

# **City of Helena Sustainability Report 2020**



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# 1) Introduction

On December 3, 2007, the Helena City Commission adopted Resolution 19530 to establish a Climate Change Task Force. The group's charge was to assess the City's contribution to the urgent problem of global climate change, and to recommend measures for reducing the City's greenhouse gas (GHG) emissions. In particular, the task force was directed to examine:

- the potential for waste reduction (energy, water, solid waste, etc.)
- the potential for renewable power generation
- ways to improve the security of the community's water supply
- strategies for improving resilience in the face of a rapidly changing climate

The nine-member task force, which was aided by additional volunteers from the community, submitted its 200-page Climate Action Plan (2009 CAP) to the City Commission on August 19, 2009. The plan included an energy use inventory and GHG assessment for City government operations (for test years 2001 and 2007), and advanced a total of 44 recommended actions (6 interim recommendations that had been forwarded previously plus 38 new recommendations).<sup>1</sup> One of these recommendations (IMP-6) was to adopt a goal of reducing City government GHG emissions 20% below 2007 levels by 2020.

On June 26, 2017, the City Commission adopted Resolution 20347 "affirming Helena's continued efforts to combat climate change."<sup>2</sup> Section 4 calls for an annual report "to document specific activities implemented by the City, track greenhouse gases, energy usage and other resources such as water, and recommend future sustainability measures for the City of Helena." Annual reporting of this type was also envisioned in the 2009 CAP (IMP-5), as part of the duties of a new Sustainability Coordinator position (IMP-1). On November 18, 2019, the City hired a half-time Sustainability Coordinator, thereby facilitating the preparation of this document as the first such annual report.

The timing of this renewed analysis is apt, in light of the 2009 CAP's ten-year planning horizon (implicit in the "20 by 2020" goal described above). As that period draws to a close, it is natural and appropriate to take stock of the City's progress over the last 10+ years, and also to investigate new opportunities, goals, and strategies. The global community of climate scientists has identified the next ten years as vitally important for taking decisive action to avert the worst impacts of a changing climate.<sup>3</sup>

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<sup>1</sup> The 2009 Climate Action Plan is posted at the top of the Citizen Conservation Board webpage:

<https://www.helenamt.gov/government/departments/citizen-conservation-board>

<sup>2</sup> <https://www.helenamt.gov/government/departments/city-commission/ordinances-resolutions>

<sup>3</sup> Special Report: Global Warming of 1.5°C, Intergovernmental Panel on Climate Change, October 2018:

<https://www.ipcc.ch/sr15/>

## 2) Progress Report: 2009 Climate Action Plan

The 2009 Climate Action Plan (2009 CAP) includes a total of 44 recommendations, consisting of six interim measures submitted prior to the final report and an additional 38 that make up the bulk of the plan. This chapter endeavors to assess progress made on all of those recommendations, plus some additional "beyond the plan" measures taken by the City.

The 2009 CAP divides its recommendations into four broad categories, based the Climate Change Task Force working groups. These include:

1. Implementation (IMP)
2. Energy (NRG)
3. Water (WTR)
4. Transportation, Waste, Recycling, and Public-Private Partnership (TWRP).

For purposes of brevity, summaries of the recommendations are given in bullet-point form. Progress is categorized along the following continuum:

**COMPLETE -- substantial progress (13 recommendations)**

**UNDERWAY -- partial progress (21 recommendations)**

**INCOMPLETE -- little or no progress (9 recommendations)**

**UNKNOWN -- insufficient information by publication time (1 recommendation)**

Note that a designation of "COMPLETE" does not imply that no further work need be done. Rather, many of these measures require ongoing attention. Note also that a summary list of the recommendations & their status is included as Appendix C of this report.

### 1) IMP-1: Hire Sustainability Coordinator

**COMPLETE**

- prepare GHG Assessment & achieve other ICLEI Milestones
- extend analysis to broader community
- foster sustainability programs & policies, and assist City departments
- track implementation of Climate Action Plan
- develop additional initiatives with Citizen Conservation Board, Green Team, etc.
- prepare an annual report to the commission
- coordinate with agencies & nonprofits to educate the Helena community
- staff the Citizen Conservation Board & Green Team

***Notes: Shortly after the 2009 CAP was released, a half-time Sustainability Coordinator was hired to work jointly for the City and County (quarter-time for each). This one-year assignment was funded through the federal Department of Energy's (Energy Efficiency and Conservation Block Grant program) as part of the American Recovery and Reinvestment Act of 2009. The County continued to fund a Sustainability Coordinator through at least 2014. In the fall of 2019, the City hired a permanent half-time Sustainability Coordinator.<sup>4</sup> This position reports directly to the City Manager.***

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<sup>4</sup> <https://www.helenamt.gov/government/departments/human-resources/position-descriptions>

## 2) IMP-2: Develop Green Team

UNDERWAY

- include a representative from each department
- track implementation of recommendations assigned to their department
- develop new policies, programs, and processes for their department
- coordinate inter-departmental efforts
- promote low-cost and no-cost measures to save energy and water, and to reduce waste:
  - turning-off unneeded lights, recycling, biking, walking, carpooling, reduced printing, etc.
- provide education for all City staff
- assist with the Annual Sustainability Report
- pursue green procurement

**Notes: A Lewis & Clark County Green Team was formed some time ago, and did some excellent work on projects pertaining to both the City and County (e.g. increased recycling and installation of water bottle filling stations in the shared City-County building). Recently, that group has been somewhat dormant, especially since the County Sustainability Coordinator position was discontinued. In early 2020, initial plans were developed to form a joint City-County Green Team that would be staffed by an Energy Corps<sup>5</sup> member. Unfortunately, the Energy Corps program lost its funding for the 2020-2021 class. Starting in March of 2020, the coronavirus epidemic presented additional challenges. As a result, this project was temporarily placed on hold.**

## 3) IMP-3: Form a Citizen Conservation Board

COMPLETE

- develop policies for energy & water conservation, GHG reduction, etc.
- build a community approach to climate change
- help amend mission statements of other City boards to incorporate sustainability

**Notes: The City Commission established the Citizen Conservation Board (CCB) in August 2017 (Resolution 20375) to "support, recommend, report on, and monitor sustainability measures undertaken by the City of Helena."<sup>6</sup> The CCB convened in January 2018, and will sunset in January 2023 unless reauthorized. In April 2018, the CCB articulated its purpose, which reads in part "to advise the Helena City Commission regarding actions to meet the goals of the Paris Agreement, including the goal to hold warming to well below 2°C, and to accelerate the transition to a clean energy economy that will benefit Helena's security, prosperity, and health."<sup>7</sup> The CCB has met on a monthly basis (except when all such boards were suspended from March through July 2020, due to the coronavirus outbreak). In addition to these regular meetings, the CCB has met for several informational tours (Helena Recycling facility, Transfer Station, Ten Mile Treatment Plant, County Landfill) and two strategic planning retreats. The**

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<sup>5</sup> <https://www.energycorps.org/>  
<https://www.energycorps.org/category/montana/>

<sup>6</sup> <https://www.helenamt.gov/government/departments/city-commission/ordinances-resolutions>

<sup>7</sup> <https://www.helenamt.gov/government/departments/citizen-conservation-board>

**CCB currently has four subcommittees: Energy & Transportation, Waste & Recycling, Water Conservation, and Public Education & Outreach.**

4) IMP-4: Conduct Education & Outreach

**UNDERWAY**

- coordinate with agencies & non-profits
- promote direct & indirect benefits of GHG reduction (climate, clean air, public health, traffic)
- co-sponsor tours & seminars
- promote alternative transportation (e.g. "Bike/Walk to Work Week")
- cover a wide range of topics (energy, water, solid waste, etc.)
- publicize incentives via website, brochures, bill stuffers, etc.
- issue "Lead by Example" news releases
- present awards
- partner with schools

**Notes: Some good outreach has been conducted (newspaper & radio interviews; Earth Day website and water bill insert; Waste Reduction Community Conversations, interaction with agencies, non-profits, schools, etc.). A Public Information Officer position was created in 2019 (but stood vacant through much of 2020), and the CCB formed a Public Education & Outreach Committee in 2020. Much more can and should be done to implement this recommendation going forward.**

5) IMP-5: Systematize Data Collection, Monitoring & Reporting

**COMPLETE**

- strive to standardize methodology, software, etc. to ensure accurate trend analysis
- make use of DEQ EnergyCAP data (or alternately-sourced, similar information)
- extend analysis to water
- prepare annual updates to the inventory
- prepare annual sustainability/environmental footprint report
- obtain energy audit information from NorthWestern Energy
- maintain ICLEI membership (ClearPath software, technical assistance & other resources)

**Notes: Since the creation of the CCB, some good progress has been made with this recommendation. City staff have kept a running record of "Beyond the Climate Action Plan - Accomplishments" in a spreadsheet called "Climate Change Matrix." In addition, Facilities Superintendent Troy Sampson has kept a record of "City Facilities Energy Projects 2009-2017)." Finally, this Annual Sustainability Report is intended to fulfill the goals of this recommendation for Calendar Year 2019, using many of the suggested techniques.<sup>8</sup>**

6) IMP-6: Establish a Municipal Government GHG Reduction Goal

**COMPLETE**

- goal is to reduce municipal government energy and carbon "20% below 2007 levels by 2020"

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<sup>8</sup> See Appendix I for additional notes on methodology.

**Notes: The analysis contained in this report indicates a continuing downward trend for City government energy usage, although the rate of decline is not as fast as initially envisioned. With one year remaining, Helena still has a chance to meet the "20% by 2020" energy reduction goal. The situation with respect to carbon is decidedly better: it appears that Helena has already reached its "20 by 20" CO<sub>2</sub>-reduction goal. This is partly due to the City's decreased energy use, but mostly a result of the dramatic improvement in the carbon intensity of the Pacific Northwest grid power. Chapter 3 of this report includes a full discussion of these issues. Ideally, and with the proper commitment and effort, next year's report will be able to show the successful achievement of the energy goal as well as the carbon goal.**

**7) IMP-7: Sign Mayors' Climate Protection Agreement (MCPA)**<sup>9</sup>

**COMPLETE**

- join 1000+ cities (including Billings, Bozeman, Missoula, and Red Lodge) in signing the MCPA
- the MCPA includes a commitment to the Kyoto GHG goal of "7% below 1990 levels by 2012"
- advocate for state and federal adoption as well

**Notes: Mayor Jim Smith signed the Mayors' Climate Protection Agreement on January 6, 2010. While this goal had already been met by the City government (2009 CAP, p. 27), the intent was to accomplish it community-wide. A community-wide analysis was not performed until this year, so it is unclear what those trends looked like for the period 1990-2012. Note that international goals have since been updated, the most recent being the 2015 Paris Climate Agreement. In 2017, the City of Helena endorsed the Paris goal of limiting warming to well below 2°C (Resolution 20347, adopted 6-26-17).<sup>10</sup> And in 2020, Helena signed onto the "America Is All In" Climate Statement.<sup>11</sup>**

**8) IMP-8: Develop Funding and Leveraging Resources**

**UNDERWAY**

- re-invest efficiency savings into additional projects
- take advantage of rebates and similar programs
- seek grant funding from agencies and other entities

**Notes: For some time now, the City Facilities Department has redirected energy savings to fund new efficiency projects (a process which can be thought of as internal performance contracting). In addition, the City is now looking into a partnership with an energy service company (ESCO) to perform major efficiency upgrades. The City has also pursued and received NorthWestern Energy demand-side management (DSM) rebates. Finally, the City has successfully applied for a number of sustainability-related grants. Two examples include:**

- A 2009 NorthWestern Energy Universal System Benefits (USB) grant for a pole-mounted 3.5-kW solar electric system at the Wastewater Treatment Plant. Note that USB is a state-

<sup>9</sup> <https://www.usmayors.org/programs/mayors-climate-protection-center/>

<sup>10</sup> <https://www.helenamt.gov/government/departments/city-commission/ordinances-resolutions>

On 12/7/2020, the Mayor & Commission also voted to join this statement: <https://americaisallin.com/>

<sup>11</sup> <https://americaisallin.com/>

*mandated program, funded by ratepayers to support conservation, renewable energy, R&D, and low-income bill assistance. An additional application for a 50-kW project is pending.*

- *A 2020 Montana DEQ grant for the installation of three dual-port electric vehicle charging stations to be located at city-owned properties.*

*The City should continue to look for similar opportunities in the future, as well as EnergyCorps or AmeriCorps staffing, should funding again become available.*

9) NRG-1: Lighting Upgrades at Ten Mile Treatment Plant

**UNDERWAY**

- replace T8 fluorescent lights with T5 or spectrally enhanced lighting

*Notes: While the specifics of this recommendation are somewhat obsolete (T5 fluorescent bulbs are no longer considered the industry-standard for efficiency), the spirit of the recommendation is entirely on point. Lighting upgrades remain at the top of the list of energy- and cost-saving measures for buildings, and even more so with the advancement of LED technology. LEDs are more efficient and longer lasting than fluorescents and avoid the trace mercury concerns. Ten Mile Plant Supervisor Ben Rigby reports that LED lighting upgrades are underway. Electrician Joe Edwards has been doing the work.*

10) NRG-2: Water-Source Heat Pump at Ten Mile Treatment Plant

**COMPLETE**

- replace electric-resistance heating with a water-source heat pump

*Notes: The electric resistance heaters (expensive to operate and GHG-intensive) were initially replaced with propane heaters -- a step in the right direction. In May 2011, these were swapped out for the efficient water-source heat pump envisioned by this recommendation (for cooling, as well as heating). Unfortunately, this particular heat pump has suffered a number of breakdowns resulting in some costly repairs. Proprietary software has also complicated the situation. Plant operators are working to address these concerns.*

11) NRG-3: Biomass Generator at Ten Mile Treatment Plant

**INCOMPLETE**

- study the feasibility of a 5-50 kW biomass generator, potentially also utilizing the waste heat (in 2009, the estimated cost of such a system was between \$0.70 - \$5.00 per watt)

*Notes: While this project never materialized, there has been some research into the possibility of a 50-kW (or larger) solar electric system at this location. Since 2009, the cost-per-watt for solar electric has come down substantially (from roughly \$6 to roughly \$2). In addition, the operation of solar photovoltaic (PV) systems avoids the air pollution and other environmental concerns associated with biomass (SO<sub>x</sub>, NO<sub>x</sub>, PM, etc.). The stated advantages of the biomass system include a much higher capacity factor (86% vs 15%) and the potential connection to the fuel-reduction projects in the Ten Mile watershed. In light of the water-source heat-pump, the co-gen (combined heat and power, or "CHP") aspect of the proposed plant is no longer needed. On balance, given current technology, a solar project appears to be the better approach for reducing the energy bills and carbon emissions associated with this facility.*



12) NRG-4: Efficiency Upgrades at Wastewater Treatment Plant

UNDERWAY

- improve aeration system (completed in June 2008)
- install Stirling Engines (installed, but subsequently disconnected)
- install blower building heat recovery systems (completed)
- install variable frequency drives and improved controls (completed)

**Notes: (These measures pertain to the Wastewater Treatment Plant, not the Ten Mile facility -- there was an error in the title of this section in the 2009 CAP.)**

**Even by the time of publication of the 2009 CAP, many of these projects had been completed. They were included in the report due to their ability to reduce the City's energy and GHG figures following the 2007 test year. This recommendation is categorized "UNDERWAY" because 1) the Stirling Engines were disconnected due to technical problems, and 2) there are always additional efficiency opportunities to be had in such large, complex, and energy-intensive facilities. As noted in the 2009 CAP, the operators of Helena's water and wastewater treatment plants have an impressive track record for innovation and efficiency, and they have continued to achieve sizable reductions.**

13) NRG-5: "Zero Net Energy" Target for Wastewater Treatment Plant

INCOMPLETE

- make Helena a national leader by achieving energy self-sufficiency at the WWT plant
- produce energy from methane gas capture, heat recovery boilers, Stirling Engines, etc.
- investigate the potential for an algae oil biodiesel pilot facility

**Notes: While the water and wastewater treatment plants have demonstrated an exemplary commitment to sustainability, this specific goal has not yet been adopted or achieved. The sheer quantities of energy involved make the goal inherently challenging, especially in the short-term. The 2009 CAP described Zero Net Energy as a "reach" goal for the wastewater plant -- sufficiently lofty that Helena might be the "first in the nation" if it were able to achieve it. For a variety of reasons, it would likely be easier to meet a Zero Energy goal at the Ten Mile Treatment Plant first.**

14) NRG-6: Develop a Comprehensive Energy Strategy

UNDERWAY

- conduct a detailed energy analysis (starting with building audits) across all departments
- establish goals and an action plan
- monitor progress
- look for synergies across the system as a whole and "Integrated Design" opportunities

