

Pathway to Net-Zero Buildings

A guide to help property owners and managers achieve greenhouse gas pollution free buildings



The Challenge

The United Nations Intergovernmental Panel on Climate Change, the State of Colorado, Boulder County, and the City of Boulder have all set greenhouse gas pollution reduction goals of 50% by 2030 and 90% by 2050. To avoid the worst impacts of the climate crisis, every organization and individual must participate. The good news is that property owners and managers are well positioned to be leaders in turning this challenge into an opportunity.

This guide outlines steps you can take to make your property portfolio more energy efficient and resilient, while reducing your climate impact to zero. It is a way to baseline your building portfolio, set goals, and determine each step along the journey.

The Goal

The goal of this effort is to empower property owners and managers to take active and visible action, through tangible measures aimed at transforming their facilities to achieve zero climate impact. Additionally, we strive to motivate you to share your story and inspire other businesses to act; both locally and across the country.

The Vision

A significant number of businesses have become inspired to take action that demonstrates the benefits of converting to efficient lighting and equipment in addition to adding renewable energy. Many are also actively working with their own supply chain to inspire and empower stakeholders to take similar action. Through making these efforts highly visible, this leadership inspires a larger movement that significantly accelerates the adoption of a sustainability lifestyle – first around energy, but also around other critical natural resources and relationship to the natural world.

Step 1: Assess, Measure & Plan

It is important to understand which opportunities are appropriate for your business, and incentives that are available to help offset costs. To make informed decisions, you will need to measure success, by first benchmarking each of your building's energy use and calculating greenhouse gas emissions. By taking this first step, and repeating this annually, you can create a plan and set goals that drive your journey toward achieving net zero. Feel free to use the action steps in this document as a guide to help inform your action plan to address climate change and resiliency.

ACTION	Target Date	Person Responsible
<input type="checkbox"/> Sign the climate action commitment*		
<input type="checkbox"/> Engage with PACE to learn about resources, incentives and opportunities*	Ongoing	
<input type="checkbox"/> Work with PACE and Xcel to complete building assessments*		
<input type="checkbox"/> Review local sustainability ordinances and how they apply to your business*	Ongoing	
<input type="checkbox"/> Identify electric conversion opportunities to pair with renewable energy*		
<input type="checkbox"/> Evaluate renewable energy opportunities to offset electric load (such as solar PV, RECs, etc) *		
<input type="checkbox"/> Determine budget and available financing options*		

Measure and Track	Target Date	Person Responsible
<input type="checkbox"/> Establish a benchmarking process to measure energy use for each building in your portfolio*		
<input type="checkbox"/> Calculate annual greenhouse gas emissions*	Ongoing	
<input type="checkbox"/> Continue to measure and track progress against goals	Ongoing	

Plan	Target Date	Person Responsible
<input type="checkbox"/> Develop the action plan (<i>determine level of tenant commitment and responsibility</i>) *		
<input type="checkbox"/> Evaluate cost/payback of each measure to help prioritize budget*	Ongoing	
<input type="checkbox"/> Set tangible and actionable goals, and timeline*	Ongoing	

* First priority actions

Step 2: Engage and Communicate

It is beneficial to engage with employees, tenants, and other stakeholders at the start of this process, and throughout. Engaging your community of stakeholders is great for business, and many studies have shown that employees and customers invest more in businesses that are value driven. Additionally, by publicizing and sharing your success, you can inspire others to work toward an effective action plan aimed toward climate change solutions.

Team Engagement (Owners, Management, Employees)	Target Date	Person Responsible
<input type="checkbox"/> Appoint an energy steward, champion and/or develop a green team*		
<input type="checkbox"/> Share goals and commitments with property management team and employees*	<i>Ongoing</i>	
<input type="checkbox"/> Create a forum for employees to share and suggest their ideas		
<input type="checkbox"/> Create a sustainability/purchasing policy to include in bids and contracts*		

Tenant Engagement	Target Date	Person Responsible
<input type="checkbox"/> Consider revised leasing structure (eg. shared responsibility, benefits, goals, etc)*		
<input type="checkbox"/> Present climate action plan with tenants to gain support and commitment*		
<input type="checkbox"/> Provide sustainability education and outreach to tenants	<i>Ongoing</i>	

External Stakeholder Engagement	Target Date	Person Responsible
<input type="checkbox"/> Engage with external stakeholders to gauge interest, commitment and support*		
<input type="checkbox"/> Participate in sustainability leadership groups to better understand current trends	<i>Ongoing</i>	
<input type="checkbox"/> Join industry specific groups to learn how peers are addressing sustainability	<i>Ongoing</i>	

Communication and Recognition	Target Date	Person Responsible
<input type="checkbox"/> Publish your climate action commitment on your website, office and/or other forum*		
<input type="checkbox"/> Establish a means of celebration for milestone achievements*		
<input type="checkbox"/> Communicate successes with employees, stakeholders and tenants	<i>Ongoing</i>	
<input type="checkbox"/> Become PACE Certified business		

* First priority actions

Step 3: Implement Energy Efficiency

The checklists below are examples of how you might list and prioritize measures according to your action plan. The first section includes efficiency measures that typically have a quick payback and/or enhance the quality of your building(s). The second set of actions may require higher capital investment, and are essential to reduce building energy load in preparation for investing in renewable energy.

