



BROOMFIELD CITY COUNCIL

STUDY SESSION

To: Mayor and City Council
From: Jennifer Hoffman, City and County Manager
Kevin Standbridge, Deputy City and County Manager
Presented by: Advisory Committee on Environmental Sustainability Members
Tami Yellico, Director of Strategic Initiatives

Meeting Date	Agenda Item #
August 18, 2020	XX
Report from Advisory Committee on Environmental Sustainability: Update on 2020 Goals and Recommendations	
Summary	
- On July 28, 2018, Council adopted Resolution No. 2018-121 creating the Environmental Stewardship Advisory Task Force (ESATF), for the further implementation of the Environmental Stewardship Chapter to Broomfield's Comprehensive Plan. - Resolution No. 2018-121 set forth ESATF duties, including recommendations for new environmental stewardship policies and programs. ESATF has been meeting monthly since October 2018. - On February 11, 2020, City Council approved Resolution 2020-64, changing the name to the Advisory Committee on Environmental Sustainability (ACES) and making it a permanent advisory committee. - On February 11, 2020, Council approved Resolution No. 2020-65, adopting Zero Waste Goals. - This memo summarizes the efforts the ACES has made in 2020, including an update on the following 2020 primary recommendations, presented to the City Council at the February 4, 2020, Study Session. - Also included is an Update on the waste inventory to identify the composition analysis of refuse, recyclables, and organics from single-family, multi-family, commercial, and self-haul of waste, the Greenhouse Gas Emissions (GHG) Study, and the trash hauler ordinance, as previously approved by City Council. - This memo includes information on the ACES Goals for 2020 for each of the following subgroups: - Energy - Zero Waste - Transportation	
Prior Council and BURA Action	
- July 28, 2018, Council adopted Resolution No. 2018-121 creating the ESATF - September 25, 2018, Council appointed 11 members to the ESATF - August 20, 2019, Council extended the term of the task force through September 25, 2019. - February 11, 2020, Council adopted Resolution No. 2020-64 making the committee permanent and changing the name. - February 11, 2020, Council approved Resolution No. 2020-65, adopting Zero Waste Goals.	
Financial Considerations	
N/A	
Alternatives	
N/A	
Proposed Actions/Recommendations	
Discussion by the City Council regarding the 2020 ACES goals.	

BACKGROUND

On July 24, 2018, Council adopted [Resolution No. 2018-121](#) creating the Environmental Stewardship Advisory Task Force (ESATF). Resolution No. 2018-121 gave ESATF the following duties:

- The Task Force is charged with reviewing the Chapter and reviewing and providing comments and recommendations for improvements on Broomfield current environmental stewardship policies and review information on existing programs in Broomfield or other communities.
- The Task Force shall provide recommendations for new environmental stewardship policies and programs.
- The Task Force shall make a recommendation to Council on establishing priorities and goals for environmental stewardship activities, including the management of waste, water, and energy, as well as other activities that support resource conservation and improved air and water quality.
- The Task Force shall prepare a recommended action plan that sets forth and prioritizes recommended policies, programs, education, and outreach that continue the implementation of the goals and action steps of the Chapter.
- The Task Force may provide a forum for citizen comment on environmental stewardship issues.
- The Task Force may recommend change for the Broomfield Municipal Code to codify environmental stewardship programs or policies.
- The Task Force may request that the City & County Manager, with City Council approval, procure the services of professional consultants to assist it, if it deems such services necessary.
- The Task Force shall remain in place for one (1) year from the date of its appointment by City Council, unless City Council determines that such term should be extended. In 2019, this date was extended by Council to September 2020.
- The Task Force should recommend education and outreach programs; and
- City Council approval is required, if the Task Force recommends hiring professional consultants.

On February 11, 2020, City Council approved Resolution 2020-64, changing the name to the Advisory Committee on Environmental Sustainability (ACES) and making it a permanent advisory committee.

