UNDER 2 MOU APPENDIX- CITY OF BOULDER, COLORADO

About Boulder

Tucked into a picturesque valley below the iconic Flatirons, Boulder hosts thriving tech and natural foods industries, supports a renowned entrepreneurial community, has some of the region's best restaurants, and is home to many federal research labs and a world-class university. Furthermore, the city of Boulder frequently receives high rankings in art, health, well-being, quality of life, and education.

Boulder is known as one of the best places to live because of its beautiful setting, its 45,000 acres of open space and its lively atmosphere. Home to approximately 107,000 residents, Boulder has a mild, dry climate with more than 300 days of sunshine per year. Over 300 miles of bike lanes, bike paths, bike routes, designated shoulders and paths in and around Boulder, as well as a convenient bus system, provide transportation excellent options for getting around town.

Boulder is the home of the University of Colorado, and Naropa University, a secular Buddhist-oriented school. Boulder is also home to several government scientific institutions: NIST (National Institute of Standards and Technology;), home of the atomic clock that defines the world's time, NCAR (National Center for Atmospheric Research), and NOAA (National Oceanographic and Atmospheric Administration). Boulder has preserved more than 45,000 acres of open space, much of which surrounds the city and helps maintain its geographical boundaries.

Boulder's Climate Commitment

Boulder has long understood the importance of local climate action. Boulder's residents and businesses were among the first in the country to implement programs like the Climate Action Plan Tax (CAP Tax) and a host of other energy efficiency and conservation programs. Some of these, including EnergySmart, SmartRegs and the Building Performance Ordinance, are being replicated elsewhere as they begin to achieve the full benefits of their implementation locally. Others, like a local carbon offset fund and changing our energy supply from fossil fuels to renewable sources through the possible creation of a local electric utility, are still taking shape.

Over our years of work, however, the reality has become increasingly clear: climate change is happening, human activity is the cause and the scale of the challenge is even greater than we originally understood. Scientists now tell us that we need to reduce greenhouse gas emissions by at least 80 percent by 2050 to stop the trend of warming – and slow the impacts already underway. Successfully addressing this challenge will require bold, broad measures. Boulder's Climate Commitment and Resilience Strategy outline the areas of action that Boulder focus on in the years ahead.

BOULDER EMISSIONS - PRESENT AND FUTURE

WHERE WE ARE
2015
1,848,741 MT

OUR GOAL IS AN
80% REDUCTION

WHERE WE WANT TO BE
2050
390,000 MT

HOW DO WE COMPARE?
GHG EMISSIONS PER PERSON

COLORADO: 25 MT (2010)
DENVER, CO: 17 MT (2013)
BOULDER, CO: 17 MT (2015)
FORT COLLINS, CO: 15 MT (2014)
NEW YORK, NY: 5.8 MT (2014)
BOULDER, CO: 2050: 3 MT

*MT = metric ton = 2,204 lbs

Targets

In 2016, the city adopted the International Council for Local Environmental Initiatives (ICLEI) Global Cities greenhouse gas inventory protocol and the now standardized CLEAR Path improvements that have now become standard practice. It will also streamline inventory preparation. inventory tool. The city had previously utilized the ICLEI US Cities protocol, which as a common standard when the city last conducted its inventory for 2012. The updated Global ties protocol will enable the city to begin integrating more consumption-based emissions factors.

CITY OF BOULDER CLIMATE AND ENERGY GOALS

80 x 2050
COMMUNITY
EMISSIONS REDUCTION

80 x 2030
CITY ORGANIZATION
EMISSIONS REDUCTION

100 X 2030
PERCENT
CLEAN ELECTRICITY

100 X 2030
MEGAWATTS
LOCAL GENERATION

Emissions and Energy Goals[3]

	TARGET AREA	2020	2030	2050
COMMUNITY	Emissions Reduction	15%	50%	80%
CITY ORGANIZATION	Emissions Reduction	50%	80%	+90%
RENEWABLE ENERGY	Percent of electricity supply that is renewable	40%	100%	100%

[1] The City of Boulder uses the Global Protocol for Community-Scale Greenhouse Gas Emission Inventories (GPC) for greenhouse gas accounting.