**Notes: As acknowledged in the 2009 CAP, "The City already looks at energy usage data and potential efficiency projects collectively, across many of its buildings (apparently, it's somewhat rare for a City to have a centralized 'facilities department' -- in fact, Helena may be the only community in Montana to use this approach, which has proven effective in bringing greater focus on energy issues.)" Annual sustainability reporting also helps advance the goals of this recommendation. Since the 2009 CAP, numerous efficiency projects have been**

*finalized, and others initiated. According to the "City Facilities Energy Projects 2009-2017" list, the City has completed the following:*

- **City County Building**
  - *cooling phase 1-4*
  - *replace radiator control valves*
  - *replace/recalibrate room thermostats*
  - *retrofit both boilers with new controls*
  - *seal exterior doors (envelope upgrade)*
  - *replace cooling pump with energy efficient Grundfos pump*
  - *energy efficiency improvements to domestic hot water system*
- **Fire (Main Station)**
  - *Grundfos heat system pump, highest efficiency (2014)*
  - *new AC condenser coil*
  - *replaced large air compressors with smaller efficient models (2017)*
  - *weight room window replacement (envelope upgrade)*
- **Fire (Eastside)**
  - *installed insulated garage doors (envelope upgrades, 2013-2016)*
  - *new AC condenser coil*
  - *Energy Star microwave, dishwasher, refrigerator, stove replacement*
- **Capital Transit**
  - *high efficiency heating & cooling (new building opened mid-2011)*
  - *Energy Star microwave, garbage disposal replacement*
  - *computer heat controls updated (2017)*
- **City Shop**
  - *Grundfos heat system pump, highest efficiency (2016)*
  - *installed insulated garage doors (envelope upgrades, 2011-2016)*
  - *upgrade boiler controls (2017)*
  - *installed fans to better circulate heat*
  - *extended distribution waste oil burner*
  - *air compressor heat control dryer*
- **Neighborhood Center**
  - *Grundfos heat system pump, highest efficiency (2017)*
  - *Grundfos boiler circulating pump*
- **Civic Center**
  - *Grundfos heat system pump, highest efficiency (2017)*
  - *generator replacement (2017)*
  - *seal exterior doors (envelope upgrade)*
  - *Energy Star washing machine, replacement (2017)*
  - *Energy Star commercial freezer, replacement (2016)*

- *window replacement ballroom (envelope upgrade)*
- **Chamber of Commerce Building**
  - *hot water heater replacement*
- **Utilities Building**
  - *hot water heater replacement*
- **Parks Maintenance Building**
  - *new AC compressor (2017)*
  - *new energy efficient heater, replacement*
- **Police Storage**
  - *new energy efficient heater, replacement*

*Of course, significant opportunities for additional improvements remain. According to a recent analysis performed by the energy services company Ameresco, the 90,000 square-foot City-County building could reduce its energy 37% below 2019 levels (from 84,300 to 52,900 Btu/ft<sup>2</sup>). In 2019 (admittedly a harsh weather year), the combined energy bill for the City-County building was \$92,733 (\$54,719 for electricity and \$38,014 for natural gas).*

15) NRG-7: Adopt Energy Efficiency Standards for City-Owned Buildings **INCOMPLETE**

- follow the lead of the State of Montana with a "20% better than IECC" building standard
- for existing building stock, achieve a 10% reduction by 2020

***Notes: While the City has completed numerous efficiency improvements, as described above, it has not formally adopted these goals.***

16) NRG-8: Improve Lighting Efficiency of City Buildings **UNDERWAY**

- replace all incandescents, T12 fluorescents, and T8 fluorescents
- install motion sensors
- upgrade other lights (Legion Field, exit signs, etc.)

***Notes: Since 2009, LED lights have become the standard for energy efficiency. With their impressive cost savings and other benefits (longer life, cooler operating temperature, etc.), they are being broadly deployed throughout society. The City is making good use of this technology in both new construction and retrofits, and is collecting rebates from NorthWestern Energy's demand-side management (DSM) program. (The recommendation to convert to T5 fluorescents is now obsolete.)***

17) NRG-9: Reduce "Plug Loads" in Buildings **UNKNOWN**

- adopt a policy to procure Energy Star and "power managed" equipment
- encourage employees to do the same at home, via the Green Team
- systematically shut down office equipment at the end of the day, when possible
- consider the use of "smart power strips" to reduce phantom loads
- also consider embedded energy costs before replacing equipment (life-cycle analysis)

**Notes: As envisioned by the 2009 CAP, the City Green Team was to play an important role in implementing this recommendation. Since that body has yet to move forward, it's unclear exactly where the City stands with regard to these suggestions. Presumably, the continuation of the City's practices (2009 CAP, p. 47) coupled with rapid innovation in the electronics industry have yielded at least some savings in energy use and cost.**

**18) NRG-10: Work with the Utility & PSC on Clean Energy Policy**

**UNDERWAY**

- work to protect, expand, or adopt rate structures favorable to clean energy
  - volumetric rates (as opposed to flat charges or demand charges)
  - inverted block rates
  - interruptible rates
  - time of use rates
  - decoupling
- work with other Montana cities and advocates to achieve clean energy policy goals

**Notes: While City staff has yet to participate in Public Service Commission or other state-level policy-making processes on these issues (due to capacity and other considerations), the City has been involved (along with other Montana communities) in NorthWestern Energy stakeholder groups addressing topics such as:**

- **Utility-Scale and Community-Scale Renewable Energy Projects**
- **Green Tariffs**
- **Data Sharing**
- **Demand-Side Management**
- **Advanced Metering Infrastructure**
- **USB Renewables**
- **Resource Planning and Procurement Processes**
- **Electrification of Transportation**

**19) NRG-11: Install Renewable Energy Systems at City/County Facilities**

**UNDERWAY**

- install a 10-kW solar PV array on the City-County building
- install a 50-kW wind project at the County landfill
- consider projects at other locations as well

**Notes: In 2009, the City of Helena received a USB grant through NorthWestern Energy to install a 3.5-kW solar system at the Wastewater Treatment Plant. While that was a good first step, Helena has yet to meet the more ambitious targets of this recommendation. That could soon be remedied, however, with FY-2021 budget approval of \$90,000 for a 50-kW solar electric system. The economics of such a project appear to be favorable. Preliminary calculations show a payback period of approximately 17 years. Warranties for such systems are typically 25 years, and the expected service life is 30+ years.**

**By comparison, wind projects of this scale have roughly the same payback period but must contend with additional challenges. They tend to be more maintenance-intensive, for**

*example, and are also subject to zoning restrictions (on tower height, noise, etc.). Due to those considerations as well as the plummeting cost of solar, solar has become the preferred option for most installations in this size range (kilowatt-level, as opposed to megawatt-level).*

20) NRG-12: Adopt Standards & Improve Performance of Fleet Vehicles

**UNDERWAY**

- adopt State of Montana fleet efficiency standards
  - federal CAFE standard (~35 mpg for newly acquired vehicles)
  - Gov. Schweitzer goal of 30 mpg fleet average in each department
- adopt a procurement policy of "smallest & most efficient possible," which would allow for a small price premium for hybrid technology, for example
- conduct a fleet assessment and create a plan for saving fuel and reducing emissions
- acquire more efficient vehicles and use vehicles more efficiently (idle reduction, etc.)
- leverage fuel and maintenance savings into additional upgrades

***Notes: No such formal standard has been adopted, but some progress has been made. In 2017, the City acquired a Chevy Volt plug-in hybrid electric for its mail route. The City has about a half-dozen other hybrids in its fleet of 452 vehicles. Transportation Services Director David Knoepke is in the process of developing new purchasing guidelines that emphasize "the right vehicle for the right job." In addition, he is preparing a fleet assessment that will attempt to answer the question: "What is the appropriate replacement schedule for each type of vehicle?" In his estimation, some departments probably swap out their vehicles too frequently, and some not frequently enough (leading to excessive maintenance costs).***

21) NRG-13: Study Biodiesel Use and Supply

**INCOMPLETE**

- study the potential use of a 20% biodiesel blend (B20) in city-owned diesel vehicles
- study the availability of biodiesel supply, ideally from local sources

***Notes: No such study has been performed. Since 2009, enthusiasm for renewable fuels has waned, at least from a policy perspective. In 2017, for example, the Montana legislature passed SB 101 to repeal Montana's ethanol standard on a nearly unanimous vote.<sup>12</sup> The rapid advancements with electric vehicles have provided a different (and for some, more attractive) pathway to lowering GHG emissions in the transportation sector. But it is still official state policy that "The state of Montana encourages the use of alternative fuels and fuel blends to the extent that doing so produces environmental and economic benefits to the citizens of Montana . . . State and local governments should be encouraged to set an example with their vehicle fleets in the use of alternative fuels and fuel blends."<sup>13</sup> It should be noted that biodiesel avoids many of the drawbacks of corn-based ethanol, but has some of its own challenges. Montana DEQ offers a number of programs to encourage less-polluting***

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<sup>12</sup> <https://www.leg.mt.gov/bill-info/>

<sup>13</sup> MCA 90-4-1011: <https://www.leg.mt.gov/bills/mca/index.html>

**alternatives to traditional diesel vehicles.<sup>14</sup> These include electric vehicles, fuel cell vehicles, propane-powered vehicles, etc. All such approaches, including biodiesel, should be investigated.**

**22) NRG-14: Street Lights, Traffic Lights, & Fire Tower**

**COMPLETE**

- replace all streetlights, parking lot lights, etc. with LEDs
- use LEDs for the wintertime lighting of the Fire Tower
- ensure that replacement lights meet the Lighting Standards ordinance
- consider solar-powered lights

**Notes: Significant progress has been made in this area. In late 2018, NorthWestern Energy (NWE) announced a four-year, \$24 million statewide project to convert its 43,000 streetlights from using high-pressure sodium lamps to using LEDs.<sup>15</sup> The project was launched in Helena and Billings. NWE owns approximately 3,400 streetlights in Helena. The overwhelming majority have the "Cobra-head" design, with the remainder consisting mostly of Lexington, Contemporary, and Acorn designs.<sup>16</sup> While there were early questions about compliance with Helena's Lighting Standards Ordinance (City Code, Title 10<sup>17</sup>) and concerns about the overall aesthetics, NWE committed to providing timely solutions (shielding, re-orienting the lamps, etc.) in the minority of cases where "light trespass" or "objectionable glare" proved to be an issue. The company also committed to reducing the color-temperature to a "softer" 2700 K (instead of 3000 K) for all fixtures previously rated at 100 watts or lower (residential areas). By comparison, the high pressure sodium lights have a color temperature of about 2200 K, so 2700 K is something of a mid-way compromise. While the aesthetics are not to everyone's liking, the energy savings are impressive -- LED streetlights use about 60% less energy, and also last significantly longer (~50,000 hours vs. 20,000 hours). As for some of the other recommendations in NRG-14, Helena has acquired a number of solar-powered lights (e.g. along the Centennial Trail near the Last Chance Gulch underpass), and the City does indeed rely upon efficient LEDs with timers for seasonal Fire Tower lighting. With regard to parking garage lights, Interim Parking Manager Tim Nickerson reported in September 2020 that LED upgrades are saving the division approximately \$5,000 per month in energy costs compared to three years ago (reduced from \$7,600 to \$2,600).**

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<sup>14</sup> <http://deq.mt.gov/Energy>

<sup>15</sup> [https://helenair.com/news/local/northwestern-energy-makes-moves-to-replace-streetlamps-with-led-lighting/article\\_b4d0eedb-121d-53be-9bf0-d0f2f6f51683.html](https://helenair.com/news/local/northwestern-energy-makes-moves-to-replace-streetlamps-with-led-lighting/article_b4d0eedb-121d-53be-9bf0-d0f2f6f51683.html)

<sup>16</sup> According to an email from Howard Skjervem of NorthWestern Energy (10/27/20), the breakdown is approximately as follows:

Cobrahead -- 2174  
Lexington -- 420  
Acorn -- 401  
Contemporary -- 240  
Yardlight -- 171  
TOTAL -- 3406

<sup>17</sup> [https://codelibrary.amlegal.com/codes/helenamt/latest/helena\\_mt/0-0-0-1](https://codelibrary.amlegal.com/codes/helenamt/latest/helena_mt/0-0-0-1)

23) NRG-15: Employee Commute & Waste Reduction

UNDERWAY

- promote carpooling, non-motorized commuting, telecommuting, etc.
- promote recycling at City workplaces

**Notes: As mentioned earlier (IMP-2), the L&C County Green Team made some good progress on waste reduction at City-County workplaces. Further progress could be made with the formation of a joint City-County Green Team.**

**The COVID-19 pandemic inspired a nationwide/worldwide trend toward teleworking. As a public health measure, City employees were encouraged to work remotely when possible. As a result, it's expected that next year's analysis of employee commute (vehicle-miles-traveled in Calendar Year 2020) will decline below 2019 values. Many expect this trend to continue, at least to some extent, beyond the current health crisis. The recent and rapid adoption and improvement of video conferencing technology, for example, is likely to have lasting effects on the workplace.**

24) WTR-1: Adopt Water Conservation Rates

COMPLETE

- consider implementing tiered and/or seasonal water rates to promote conservation
- ensure new rates will provide adequate revenue for water/wastewater utilities

**Notes: On August 22, 2016, the City Commission adopted utility rates that included the following inclining tiers for residential water use (on top of a standard base rate):**

|                                 |                    |
|---------------------------------|--------------------|
| <b>first 8 units per month:</b> | <b>\$2.95/unit</b> |
| <b>units 9 through 15:</b>      | <b>\$3.00/unit</b> |
| <b>units 16 and above:</b>      | <b>\$3.10/unit</b> |

**(Note that a "unit" of water is 100 cubic feet or 748 gallons.)**

**Over time, the rates have been adjusted on occasion, but the tiered structure has remained.**

**As of November 2020, the rates are as follows:**

|                                 |                                 |
|---------------------------------|---------------------------------|
| <b>first 8 units per month:</b> | <b>\$3.39/unit</b>              |
| <b>units 9 through 15:</b>      | <b>\$3.80/unit</b>              |
| <b>units 16 and above:</b>      | <b>\$3.86/unit<sup>18</sup></b> |

**The goal of these rates is to provide a conservation incentive while also ensuring fairness, quality service, and adequate revenue for the City water utility.**

25) WTR-2: Continue Upgrade of Water Treatment Facilities

COMPLETE

- implement the recommendations of the 2005 Water Facilities Plan
- specifically, consider relying more heavily on the Missouri River Plant vs. Ten Mile Plant
- expand capacity of the Missouri River Treatment Plant from 7 to 12 mgpd
- address the issue of "unaccounted for water" (i.e. leaks in the system)

**Notes: Helena is well-served having two water supply systems to draw from, especially during peak-demand summer months. This dual-system provides enviable resiliency for the**

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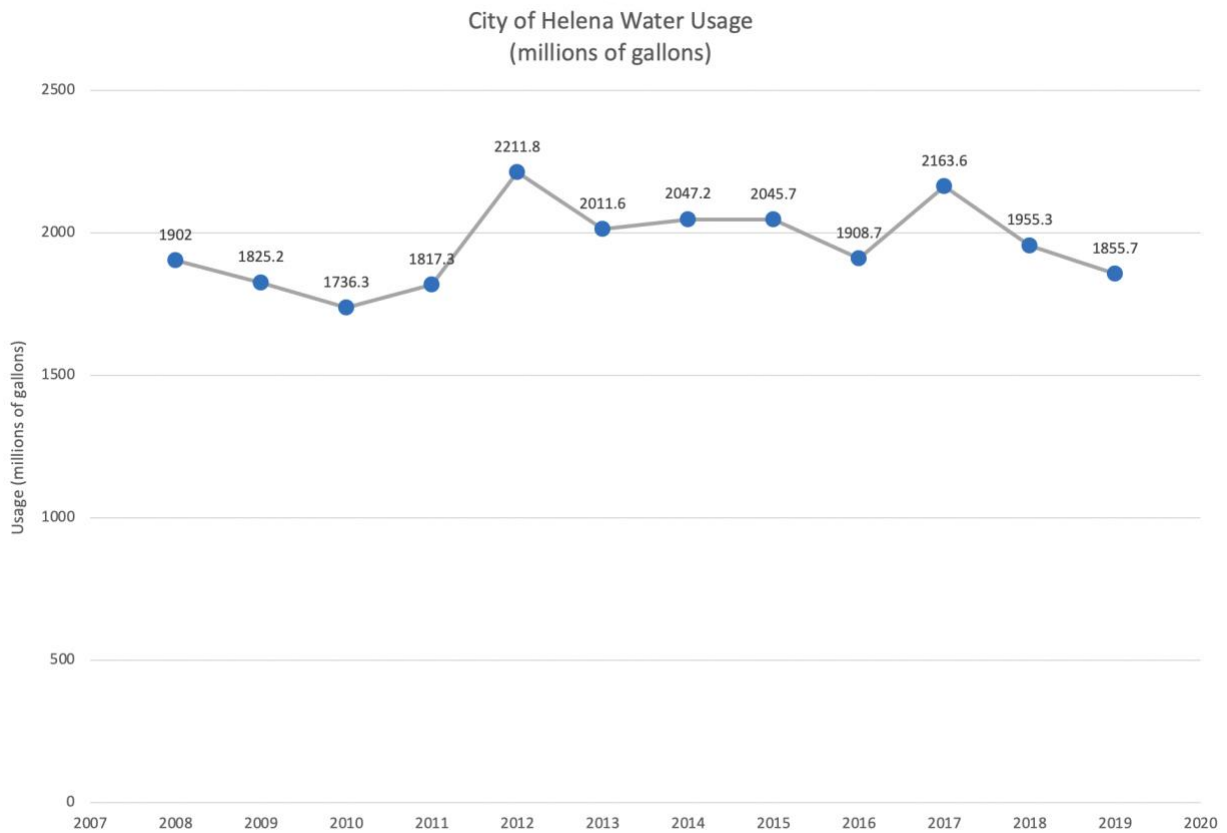
<sup>18</sup> <https://www.helenamt.gov/government/departments/finance/utility-customer-service/utility-faqs>