UPDATE 2020 ACES EFFORTS

The ACES continues with the efforts involving its 2020 primary recommendations, presented to the City Council at the February 4, 2020, [Study Session](#). The ACES has done extensive outreach and continues to finalize sustainability recommendations. Some highlights of 2020 efforts to date include that ACES is recommending the adoption by City Council of greenhouse gas (GHG) reduction goals and City Council's support for ACES development of a GHG Emissions Reduction Plan. Representatives of the Colorado Energy Office and the Energy Performance Program (EPC) from the State of Colorado have made presentations and ACES is recommending to Council Broomfield's participation in an EPC audit of Broomfield facilities for energy savings measures. ACES recommended participation in CC4CA to Council and ACES members track and comment on CC4CA policy issues and provide input as requested on legislative issues. The ACES provided comments to CC4CA on its 2020 policy statements and recommended Council's approval of the same. The ACES recently submitted its first set of comments on a development application, the Civic Center, to Planning - Link [HERE](#).

The ACES has three subcommittees, each of which focus efforts on the sustainability issue areas of energy, zero waste and transportation. The subcommittees develop issues and bring recommendations forward for discussion and consideration by all committee members of ACES. ACES and its subcommittees are staffed by the Department of Strategic Initiatives and work closely with representatives of other departments on policy and program recommendations. The ACES have frequent presentations and discussions with staff from the departments and divisions of Community Development/Planning, Building, Public Works, City Engineer, Finance/Procurement, Environmental Services, Transportation, Facilities, Open Space, and Fleet

Maintenance. Many recommendations of the ACES to City Council come to the full committee from its subcommittees and below is a summary of issues being addressed by the Energy, Zero Waste and Transportation Subcommittees this year.

ACES ENERGY SUBCOMMITTEE 2020 UPDATE

The Energy Subcommittee has as its primary goal to pursue policies and programs that will reduce the carbon footprint of energy usage in Broomfield. This includes efforts to reduce total energy usage, reduce peak demand for energy and increase the use of energy from low carbon sources.

GHG Goals & GHG Emissions Reduction Plan

The ACES and the Energy Subcommittee are recommending that the City Council adopt GHG emission reduction goals and the development of a GHG Emissions Reduction Plan to meet the recommended goals. Greenhouse gas reduction goals draft resolution is linked [here](#) and is scheduled for City Council's consideration at its August 25, 2020, regular meeting.

This GHG goals resolution recommends a GHG Emissions Reduction Plan will be designed by ACES to achieve the initial goals of reducing GHG emissions in the City and County of Broomfield, as a community and geographic area, by the following percentages and dates (these dates and percentages are in line with Colorado's science based targets in the state's [GHG reduction roadmap](#)):

- 2025 26%
- 2030 50%
- 2050 90%

The resolution includes the ACES recommendation that the City and County of Broomfield, as an organization, should lead by example for city and county owned facilities and set goals that are more ambitious than Broomfield, the community and geographic area.

The GHG goals resolution includes the ACES recommendation reducing GHG emissions by efforts of the City and County of Broomfield, as an organization, by the following percentages and dates:

- 2025 30%
- 2030 60%
- 2045 90%
- 2050 100%

The GHG Emissions Reduction Plan recommended for approval by City Council is also referenced in the GHG goals resolution. It is recommended by ACES that the GHG Emissions Reduction Plan assess Broomfield's current levels of GHG emissions to identify objectives; and recommend short-, medium-, and long-term actions to reach these goals. The GHG Emissions Reduction Plan will, within budget constraints, seek to effectively, efficiently, and quickly address the issues identified as well as allow for a public process to address recommended actions. The basis for the GHG Emissions Reduction Plan will be the GHG Inventory and recommendations by the University of Colorado-Denver College of Engineering and Applied Science waste inventory, as outlined above.

