

I. Environment

This chapter details the Vision Statement, goal, and strategies developed by the Environment Citizen Topic Group. They looked at three subtopics:

- Subtopic: Environmental Quality
- Subtopic: Resource Conservation
- Subtopic: Energy Efficiency

The Environment Vision Statement is as follows:

“Columbia residents and businesses conserve all the community's natural resources, work cooperatively to apply best planning practices, model energy efficiency, transition to renewable energy, and approach zero waste generation.”

Environmental Quality

Goal:
Columbia and its neighboring communities will be a place where the air, water, land, and natural aesthetic qualities of our environment shall be protected by a combination of conservation strategies including, but not limited to, regulations and ordinances, conservation incentives, education programs, and smart growth planning.

Strategies and Action Plans

Strategy 1: Develop an environmental protection plan.

Action Plan

Who should take the lead: Director of Planning	
Who else should be involved:	Potential roles:
Boone County Smart Growth	Advisors
Columbia Public Works	Project engineers
How to jumpstart implementation:	Other recommended action steps:
	<ul style="list-style-type: none"> Identify storm water problem areas to target for retrofitting Consult with permit writers and council members about incentives

Strategy 2: Preserve open space, farmland, natural beauty, and critical environmental areas using techniques promoted by the International City/County Management Association’s publication, co-produced with the U.S. Environmental Protection Agency, “Getting to Smart Growth: 100 Policies for Implementation.”

Action Plan

Who should take the lead: City Manager	
Who else should be involved:	Potential roles:
City of Columbia Planning	
Boone County Planning	
Columbia Planning and Zoning	
Boone County Smart Growth Coalition	
Regional Economic Development Inc.	
Environment and Energy Commission	
Regional Planning Commission	
How to jumpstart implementation:	Other recommended action steps:
One-day conference	<ul style="list-style-type: none"> Ensure that all parties involved in planning and development are familiar with the ICMA document. This could be achieved by a one-day conference led by Boone County Smart Growth and sponsored by the City of Columbia. ICMA representatives could be invited to make presentations as well The City Council should enact ordinances, modify building codes, and set policies as described in the ICMA document

Strategy 3: Form a Natural Resources Committee.

Action Plan

Who should take the lead: Director of Public Works

Who else should be involved:	Potential roles:
Department of Conservation, Head of Resource Science	Advisors in selection process, members of committee, can define roles of individual agencies
US Forest Service	Advisors in selection process, members of committee, can define roles of individual agencies
USGS	Advisors in selection process, members of committee, can define roles of individual agencies
Fish and Wildlife Service, Columbia Office Director	Advisors in selection process, members of committee, can define roles of individual agencies
MU School of Natural Resources, Department Chair	Advisors in selection process, members of committee, can define roles of individual agencies
How to jumpstart implementation:	Other recommended action steps:
	<ul style="list-style-type: none"> • Confirm participation of local representatives of resource agencies • Identify council issues, potential sites, and internal policies that committee should address • Consult with city arborist, parks horticulturalist, storm water engineers and other city employees involved with natural resources for their thoughts, ideas for issues

Resource Conservation

Goal:
Columbia will be a model community that approaches zero waste of all primary and secondary forms of energy and goods, and that implements best management practices in order to protect and conserve its natural resources and intrinsic beauty for future generations.

Strategies and Action Plans

Strategy 1: Engage in a life-long understanding of the value of environmental stewardship.

Action Plan

Who should take the lead: Columbia Chamber of Commerce; Board of Education	
Who else should be involved:	Potential roles:
Teachers	Teach low-impact environmental practices
DNR and MDC	Provide updated scientific information to compliment educational efforts
Private advertising firms	Develop campaigns to remind population of available recycle services and how to use them
How to jumpstart implementation:	Other recommended action steps:
Publish current policies on topics Acquire recently developed educational material to implement in present curriculum	<ul style="list-style-type: none"> • Create curriculum of age-appropriate educational material and activities in topics such as energy conservation – utilities, vehicles, buildings; water; importance of recycling; value and tips on reducing consumption; care and value of native green space; yard waste management; regular reports on and progress of current policies on these topics

Strategy 2: Reach a goal of zero waste through both increased recycling and reduced consumption throughout Columbia.