*community of Helena. The recommendation that the Missouri River Treatment Plant (MRTP) increase its capacity has been accomplished. The 2009 CAP reports a capacity of 7 million gallons per day (mgpd), with a recommendation that it be expanded to 13 mgpd. In 2020, the capacity of this plant was reported to be 12 mgpd. However, the recommendation that Helena make MRTP its primary water source has not been implemented and may not make sense. On January 25, 2020, the CCB met with Drinking Water Superintendent Eric Urban and Ten Mile Treatment Plant Supervisor Ben Rigby. During that discussion / plant tour, the benefits of continuing to rely primarily on the Ten Mile Treatment Plant (TMTP) became clear. Using a gravity-fed system saves large amounts of energy in avoided pumping. In addition, the raw water from the Ten Mile system has fewer impurities, which means fewer chemicals, less processing, and better taste. These factors translate into considerable cost savings for Helena ratepayers (assuming the Ten Mile remains physically and legally available as the primary source). Superintendent Urban also pointed to the third option of more fully utilizing the City's extensive groundwater reservation. According to a 2014 Water Supply Planning report prepared by HydroSolutions, the City is using less than 1% of its reservation ("the largest municipal water reservation in the Upper Missouri," which is especially valuable in a closed basin). The report also noted that "unperfected water use of the water reservation sunsets (expires) December 31, 2025."*

*Regarding the issue of "unaccounted for water," the City has made excellent progress tracking down and eliminating major leaks. One example is the replacement of the water main traveling from TMTP into town. The first phase of this project, which included a two-mile stretch from the plant to Baxendale, was completed in 2019 and resulted in substantial water savings. Another project, the lining of the historic Hale Reservoir (a brick-and-mortar building constructed in 1887), also achieved significant savings. All told, the City Engineer estimates a savings of well over a half-million gallons per day from recent projects. Helena's efforts to conserve water are reflected in the following chart (Figure 1), which shows surprisingly constant water usage, despite growth in the City. Note that this figure shows production-based data, and therefore will continue to improve with future leak-reducing infrastructure projects. Future editions of this report should also include consumption-based data. The delta between those two numbers represents the remaining "unaccounted for water" in the system.*



**Figure 1**

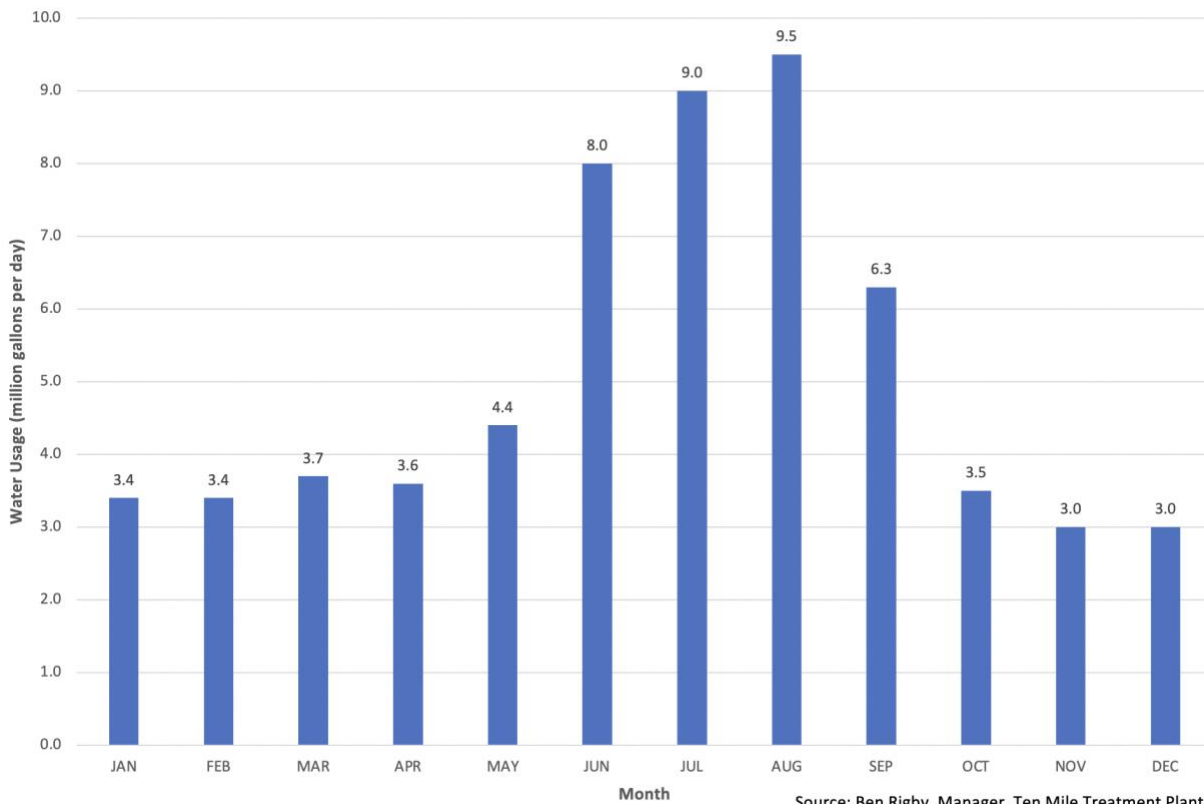


Source: Ben Rigby, Ten Mile Treatment Plant Manager

***Thanks in part to the 2020 infrastructure projects, the downward trend of the past couple of years should continue into the future.***

***It is also instructive to look at the monthly variability in Helena's water demand. As can be seen in Figure 2 below, Helena's water usage spikes dramatically in the summer months. This tripling of demand (from roughly 3 mgpd to 9 mgpd) underscores the importance of addressing summertime water use, particularly with regard to irrigated landscapes (parks, lawns, etc.). It is precisely this increase that requires the activation of the more costly Missouri River Treatment Plant in summer months. For other months, the Ten Mile Treatment Plant has sufficient capacity to cover all of Helena's needs.***

**Figure 2**  
**City of Helena**  
**Average Daily Water Consumption (2019)**



26) WTR-3: Adopt "Lush and Lean" Landscaping Practices

**UNDERWAY**

- City takes a leadership role in demonstrating responsible landscaping practices
- Reduce water use by City departments such as Parks

***Notes: One exciting development in this area is a program to shift the irrigation of City parks away from treated drinking water. City Parks is by far the City's largest water user (50.87 million gallons in 2016 according to the HydroSolutions report). Hill Park and Women's Park have already been converted to well water, with Waukesha Park slated to go next (other near-term possibilities are Lockey Park, Northwest Park, and the Carroll College campus). Kindrick-Legion Field has an existing well. The City of Helena has an extensive groundwater reservation that could be used to further diversify the City's water sources thereby increasing resiliency. Another option suggested by former Water Superintendent Eric Urban is to look at using "purple pipe" water from the wastewater treatment plant (at Bill Roberts Golf Course, for example). The Water Subcommittee of the CCB has indicated an interest in developing one or more demonstration projects, possibly including the south lawn of the City-County building.***

27) WTR-4: Study and Develop Community Water Conservation Incentives

UNDERWAY

- research incentive programs from other communities
- establish a fund to implement incentives (such as rebates)
- reduce per-capita average annual water usage from 175 gallons per day to 100 gpd
- reduce per-capita peak water usage from 487 gallons per day to 287 gpd

**Notes: While no such program yet exists in Helena, the CCB has identified this recommendation as a priority. Based on figures provide by TMTP Supervisor Ben Rigby, Helena has made good progress in making its water system more efficient. In 2008, the water system supplied an average of 5.2 million gpd and a peak of 12.7 million gpd. In 2019, those figures were 5.1 million gpd and 12 million gpd. While 2019 was a bit of an outlier (lower use due to mild weather), the overall conclusion remains true -- Helena has been able to keep its water demand relatively flat over an extended period of time, despite growth in its population and economy. Based on Helena's 2019 estimated population of 33,124<sup>19</sup>, the per-capita figures are: 154 gpd average and 400 gpd peak.\* So while Helena's water use intensity appears to be on a downward trend, more work will be needed to achieve the goals of this recommendation. The CCB Water Committee requested and received materials and advice from the City of Bozeman Public Works department, which has a robust program with three full-time staffers working exclusively on water conservation.**

**\*Although the specific numbers differ somewhat, the HydroSolutions Report showed a similar downward trend:**

| <u>Timeframe</u> | <u>Population</u> | <u>Average Use, Per-Capita</u> |
|------------------|-------------------|--------------------------------|
| 1984-1993        | 24,609            | 232 gpd                        |
| 1994-2003        | 25,780            | 203 gpd                        |
| 2013             | 29,560            | 186 gpd                        |

28) WTR-5: Develop an Education & Outreach Program on Water Conservation

UNDERWAY

- launch an extensive education and outreach campaign
- achieve the same per-capita water use goals identified in WTR-4

**Notes: While the City provides conservation tips and resources (utility bill inserts, public works website<sup>20</sup>, etc.), the level of activity described in this recommendation has not been achieved. The Water Subcommittee of the CCB is developing a series of workshops to educate the public about water conservation topics such as:**

- 1) **Introduction and Overview**
- 2) **Home Water Audit & Tips - Indoor Savings**
- 3) **Home Water Audit & Tips - Watering & Landscaping**
- 4) **City Water - Infrastructure & Opportunities**

<sup>19</sup> <https://www.census.gov/quickfacts/fact/table/US/PST045218>

<sup>20</sup> <https://www.helenamt.gov/government/departments/finance/utility-customer-service/utility-fags>  
<https://www.helenamt.gov/public-works/drinking-water>

*The Committee plans to launch these workshops in spring or summer of 2021. The Public Information Officer could be another key player in propelling this recommendation forward. The Committee is also interested in developing water-wise demonstration gardens.*

29) WTR-6: Research and Adopt a Targeted Program to Regulate Water Use **INCOMPLETE**

- consider adopting regulations to enforce water conservation
- achieve the same per-capita water use goals identified in WTR-4

*Notes: The 2009 CAP recommended pursuing these measures as needed to meet the water use targets following the implementation of WTR-4 and WTR-5: "The point of deferring a comprehensive regulatory scheme until completion of the other strategies is to first derive as much conservation benefit from the voluntary strategies as is possible." Hence, while it may be premature to implement such regulations, it would be worthwhile to begin the process of researching them. As mentioned in the 2009 CAP, Helena already has an emergency "water use reduction staging plan" that takes effect when system capacity is strained.<sup>21</sup>*

30) WTR-7: Pursue Water Supply / Municipal Watershed Protection **UNDERWAY**

- protect and enhance the resiliency and integrity of the Ten Mile watershed
- implement the recommendations of the Ten Mile Watershed Collaborative Committee

*Notes: The Ten Mile Watershed Collaborative Committee (TMWCC) concluded its work on June 17, 2009. The final report (reproduced as Appendix O of the 2009 CAP) contained numerous recommendations organized under the following major goals:*

- *Protect and Improve Water Quality and Quantity*
- *Protect City Water Delivery Infrastructure*
- *Protect and Improve Long-Term Quality of Wildlife Habitat*
- *Reduce Damage of Major Wildfire*
- *Promote Potential for Restoration in Watershed of a Viable Fishery and Wetlands*
- *Provide for Present and Future Public Safety*

*The TMWCC was convened to address concerns over the potential for catastrophic wildfire resulting from numerous contributing causes -- decades of fire suppression, inconsistent management due to a complicated mix of private and public lands, extensive mortality due to the pine beetle epidemic, climate change, etc. One major fear was that a wildfire would compromise the municipal water supply due to ash and sediment loading.*

*Since 2009, considerable investment has been made to advance these six goals using city, state, and federal funding. The first area of focus was the removal of dead trees in the vicinity of the Red Mountain Flume and the Chessman Reservoir. In 2014, another group was formed: the Ten Mile - South Hills Forest Restoration Collaborative Committee. This group recommended 36 actions to protect and improve the Upper Ten Mile Watershed and surrounding areas. In 2018, the Forest Service adopted its Record of Decision for the "Ten Mile*

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<sup>21</sup> City Code 6-2-3, Rule 8: [https://codelibrary.amlegal.com/codes/helenamt/latest/helena\\_mt/0-0-0-1](https://codelibrary.amlegal.com/codes/helenamt/latest/helena_mt/0-0-0-1)

***- South Helena" proposal, which included significant fuel reduction projects south and west of Helena (timber sales, prescribed burns, etc.) to occur over the next 15 years. This proposal engendered substantial controversy, including legal challenges. Opponents are concerned about the cumulative effects of multiple landscape-level projects in the area -- specifically, impacts to wildlife and the integrity of the inventoried roadless areas (Jericho Mountain & Lazyman Gulch). They object to new logging roads (and the sediments they cause), mechanized logging, expanded use by mountain bikes, and general large-scale disturbances. In September 2019, the City submitted an amicus brief describing the City's history and interest in the project. Lewis & Clark County submitted a similar brief.***

**31) TWRPP-1: Support Formation of an Urban-Area Transportation District**

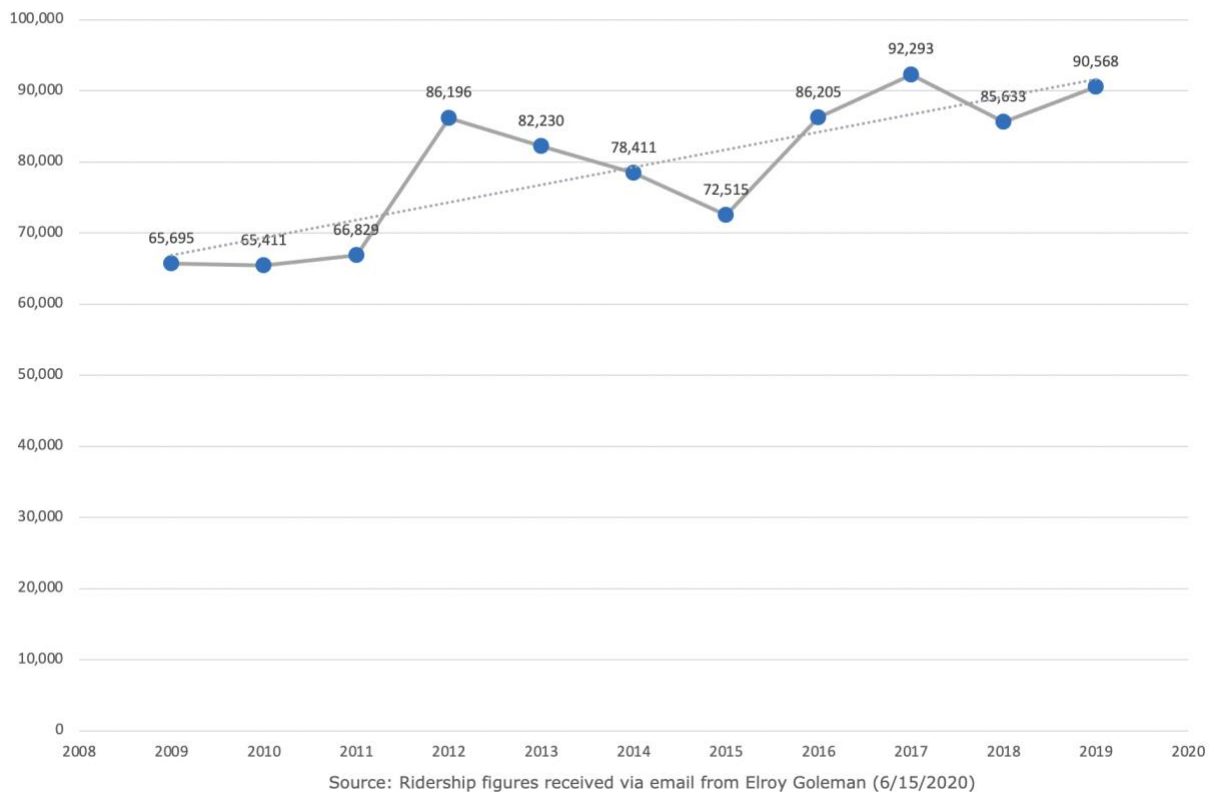
**UNDERWAY**

- reduce vehicle-miles-traveled with improved public transit
- create an Urban-Area Transportation District (UATD) to fund these efforts