Another basis of the GHG Emissions Reduction Plan, if approved by Council, would be the results of a recommended facilities audit that Broomfield could contract for through the Colorado Energy Office's Energy Performance Contracting program (EPC). The EPC program would provide an investment grade audit of all Broomfield facilities, recommend and prioritize energy savings projects, and measure the energy savings

results of such projects. A description of the process and findings that will inform recommendations from the GHG inventory and the EPC program follows.

Greenhouse Gas Inventory

In 2007 and 2009, two studies were performed based upon a recommendation by Broomfield's previous environmental stewardship task force. The inventory of greenhouse gas emissions (GHG) that was conducted by UCD in 2007, for a cost of \$50,000, is linked [here](#). In 2009, a Government Focused Efficiency Optimization Study was completed, including recommendations on achieving a more sustainable future, prepared by MWH (now Stantec) at a cost of \$50,000. The MWH study is linked [here](#).

At ACES' recommendation and with Council approval, Broomfield contracted with the University of Colorado-Denver, College of Engineering and Applied Science, to provide an update on sustainable energy benchmarking and a GHG inventory, in order to evaluate the greenhouse gas emissions from energy and chemical use, and other sources. The results of the greenhouse gas study indicate sources of GHG emissions, to be used to develop policy recommendations, and to provide Broomfield the tools to update this study in the future, with more limited assistance. The cost of the study was \$85,000, and a scope of services is linked [here](#).

The summary of findings to date of the greenhouse gas emissions inventory can be viewed [here](#) and in the following charts.

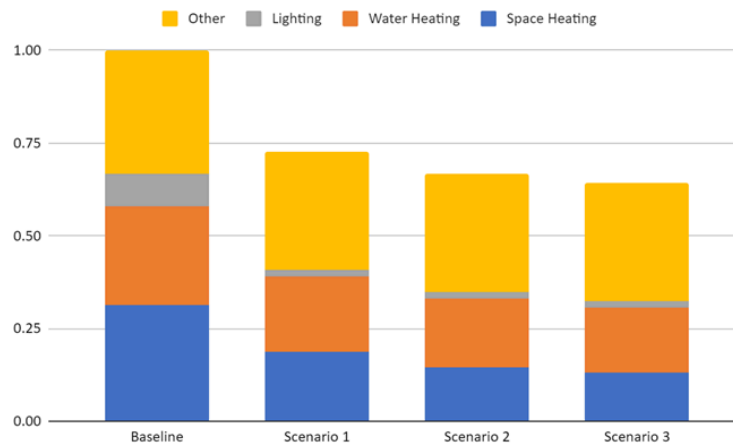
The charts below details the estimated percentages of GHG emissions by source from residential property. The three tiers of improvements are defined as:

- Tier 1 Upgrades - 2 inches of insulation added to ceiling and replace single pane windows with double pane.
- Tier 2 Upgrades - 4 inches of insulation added to ceiling, solid core doors, double paned windows, and one rigid layer of insulation to the walls.
- Tier 3 Upgrades - windows, doors and ceiling replaced with highest grade materials, two rigid layers of insulation to the walls. Most efficient HVAC and circulation system, and sealing ducts, leaks and gaps.

The savings associated with the tiered improvements residential categories below are defined as:

- Baseline - no upgrades
- Scenario 1 - conservative - assumes 30% of homes receive Tier 1 upgrades, 35% of homes received Tier 2 upgrades, and 35% of homes receive Tier 3 upgrades. This would reduce space heating energy by 40%, water heating energy by 24%, and light energy by 80%.
- Scenario 2 - aggressive scenario - assumes 50% of homes with Tier 2 improvements and remaining homes with Tier 3 improvements.
- Scenario 3 - maximum improvements - assumes 20% of homes with Tier 2 improvements and 80% of homes with Tier 3 improvements.