[2] The current methodologies for calculating community-wide greenhouse gas emissions account primarily for energy-related sources. Recognizing the important role that both resource use and ecosystem management play in emissions reduction, the city is working on incorporating methods for quantifying the impacts of actions in these areas.
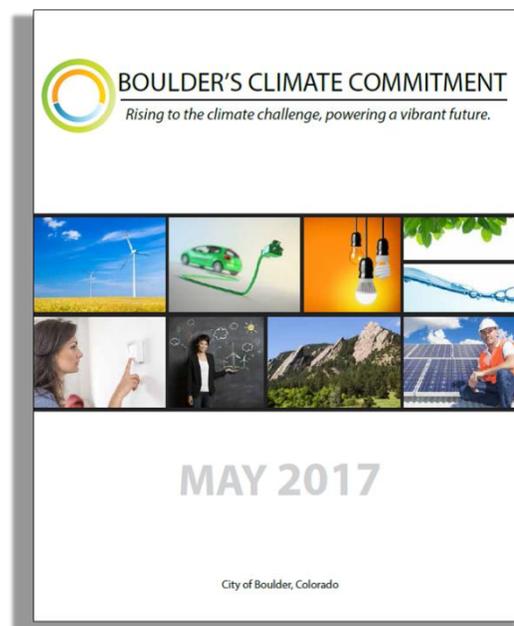
[3] Community emissions are measured against a 2005 baseline. City organization emissions are measured against a 2008 baseline.

Mitigation Efforts

Vision

Boulder is a world leader in the development and implementation of renewable energy and emissions reductions programs that create local economic opportunities, enhance community well-being and build resilience. Through these efforts, Boulder inspires and enables other communities to participate in reducing carbon emissions and stabilizing the climate.

The strategic framework laid out in the Climate Commitment ⏸guides the city's climate work in four action areas: energy, ecosystems, resources and

BOULDER'S CLIMATE COMMITMENT
Rising to the climate challenge, powering a vibrant future.

MAY 2017

City of Boulder, Colorado

community climate action. Rising to the climate challenge will require long-term action in all four areas; however, the city's short-term strategy has focused on the first— energy — as the chief driver of climate change.

Boulder launched its first formal climate action efforts in 2002. Since that time, the city has been at the forefront of innovation in working to reduce climate impacts: adopting the country's first tax dedicated to addressing climate change, developing a national model for delivering energy efficiency services, enacting the country's most stringent energy code for new buildings and much more.

During the past dozen years, we've made progress and learned lessons. In recent years, we have integrated climate action strategies within relevant planning efforts, such as the Transportation Master Plan and the Boulder Valley Comprehensive Plan, and developed better tools for analyzing and tracking progress. We are working on an array of policies, programs and projects to reduce emissions and realize other important community outcomes. We know that long-term success will require better feedback loops, honest assessment, persistence and collective action.

Perhaps most important, it has become clear that while energy efficiency and related investments are essential to long-term impact, we need to fundamentally transform our energy system—not just in electricity, but also natural gas and transportation fuels.

It is this realization—grounded in extensive analysis, affirmed through engagement with numerous experts and reflected in industry and technology trends—that led the city to explore municipalization of its electric utility in recent years. Guided by the principles of "Decarbonize, Democratize, and Decentralize" and by our vision for the "Utility of the Future" (described in detail at BoulderEnergyFuture.com), Boulder's municipalization effort is a key step toward energy system transformation. If this effort is not successful, the city will redirect its efforts to partner with the current electric utility and/or explore other options.

Organizing for Action

Recognizing the need for a comprehensive strategy, Boulder's Climate Commitment is divided into three areas: Energy, Resources and Ecosystems. Of these, energy is the primary near-term focus due to the critical importance of reducing fossil fuel combustion. Simultaneously, the city and community continue to explore ways to address the impact that resource use has on emissions, and how ecosystem management can enhance the emission-minimizing services provided by natural systems. In recognition that community action is integral to success, a fourth section, "Community Climate Action," provides details about how the city will support these efforts.