***Notes: While a UATD has not been established, significant work has been completed in the area of Helena's public transit system. In 2016, a new bus service -- the "Capital Transit" (aka "Capital T") -- replaced the "Helena Area Transit Service (HATS)" complete with new buses and routes. Another major accomplishment was the construction of the new Bus Depot (opened in mid-2011 at 1415 N Montana Ave) and the subsequent sale of the former depot (630 N Last Chance Gulch). However, major concerns remain regarding ridership levels (exacerbated by the current pandemic). For example, in its "Review and Recommendations Regarding the Fiscal Year 2021 Revised Preliminary City Budget" the Helena Citizens' Council communicated the following to the City Commission: "Fund #580 - Capital Transit - Increased ridership is critical and the HCC supports efforts to change the fixed routes and/or initiate an on-demand service approach to increase ridership. A robust publicity effort is needed and should accompany any route changes and/or new services." In addition, there are concerns over the efficiency and pollution associated with the existing fleet of diesel buses. The City should consider alternatives for future purchases, such as the electric buses used by Mountain Line in Missoula, compressed natural gas, propane, etc.). Another approach being looked at is a return to more of a demand-response type system (similar to the old "Dial-a-Ride"), as opposed to fixed routes and making use of smaller / more efficient vehicles.***

**Figure 3**

City of Helena  
Transit Ridership



***Transit Superintendent Elroy Goleman notes that East Valley service started in 2012, and Legislative Shuttle service started in 2015 (odd-numbered years only).***

**32) TWRPP-2: Improve Non-Motorized Transportation and Infrastructure UNDERWAY**

- implement recommendations of the Non-Motorized Travel Advisory Council
- support alternative transportation through education, infrastructure, etc.

***Notes: The Helena City Commission adopted a "Complete Streets Policy" on December 20, 2010 (Resolution 19799).<sup>22</sup> Ten years later, there is good evidence that Helena has improved its walkability, bike-ability, etc. Nonetheless, much work remains to be done to fully implement this recommendation. For example, Helena has yet to join Billings, Bozeman, and Missoula as an officially-designated "Bicycle Friendly Community."<sup>23</sup>***

**33) TWRPP-3: Establish a "Pay-As-You-Throw" (PAYT) Solid Waste Program INCOMPLETE**

- incentivize solid waste reduction with volumetric disposal rates (versus flat fees)

***Notes: This type of program has not been broadly implemented in Helena. As of 2020, City homeowners pay a flat fee (\$176.10) on their property taxes for solid waste services, which***

<sup>22</sup> <https://www.helenamt.gov/government/departments/city-commission/ordinances-resolutions>

<sup>23</sup> <https://www.bikeleague.org/community>

*entitles them to weekly pickup and 3,000 pounds worth of disposal at the transfer station. Only after that limit is reached do permit-holders enter a PAYT system.<sup>24</sup> Note that the landfill assesses a "tipping fee" of \$23/ton for construction & demolition (C&D) waste. Potential downsides to a universal PAYT program include a heightened risk of illegal dumping on public or private lands, and greater complexity and/or higher administrative costs, particularly given that much of Helena's residential waste is collected in 96-gallon roll-out containers, or shared-use, 300-gallon alley containers -- none of which are weighed. Furthermore, additional cash transactions could aggravate wait-times and congestion at the Transfer Station, although it could also discourage the frequency of use. Finally, implementation would require issues of equity to be addressed to ensure fairness to low-income community members. On the other hand, some have argued that Helena's existing system is perhaps "too cheap and convenient," with little incentive to employ "upstream, midstream, and downstream" methods of reducing landfill-destined waste.*

34) TWRPP-4: Adopt a Solid Waste Reduction Goal

**UNDERWAY**

- achieve the EPA goal of 35% diversion by 2020 (based on 2006 baseline)
- promote the integrated waste hierarchy of reduce, reuse, recycle, rot (compost)

*Notes: Helena offers fairly comprehensive recycling services at the Transfer Station (1975 N Benton Ave), with the following materials being collected<sup>25</sup> (and with the benefit that recyclables do not count toward the 3,000-pound annual permit limit):*

- *newspaper, office paper, magazines, etc.*
- *"tin" (steel) cans*
- *aluminum cans*
- *glass containers*
- *plastics (1 & 2 only, but no black plastics)*
- *refrigerators (if properly prepared)*
- *other scrap metal (appliances, etc.)*
- *car batteries, oil, antifreeze*
- *e-waste (except some tv's)*
- *tires*
- *yard waste (branches, leaves, and grass clippings) -- does count toward the 1.5-ton limit*
- *paint exchange events*
- *household hazardous waste collection day*

*In addition, the City provides off-site collection at six locations (for mixed paper, cardboard, and metal cans only):*

**1) Safeway (611 N Montana Ave)**

**2) Dale Harris Park area (near the intersection of Cruse Ave & Park Ave)**

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<sup>24</sup> <https://www.lccountymt.gov/public-works/solid-waste/pay-as-you-throw.html>

<sup>25</sup> <https://www.helenamt.gov/government/departments/public-works/solid-waste/recycling>

**3) L&C County Fairgrounds (98 W Custer Ave)**

**4) Boeing (3200 Skyway Dr)**

**5) Grub Stake (1450 Lincoln Rd E)**

**6) Mini-Basket (3012 Canyon Ferry Rd)**

***In 2016, the City entered into a public-private partnership with Helena Recycling<sup>26</sup> to provide curbside recycling services. As of 2020, customers pay \$8 per month on their water bills for every-other-week pick-up (scheduled to be reduced to \$7 per month sometime in FY 2021).***

***The City subsidizes the service with a contribution of \$4.20 per customer per month (recently reduced from \$5.20 per month when Helena surpassed 1,000 customers - however, this could be bumped back up to \$5.20 to fund the \$1 customer fee reduction described above).***

***Customers are provided with four City-owned bins for: mixed paper, metal cans (steel & aluminum), plastic containers (#1 and #2), glass containers, and cardboard (flattened and placed under one of the bins). Approximately 1,300 customers are currently enrolled. Helena Recycling also offers curbside recycling services to renters, county residents, businesses, State of Montana, etc., but not with the benefit of City-subsidized rates.***

***According to the 2009 CAP, Helena produced 41,437 tons of solid waste in 2006. 35% of that figure would be 14,503 tons. As can be seen in the following table, Helena's diversion rates have been improving, but remain well below the goals of this recommendation.***

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<sup>26</sup> <http://www.helenarecycling.com/>



| <b>Table 1: City of Helena Transfer Station Waste and Diverted (Recycling + Compost) Tonnage</b> |                        |                 |                       |
|--|------------------------|-----------------|-----------------------|
| <b>Fiscal Year</b>   | <b>Solid Waste Out</b> | <b>Diverted</b> | <b>Diversion Rate</b> |
| 1992   | ?                      | 208             | ?                     |
| 1993   | ?                      | 326             | ?                     |
| 1994   | ?                      | 382             | ?                     |
| 1995   | ?                      | 1,290           | ?                     |
| 1996   | ?                      | 3,086           | ?                     |
| 1997   | ?                      | 3,811           | ?                     |
| 1998   | ?                      | 3,167           | ?                     |
| 1999   | ?                      | 3,863           | ?                     |
| 2000   | ?                      | 3,766           | ?                     |
| 2001   | ?                      | 4,055           | ?                     |
| 2002   | ?                      | 4,174           | ?                     |
| 2003   | ?                      | 4,046           | ?                     |
| 2004   | ?                      | 4,746           | ?                     |
| 2005   | 37,511                 | 5,375           | 14.3%                 |
| 2006   | 38,407                 | 5,076           | 13.2%                 |
| 2007   | 39,647                 | 5,757           | 14.5%                 |
| 2008   | 38,988                 | 5,336           | 13.7%                 |
| 2009   | 36,233                 | 5,008           | 13.8%                 |
| 2010   | 36,818                 | 6,838           | 18.6%                 |
| 2011   | 36,907                 | 6,461           | 17.5%                 |
| 2012   | 36,314                 | 6,418           | 17.7%                 |
| 2013   | 36,801                 | 5,656           | 15.4%                 |
| 2014   | 37,401                 | 6,367           | 17.0%                 |
| 2015   | 37,572                 | 6,121           | 16.3%                 |
| 2016   | 37,114                 | 5,893           | 15.9%                 |
| 2017   | 36,230                 | 6,304           | 17.4%                 |
| 2018   | 35,932                 | 6,746           | 18.8%                 |
| 2019   | 35,433                 | 7,956           | 22.5%                 |
| 2020   | 39,804                 | 6,713           | 16.9%                 |
| <i>Source: Email from Jacob Larson (9-17-20), forwarded by Kim Carley &amp; Pete Anderson.</i>   |                        |                 |                       |

*The table shows encouraging early growth, but a flattening over the last ten years. It should also be noted that a growing fraction (in fact, a fairly large majority) of the diverted tonnage is yard-waste. Recyclables (at least those processed at the Transfer Station) have not shown much recent growth. This could be, in part, a result of the major shifts in the recycling industry due to China's changing policies regarding imports, and the associated incorrect perception*

that Helena's recyclables are being landfilled. This is an area the CCB's Waste Committee has identified as ripe for increased public education.

Note that the 2006 waste figures in the 2009 CAP and the above table differ somewhat. This underscores the many challenges of pinning down firm numbers. As just one example, the Column 2 figures used in the table above refer only to the Transfer Station as opposed to Landfill tonnages (which are significantly higher, since they include other sources of solid waste). Similarly, the Column 3 diversion numbers do include the remote recycling sites, but do not include Helena Recycling or other private collections and diversions (Pacific Steel, 406 Recycling, ReStore, etc.). Finally, it should be verified that the Column 3 numbers are included as part of Column 2 (i.e. that Column 2 captures the total tonnage flowing through the Transfer Station). If that's not the case, then the diversion rates reported above could be artificially high.

| <b>Table 2: State of Montana and City of Helena<br/>Solid Waste Diversion Goals and Percentages</b>  |                |                  |                    |                      |
|--|----------------|------------------|--------------------|----------------------|
| <b>Year</b>  | <b>MT Goal</b> | <b>MT Actual</b> | <b>Helena Goal</b> | <b>Helena Actual</b> |
| 2003   |                | 15.0%            |                    |                      |
| 2004   |                | 15.0%            |                    |                      |
| 2005   |                | 18.7%            |                    | 14.3%                |
| 2006   |                | 18.6%            |                    | 13.2%                |
| 2007   |                | 18.3%            |                    | 14.5%                |
| 2008   | 17%            | 19.6%            |                    | 13.7%                |
| 2009   | 17%            | 19.1%            |                    | 13.8%                |
| 2010   | 17%            | 19.7%            |                    | 18.6%                |
| 2011   | 19%            | 19.4%            | 19%                | 17.5%                |
| 2012   | 19%            | 21.9%            | 19%                | 17.7%                |
| 2013   | 19%            | 15.9%            | 19%                | 15.4%                |
| 2014   | 19%            | 22.2%            | 19%                | 17.0%                |
| 2015   | 22%            | 17.6%            | 22%                | 16.3%                |
| 2016   | 22%            | 17.1%            | 22%                | 15.9%                |
| 2017   | 22%            | ?                | 22%                | 17.4%                |
| 2018   | 22%            | ?                | 22%                | 18.8%                |
| 2019   | 22%            | ?                | 22%                | 22.5%                |
| 2020   | 22%            | ?                | 35%                | 16.9%                |
| <b>Table 2 Sources</b><br><b>Column 2: State of Montana Diversion Targets<sup>27</sup></b><br><b>Column 3: State of Montana Diversion Percentages<sup>28</sup></b><br><b>Column 4: City of Helena Diversion Targets<sup>29</sup></b><br><b>Column 5: City of Helena Diversion Percentages<sup>30</sup></b> |                |                  |                    |                      |

<sup>27</sup> Montana Integrated Waste Management Act (MCA 75-10-803):

[https://www.leg.mt.gov/bills/mca/title\\_0750/chapter\\_0100/part\\_0080/section\\_0030/0750-0100-0080-0030.html](https://www.leg.mt.gov/bills/mca/title_0750/chapter_0100/part_0080/section_0030/0750-0100-0080-0030.html)

<sup>28</sup> MT DEQ Recycling Summary (2016 Summary Report): [http://deq.mt.gov/Land/recycle/recycling\\_statistics\\_page](http://deq.mt.gov/Land/recycle/recycling_statistics_page)

<sup>29</sup> Helena Climate Action Plan (TWRP-4, page 84, see Footnote 1 for link)

<sup>30</sup> Email from Jacob Larson (9-17-20), forwarded by Kim Carley & Pete Anderson

The CCB has identified solid waste reduction as a major priority for the coming year. Whether the effort is termed "Integrated Solid Waste Management," "Alternative Waste Management," "Waste Reduction" (all with specific numeric reduction goals), or even the more ambitious vision of "Zero Waste"<sup>31</sup> it's clear that there is a lot of interest and momentum for reducing Helena's wastestream. Here is a quick summary of CCB efforts:

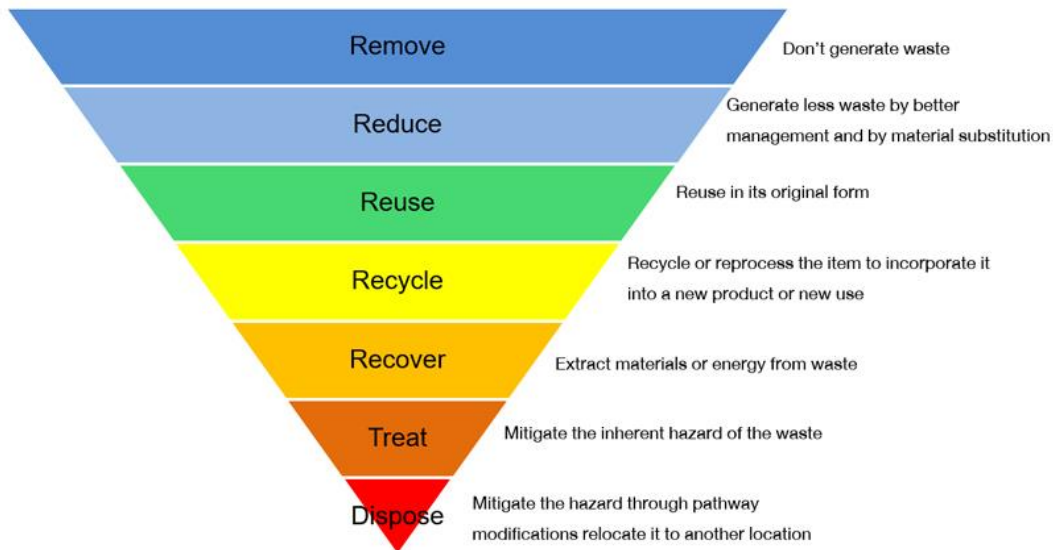
- Tour of the Helena Recycling facility (6/14/18)
- Letter to the City Commission regarding waste language in the Growth Policy (12/12/19)
- Tour of the Transfer Station (12/13/19)
- Community Conversation About Reducing Helena's Waste Footprint (8/18/20)
- Follow-up community waste reduction meeting (9/14/20)
- Tour of the County Landfill (9/25/20)
- Community Forum on Recycling in Helena (11/10/20)

On June 29, 2020, the City Commission adopted a new Growth Policy with strong goals regarding climate change, solid waste reduction, and environmental sustainability. As recommended by the CCB, it included the following action item (A.48):

" Develop an integrated solid waste management plan which establishes priorities for waste management and sets a waste reduction target (which may include a Zero Waste target). These approaches, in order of priority, are: 1. Source Reduction; 2. Reuse; 3. Recycling; 4. Composting; and 5. Landfill."