Operational Projects		Target Date	Person Responsible
Lighting Efficiency	<input type="checkbox"/> Determine overlit areas and reduce unnecessary fixtures		
	<input type="checkbox"/> Replace inefficient lighting with LED (Energy Star or DLC qualified)		
	<input type="checkbox"/> Install interior lighting controls a (daylight/occupancy)		
	<input type="checkbox"/> Consider curfew controls for exterior lighting		
HVAC Optimization	<input type="checkbox"/> Adjust thermostat temperature setpoints and setbacks	Ongoing	
	<input type="checkbox"/> Insulate ductwork and/or bring into condition space		
	<input type="checkbox"/> Install economizers to maximize efficiency when outdoor air is optimal		
Water Heating	<input type="checkbox"/> Adjust water heater to appropriate thermostat temperature setpoints		
	<input type="checkbox"/> Replace faucet aerators and pre-rinse spray valves with high efficiency		
Building Envelope	<input type="checkbox"/> Weatherstrip drafty doors and windows		
	<input type="checkbox"/> Weatherstrip and insulate garage-style doors		
Kitchen and Office Equipment	<input type="checkbox"/> Replace inefficient equipment with Energy Star qualified equipment	Ongoing	
	<input type="checkbox"/> Instate a power management policy to reduce unnecessary run-time		

Higher Capital Investment Projects		Target Date	Person Responsible
Lighting and HVAC Optimization	<input type="checkbox"/> Add a building automation system (for lighting, HVAC or both)		
	<input type="checkbox"/> Add VFDs to exhaust fans, RTUs, air handlers, and comm'l kitchen vent hoods		
	<input type="checkbox"/> Perform test & balance of air distribution system		
Building Envelope	<input type="checkbox"/> Increase insulation R-Value in roof (above deck when possible)		
	<input type="checkbox"/> Invest in efficient windows (higher SHGV value) or install window film		
Other	<input type="checkbox"/> Hire a retrocommissioning professional to examine building design/operation		

Step 4: Adopt Renewable Energy

The checklists below are an example of what you might include in your action plan regarding renewable energy. The first section focuses on installing on-site renewable energy to directly off-set energy use. The second section provides alternative ways to purchase renewable energy if on-site renewable is not an option, or if you cannot meet the load demands with self-generation.

Higher Capital Investment Project		Target Date	Person Responsible
Install Renewables	<input type="checkbox"/> Review incentives , financing and power purchasing agreement options*		
	<input type="checkbox"/> Get bids from several contractors*		
	<input type="checkbox"/> Install/Purchase Renewable Energy		

Other Renewable Options		Target Date	Person Responsible
Community Solar	<input type="checkbox"/> Investigate community solar opportunities*		
	<input type="checkbox"/> Invest in community solar		
Renewable Energy Credits	<input type="checkbox"/> Investigate renewable energy credit opportunities*		
	<input type="checkbox"/> Invest in renewable energy credits		

* First priority actions

Step 5: Pursue Electrification

The checklists below are an example of what you might include in your action plan. Electrification is a crucial step to becoming a net zero business, because regardless of how efficient your buildings are, or how much energy you produce with renewables, if you continue to use natural gas to power heating and/or other equipment, you are still burning fossil fuel.

Electrification	Target Date	Person Responsible
<input type="checkbox"/> Review incentives and financing *		
<input type="checkbox"/> Convert from gas to efficient electric equipment (water heating, HVAC, etc)		
<input type="checkbox"/> Reduce distribution losses with tankless water heating for remote indoor water-use areas		
<input type="checkbox"/> Install electric vehicle charging stations		

* First priority actions

** Ongoing Actions

Step 6: Execute Other Strategies

The impact you can have spans further than your buildings and the energy they consume. Below is a list of things you could consider adding to you plan that begin to address the broader climate impact of your business. The scope of what you address may vary and you likely will add additional actions.

Other Emission Reduction Strategies		Target Date	Person Responsible
Transportation Alternatives	<input type="checkbox"/> Install bike racks to encourage staff and customer cycling		
	<input type="checkbox"/> Identify ways to increase pedestrian friendly zones		
	<input type="checkbox"/> Educate tenants/patrons on available transportation options		
Landfill Waste Diversion	<input type="checkbox"/> Develop a zero-waste program		
	<input type="checkbox"/> Educate tenants and patrons on zero waste goals		
	<input type="checkbox"/> Install appropriate signage at all collection areas		
Efficient Water Use	<input type="checkbox"/> Use drip irrigation and native drought-tolerant plants		
	<input type="checkbox"/> Conduct an outdoor irrigation assessment		
	<input type="checkbox"/> Replace inefficient toilets with WaterSense-labeled models		