Energy—Nationally, close to 90 percent of GHG emissions are generated by energy-related activities. Locally, over 96 percent of the emissions tracked through Boulder's 2015 inventory were from burning fossil fuels. The three areas of action within Energy are High Performance Buildings, Clean Mobility and Clean Electricity Sources.

Resources—Boulder is also responsible for emissions related to the production, distribution and disposal of resources in the goods and services we consume. This includes the acquisition of raw materials and the energy used to transform those materials into useful products and services. The majority of these products and services are produced outside Boulder and are not included in Boulder's GHG emissions inventory, though they are part of our carbon footprint[1]. The three areas of action within Resources are Waste, Water and Food.
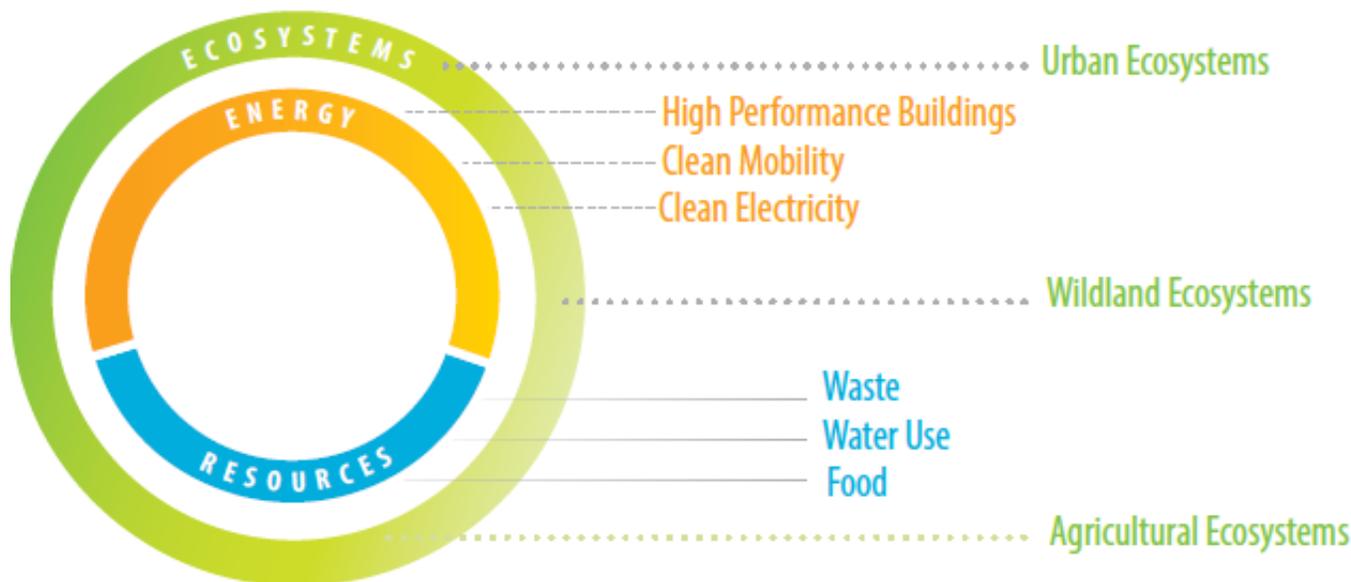
Ecosystems—The unseen regulators of GHG emissions are the different natural ecosystems that can reduce emissions and even remove or "sequester" CO_2 out of the atmosphere. Trees, for example, capture atmospheric carbon while also providing temperature buffering and moisture retention. The three areas of action within Ecosystems are Urban, Wildland and Agricultural. Currently, ecosystem services are not included in the protocols for Boulder's GHG inventory.

Act Locally, Impact Globally

In 2014 Boulder was invited to join 20 other vanguard cities committed to deep carbon reductions. The Carbon Neutral Cities Alliance—representing a diversity of cities such as London, New York, Copenhagen, Yokohama, and San Francisco—is a learning and innovation network that seeks to develop and test new approaches to accelerated climate action. The Alliance also helps ensure a stronger voice for cities in global climate discussions, and recognizes that urban centers are the innovation labs where the world's climate solutions will be pioneered. Boulder is also active in climate and sustainability work with International Council for Local Environmental Initiatives (ICLEI), National League of Cities, the Compact of Mayors and other venues.