Action Plan

Who should take the lead:	
Who else should be involved:	Potential roles:
Waste Minimization Specialist	
MO Department of Conservation	Education
MU Solid Waste and Recycling Coordinator	Expanding MU’s receptacle system to downtown
“Pay as You Throw” programs around the country	Incentives
MORA – MO Recycling Association	
Environment and Energy Commission	
How to jumpstart implementation:	Other recommended action steps:
Create incentive programs for recycling and reduce consumption which will also bring awareness for further efforts	<ul style="list-style-type: none"> • Create incentives for recycling, balanced by fines for landfill destined trash • Create an education/advertising campaign to accent the benefits of conservation consumption and total recycling • Extend the collection of recyclables by placing receptacles throughout the downtown area possibly extending to county-wide communities • Incorporating plans specifically for consumers living in rental buildings • Transitioning to reusable bins rather than disposable bags for curbside recycling

Strategy 3: Create an encouraging atmosphere for business opportunities based on environmental stewardship.

Action Plan

Who should take the lead: Columbia Chamber of Commerce; Solid Waste Committee of Special Business Board	
Who else should be involved:	Potential roles:
Solid Waste Committee of Special Business District Board	
Environment and Energy Commission	
Civic recycling	
How to jumpstart implementation:	Other recommended action steps:
Provide incentives for businesses that practice sound and responsible conservation and recycling habits, if even as simple as certificate of merit for marketing purposes	<ul style="list-style-type: none"> • Provide incentives for businesses that practice sound and responsible conservation and recycling habits • Recycling requirements for bars and restaurants • Plan with 50+ years in mind • Encourage businesses such as: 1) transport and maintenance of recycling receptacles, 2) mosquito chemical alternatives, 3) yard waste program, 4) manufacture and sales of recyclables

Energy Efficiency

Goal:
Columbia will work toward achieving maximum energy efficiency and transition to renewable energy sources.

Strategies and Action Plans

Strategy 1: Invest in energy efficiency and renewable energy to protect Columbia’s economy from energy dollar outflow. (e.g. implement a Public Benefits Fund, increase renewable energy targets, expand the use of energy efficient technologies, etc.)

Action Plan ***Note: Please see Appendix E for further details regarding Energy Efficiency strategies.*

Who should take the lead:	
Who else should be involved:	Potential roles:
Water & Light Department	Evaluate current department programs for potential to expand and add additional programs including but not limited to those listed in this visioning goal and strategies statement. From this evaluation establish a rate structure to provide the necessary funds to sustain these programs Include evaluation of Biomass in any evaluation of long-term power supply. Include cost-benefit analysis of biomass resource over the life of a power plant, at various fuel mix ratios Identify existing programs and evaluate expansion of existing programs or development of new programs Identify all programs currently available. Meet with representative group of customers to discuss existing programs and other programs that would be beneficial. Develop identified programs Include evaluation of Biomass in any evaluation of long-term power supply. Include cost-benefit analysis of biomass resource over the life of a power plant, at various fuel mix ratios
Columbia Public Works Department	
City Council	Develop an ordinance that requires the city to purchase only energy star appliances Develop policies that create incentives for builders through tax credits, fast track permitting, reduced permitting costs, and/or lowered utility rates Identify existing programs and evaluate expansion of existing programs or development of new programs
Mayor	Develop an ordinance that requires the city to purchase only energy star appliances Develop a standard of illumination by which all future street lights will be required to perform Develop policies that create incentives for builders through tax credits, fast track permitting, reduced permitting costs, and/or lowered utility rates Identify existing programs and evaluate expansion of existing programs or development of new programs
City Manager	Develop an ordinance that requires the city to purchase only energy star appliances
Citizens of Columbia	
Water and Light Advisory Board	Gather information on programs at other utilities. Develop program for W&L, including estimate of potential peak and energy reduction
Environment and Energy Commission	
Columbia Chamber of Commerce	
Visioning - Development Topic Group	
Visioning - Economic Development Topic Group	
MO DNR Energy Center	Explore options to provide a greater % of energy through Photovoltaics