A helpful visual that emphasizes the relative importance of those approaches -- from most desirable to least -- follows:

**Figure 4<sup>32</sup>**



<sup>31</sup> <https://www.zerobyfiftymissoula.com/>

<sup>32</sup> <https://greens.org.au/sites/default/files/inline-images/hierarchy.png>

35) TWRPP-5: Institute a Per-Bag Fee for Disposable Shopping Bags INCOMPLETE

- pass a City ordinance requiring a 10¢ or 25¢ fee for each disposable shopping bag

**Notes: As mentioned in the 2009 CAP, some Helena retailers have voluntarily adopted policies aimed at reducing or eliminating disposable shopping bags, and some provide plastic bag recycling bins, but no such City mandate has been adopted. Voluntary reduction of disposable shopping bags may also be an area appropriate for public education, which could include promoting those retailers with resource-conscious practices.**

36) TWRPP-6: Adopt a Municipal Back-to-the-Tap Policy INCOMPLETE

- promote Helena's clean, energy-efficient municipal tap water over bottled water  
(specific actions include assessments, education, and policy changes)

**Notes: While some progress has been made by the L&C County Green Team (installing water bottle refilling stations at the City-County Building for example), most of the specific actions associated with this recommendation have not been implemented.**

37) TWRPP-7: Adopt a Green Blocks Program COMPLETE

- conduct energy, water, and waste audits followed by retrofits for 100 homes
- model the project after the Missoula program that was conducted in 2008-2009
- publicize the project

**Notes: The City of Helena, in partnership with NorthWestern Energy and AERO, conducted a Green Blocks program in the summer of 2010.<sup>33</sup> In addition, Helena was a key participant in NorthWestern Energy's "Smart Grid Demonstration Project" which took place in the years 2010-2014.<sup>34</sup> This project tested a variety of smart grid technologies such as advanced metering infrastructure, dashboard displays, and time-of-use rates. Both of these early programs were encouraging from the standpoint of energy conservation, though limited in their scope and scale. In the spring of 2019, Resilient Helena<sup>35</sup> organized a neighborhood education program as part of the "Transition Streets" movement. The first iteration took place in the "Bentonia" neighborhood and included wide-ranging discussions on energy, water, and waste. This model could be replicated throughout Helena.**

38) TWRPP-8: Increase Local Food Production and Consumption COMPLETE

- support the Helena Farmers' Market
- support community gardens
- promote water-wise, organic, sustainable, low-input gardening

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<sup>33</sup> [https://helenair.com/news/city-launches-green-block-project-with-northwestern/article\\_7b94af4a-5d80-11df-a812-001cc4c03286.html](https://helenair.com/news/city-launches-green-block-project-with-northwestern/article_7b94af4a-5d80-11df-a812-001cc4c03286.html)

<sup>34</sup> <https://www.northwesternenergy.com/docs/default-source/documents/defaultsupply/plan15/volume2/smartgriddemonstrationproject>

<sup>35</sup> <https://resilient-helena.org/>

**Notes: Since 2009, interest in and support for local and organic food has grown considerably. As the longest-running operation of its kind in Montana (46 years in 2019), the Helena Farmers' Market experienced impressive growth over that time frame.<sup>36</sup> In a typical year, the market spans two city blocks and features over 350 vendors per season. Other farmers' markets have been emerging as well, such as Capitol Square Farmers' Market<sup>37</sup> and Meadowlark Farmers' Market.<sup>38</sup> Helena's community gardens are also flourishing. Most of the 11 properties are managed by Helena Community Gardens, a non-profit that formed in 2012.<sup>39</sup> One great showcase project is the City-owned 6th Ward Garden Park, which was started in 2013 with the vision of becoming Montana's first "urban edible forest."<sup>40</sup> The City of Helena has been an important partner in these efforts.**

### Other Recommendations

Prior to its final report, the Climate Change Task Force had advanced six "Interim Recommendations." These are summarized on pages 9-10 of the 2009 CAP as follows: "In September 2008, the Task Force issued a Mid-Term Report to the City Commission (Appendix F1), with four specific recommendations. The Task Force felt the recommendations were timely and reasonable, regardless of the final outcome of their deliberations. The Task Force continues to stand by those recommendations, which include:

- 1) That the City reduce permit fees for certain construction or installation projects that are for renewable energy;
- 2) That the City Commission endorse a change in State law to allow cities the authority to adopt energy building codes more stringent than the state code;
- 3) That the City create a "green" procurement team that would review existing office equipment inventory and purchasing schedules and create a policy that would increase the energy efficiency of municipal office equipment; and
- 4) That the Utility Billing Unit reformat water bills to provide more transparency to customers: namely, to explain key billing terminology (e.g. define "CCF" in terms of the numbers of gallons it represents); and to provide customers with a breakdown of the previous twelve months of water usage.

(See Appendix F1 for a more detailed description of these recommendations and the rationale behind them.)

The Commission, after staff review of the recommendations, responded as follows:

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<sup>36</sup> <https://www.helenafarmersmarket.com/>

<sup>37</sup> <https://www.facebook.com/CapitolSquareFarmersMarket/>

<sup>38</sup> [https://helenair.com/news/local/meadowlark-farmers-market-held-downtown-every-saturday/article\\_470cf1dd-818a-5cb1-bd14-8f0830b7db7d.html](https://helenair.com/news/local/meadowlark-farmers-market-held-downtown-every-saturday/article_470cf1dd-818a-5cb1-bd14-8f0830b7db7d.html)

<sup>39</sup> <http://helenagardens.org/>

<sup>40</sup> <https://6thwardgardenpark.com/>

**Recommendation (1)**—based on the staff finding that the City’s permit requirements and costs seemed consistent with those of other cities, the Commission endorsed the exploration of other incentives besides fee reductions;

**Recommendation (2)**—the City accepted this recommendation and brought it to the League of Cities and Towns as an action item for the 2009 Legislature. Although the League supported the legislation (HB 420), the version that passed was considerably weakened.

**Recommendation (3)**—the staff research indicated that the City IT department already had a policy emphasizing Energy Star purchases, and suggested that for other City equipment, the City’s administrative services department could coordinate the development of a green procurement policy. The Commission endorsed that approach.

**Recommendation (4)**—First, the finance department modified the City water bill to identify the gallon equivalent of the billing unit (1 CCF = 100 cubic feet = 748 gallons). Second, the staff suggested that conversion to an electronic billing system could provide the best access to a customer’s water-use history, but noted that such a system could cost as much as \$95,000. The Commission endorsed the idea of an electronic billing option because of its potential use in all City billing functions.

The Task Force provided interim recommendations on two other occasions. In March 2009, the Task Force weighed in on the City’s proposed list of projects to receive funding under the Stimulus Bill (officially, the American Reinvestment and Recovery Act of 2009). These appear as Appendix F2. Later in May, the Task Force recommended projects for funding by the federal Energy Efficiency and Conservation Block Grant program (also part of ARRA). This communication appears as Appendix F3. "

**Notes: Regarding Recommendation (1), the City passed Resolution 20074 on March 24, 2014 that included an "alternative energy incentive to promote the use of solar electric, solar water, wind turbine, and geothermal and ground source heat pump systems in the City of Helena."<sup>41</sup> The reduced permitting fees in that incentive contributed to Helena's recognition as a "SolSmart Silver" city in 2018.<sup>42</sup>**

**Regarding Recommendation (2), there have been no further updates. Under state law, cities may not pass mandatory building codes stronger (or weaker) than the state code, although they may adopt incentives for meeting higher standards. The City of Helena has yet to do so. However, the State has continued to update its energy codes (as part of the broader building codes) to conform to more recent iterations of the International Energy Conservation Code (including a proposed update to the 2018 IECC in early 2021).**

**Regarding Recommendation (3), further review and work on procurement policies is awaiting the convening of the City Green Team.**

**Regarding Recommendation (4), despite a lapse of unknown duration, the City resumed printing the "1 CCF = 100 cubic feet = 748 gallons" message on water bills in early 2020. In**

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<sup>41</sup> <https://www.helenamt.gov/government/departments/city-commission/ordinances-resolutions>

<sup>42</sup> <https://solsmart.org/>

*addition, citizens now can request their water bills to be sent electronically, which saves paper and postage. For some time now, citizens have been able to pay their water bills online, but the system could be modernized and improved to include payment and usage history, etc. Regarding Recommendation (5), numerous projects identified by the Climate Change Task Force in its "Stimulus Funding Recommendations and Endorsements" list (Appendix F2 of the CAP) have been completed or partially completed. However, numerous others remain unattended to. Because of the mixed progress, the status is considered "Underway." Regarding Recommendation (6), the City was successful in obtaining funding for a one-year, part-time Sustainability Coordinator shared with the County (hired in October 2009). Other portions of the recommendation (such as the installation of solar panels at the City-County Building) were not funded. Because of the mixed progress, the status is considered "Underway."*

*In Summary,*

- |  |            |
|--|------------|
| 39) INT-1: Reduced Fees for Renewables                         | COMPLETE   |
| 40) INT-2: Energy Efficient Building Codes (see NRG-7)         | INCOMPLETE |
| 41) INT-3: Green Team / Procurement Policy (see IMP-2 & NRG-9) | UNDERWAY   |
| 42) INT-4: Transparency in Water Bills                         | COMPLETE   |
| 43) INT-5: Stimulus Recommendations                            | UNDERWAY   |
| 44) INT-6: Block Grant Recommendations                         | UNDERWAY   |

### 3) Energy Use & Greenhouse Gas Assessment: City Government

A key step in climate action planning is the analysis of a jurisdiction's energy use and associated greenhouse gas (GHG) emissions. Members of the 2008-2009 Climate Change Task Force spent several months working with City staff to gather and analyze data for two test years (calendar years 2001 and 2007), for the purpose of establishing a baseline and discovering trends. Given limited time and resources, the group confined its analysis to the municipal government only, as opposed to the broader Helena community. GHG modeling was performed using the Clean Air and Climate Protection (CACP) software, which was made available through Helena's membership in "ICLEI" (International Council for Local Environmental Initiatives).<sup>43</sup>

The Task Force was pleasantly surprised to discover that the City government's energy use and associated emissions were already on a downward trend. Both had declined approximately 20% over the six-year period between the two test years. The decreases were attributable largely to upgrades and innovations in the water and wastewater treatment plants, as well as improved energy efficiency in City buildings.

Based on this data, the task force recommended a goal of reducing the City government's GHG emissions an additional 20% from 2007 levels by 2020 (Recommendation #IMP-6). The following analysis attempts to quantify Helena's progress toward that goal. It is important to note that any such analysis is subject to multiple sources of uncertainty, and the results should be considered best estimates only. In particular, this analysis had to contend with the following challenges:

- 1) **Different software.** Sometime between 2009 and 2019, ICLEI converted its software from CACP to ClearPath.<sup>44</sup>
- 2) **New assumptions.** Protocols underlying the calculations in the software continually evolve, to comport with the most recent science and international guidelines.
- 3) **Different data-gathering procedures.** For the current analysis, electricity & natural gas data were collected through MT Department of Environmental Quality<sup>45</sup> instead of by hand (as was done for 2001 and 2007).<sup>46</sup> While this approach is far less labor-intensive, the data set is known to have some limitations. In particular, some newer accounts (including some big ones like the Law & Justice Center) appear not to be included.
- 4) **Insufficient documentation of methodology.** As an example, the 2009 CAP does not describe how the emissions associated with solid waste were calculated. The reported emissions from this sector are quite low for both 2001 & 2007 -- not surprising given that the analysis is confined to City government operations only (e.g. trash collection at City-owned buildings), as opposed to the broader

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<sup>43</sup> <https://icleiusa.org/>

<sup>44</sup> <https://icleiusa.org/clearpath/>

<sup>45</sup> Specifically, Energy Engineer Dave LeMieux.

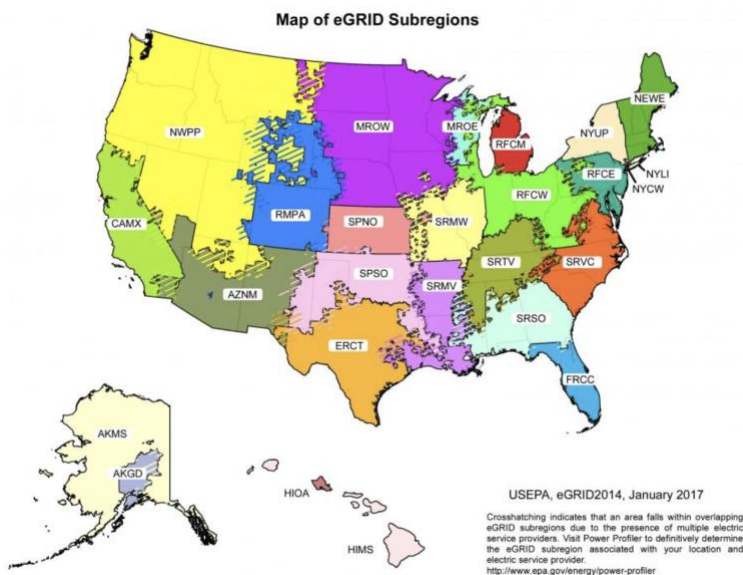
<sup>46</sup> Assisted greatly by Carrie Hahn and Liz Hirst.



community. Due to the unknowns regarding how the original waste figures were calculated, the current analysis substitutes a simple linear extrapolation of the growth that occurred in this category between 2001 and 2007.<sup>47</sup> While less-than-ideal, this approach seemed acceptable due to the relatively minor role played by this sector in the overall inventory in the previous analysis.

In general, the guiding principle behind the calendar year 2019 analysis was to make it as comparable as possible to the earlier snapshots (2001 and 2007). For example, in the interest of consistency, all emissions continue to be reported in units of "U.S. tons of carbon-dioxide equivalent," even though the preferred unit is now "metric tons" (aka "MT" or "tonnes"). The outputs generated by ClearPath were converted to U.S. tons (aka "short tons") by multiplying by the appropriate conversion factor (2204.6 lbs per MT / 2000 lbs per short ton = 1.1023).

Another example of this attempt toward consistency was the reliance on the regional average mix of electric generation resources, rather than the local (NorthWestern Energy) mix. These values were sourced from the most recent available year (2018) from EPA's "eGRID" database for the "Northwest Power Pool" (aka Western Electricity Coordinating Council Northwest).<sup>48</sup> A map of the various eGrid subregions appears below:<sup>49</sup>



<sup>47</sup> Formula used for calculating emissions from City govt waste category:  $\text{tons of CO}_2\text{e} = (2)(\text{Year}) - 3900$ . This formula yields the following values: 102 tons in 2001, 114 tons in 2007, and 138 tons in 2019. The first two values are in agreement with the 2009 CAP (page 10).

<sup>48</sup> Data file downloaded from:

<https://www.epa.gov/energy/emissions-generation-resource-integrated-database-egrid>

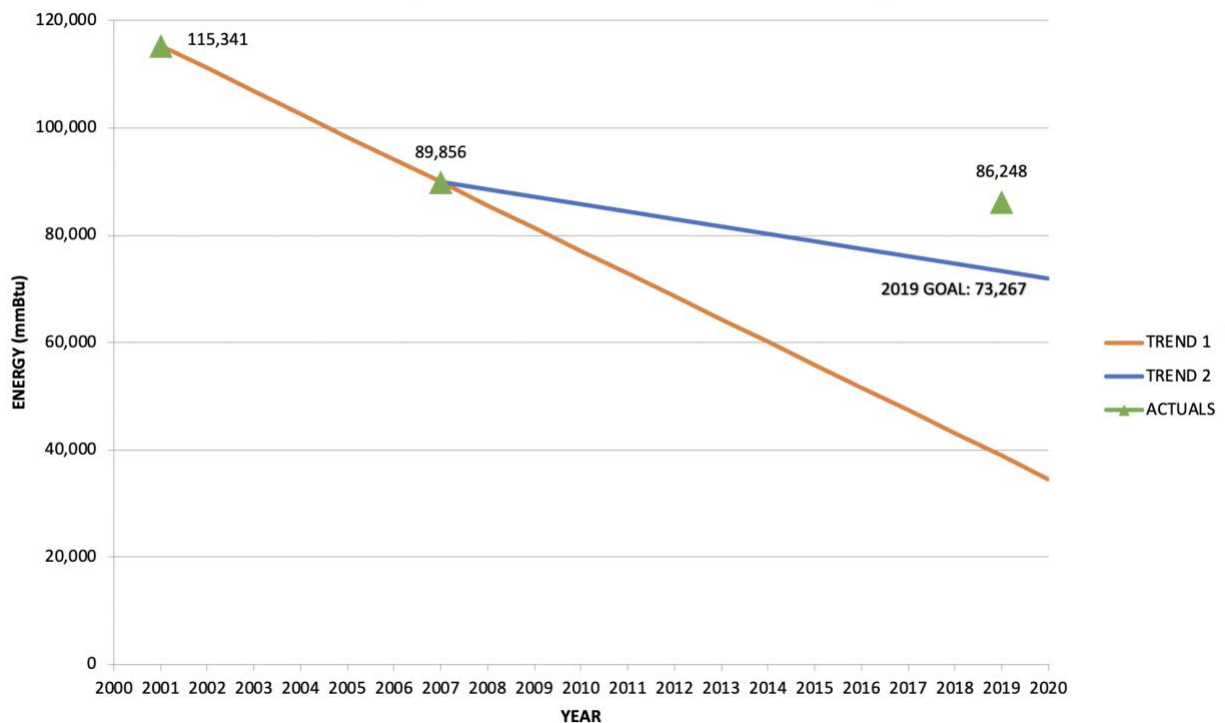
<sup>49</sup> <https://www.epa.gov/energy/egrid-subregion-representational-map>

It is recommended that this approach be followed for one more year, as 2020 represents the end of the planning period originally envisioned in the 2009 CAP. Starting with that year, however, the City should also conduct a new analysis using all current protocols (measurements in metric tons, NorthWestern-specific emissions factors, etc.), set new goals based on that analysis, and update that analysis each year going forward. Detailed notes about the methodology used to prepare the 2019 analysis are on record with the Sustainability Coordinator. A summary is included in Appendix I.