The Climate Emissions System

ECOSYSTEMS · · · · · · · · · · · · · · · · Urban Ecosystems
ENERGY - - - - - - - High Performance Buildings
- - - - - Clean Mobility
- - - - Clean Electricity
· · · · · · · · · · Wildland Ecosystems
Waste
Water Use
RESOURCES
Food
· · · · · · · · · · Agricultural Ecosystems

[1] The city adopted the ICLEI Global Communities Inventory method for assessing community-wide GHG emissions. This community protocol is primarily energy related. Methods for evaluating emissions impacts of resource use and ecosystem management are in development and will be incorporated as they become available.
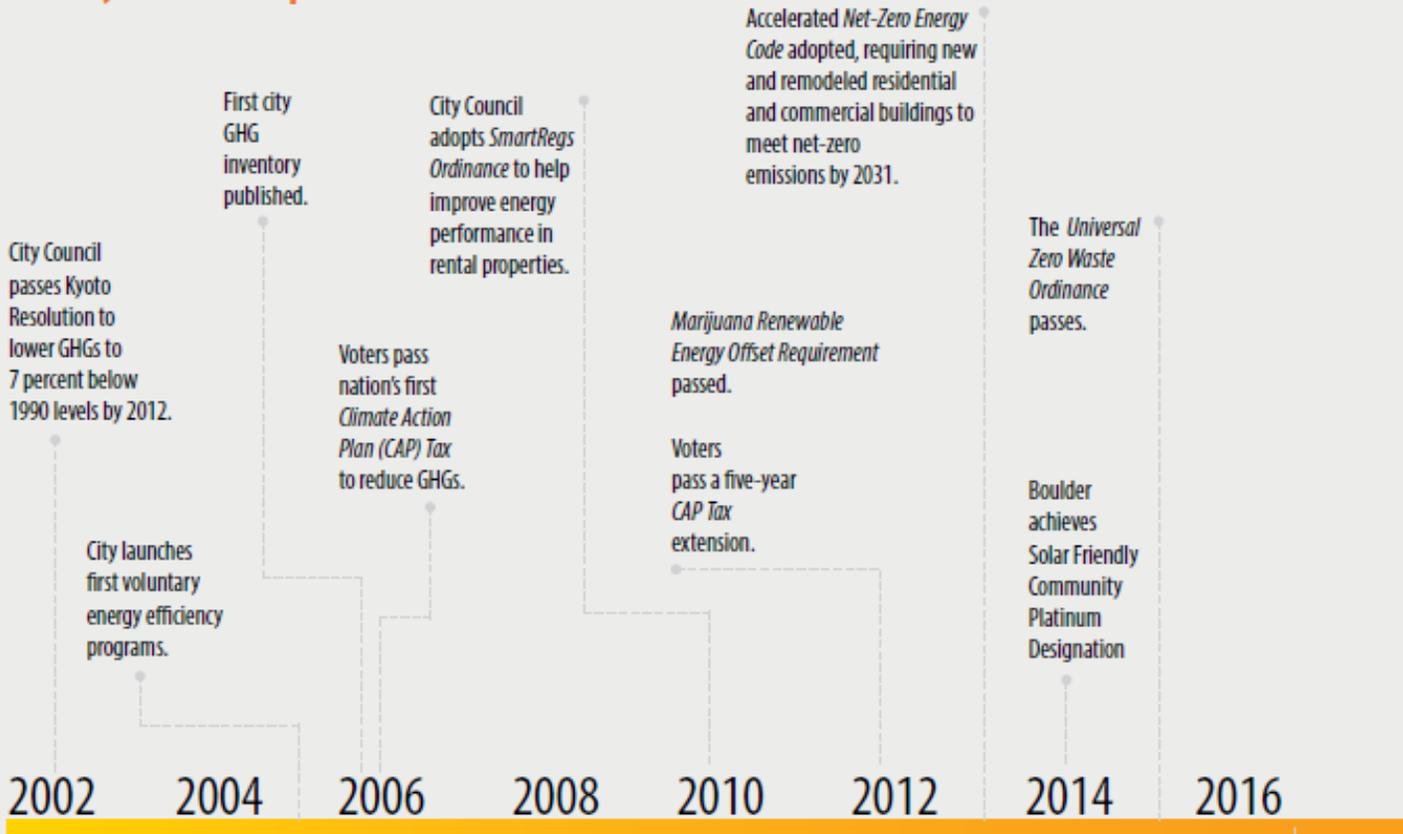
Building Resilience for an Unpredictable Future

