

2021 Building Code Adoption

Electrification and Above Code Provisions



Climate Action Goals

Short-Term Goals: Reduce Greenhouse Gas emissions of Town operations by 50% and the community at-large by 25%, by 2023

Long-Term Aspiration: Work towards becoming a net-zero community by 2030 (joined MT 2030 pledge)

Building Energy Use Chapter: Adopt above code standards.

- Specifically relating to:
 - Energy Conservation
 - Renewable Energy
 - Electric Vehicle Readiness
 - Building Electrification





December 2019

Climate Action Plan Trajectory



Update building code

Ongoing: Introduce education programs for builders and assessment / retrofit programs for existing homes

Above Code

- International Green Construction Code (IgCC) Sections
 - Building water conservation for fixtures
 - Interior Environment Improvements- materials and ventilation
 - Increase site stormwater management
 - Increase construction site recycling requirements
- Electrification (commercial kitchen exemption)
- Solar Ready and Installation
- EV Charger and Ready Space



Building Electrification Considerations:

- Overall Goal = Decarbonize grid and electrify buildings to directly utilize an increasingly renewable grid
- Tri-State will reduce their GHG emissions by 80% by 2030

WHAT IS BENEFICIAL ELECTRIFICATION ?

Equipping homes and buildings to be able to connect to an increasingly renewable energy grid, making them less reliant on outdated fossil fuels.

Solar Ready & Installation:

- Delete LEED requirement from Town Code for structures larger than 20,000 square feet.
 - ► Replace with:
 - Commercial Buildings < 5,000 sq ft: Solar ready requirement.</p>
 - Commercial Buildings > 5,000 sq ft: Solar installation requirement.

(Size of solar PV system based on IgCC calculations, with a maximum of GCEA's net metering limit)

Increase roof structural load capacity by 5 psf for roof pitches greater than 2/12 and 10 psf for roof pitches 2/12 and flatter to allow for future addition of solar electric panels.

Electric Vehicle Ready Considerations:

- 1 Level II Charger Per Building (buildings with 2 spaces or more)
- ▶ 10% of Spaces (rounded up) are EV Ready
- DC Fast Charger (25 kW) equivalent of 5 ready spaces

*Town to further analyze public charging needs and infrastructure through 2023 transportation master plan



Commercial Remodels

- All remodels are required to meet 2021 IEBC & IgCC sections
- Level 3 Alterations are additionally required to:
 - Solar Ready or Installed
 - ► Electric Vehicle Ready
 - Electric ready



Above Code

- Department of Energy ZERH Certification
 - Includes Solar Ready
- Electrification
- EV Ready Space
- Solid Fuel Burning Devices: Revised HERS requirements



Proposed Addition of Department of Energy ZERH Certification Program:

- Requires Homes Energy Rating System (HERS) modeling during design & construction inspections.
- Building infiltration level of 2.0 (ACH 50 Pascals)
- ▶ Window U Factor of 0.27 or less
- ► Water efficiency measures.
- Efficient whole house ventilation systems
- Solar ready requirement with exceptions
- Increase roof structural load capacity by 5 psf to accommodate future solar panels.



Additional Town Code Considerations:

- Construction Site Recycling Requirements
- New Solid Fuel Burning Devices Amendment
 - Revise the maximum allowed HERS rating requirements.





Electric Vehicle Ready Considerations:

- ▶ 1 EV Ready Space per dwelling unit.
- All new garages or garage remodels require 1 EV Ready Space.

*Town to partner with GCEA on rebate program



Residential Remodels

- Projects that meet Alteration Level 3 are required to meet IEBC and provide the following:
 - Home Energy Assessment
 - Electric Ready requirements
 - Electric Vehicle Ready
 - Solar Ready
- All Remodels below Level 3:
 - Town will incentivize free home energy assessments
 - Promote and educate energy efficiency and rebate opportunities



Other considerations

- Natural gas is less carbon intensive than electricity
- Can't efficiently heat a home in our environment with electricity
- Natural gas is less expensive than electricity
- Indoor air quality
- More expensive to build and operate an all-electric home

	Natural Gas	Electric
HVAC Costs	95% Efficient Gas Boiler	Cold-Climate Heat Pump with
		Hvdronic Heat
Equipment Cost	\$3,500	\$16,000 (2 heat pumps based on size and energy
		usage)
Available Rebates	\$300	\$4,800
Total Cost After Rebate	\$3,200	\$11,200
Energy Star Water Heater Costs	Gas Water Heater	Heat Pump Water Heater
Installed Cost	\$1,500	\$2,500
Available Rebates		\$740
Total Cost After Rebate	\$1,500	\$1,760
Stove/Range	Gas Stove	Electric Induction Stove
Cost*	\$3,200	\$3,200
Available Rebates		\$500 (\$350 + 25% additional off
		purchase price up to \$150)
Total Cost After Rebate	\$3,200	\$2,700
Infrastructure Costs	Gas Equipment	Electric Equipment
Electrical modification		\$500
Gas connection & piping	\$12,600 (\$2,100 gas line to house,	
	\$10,500 internal piping and ventilation)	
Total Installation/Equipment Costs	\$20,500	\$16,160
Annual Energy Costs		
Calculated Annual Energy Costs	\$2,008	\$2,722
Scenario: Annual Energy Costs (with 10	\$1,099 (off-setting lighting and other	\$813 (off-setting heating, hot water
kW of solar)	appliances)	heating, lighting, and appliances)

Next Steps

- Education for designers and construction community
- Partnering with Gunnison County Electric Association
 - Rebates for heat pumps, LED lighting, electric appliances, EV chargers
- Expanding GreenDeed program
- Transitioning Town's employee residential units
- Revisit in 3 years

Questions?

Link to FAQ document



2021 Code vs. ZERH: Duplex

2021 IRC with efficient HVAC



ZERH

Framed Floor: N/A

ekotrope



Matt Wright, Certified Energy Rater Date: 5/8/22 at 10:17 PM

2021 Code vs. ZERH: Single Family

2021 IRC with efficient HVAC



ZERH



💧 ekotrope

Ekotrope RATER - Version: 4.0.1.290

Estimated ZERH Cost Implications

ZERH certification costs (including HERS):

- Simple, smaller residential units: \$1,100
- Larger single-family units: \$2,500 \$5,000
- Insulation costs: will increase approximately 30% for R-60 ceiling cavity insulation using 9 inches of high R Value closed cell spray foam.

Windows cost: will increase approximately 15-20% for the more efficient U Factor 0.27 windows.

► Radon testing: \$250