GHG emission reduction as a % of Broomfield residential GHG emissions



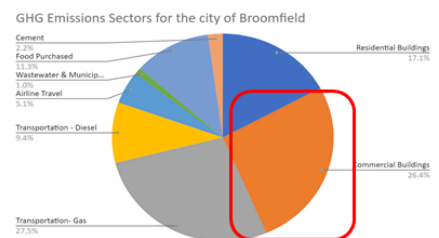
Space heating, water heating and lighting for all three scenarios based on the total energy used in Broomfield

The chart below details the GHG emission from commercial properties and the GHG emissions reduction that could be garnered from retrofits and energy efficient buildings.

Commercial Buildings – Retrofit & Energy Efficiency

GHG Emissions from Commercial Building Energy Use in Broomfield, CO

Broomfield Commercial Buildings (2016)	Baseline	Commissioning	Standard Retrofit	Deep Retrofit
GHG Emissions (Metric Tons CO ₂)	239,418	181,349	136,012	88,288
Site Energy Use Intensity (EUI)	86.00	65.36	49.02	31.82



Tier 1 Retrofit (standard retrofit)

The data in this chart is specific to the climate of Broomfield and the Reference Baseline Building for Broomfield Office Buildings

System	Measure Description	Savings as % of Total Site Usage
Lighting	Install occupancy sensors to control interior lighting	1.3%
Lighting	Add daylight harvesting	0.7%
Lighting	Retrofit exterior fixtures	2.5%
HVAC - Air Side	Widen zone temperature deadband (replace pneumatic thermostats)	7.4%
HVAC - Air Side	Lower VAV box minimum flow setpoints (rebalance pneumatic boxes)	7.1%
Total		19%

Tier 2 Retrofit (deep retrofit)

The data in this chart is specific to the climate of Broomfield and the Reference Baseline Building for Broomfield Office Buildings

System	Measure Description	Savings as % of Total Site Usage
Lighting	Retrofit interior fixtures	6.3%
Envelope	Add roof insulation	6.2%
HVAC - Air Side	Widen zone temperature deadband (upgrade to DDC zone control)	9.1%
HVAC - Air Side	Lower VAV box minimum flow setpoints, reset duct static pressure (upgrade to DDC zone control)	10.0%
HVAC - Air Side	Add demand-controlled ventilation	0.2%
HVAC - Air Side	Replace supply fan motor and VFD	2.6%
HVAC - Air Side	Replace boiler	5.0%
Total		39%

Colorado Energy Performance Program

As noted above, ACES is recommending that a facilities audit be conducted through the Colorado Energy Office's Energy Performance Program. This energy audit would:

- Provide an investment grade audit of Broomfield facilities;
- Recommend and prioritize energy savings projects; and
- Measure the energy savings results of such projects.

Here is a matrix of the [potential Broomfield facilities](#) to be audited. Other elements of the EPC audit include:

- Cost of this facilities audit is estimated to be \$ 95,000, however this cost can be deferred by inclusion into a financing package that is used to pay for the upgrades.
- Cost savings from the upgrades are used to service the debt over a predetermined number of years (typically 20, but it can be less).
- A memorandum of understanding (MOU) with the State is required to participate in the EPC Program. Once funding is discussed, and if funds are appropriated for this purpose by the City Council, that MOU will be brought to City Council for its consideration.

ACES ZERO WASTE SUBCOMMITTEE 2020 UPDATE

Zero Waste Plan

In 2020, the ACES recommended and the City Council adopted a [Zero Waste Resolution](#). This resolution solidified Broomfield's commitment to promoting, facilitating, and modeling Zero Waste in the community and adopted zero waste goals and directed ACES to create a Zero Waste Plan designed to achieve the initial goal of: increasing waste diversion for the local government of Broomfield and for Broomfield as a whole, to 50% or better by the year 2025. The ultimate goal of Broomfield's Zero Waste Plan is to eliminate waste (i.e. achieve Zero Waste) by 2035.