Like many cities and communities across the country and around the world, Boulder is adjusting to a "new normal," where the effects of climate change are becoming increasingly apparent. And like residents of other cities that have recently experienced a severe natural disaster, many of us understandably perceive resilience as preparing for the kinds of events that are magnified by climate change. But shocks are not limited to natural hazards or the effects of climate change. A hyper-connected economy and the ability for pests and diseases to circle the globe with unprecedented speed, for example, mean the community is confronting a host of challenges that can strike at little notice and have severe, unknowable repercussions. Boulder is one of the first 32 cities chosen to participate in [100 Resilient Cities](#). The program, pioneered by the Rockefeller Foundation, is funding 100 chief resilience officers in selected cities worldwide. These officers are working together -- and with their communities -- to build resilience.

The launch of Boulder's first [resilience strategy](#) is a continuation of long legacy. Over the last century, Boulder has consistently served as a destination for individuals defined by their creative and innovative spirit, originating some of the most progressive policies in the United States in a variety of areas. Its long history of preserving open space and its bold climate action plans and programs are just a few examples.

The Boulder Resilience strategy takes a comprehensive and honest view of Boulder's resilience challenges and opportunities. It outlines a path forward for the city to confront not just its most obvious shocks, like flash flooding or wildfires, but also the chronic stresses, such as the need for affordable housing, integrated regional planning, and strong, cohesive communities, which exacerbate those shocks and impact the city over the long term. The City Resilience Framework (CRF) provides a lens to understand the complexity of cities and the drivers that contribute to their resilience, and a common language that enables cities to share knowledge and experiences. The framework is built on four essential dimensions of urban resilience: Leadership & Strategy, Health & Wellbeing, Economy & Society, and Infrastructure & Environment. Each dimension contains three "drivers," which reflect the actions cities can take to improve their resilience.

History and Accomplishments To Date

City Council passes Kyoto Resolution to lower GHGs to 7 percent below 1990 levels by 2012.

First city GHG inventory published.

City Council adopts *SmartRegs Ordinance* to help improve energy performance in rental properties.

Accelerated *Net-Zero Energy Code* adopted, requiring new and remodeled residential and commercial buildings to meet net-zero emissions by 2031.

The *Universal Zero Waste Ordinance* passes.

Voters pass nation's first *Climate Action Plan (CAP) Tax* to reduce GHGs.

City launches first voluntary energy efficiency programs.

***Marijuana Renewable Energy Offset Requirement* passed.**

Voters pass a five-year *CAP Tax* extension.

Boulder achieves Solar Friendly Community Platinum Designation

| 2002 | 2004 | 2006 | 2008 | 2010 | 2012 | 2014 | 2016 |

14 miles per resident per day driven

11 miles per resident per day driven

First home enrolls in EnergySmart and first rental unit receives compliance certificate.

EnergySmart has advised 7,500 homes and 1,600 businesses. 6,500 rental units are SmartRegs compliant

About 50 solar photovoltaic (PV) installs; 1 megawatt of solar capacity; $0 for local solar development.

Community actions through 2014: 2,000 solar installs; 12 MW of solar; $200,000 in grants for local solar.

City launches effort to reduce its own operational emissions.

City reduces its operational emissions by 34 percent.

The *Building Performance Ordinance* passes.

***Building Performance Ordinance* achieves 100 percent compliance for first round.**