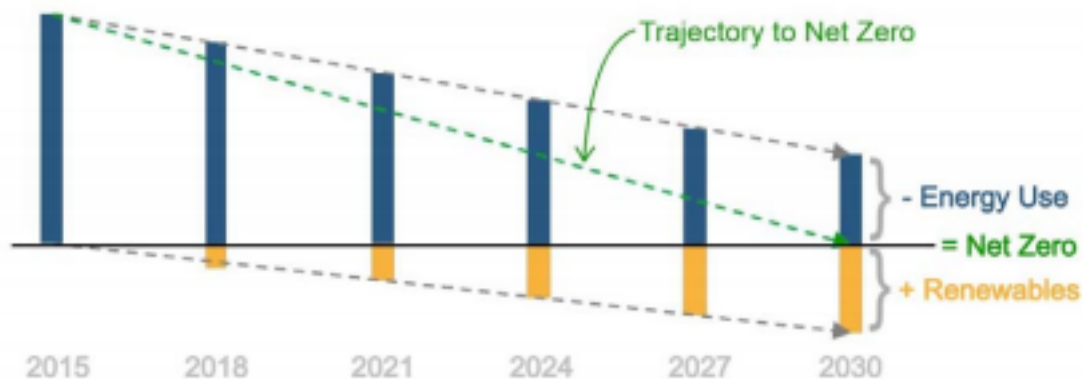
The **Town of Basalt's climate goals** are to achieve a 25% reduction in greenhouse gas emissions town wide from base year of 2014 by 2025 and 80% by 2050 (add **climate emergency** info from 2019 - Resolution 34-2019)

Our goal is to get something in place ASAP, while it may not be perfect, it moves us in the right direction. The focus is the advancement of green codes in line with what other jurisdictions are doing as well as making significant strides toward net zero construction. Future proofing these buildings is important, but we don't want our hands to be tied by trying to make it perfect. Updating the requirements regularly is the key to staying current with technological changes.

After receiving input from numerous groups including: Town of Carbondale, City of Boulder, SWEEP, Colorado Energy Office, Colorado Code Consulting, Carbondale Environmental Board, CORE & CLEER, we have summarized some discussion points as well as drafting some recommendations for review.

Existing buildings are an important part of this process. The majority of buildings that will exist in 2050 have already been constructed. Local and state efforts need to be ramped up significantly in order to meet the climate goals for all buildings.

Path to Net Zero by 2030:



Key Discussion Points:

Below are some key points that communities have to consider when implementing renewable energy requirements and associated steps to achieve net zero goals.

How to define Net Zero, do we consider building loads or process loads?

One potential definition is:

Net Zero Building Definition:

A building that annually produces as much energy as it consumes for the heating, cooling, water heating, and basic electrical loads including lighting, plug loads and fans.

A Net Zero Building does not have any natural gas infrastructure connected to the building.

This definition assumes we are not including process loads, such as those used not for heating and water heating at this time. Other larger communities (Denver for example) have not found a way to address process loads (i.e. high use buildings such as restaurants, medical centers, industrial businesses, etc) .

Ideally the sum of *all* uses would be net zero, but, this could be very difficult to achieve at this time.

Should we prioritize on-site renewables vs off-site?

With the continued greening of the grid, there is widespread perception that there is less of a need to provide on-site renewables. However, providing on-site renewables is an important part of the equation toward a carbon free future and a modernized utility grid.

In the currently adopted commercial energy code there is a 50% penalty for off-site renewables (10% on-site vs 15% off-site), in the Town of Carbondale. Using this model, the recommended off-site requirements would be 37.5% with the recommended on-site requirement of 25% in 2021.

Another option is requiring the same amount of renewables for on-site or off-site, but if off-site is chosen, then they would also have to pay a fee (to be determined) by the local jurisdiction. Those fees can then be used to help reach climate goals, by offering incentives to others who want to “do the right thing”, i.e. all-electric/no natural gas buildings, but need financial support.

In evaluating future increases to the amount of PV required, a valid concern is whether there will be sufficient space on-site for the incremental increases. Based upon this, we recommend that as the amount of renewables required increases every three years, the on-site portion can remain at 25% as long as the off-site makes up the difference (with no penalty for this portion being off-site). This can be reevaluated as the utilities progress towards more renewables in their fuel mix.

One of the major challenges is that it is hard to track the on-going use of Renewable Energy Credits (RECs). Who would be responsible for tracking this and how long should the contract be for?

How do we encourage Beneficial Electrification?

Building electrification, or the shift from gas appliances to all-electric appliances and technologies powered by an increasingly clean grid, is widely recognized as a critical pathway for achieving significant greenhouse gas (GHG) emission reduction. As grid-delivered electricity gets cleaner, the importance of building technologies grows. Transitioning away from direct use of fossil fuels (i.e. natural gas, propane) on-site is the next step in the energy transformation.

A no natural gas or all electric building is a building that has no natural gas infrastructure in place or an existing building that has replaced all gas appliances with electrical appliances.

There has been much discussion as to whether gas lines should be banned entirely or whether it should be a phased approach that at this point could allow gas appliances for restaurant use and process loads and phase those out in future years.