The Front Range Waste Diversion Program and Enterprise Fund was approved by the Colorado State Legislature in 2019, and collects funds from an increase in user fees at front range landfills to provide grants and technical assistance to front range communities to increase recycling, composting, and waste reduction. ACES and the Zero Waste Subcommittee have taken a major step in the development of the Zero Waste Plan, with the submission of a planning/implementation grant for the plan to the [Front Range Waste Diversion Grant](#) Program of the Colorado Department of Health and Environment . The application was submitted by an August 10th deadline and requested \$75,000 to \$100,000 to reimburse Broomfield for consulting and other zero waste program costs.

Public Outreach

The Zero Waste Subcommittee of ACES has as its primary goal to pursue policies and programs that will reduce waste and to pursue community involvement in waste reduction efforts with the ultimate goal of attaining the adopted waste diversion metrics (50% diversion by 2025, 100% diversion by 2035). The Zero Waste Subcommittee has developed the Zero Waste Website Kick off program, which has attracted over 650 unique hits and counting - <https://www.broomfield.org/3238/Waste-Zero>. This campaign has led to over 450 responses to a short composting and recycling survey to garner community input and support upcoming policy recommendations. Some conclusions are that interest and enthusiasm for recycling and composting are high in Broomfield, but lack of access is a barrier to higher waste diversion rates. [Survey](#) results on recycling and composting survey will be rolled into support of efforts to be outlined in the forthcoming zero waste plan.

Trash Hauler Reporting Ordinance

Another effort of the Zero Waste Subcommittee of ACES is to use the data now being reported by trash haulers to develop policy efforts. At the recommendation of ACES, City Council adopted a trash hauler reporting ordinance to provide the necessary baseline data for the waste inventory and a means to track such data over time. On August 20, 2019, Council adopted an ordinance to require haulers to provide reports on the amount of waste collected in Broomfield from commercial and residential pickups. Broomfield haulers are currently providing this information to other municipalities. The data will provide a baseline that will enable the subgroup to quantify municipal solid waste collection data and create Broomfield specific indicators that will allow ACES to recommend trash reduction measures in the future. Some trash haulers began voluntarily reporting for 2019. A summary of the report can be viewed [here](#).

Haulers are required to report beginning in 2020, however preliminary data from 2019 (representing 73% of Broomfield's total waste volume) indicates some items of note. The multi-family residential sector has the highest waste diversion rate, at 23.2%. The commercial sector has the lowest diversion rate, at 6.69% while making up 59% of the total reported waste volume. While 2019 remains an incomplete picture, the data from this year suggest that promoting recycling and composting within the commercial sector may yield a rapid increase in Broomfield's overall waste diversion rate.

Update on Waste Audit

The countywide waste composition analysis study (WACS) is being conducted by a professor and graduate students at the University of Colorado at Denver UCD) at a total cost of \$77,931, and the scope of services is linked [here](#). The waste inventory determines the composition of materials generated in Broomfield and identifies their final destinations. The waste inventory includes a representative sample of the entirety of Broomfield's four waste streams (trash, recycling, compost/organics, construction and demolition materials) for each service sector, the number of samples to be collected and sorted at each location and facility, and the number of days. To date, UCD has inventoried single family and commercial waste streams and is currently scheduling the multifamily waste stream, which was delayed as the staff and the consultant located a trash company to cooperate in this data collection.

The summary of findings and recommendations to date of the waste audit can be viewed [here](#) and in the charts below.

A summary of the initial waste audit results is set forth in the charts below.