### Results

As can be seen in **Figure 1** below (and subject to the cautionary remarks mentioned previously), it appears the City has continued to make modest reductions in its overall energy use, but not at the rate recommended by the 2009 CAP (i.e. Trend 2, as Trend 1 was considered by the Climate Change Task Force to be unrealistic). Any reduction in energy (especially in the context of a growing and vibrant city) should be taken as a positive, of course, both in terms of reduced environmental impact and savings on the City's utility and fuel bills. That being said, the modest 4% decline between 2007 and 2019 is somewhat disappointing compared to the hoped-for 18%-by-2019 reduction envisioned in the 2009 CAP.

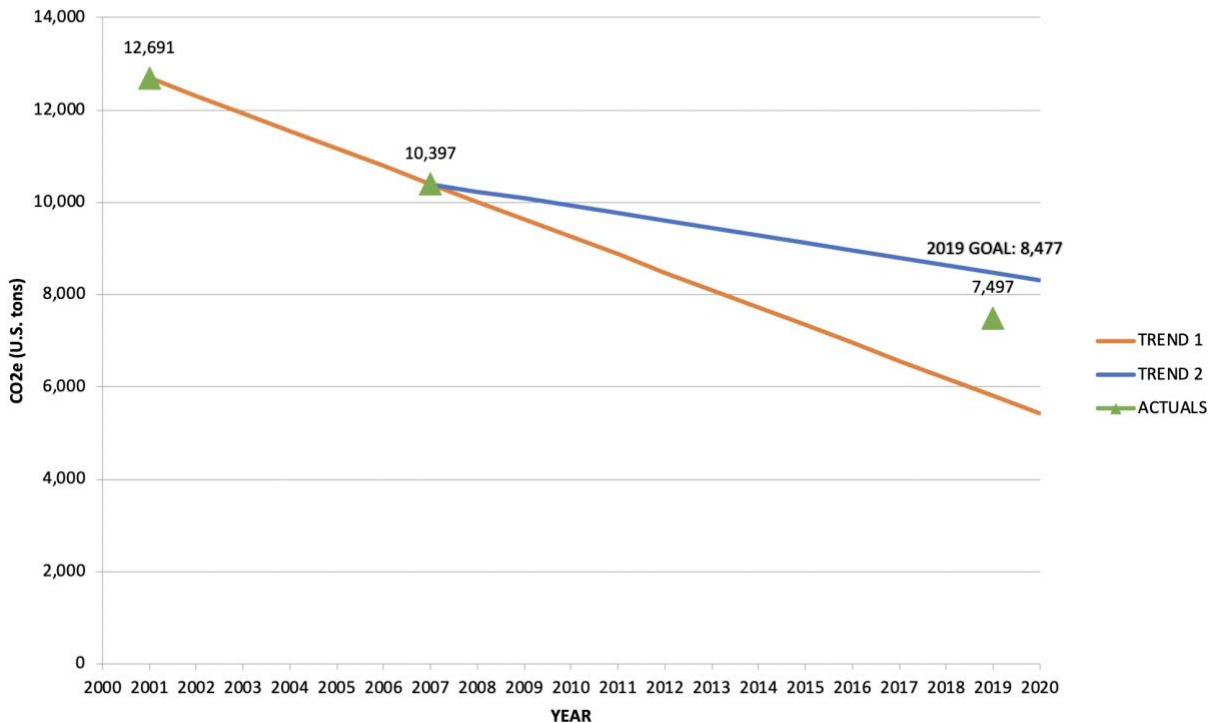
**Figure 1**  
**CITY OF HELENA GOAL-SETTING BRACKETS (GOVT ENERGY)**  
**Blue Line Represents Goal of 20% Reduction by 2020**



More encouraging, the City appears to have already surpassed its greenhouse gas reduction goals for both 2019 and 2020 (see **Figure 2** below), with a value of 7,479 tons CO<sub>2</sub>e -- 28% below 2007. Given that GHG emissions are largely proportional to energy use, this is a somewhat perplexing (albeit welcome) result. The resolution of the seeming paradox is that "grid power" in the Pacific Northwest (and Montana) has gotten substantially cleaner in the last dozen years. A combination of new renewable energy sources (particularly utility-scale wind), increased capacity from refurbished hydroelectric plants, and low-cost natural gas have all worked to displace higher-polluting coal-fired power generation. As a result, the carbon-intensity (measured in pounds of CO<sub>2</sub>e / megawatt-hour) of the regional and local power grids has decreased significantly. Of course, "Mother Nature" is far more interested in total emissions than emission rates. But as the simple multiplicative product of two variables, total emissions can be reduced either through reduced consumption or reduced emissions intensity (ideally both).

**Figure 2**

**CITY OF HELENA GOAL-SETTING BRACKETS (GOVT CARBON)**  
**Blue Line Represents Goal of 20% Reduction by 2020**



The following table (**Table 1**) and chart (**Figure 3**) illustrate a dramatic 25% reduction in the carbon intensity of Pacific Northwest grid power since 2007:<sup>50</sup>

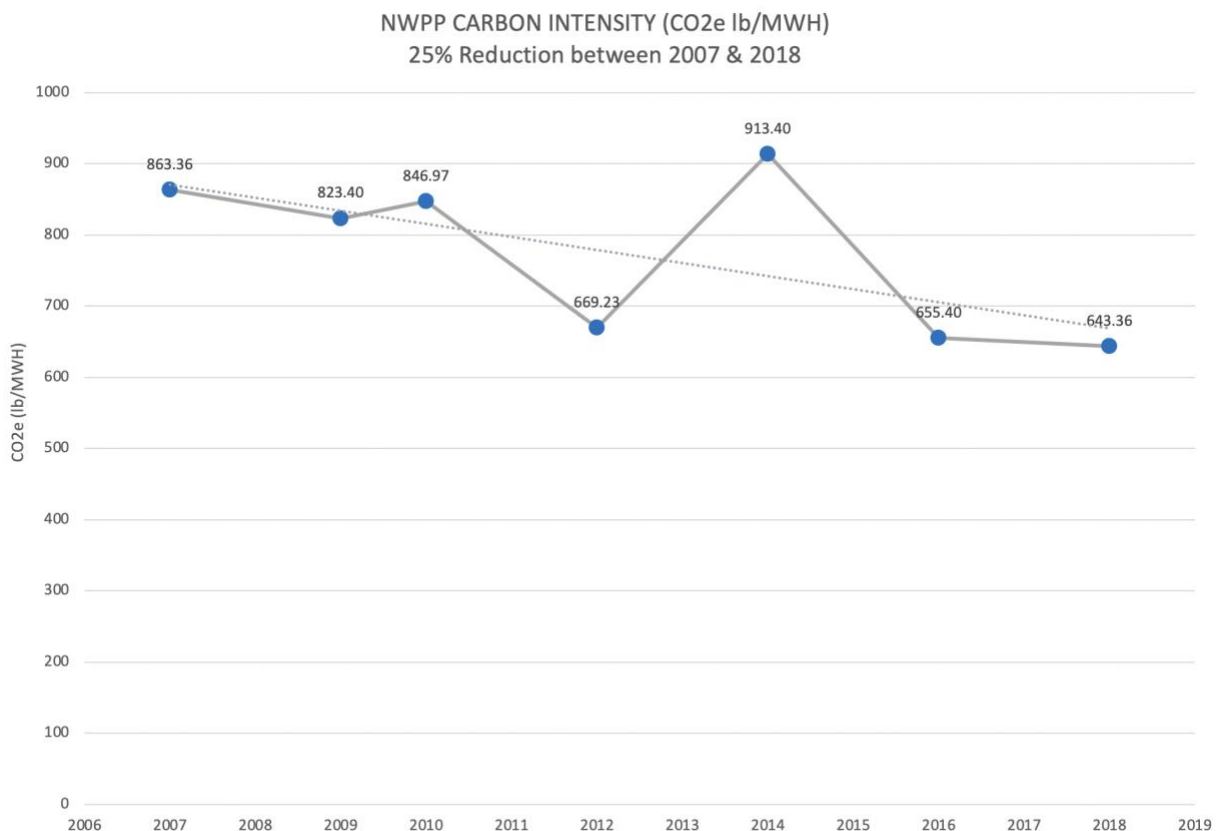
<sup>50</sup> Historic carbon intensity data is available through EPA, including the 2007 figures at: [https://www.epa.gov/sites/production/files/2015-02/documents/egrid2010v1\\_1\\_year07\\_summarytables.pdf](https://www.epa.gov/sites/production/files/2015-02/documents/egrid2010v1_1_year07_summarytables.pdf) Note, however, that the 2009 CAP modeling used a CO<sub>2</sub>e value of 1,093.8 lb/MWh (or 546.9 tons/GWh) for 2007, the best estimate available at the time.

**Table 1**

| NWPP GHG               | 2007 (lb/MWh) | 2018 (lb/MWh)  | % Change      |
|------------------------|---------------|----------------|---------------|
| CO <sub>2</sub>        | 858.79        | 639.037        | -25.6%        |
| CH <sub>4</sub>        | 0.01634       | 0.064          | +292%         |
| N <sub>2</sub> O       | 0.01364       | 0.009          | -34.0%        |
| <b>CO<sub>2</sub>e</b> | <b>863.36</b> | <b>643.363</b> | <b>-25.5%</b> |

Note that the CO<sub>2</sub>e values above represent a weighted sum of the three different GHGs considered here. Such a sum takes into account their varying values of Global Warming Potential (GWP). For example, according to the IPCC's 5th Assessment Report, on a 100-year time horizon, methane is 28 times more powerful than carbon dioxide (always given a GWP reference value of 1), and nitrous oxide is 265 times more powerful.<sup>51</sup>

**Figure 3**



"historical files": <https://www.epa.gov/energy/emissions-generation-resource-integrated-database-egrid>

<sup>51</sup> [https://ghgprotocol.org/sites/default/files/ghgp/Global-Warming-Potential-Values%20%28Feb%2016%202016%29\\_1.pdf](https://ghgprotocol.org/sites/default/files/ghgp/Global-Warming-Potential-Values%20%28Feb%2016%202016%29_1.pdf)

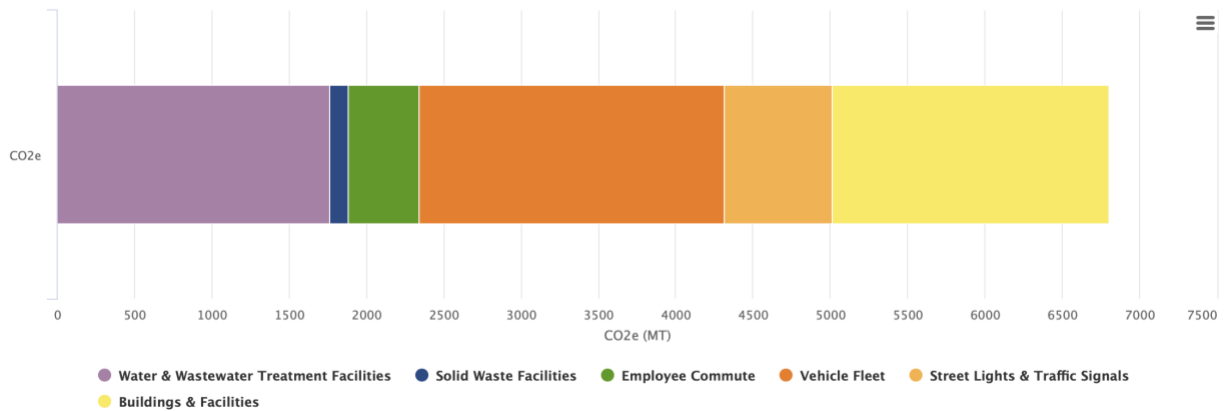
In addition to its numerical outputs, the ClearPath software can generate some useful visuals such as **Figure 4** below, which shows the breakdown of the 6,800 tonnes (7,500 U.S. tons) of CO<sub>2</sub>e emissions attributable to the City government's operations in 2019. This chart underscores the importance of three sectors in particular: water & wastewater treatment, vehicle fleet, and buildings. As a consequence of their outsized importance as energy users, these sectors should continue to be prioritized for future efficiency projects. Renewable energy could also play a role in reducing both emissions and costs associated with these sectors.

**Figure 4**  
**(emissions in tonnes)**

Inventory By Sector

CO<sub>2</sub>e by sector for the selected inventory year.

| Sector                                  | CO <sub>2</sub> e |
|---|-------------------|
| Buildings & Facilities                  | 1,787             |
| Street Lights & Traffic Signals         | 700               |
| Vehicle Fleet                           | 1,975             |
| Employee Commute                        | 455               |
| Solid Waste Facilities                  | 124               |
| Water & Wastewater Treatment Facilities | 1,760             |



**Table 2** (below) gives additional details about energy consumption, costs, and associated GHG emissions (with slightly different categories from Figure 4 above). "MMBTU" (or millions of BTUs) is a commonly used unit for "apples-to-apples" comparisons of energy usage from different sources (for example, it would be inappropriate to try to directly compare or combine "kWh" and "therm").