Columbia Home Builders Association	Develop policies that create incentives for builders through tax credits, fast track permitting, reduced permitting costs, and/or lowered utility rates
Columbia W&L	Identify existing programs and evaluate expansion of existing programs or development of new programs Explore options to provide a greater % of energy through Photovoltaics
Central Missouri Community Action (CMCA) - Weatherization Director	Identify areas of the community where the need for these services is greatest and promote and provide demonstrations of these services. Contact neighborhood associations and provide incentives through reduced utility bills
Columbia Wastewater Treatment Plant	
How to jumpstart implementation:	Other recommended action steps:
	<ul style="list-style-type: none"> • Implement a Public Benefits Fund (PBF) that will help the City of Columbia reach the desired energy efficiency and renewable energy goals • Utilize the Missouri Department of Natural Resources Revolving Loan Fund to help finance energy efficiency improvements of city buildings • Increase the targets of the Renewable Energy Ordinance to achieve 20% of retail sales supplied by renewable energy sources by the year 2020 • As part of the landfill gas project the Water & Light Department should work to identify potential industrial customers that could use the waste heat • Purchase only Energy Star equipment and appliances for City use and ensure that the energy saving features are enabled on all computers and other office equipment • Increase the average fuel efficiency of municipal fleet vehicles; reduce the number of vehicles; launch an employee education program including anti-idling messages; convert diesel vehicles to bio-diesel • Establish a local Home Performance with Energy Star Program. To implement this, the City shall work with the MO DNR, Energy Center to provide contractor training and establish a promotional program with incentives to encourage homeowners to participate in the program • Establish an Energy Star Qualified New Homes Program. The program shall include recruitment and training of Home Energy Rating System (HERS) raters, homebuilder training and marketing outreach, and outreach to the home lending institutions to establish an energy efficient loan program. The HERS program shall be based on the Residential Energy Services Network and establish a goal of making homes 30% more efficient than the current standard • Work with the Columbia Home Builders Association to establish a Green Home Building Program. The program shall be based on either the LEED for Homes guidelines or the National Association of Home Builders Model Green Home Building Guidelines. Training of the home builders and building trades' professionals should include technical aspects as well as marketing advantages • The Columbia Water and Light Department has been a leader in the State of Missouri with energy conservation programs. The City Council should support and encourage W&L to continue to identify and pursue electrical base load and peak electrical demand management strategies and programs • Expand the current Water & Light rebates for energy efficient air conditioners and heat pumps to include rebates for Energy Star appliances • Start a low-income utility assistance program that uses the C.A.S.H., H.E.L.P. and LIHEAP funds to pay for weatherization of homes. As part of the Change a Light Program all qualified low-income homes should be provided five Compact Fluorescent Light Bulbs • The Columbia Water and Light Department needs to increase the assistance provided to medium and large commercial and industrial customers to identify ways to help reduce energy use and cost. This would include but not be limited to, identifying consultants that are skilled at addressing specialty energy conservation measures and providing financial incentives • Fund the installation of Photovoltaic (PV) systems on public buildings, to include city owned buildings, schools, and parking structures • Fund the installation of solar water heating systems on city-owned buildings, to include the renovation and addition of the Daniel Boone Building and other city buildings