Single Family Residential - Trash

Composition of Broomfield SFR Trash Sent to Landfill		Waste Generated [tons/yr]	
Paper	20%	Paper	3134
Plastics	13%	Plastics	2037
Glass	2%	Glass	313
Metals	1%	Metals	157
Organics	55%	Organics	8618
C&D	3%	C&D	470
Hazardous	1%	Hazardous	157
Misc	4%	Misc	627

Compostable paper	2139	13 %	Total Compostable 61 %
Compostable organics	7521	48 %	
Recyclable paper	995	5 %	Total Recyclables 16 %
Recyclable plastic	1257	8 %	
Recyclable glass	291	2 %	
Recyclable metal	157	1 %	
Total Compostable and Recyclables in the SFR Trash disposed to landfill			77%

Single Family Residential - Recycle

Composition of Broomfield SFR Recycle Sent to BCRC		Waste Generated [tons/yr]	3591
Paper	62%	Paper	2226
Plastics	14%	Plastics	503
Glass	18%	Glass	646
Metals	6%	Metals	215
Organics	0%	Organics	0
C&D	0%	C&D	0
Hazardous	0%	Hazardous	0
Misc	0%	Misc	0

Environmental Ambassador Program

The Environmental Ambassador Program is described as a neighborhood centric outreach program to engage underserved communities in Broomfield. One ACES member has participated in the training for this program and would like to initiate this engagement method in Broomfield. The program is called the Community BOND (Building Outreach for Neighborhood Discussion) Initiative, whose mission is to: provide a voice for the marginalized and under-represented members of our community that provides critical feedback to social and civic issues and creates a unifying sense of belonging.

This program will be a useful strategy in engaging marginalized and underrepresented communities in important dialogue at the municipal level that they might not otherwise have access to.

ACES TRANSPORTATION SUBCOMMITTEE 2020 UPDATE

The primary goal of the ACES Transportation Subcommittee is to reduce Broomfield's environmental footprint of transportation and improve air quality. The Subcommittee has indicated the desire for City & County of Broomfield to become a leader in sustainable transportation as an organization and employer. Some of the specific goals of the Transportation Subcommittee include increasing the number of private and public electric vehicle (EV) charging stations in Broomfield, to develop policies that encourage EV charging and alternative transportation modes in new development, convert City fleet to electric vehicles or other alternative fuel sources, and to encourage and support sustainable transportation modes.

Bicycle Education Program

The Transportation Subcommittee has expressed a desire for Broomfield to promote bicycle safety education for children and adults to promote sustainable active transportation. As a result, staff is exploring potential partnerships with organizations to provide bicycle education.

Transit

The Transportation Subcommittee supports transit in Broomfield including Broomfield Easy Ride for older adults and individuals with disabilities as well as the RTD Flexride, a curb to curb service available to all ages and abilities, and supports campaigns to promote use such as the Free Fare Summer program. The Subcommittee also supports sustainable commuting by transit via the Flatiron Flyer Bus Rapid Transit service along US 36, as well as support for Broomfield commuter programs, encouraging sustainable commute options via transit. Expansion of RTD transit access to north Broomfield is also supported.

Electric Vehicles

The Transportation Subcommittee supports electric fleet conversion for Broomfield City Fleet. The Subcommittee supports Public Works efforts with Denver Metro Clean Cities Coalition to conduct a fleet assessment which will provide a baseline for our current fleet and help Broomfield understand options available to create a more sustainable fleet. The effort is anticipated to begin in September 2020 with report and findings complete in January 2021.

Electric Vehicle Charging Stations

The Transportation subcommittee has provided direction to Community Development to promote more electric vehicle charging stations in new development and refine requirements for bicycle parking. Additionally, the Subcommittee has worked to support staff on successful grant efforts for public EV charging stations in Broomfield municipal buildings, including the Paul Derda Recreation Center and the Health and Human Services Building.

Teleworking

The Transportation subcommittee has seen the benefits to the environment from the increase in teleworking and associated reduction in vehicle emissions. The Transportation subcommittee requested staff to develop a Teleworking [white paper](#) as a tool to promote teleworking policies throughout Broomfield. The Transportation subcommittee is supportive of a teleworking policy for the City and County of Broomfield, which is currently in draft form. The Subcommittee has indicated that the policy could be a first step toward an employer commuter program, encouraging more sustainable, clean air commute options for Broomfield employees.