We are recommending a phased approach that would incentivize elimination of gas lines to buildings in the current phase, while penalizing the inclusion of gas lines to buildings if used for Heating or Water Heating. Early adoption would allow gas for cooking and fireplaces, as the carbon impact of cooking or utilizing gas fireplaces is minimal compared to heating. All buildings would need to include provisions for adapting to all-electric (i.e., sizing of electrical panels), making them “Electric Ready”. Future code cycles would mandate the elimination of gas lines completely in new construction.

How do we encourage developers to go above and beyond what is mandated?

We recommend *incentives* to encourage building that goes above and beyond the code mandates including beneficial electrification, i.e. eliminating gas lines from buildings, ideas to present as possible ‘carrots’ to encourage more efficient building include:

- Rebate money from The Town or Utilities

- Permit Fee reductions-propose 50% reduction in fees, maybe varies based on level of compliance.
- Faster review process? Not sure how this would be implemented.
- Simplify code requirements, including language that allows projects that meet LEED Platinum or Zero Net Energy Option to opt out of all of the Energy Efficiency requirements of the energy code.

In addition, we are recommending phasing in the penalization of the installation of gas lines by requiring additional renewables.

Where do Electric Vehicles (EVs) fit into this plan?

Another important component of weaning off fossil fuels is the conversion to EVs.

There is a section in the IGCC on Electric Vehicle charging that should actually be part of the code. This requires EV Charging stations for >9 spaces.

Recommendations:

We recommend adopting this roadmap for achieving goals with plans to revisit every 3 years or as needed. Below is a table of recommendations for review.

Path to Net Zero - Biospaces Energy Consulting & CORE

	Current Basalt Town Code	2021	2022	2025	2028*	2031*
Code Amendments		Town adopts amendments to REMP, SBRs, construction waste. Decision regarding HERS or ERI.	Town Adopts 2021 IECC followed by other I-Codes, with Town amendments to address climate goals.	Amendments to 2021 only to address climate goals.	2027 Icodes with amendments only to address climate goals.	Amendments to 2027 only to address climate goals.
Commercial Renewables (includes multi-family) SBR 2	2% on-site- 4% off-site, (200% penalty eg: 4kw on site vs 8 kw offsite) or 25% of common load for core & shell buildings	10% Renewables-on site with 200% penalty for off-site. Or 35% of roof area in PV Equivalent whichever is higher. Non-solar sites have special exemption.	25% Renewables On-site with 50% penalty for off-site (a)	50% Renewables 25% on-site and balance off-site	75% Renewables 25% on-site and balance off-site	100% Renewables 25% on-site and balance off-site
Commercial Electrification SBR 2	None	Electric ready mandatory. Discussion. Electric panel and breaker sizing for future conversion. Verify transformer sizing w Holy Cross.	Natural Gas (NG) allowed for process loads without penalty. 25% add'l renewables for NG HVAC. (37.5%) Incentives for beyond code. Electric ready.	Natural Gas allowed for process loads only with penalty. 50% add'l renewables if gas line installed for process loads. Incentives for beyond code.	NG allowed for process loads only with penalty. 75% add'l renewables if gas line installed for process loads. Incentives for beyond code.	No gas allowed.

Single Family Residential Efficiency - SBR 1, includes some duplexes and townhomes.	JD review w AP 5 points on SBR 1 checklist for 5 points lower than code. HERS 54 is code.	HERS 40 or ERI	HERS 30 or ERI	HERS 20 or ERI	HERS 10 or ERI	HERS 0 or ERI
Residential Renewables	None. Must meet points.	10% Renewables Determine SF minimum threshold..	25% Renewables	50% Renewables	75% Renewable	100% Renewables
Residential Electrification		Electric ready incentives or mandatory? Electric panel and breaker sizing for future conversion. Verify transformer sizing w Holy Cross.	No gas except cooking or fireplaces. 25% add'l renewables for NG HVAC. Electric ready	No gas. 50% add'l renewables if gas line installed.	No gas, 75% add'l renewables if gas line installed.	No gas line allowed.
Town Bldgs Electrification Plan/Budget TBD-Needs research			All new Town bldgs all electric, Retrofit 25%, Energy Storage TBD. Add electric and renewable infrastructure. Develop policy on retrofits for remaining Town buildings.	Retrofit 50%	Retrofit 75%	All Electric No NG purchased by town.
Other		Address exterior energy use: snowmelt, radiant heaters fees and penalties. Battery storage linked to solar. Required for what size PV? 16 unit Stotts Mill or Park Modern. Maximum "Value of Resiliency" Amend setbacks in zoning code to allow battery & potentially PV. Amend zoning code for				

		SolSmart designation				
		Grant program for panel upsizing (New and Existing) approx \$3-5K				
Existing Buildings	80% by 2050					

(a) We are recommending 3.0 watts of PV/SF (or equivalent) of construction for buildings under 5,000 sf, which should equate to approximately 25% renewables for regulated, non-process loads. Buildings over 5,000 sf have to do energy modeling and show 25% renewables, also based upon regulated loads only.