	<ul style="list-style-type: none"> • Public works needs to immediately convert all traffic lights and city traffic devices (e.g. school flashing lights), to Light-Emitting Diodes (LEDs), which are 90% more efficient • Upgrade streetlights to more efficient lighting technology such as high-pressure sodium or LEDs. Identify and remove streetlights that are not needed for public safety • Audit and recommission city buildings to ensure that all efficiency upgrades are considered and that the buildings are operating as they were designed. Examples of measures that should be considered include: improvements in building envelope, upgrading HVAC systems and controls, improving lighting efficiency, adding lighting controls and ensure that the energy savings features of office equipment is properly enabled • Evaluate opportunities to increase pump efficiency of water and wastewater systems; recover wastewater treatment methane for energy production • Adopt true Net Metering billing and a simplified interconnection agreement to help encourage private individuals to invest in renewable energy systems that are inter-connected to the City’s electric utility system • Investigate use of Biomass for alternative energy resources
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Strategy 2: Educate the public in areas of energy conservation, renewable energy resources, climate change, and economic implications of energy uses. (e.g. create a citywide Energy Awareness Program, offer homeowners workshops, etc.)

Action Plan

Who should take the lead:	
Who else should be involved:	Potential roles:
Chamber of Commerce	Evaluate the impact of rising energy prices – gasoline, natural gas, and electricity – on the disposable income of citizens and translate that into economic impact. Dedicate next Annual Economic Outlook Conference to educating the business community on this issues and methods for mitigating the impact, which will create local jobs and economic investment
Williams Keepers, Inc.	Evaluate the impact of rising energy prices – gasoline, natural gas, and electricity – on the disposable income of citizens and translate that into economic impact. Dedicate next Annual Economic Outlook Conference to educating the business community on this issues and methods for mitigating the impact, which will create local jobs and economic investment
Columbia Water and Light	Taylor education programs to specific audiences – renters, homebuyers, realtors and lending agencies. The goal would be to raise awareness of what renters and homebuyers should look for when looking at potentials homes. Realtors would be able to market energy efficiency features and lending agencies should look more favorably on home with energy efficient systems
Boone Electric	Ms. Torres believes they are doing an acceptable job in this area, and does not feel the need for additional resources or help at this point. They presently have educational programs through Boone Electric and Water and Light. Teachers are in charge of implementing “extras” into core enrichment, so they would be the ones able to add more things to what is already happening in this area
Public schools - Assistant Superintendent for Curriculum and Instruction	Ms. Torres believes they are doing an acceptable job in this area, and does not feel the need for additional resources or help at this point. They presently have educational programs through Boone Electric and Water and Light. Teachers are in charge of implementing “extras” into core enrichment, so they would be the ones able to add more things to what is already happening in this area
Science teachers	Ms. Torres believes they are doing an acceptable job in this area, and does not feel the need for additional resources or help at this point. They presently have educational programs through Boone Electric and Water and Light. Teachers are in charge of implementing “extras” into core enrichment, so they would be the ones able to add more things to what is already happening in this area
City Manager	
Mayor	Continue to develop policies that encourage or assist in implementing these programs
City Environment and Energy Committee	

Churches	
Chamber of Commerce	
Schools – Public, Private and Colleges	
PedNet	Continue to develop policies that encourage or assist in implementing these programs
Realtor Agencies	Taylor education programs to specific audiences – renters, homebuyers, realtors and lending agencies. The goal would be to raise awareness of what renters and homebuyers should look for when looking at potential homes. Realtors would be able to market energy efficiency features and lending agencies should look more favorably on home with energy efficient systems
Financial Institutions	Taylor education programs to specific audiences – renters, homebuyers, realtors and lending agencies. The goal would be to raise awareness of what renters and homebuyers should look for when looking at potential homes. Realtors would be able to market energy efficiency features and lending agencies should look more favorably on home with energy efficient systems
How to jumpstart implementation:	Other recommended action steps:
	<ul style="list-style-type: none"> • The Chamber of Commerce will use its Annual Economic Outlook Conference to educate its membership on the impact of energy use on the local economy. • The public schools administration will encourage and assist teachers to incorporate teaching of energy efficiency and renewable energy sources into the curriculum, wherever possible • Create a Citywide Energy Awareness Program. The program shall encompass all sectors of the city including city government, residential, commercial, industrial, schools and colleges and cover both buildings and transportation needs. The program shall provide citizens information on setting energy usage benchmarks along with conservation measures that can be used in the home as well as at work. Sectors to establish benchmarks should include but not be limited to: residential, rental property, office, restaurants, and retail businesses. As the benchmarks are determined annual energy reduction goals should be set and revised on an annual basis. To encourage participation activities shall be created for each sector and an incentive and awards system shall be developed • Promote and improve transportation options such as bicycle trails, commute trip reduction programs, incentives for car-pooling and public transit. The City shall continue to support PedNet and its programs including trail development, bike to work program, and the walking school bus program • Offer energy awareness workshops for prospective homeowners, renters. This could be part of a citywide energy awareness program