**Table 2**

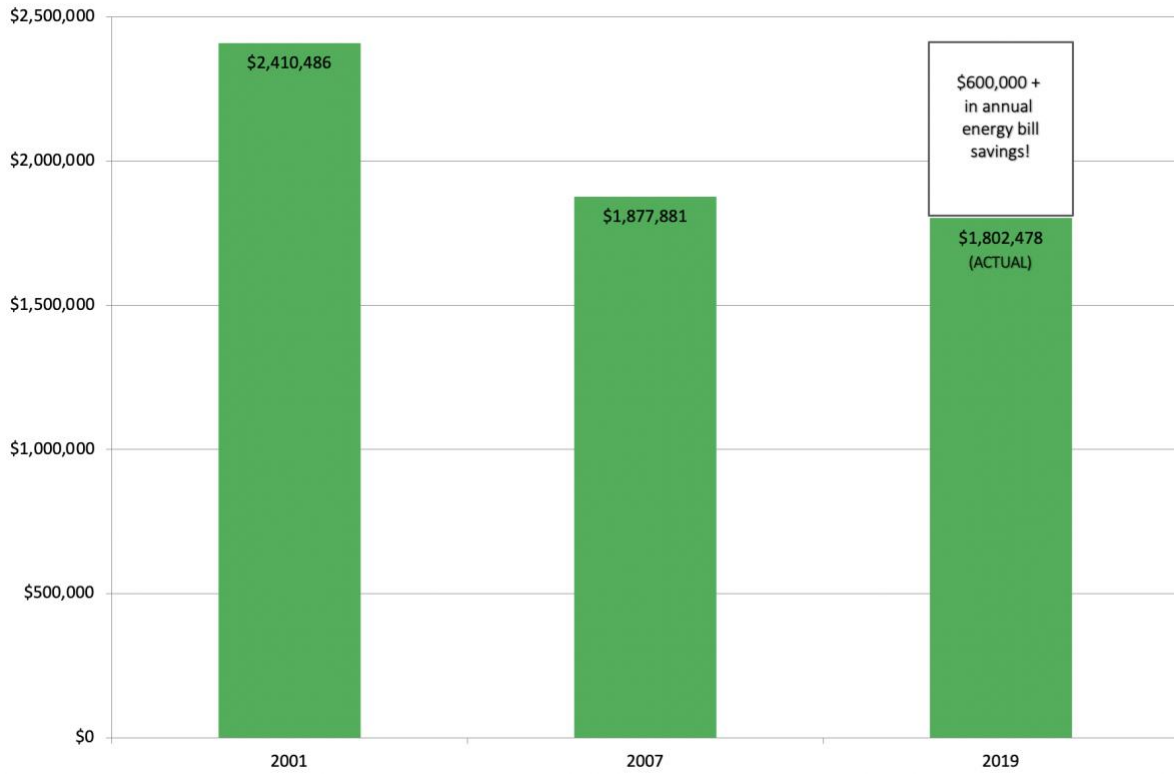
| ENERGY SOURCE     | AMOUNT         | MMBTU          | COST               | AVG PRICE            | CO <sub>2</sub> e (U.S. Tons) |
|-------------------|----------------|----------------|--------------------|----------------------|-------------------------------|
| ELECTRICITY       | 10,048,206 kWh | 34,294         | \$1,105,675        | \$0.11/kWh           | 3,232                         |
| NATURAL GAS       | 247,333 therm  | 24,733         | \$167,580          | \$0.68/therm         | 1,449                         |
| GASOLINE          | 80,930 gal     | 10,112         | \$198,860          | \$2.46/gal           | 783                           |
| DIESEL            | 123,939 gal    | 17,109         | \$330,363          | \$2.67/gal           | 1,395                         |
| COMMUTE           | NA             | NA             | NA                 | NA                   | 502                           |
| WASTE             | NA             | NA             | NA                 | NA                   | 138                           |
| <b>2019 TOTAL</b> |                | <b>86,248</b>  | <b>\$1,802,478</b> | <b>\$20.90/mmBtu</b> | <b>7,497</b>                  |
| <b>2007 TOTAL</b> |                | <b>89,856</b>  | <b>\$1,990,059</b> | <b>\$22.15/mmBtu</b> | <b>10,397</b>                 |
| <b>2001 TOTAL</b> |                | <b>115,341</b> | <b>\$1,233,607</b> | <b>\$10.70/mmBtu</b> | <b>12,691</b>                 |

*Note: MMBTU conversions and CO<sub>2</sub>e data from ClearPath.*

From a financial standpoint, it is highly encouraging that the City's overall energy bill decreased by 9.4% between 2007 and 2019, and on an absolute basis (i.e. not including the effects of inflation). This is partly the result of the 4% reduction in mmBtu, and partly the result of historically low energy prices (driven largely by the boom in shale gas & "fracking" technologies, as well as the increasing availability of low-cost renewables like utility-scale wind).

Diving further into the financials, **Figure 5** below illustrates the magnitude of the energy bill savings arising from efficiency improvements alone. If the City had continued to use 115,341 mmBtu each year (as it did in 2001), its annual energy bill would be **\$600,000+** more than it is today. While it is important to acknowledge that this figure does not include the cost of the multitudinous efficiency improvements (which would be exceedingly difficult to track down and quantify), the underlying point remains valid: the City has captured considerable economic, as well as environmental value from increasing the efficiency of its operations. Other than a few exceptions such as R&D, it is common practice in municipal government and elsewhere to pursue efficiency-related investments only when there is a clear economic benefit (i.e. the payback period is shorter than the expected life of the measure, thereby making it "cost effective"). And while some of those improvements were made specifically to capture long-term energy savings, many others were made as part of the natural cycle of replacement-and-upgrade that occurs with underperforming and/or broken equipment.

**Figure 5: City of Helena Municipal Govt  
Energy Costs Based on 2019 Prices (\$20.19/mmBtu)**



## 4) Energy Use & Greenhouse Gas Assessment: Helena Community

Thus far, the discussion of Helena's energy use and GHG emissions has been confined to municipal government operations. While this was a logical starting point for the 2009 CAP and the updates presented in Chapter 3, this chapter seeks to broaden the analysis to the entire community (as defined by the City boundaries, i.e. not including the greater micropolitan area). Toward that end, the following community-wide information was obtained for calendar year 2019:

|                            |                                |
|----------------------------|--------------------------------|
| - Electricity Use:         | 303,920,395 kWh <sup>52</sup>  |
| - Natural Gas Use:         | 23,892,224 therm <sup>53</sup> |
| - Gasoline Use:            | 25,296,900 gal <sup>54</sup>   |
| - Diesel Use:              | 5,328,288 gal <sup>55</sup>    |
| - Landfill-Destined Waste: | 38,069 ton <sup>56</sup>       |

As the first such analysis for the Helena community, more modern protocols can be followed than were used in Chapter 3, such as:

- *CO<sub>2</sub>e emissions expressed in metric tons (MT or tonnes), rather than U.S. tons*
- *emissions factors specific to the local utility (NWE), rather than the broader region*

In its most recent "ESG/Sustainability Template" filing (2018), NorthWestern Energy reported a carbon intensity of **0.49 metric tons CO<sub>2</sub>e / megawatt-hour** (490 kg / MWh) for its Montana operations.<sup>57</sup> That value was entered into ClearPath as the grid electricity emissions factor used in this analysis.

### Results

As can be seen in the following summary table (**Table 1**), the community's estimated 2019 CO<sub>2</sub>e emissions were 614,669 metric tons (MT). With a population of 33,124<sup>58</sup>, this equates to a per-capita emission rate of 18.6 MT/person. By way of comparison, the U.S.

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<sup>52</sup> NWE Electricity and Natural Gas information for Helena City Limits was received from Howard Skjervem via email on 5/13/2020.

<sup>53</sup> Ibid.

<sup>54</sup> Gasoline and "Taxable Diesel" information for the City of Helena was received from Tracy Halubka at Montana Department of Transportation via email on 4/7/2020. The Motor Fuel Section can be reached at: [mdtfueltax@mt.gov](mailto:mdtfueltax@mt.gov)

<sup>55</sup> Ibid.

<sup>56</sup> This Fiscal Year 2019 figure came from the "City of Helena Transfer Station - Solid Waste Tonnage Out" table, received from City of Helena Solid Waste Superintendent Pete Anderson via email on 1/17/20. But note that these figures include significant tonnage from County residents in the Scratchgravel Solid Waste District. It may be possible to refine the measurements in the future, to more accurately zero-in on City-specific data.

<sup>57</sup> Look for "EEl/ESG" under the "Clean Air" heading:

<http://www.northwesternenergy.com/environment/our-environment>

And then find: "Total Owned + Purchased Generation CO<sub>2</sub>e Emissions Intensity" under "Montana Generation Statistics" on page 5.

<sup>58</sup> <https://www.census.gov/quickfacts/fact/table/US/PST045218>



average is 20.3 MT/person, calculated by dividing total emissions (6,677 million MT<sup>59</sup>) by total population (328,239,523<sup>60</sup>). It is encouraging that Helena's numbers come in slightly below this national average, especially considering Montana's high use of heating fuels, long travel distances, etc. Then again, this analysis was limited to the Helena "urban" area only, with little heavy industry and some important sectors neglected (e.g. air travel). Hence, no sweeping conclusions should be drawn, but to a first approximation, the figures seem reasonable.

**Table 1: Helena Community Energy Use & GHG Emissions (2019)**

| <b>ENERGY SOURCE</b> | <b>AMOUNT</b>         | <b>MMBTU</b>     | <b>CO2e (tonnes)</b> |
|----------------------|-----------------------|------------------|----------------------|
| ELECTRICITY          | 303,920,395 kWh       | 1,037,271        | 148,921              |
| NATURAL GAS          | 23,892,224 therm      | 2,389,222        | 127,074              |
| WASTE                | 38,069 ton            | NA               | 62,165               |
| GASOLINE             | 25,296,900 gal        | 3,162,113        | 222,107              |
| DIESEL               | 5,328,288 gal         | 735,811          | 54,402               |
| <b>TRANS. TOTAL</b>  | <b>30,625,188 gal</b> | <b>3,897,924</b> | <b>276,509</b>       |
| <b>GRAND TOTAL</b>   | <b>NA</b>             | <b>7,324,417</b> | <b>614,669</b>       |

*Note: MMBTU conversions and CO<sub>2</sub>e data from ClearPath.*

In the future, a more granular analysis could be performed to explore the breakdown among various classes of energy users -- residential, commercial, industrial, etc. -- and to look at trend data over time. Some of that information (stretching back to 2016) was already made available by NorthWestern Energy and Montana Department of Transportation, but it would also be useful to acquire specific customer counts (number of households, businesses, industries, etc.) and aggregated billing data if available.

The following figure (**Figure 1**) reveals the relative contribution of the various sectors to Helena's overall GHG inventory. It is interesting that the transportation sector occupies such a large slice at 45%. This could be, in part, an artifact of the underlying data. The gasoline and diesel figures represent all fuel sold at Helena service stations, which presumably includes a significant amount purchased by tourists, visitors, and other through-traffic (freight, etc.) thereby artificially inflating the numbers. Of course, Helena residents also travel and purchase fuel out-of-town which would offset this overestimation to some degree. Note that if "electricity" and "natural gas" are combined into a single category of "buildings," it very nearly matches the transportation sector.

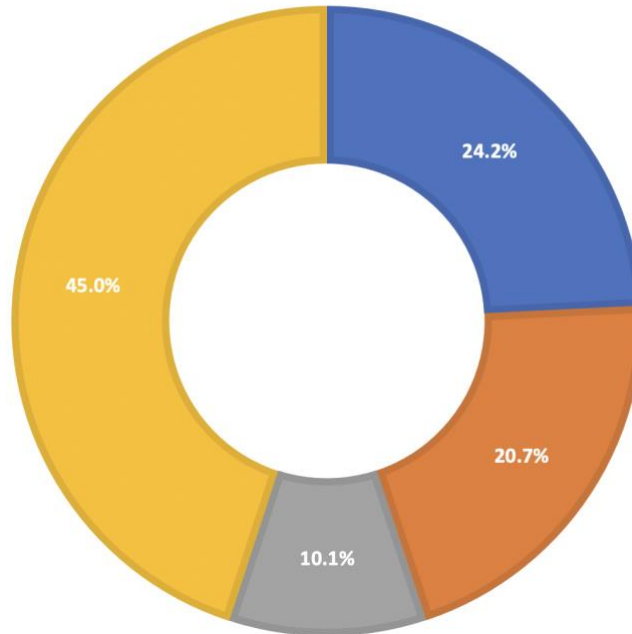
<sup>59</sup> 2018 was the most recent data available: <https://www.epa.gov/ghgemissions/inventory-us-greenhouse-gas-emissions-and-sinks-fast-facts-and-data-highlights>

<sup>60</sup> 2019 population from: <https://www.census.gov/quickfacts/fact/table/US/PST045218>

The next figure (**Figure 2**) shows the corresponding breakdown for Helena's municipal government operations. Looking at total metric tons, the City government's share of the community's overall carbon budget is relatively minor, at just 1.1% (6,803 MT / 614,669 MT). This underscores the importance of addressing emissions on a community-wide basis, including residential, commercial, industrial, and public institutions and agencies of all kinds (state, federal, and local governments, schools, etc.).

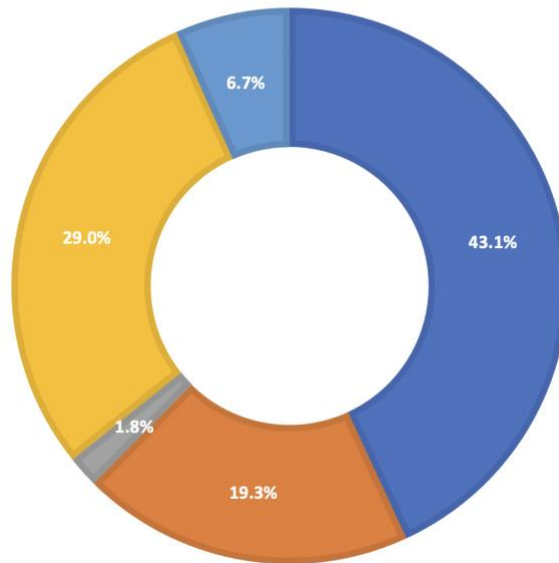
**Figure 1**  
**2019 HELENA COMMUNITY CO<sub>2</sub>e EMISSIONS**  
614,669 METRIC TONS (MT) ≈ 18.6 MT/person

■ Electricity ■ Natural Gas ■ Waste ■ Transportation



**Figure 2**  
**2019 HELENA GOVT CO2e EMISSIONS**  
**6,803 METRIC TONS (MT)**

■ Electricity ■ Natural Gas ■ Waste ■ Transportation ■ Employee Commute



**Table 3** below brings together comparison data from **Chapter 3, Table 2**, and **Chapter 4, Table 1** above. Again, this table reveals the relatively modest role played by the City government in the context of the community's overall environmental footprint. But this in no way diminishes the importance of City leadership on sustainability. The City government is in a unique position to not only address its own environmental impacts, but to provide assistance and resources to the broader community through programs, policies, and education.

| Category     | Community natural units | Community mmBtu  | City Govt natural units | City Govt mmBtu       |
|--------------|-------------------------|------------------|-------------------------|-----------------------|
| Electricity  | 303,920,395 kWh         | 1,037,271        | 10,048,206 kWh          | 34,294 (3.31%)        |
| Natural Gas  | 23,892,224 therm        | 2,389,222        | 247,333 therm           | 24,733 (1.04%)        |
| Gasoline     | 25,296,900 gal          | 3,162,113        | 80,930 gal              | 10,112 (0.32%)        |
| Diesel       | 5,328,288 gal           | 735,811          | 123,939 gal             | 17,109 (2.33%)        |
| Waste        | 38,069 tons             | NA               | 82.67 tons              | NA                    |
| <b>TOTAL</b> |                         | <b>7,324,417</b> |                         | <b>86,248 (1.18%)</b> |

## 5) Looking Forward

Looking to the future, the City of Helena sustainability program can gain direction and inspiration from many sources. First, Helena can build upon the successes of the 2009 CAP by increasing the number of "completed" or "underway" recommendations identified in Chapter 2. It can also embark upon new projects and strive toward new benchmarks. The City Commission has already identified several important objectives, through sustainability-related resolutions and policies adopted in the years since the 2009 CAP.

Prominent among these is the ambitious new goal of securing 100% clean electricity for the Helena community by the year 2030, with an interim goal of 80% by 2025.<sup>61</sup> More than just establishing targets, Resolution 20592 identifies specific steps to help implement that vision: *"Section 5. Strategies for reaching the goal include, but are not limited to, the following: advocating that the incumbent utility procure additional renewable energy resources to serve its customers, investing in renewable energy and energy efficiency projects at City-owned properties, incentivizing broad-based community participation through expansion and improvement of the City's zero-interest loan program, securing an Energy Corps member, and other approaches and mechanisms consistent with this resolution."*

At the time of this writing, the status of those proposed actions is as follows:

### **1) Advocate that the utility procure additional renewable energy to help meet the goal.**

In December 2019, talks were convened between NorthWestern Energy (NWE) and several local governments interested in a rapid transition to a low-carbon electricity future (Missoula County, and the cities of Missoula, Bozeman, Helena, and Big Sky). One potential avenue explored by the group was statewide legislation modeled after Utah's Community Renewable Energy Act.<sup>62</sup> In the Utah example, the local utility (Rocky Mountain Power) worked with Salt Lake City and other communities to advocate for and ultimately pass this enabling legislation for meeting the local clean-energy commitments. At this time, it is unclear whether a similar approach could be replicated in Montana.<sup>63</sup>

Another topic of discussion is "Green Tariffs" whereby customers (such as the municipal government itself) could select a 100% clean, renewable energy option offered through the local utility (and derived from new Montana-based projects dedicated to meeting that load). While this approach avoids the necessity of new legislation (and would instead play out before the Public Service Commission), the drawback is that it would require a longer phase-in period. As shown in Chapter 4, the City government represents just 3% of Helena's electrical load. Hence, serious progress toward the community-wide goal would require proactive participation

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<sup>61</sup> Resolution 2059, adopted by unanimous vote of the Commission on February 24, 2020, is available here: <https://www.helenamt.gov/government/departments/city-commission/ordinances-resolutions>

<sup>62</sup> See HB 411 from the 2019 session.

<sup>63</sup> Other options that could be explored independent of the utility include Community Choice Aggregation (similar to HB 411, but with energy supply secured by the City rather than the utility) and Municipalization (City acquiring the utility infrastructure and providing those services, as it does with water and wastewater).

by Helena's residential, commercial, and institutional electricity customers. Also, the success of such a program would depend upon its economic viability, i.e. the ability to secure the supply at a low enough cost to keep any extra "premium" reasonably small.