Strategy 3: Enact regulations and adopt policies to implement better, more efficient technologies. (e.g. create a city Department of Energy Efficiency and Environmental Quality, adhere to LEED principles, etc.)

Action Plan

Who should take the lead:	
Who else should be involved:	Potential roles:
City Manager	Create a city department whose job it is to coordinate energy and environmental programs across other city departments and the private sector
Mayor	Create a city department whose job it is to coordinate energy and environmental programs across other city departments and the private sector Develop a Green Building Ordinance Develop a Model Energy Code Ordinance Develop a Time-of-Sale Ordinance
City Council	Create a city department whose job it is to coordinate energy and environmental programs across other city departments and the private sector

	<p>Develop a Green Building Ordinance</p> <p>Develop a Model Energy Code Ordinance</p> <p>Develop a Time-of-Sale Ordinance</p>
Water and Light	<p>Create a city department whose job it is to coordinate energy and environmental programs across other city departments and the private sector</p> <p>Develop a Model Energy Code Ordinance</p> <p>Develop a Green Building Ordinance</p> <p>Develop a Time-of-Sale Ordinance</p>
Planning and Zoning	<p>Create a city department whose job it is to coordinate energy and environmental programs across other city departments and the private sector</p> <p>Develop energy standards for housing rehabilitation program. If unable to fully implement the Home Performance standard, develop program that requires a baseline of energy standards with a plan for moving to full implementation</p> <p>Develop a Green Building Ordinance</p> <p>Develop a Model Energy Code Ordinance</p> <p>Develop a Time-of-Sale Ordinance</p>
Public Works	<p>Create a city department whose job it is to coordinate energy and environmental programs across other city departments and the private sector</p> <p>Develop a Green Building Ordinance</p> <p>Develop a Model Energy Code Ordinance</p> <p>Develop a Time-of-Sale Ordinance</p>
How to jumpstart implementation:	Other recommended action steps:
	<ul style="list-style-type: none"> • Create an Energy Efficiency and Environmental Quality Department within City Government. This department will be in charge of coordinating programs across other city departments, the county, schools, residential, commercial, and industrial sectors. Staff shall include a director, engineering and other technical staff, public information, and financial staff. The financial staff shall also be responsible for pursuing federal, state and private grants and partnerships. This new department shall work directly with the W&L Department to assist in the implementation and promotion of current and future energy conservation programs. It shall also work directly with the Public Works Department and the Division of Protective Inspection to provide plan review, building inspections, and designer and contractor training as it relates to City adopted energy codes • Columbia’s Planning Department Housing Rehabilitation Program will enact Home Performance with Energy Star ratings for all new rehabilitation projects • Require that all new city buildings, major renovations and leased space be designed to meet LEED principles with a goal of LEED Silver Level or higher. Specific attention should be given to the computer energy modeling of the building design; life cycle cost analysis of measures incorporated into the design, and commissioning of the building from design review through construction and final occupancy • Adopt the 2006 International Energy Conservation Code (IECC); revise and update at least every three years. . A program should be developed to ensure that architects, engineers, building trade professionals and others involved in residential and commercial construction are knowledgeable about the 2006 IECC and ASHRAE Standard 90.1 Energy Standard for Buildings • Adopt time-of-sale minimum standards for rental housing to improve the energy efficiency of rental properties • All Government entities will use life cycle cost analysis when buying equipment, appliances, vehicles, and building components