Other topics of discussion with the utility include:

- demand-side management programs and policies
- the potential for a large-scale "distributed storage" R&D project in Helena in 2021<sup>64</sup>
- the anticipated roll-out of Advanced Metering Infrastructure (AMI) in 2022
- improved data-sharing, to assist with the preparation of GHG assessments
- electrification of transportation
- supply planning

## **2) Invest in renewable energy and energy efficiency at City-owned properties.**

Energy efficiency efforts such as those described in Chapter 2 of this document (in the update regarding recommendation NRG-6 from the 2009 CAP) should remain a top priority for the City. It is well established that demand-side resources like conservation and efficiency represent the cheapest, cleanest, and fastest energy solutions available to society. In keeping with Resolution 20592, it is also imperative that society address the supply-side of the equation by accelerating the move toward clean, renewable energy sources like solar, wind, and geothermal. Toward that end, the most recent City Budget (FY 2021, adopted 6/29/20) included funding for a 50 kW solar electric system to be constructed at a City facility. In today's world, such projects represent wise financial investments, with payback periods significantly shorter than the warranted life of the panels.

## **3) Incentivize community participation through the City's zero-interest loan program.**

The FY 2021 budget also included funding to boost the highly-popular and uniquely-Helena program (thought to be the only one of its kind in Montana). Originally authorized by Resolution 20218<sup>65</sup> (October 5, 2015), this program provides zero-interest loans of up to \$12,000<sup>66</sup> for residential renewable energy projects. The loans are repaid on the homeowner's property taxes over a period of ten years. The program was initially seeded with \$200,000 from a telecom settlement. As a revolving loan, the fund is replenished as payments come in, with large lumps arriving twice each year when taxes are due. As of 2020, more than two-dozen homeowners had completed projects with this funding source. The FY 2021 budget infused an additional \$60,000 -- enough for five extra projects this fiscal year.

## **4) Secure an Energy Corps member to provide additional capacity for sustainability work.**

Montana Energy Corps<sup>67</sup> was an AmericaCorps program created and operated by the Butte-based National Center for Appropriate Technology (NCAT). For eleven years, starting in

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<sup>64</sup> In addition to providing improved reliability and power quality, energy storage technologies can assist with the integration of increasing quantities of intermittent renewable energy resources.

<sup>65</sup> <https://www.helenamt.gov/government/departments/city-commission/ordinances-resolutions>

<sup>66</sup> \$12,000 will completely fund a standard 4 kW solar electric system at a typical installed cost of \$3/watt.

<sup>67</sup> <https://www.energycorps.org/>  
<https://www.energycorps.org/category/montana/>

2009, its members worked in communities across the state (including Lewis & Clark County) on a wide array of sustainability and resiliency projects. Helena's draft FY 2021 budget included \$15,000 to house an Energy Corps member for an eleven-month period (October to August), but that line item was removed when the City learned that AmeriCorps was discontinuing the program starting with the 2020-2021 cycle. Additional capacity, whether through a similar AmeriCorps type program<sup>68</sup> or additional staffing (e.g. increasing the Sustainability Coordinator office from 0.5 FTE to 1 FTE), would enable the City to more effectively and expeditiously accomplish its sustainability goals. Some specific areas in need of increased focus include City Green Team, sustainable food issues, zero-interest loan administration (currently handled by Community Development), climate adaptation & resilience, and public outreach & education.

In general, the budgeting process is a crucial venue in which the Commission identifies its sustainability (and many other) priorities. On June 29, 2020, the City Commission adopted a (revised) Fiscal Year 2021 Budget with the following sustainability items (in addition to the continuation of the half-time Sustainability Coordinator position):

- the aforementioned funding for a 50 kW solar electric project -- \$90,000
- the aforementioned support for the zero-interest loan program -- \$60,000
- co-funding for 3 x Level 2, dual-port electric vehicle charging stations -- \$15,000  
(to be located at the 6th Ave Garage, Getchell Garage, and Capital T Bus Depot)
- \$1-per-month reduction in the customer charge for curbside recycling -- \$15,000
- interlocal policy development, relating to the 100% clean electricity goal -- \$8,000
- Sun Run sponsorship, ICLEI dues, and incidentals -- \$3,000

On the same evening, the Commission formally approved a comprehensive rewrite of the City Growth Policy.<sup>69</sup> That document affirms the City's continuing commitment to environmental sustainability generally, and to addressing the urgent problem of global climate change. In addition to a thorough analysis of environmental issues in Chapter 7, the document contains a visionary statement regarding the importance of waste reduction in Chapter 5 (p. 9):

*"Consistent with its goals and objectives to conserve energy, reduce greenhouse gases, promote recycling, and reduce solid waste, the City intends to pro-actively develop an Integrated Waste Management System, much like the one established by the State of Montana for state operations (see Title 75, Ch. 10, part 8, MCA), which will reduce – through source reduction, reuse, recycling and composting – the amount of solid waste generated by households, businesses, and governmental entities located within the City and disposed of in the landfill.*

*It is important for the City to develop an efficient, convenient and cost effective Integrated Waste Management System with a zero-waste goal, covering not only solid waste collection and disposal services, but also reduction, reuse, recycling and composting, which will*

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<sup>68</sup> NCAT has proposed a Montana Resilience Corps. There has also been discussion of a national Civilian Climate Corps.

<sup>69</sup> <https://www.helenamt.gov/government/departments/community-development/planning/long-range-planning>

*minimize the amount of waste being landfilled, reduce the environmental impact of waste, and protect our local environment."*

Chapter 9 of the Growth Policy concludes with an "Implementation Goals and Objectives" section with the following sustainability-related action items:<sup>70</sup>

- Develop a comprehensive energy management strategy (A.11)
- Develop a water conservation program (A.13), including:
  - Resource inventory, loss and recovery potential
  - Educational programming
  - Incentives program
  - Regulatory recommendations
  - Maintenance recommendations
  - Land use study with recommendations
  - Facilities upgrade with recommendations
  - Grey water re-utilization
  - Rainwater capture techniques
- Pursue addition of passenger rail and expanded bus service to Helena (A.21)
- Work with NorthWestern to develop a comprehensive street lighting plan (A.30) that:
  - implements Helena's Lighting Ordinance
  - optimizes standards for light temperature
- Identify goals for GHG reduction and community renewable energy conversion (A.31)
- Develop a sustainability plan for the city (A.33)
- Develop an integrated solid waste management plan and reduction target (A.48)

In addition to Commission-adopted resolutions, policies, and budgets, another source of guidance for future sustainability work is the Citizen Conservation Board (CCB). At its December 2019 planning retreat, the CCB identified the following seven priorities:

2019 CCB Action Planning Priorities

- 1) full board -- communications strategy
- 2) full board -- Earth Day 50
- 3) water com. -- tree planting project
- 4) water com. -- conservation & education
- 5) energy com. -- clean energy resolution
- 6) energy com. -- transportation project(s)
- 7) waste com. -- zero waste goal / IWMP

Current Status (December 2020)

- incomplete (little progress made)*  
*complete (success! remove from list)*  
*incomplete (little progress made)*  
*underway (positive progress made)*  
*complete (success! remove from list)*  
*incomplete (little progress made)*  
*underway (positive progress made)*

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<sup>70</sup> Chapter 9, pages 13-19:

<https://www.helenamt.gov/government/departments/community-development/planning/long-range-planning>

Given that the CCB is now three years through its five year term, members of the group have expressed eagerness to accelerate their work and move additional projects to completion. In preparation for a December 2020 planning retreat, the following inventory of existing, emerging and potential projects (both CCB-related and staff-driven) was prepared:

## **Energy & Transportation**

### Existing Projects

- Energy Efficiency -- support City Facilities & other departments with their ongoing projects
- Energy Efficiency -- continue discussions with NorthWestern Energy (e.g. DSM workgroup)
- Zero-Interest Renewable Energy Loan Program -- continue to strengthen in 2021
- EV Charging Stations -- complete the installation process in 2021
- 50-kW Solar Project -- complete the installation process in 2021
- Big Sky Passenger Rail Authority -- meet with the new L&C County Commission in 2021
- NWE Distributed Storage Pilot Project -- continue to serve on committee, deploy in 2021
- NWE LED Streetlight Project -- continue to monitor as the project wraps up in 2021

### Emerging or Potential Projects

- Green Tariffs -- support the filing of a proposed tariff with the PSC in 2021
- Energy Performance Contract (including Energy Tracking Software) -- execute in 2021
- Transportation -- improve the efficiency of the transit system (new dispatch software, etc.)
- Transportation -- analyze fleet with an eye toward increasing efficiency (EVs, CNG, etc.)
- Building Codes -- investigate the potential for incentive-based "stretch codes"
- Building Codes -- investigate high-performance building criteria for any new City buildings
- Solar Friendly Community -- explore SolSmart Gold status (Solar Access Ordinance, etc.)

## **Water**

### Existing Water Conservation Projects

- finalize a series of educational workshops to be offered to the public in 2021
- support the Public Works Department with additional water-saving infrastructure projects
- support the Parks Department with irrigation savings, e.g. ongoing conversion to well-water
- continue to work toward the per-capita goal of "less than 100 gallons-per-day" water usage

### Emerging or Potential Projects

- assist other departments with improved metering, billing software, optimization of rates, etc.
- assist with efforts to increase the number, diversity, and drought-tolerance of urban trees



## Waste & Recycling

### Existing Projects

- continue offering educational forums to the public, on a wide variety of waste-related topics
- continue to emphasize the waste reduction hierarchy (upstream, midstream, downstream)
- continue learning about the waste system & building relationships with City staff and others

### Emerging or Potential Projects

- develop and propose waste reduction goals for the City
- obtain funding for the development of a strategic plan for achieving waste reduction goals<sup>71</sup>
- follow the State IWMP (2018) step-by-step process for local governments<sup>72</sup>
- contract for a professional "waste audit" at the transfer station, to help establish a baseline
- explore upstream solutions, through purchasing policies, etc. ("pre-cycling")
- work toward a universal curbside recycling program (assessments instead of participant fees)
- explore food waste issues, and consider establishing a City food composting program
- work to reduce construction & demolition (C&D) waste, and divert from landfill for reuse
- form partnerships with ReStore, thrift stores, and other non-profits to capture re-usable items
- segregate re-usable items and compostable "green waste" in bulk waste collection service
- conduct outreach to city businesses, institutions, etc. (schools, hotels, hospital, airport, etc.)
- install recycling containers adjacent to existing public garbage cans (downtown, etc.)
- revive community swap events (similar to Boxing Day, held annually in Helena 1985-2000)
- establish a higher-profile, community-wide public education program to:
  - dispel myths and misunderstandings
  - make waste reduction easy to understand and implement
  - demonstrate applications

## Public Outreach

### Existing, Emerging, or Potential Projects

- develop and implement a communications strategy (using consistent channels, style, etc.)
- work with the new Public Information Officer (when hired) on outreach & education
  - publicize City sustainability programs and opportunities
  - provide information and assistance to citizens, businesses, etc.<sup>73</sup>
  - gather public input and feedback

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<sup>71</sup> A "Residential Recycling Program Enhancement Study" was performed in 2009, but needs updating; note that recycling is but one component of an Integrated Waste Management Plan (which lists, in order of priority, reduce, reuse, recycle, compost, and finally landfill).

<sup>72</sup> See the "Local Government Framework" on page 4 at the following link:

<http://deq.mt.gov/Portals/112/Land/Recycle/Documents/pdf/IWMPFinal2018.pdf?ver=2019-10-30-091908-783&timestamp=1572449157973>

<sup>73</sup> One idea is to write a regular "Conservation Corner" piece in the local newspaper similar to County Public Health.

## Other Activities

### Existing Projects

- 2009 CAP and 2019 Growth Policy -- continue implementing action items
- Sustainability Report -- refine & improve the analysis (e.g. additional ClearPath functionality)
- City Green Team -- establish / coordinate with County (especially if additional FTE capacity)
- CCB -- continue to organize regular & special meetings, tours, guest speakers, etc.
- Statewide Policy -- continue to monitor (regulations, incentives, building codes, etc.)

### Emerging or Potential Projects

- LEED for Cities -- investigate LEED (and other platforms) as alternative or supplement to ICLEI
- Sustainability Plan -- consider convening a new group to update or replace the 2009 CAP
- Procurement Policies -- review, and work to improve City's current policies and practices<sup>74</sup>

As a final source of ideas, the City can look to model sustainability projects completed or underway in other municipalities across the state, region, nation, and beyond. While clearly there is no shortage of work to be done, Helena is well positioned to meet the challenge. The City has a proven track record of success and a dedicated team of elected officials, City staff across all departments, and citizen volunteers.

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<sup>74</sup> The "Montana Procurement Act" might serve as a possible model. See MCA 18-4-121.

<https://www.leg.mt.gov/bills/mca/index.html>

Implementing rules are found at ARM 2.5.101. <http://mtrules.org/>

Note that the City has an MOU with the Montana Department of Administration to make purchases through its preferred vendors.

## A) List of Abbreviations

- ARRA** - American Recovery and Reinvestment Act of 2009
- AMI** - Advanced Metering Infrastructure
- BTU** - British Thermal Unit (unit of energy often used as a common metric for electricity, natural gas, gasoline, etc. - roughly equivalent to the energy in a kitchen match)
- C&D** - Construction and Demolition, or Construction and Deconstruction (solid waste)
- CACP** - Clean Air and Climate Protection (software used in 2009 Climate Action Plan)
- CAP (or 2009 CAP)** - Helena's 2009 Climate Action Plan
- CCB** - Citizen Conservation Board
- CHP** - Combined Heat and Power (power plant that also makes use of the waste heat)
- CNG** - Compressed Natural Gas (cleaner-than-petroleum transportation option)
- CO<sub>2</sub>** - Carbon Dioxide (the most prevalent anthropogenic greenhouse gas)
- CO<sub>2e</sub>** - CO<sub>2</sub> equivalent (includes the effects of other greenhouse gases as well as CO<sub>2</sub>)
- gal** - gallon (unit of fuel, used for gasoline or diesel)
- DEQ** - Montana Department of Environmental Quality
- DOE** - U.S. Department of Energy
- DSM** - Demand Side Management (conservation and efficiency)
- EPA** - U.S. Environmental Protection Agency
- ESCO** - Energy Services Company
- FY** - Fiscal Year (the City of Helena fiscal year runs from July 1 through June 30)
- GHG** - Greenhouse Gas
- GWP** - Global Warming Potential (weighting factors representing the relative strength of GHGs)
- HATS** - Helena Area Transit Service (now "Capital Transit" aka "Capital T")
- ICLEI** - International Council for Local Environmental Initiatives (organization)
- IECC** - International Energy Conservation Code (model building codes)
- IMP** - Implementation Working Group & Recommendations (2009 CAP)
- IWMP** - Integrated Waste Management Plan
- kW** - kilowatt (unit of electrical power = 1,000 watts)
- kWh** - kilowatt-hour (unit of electrical energy = 1,000 watt-hour)
- L&C** - Lewis and Clark (as in Lewis and Clark County)
- MCA** - Montana Code Annotated
- MCPA** - Mayors' Climate Protection Agreement
- MMBTU** - millions of BTUs (each "m" = one-thousand)
- MOU** - Memorandum of Understanding
- MRTP** - Missouri River Treatment Plant (drinking water plant)
- MT** - Metric Tons (aka "tonnes")
- MW** - megawatt (unit of electrical power = 1,000,000 watts)
- MWh** - megawatt-hour (unit of electrical energy = 1,000,000 watt-hour)
- NO<sub>x</sub>** - Nitrogen Oxides (a class of air pollutants regulated by the EPA)

**NRG** - Energy Working Group & Recommendations (2009 CAP)  
**NWE** - NorthWestern Energy (electric & natural gas utility serving the Helena area)  
**NWPP** - Northwest Power Pool (sub-area of the WECC representing the Pacific Northwest)  
**PAYT** - Pay As You Throw (method for charging for solid waste services)  
**PM** - Particulate Matter (a class of air pollutants regulated by the EPA)  
**PSC** - Public Service Commission  
**QF** - Qualifying Facility (under the Public Utilities Regulatory Policies Act of 1978)  
**R&D** - Research and Development  
**SILD** - Special Improvement Lighting District  
**SO<sub>x</sub>** - Sulfur Oxides (a class of air pollutants regulated by the EPA)  
**TMTP** - Ten Mile Treatment Plant (drinking water plant)  
**TMWCC** - Ten Mile Watershed Collaborative Committee  
**TWRPP** - Transportation, Waste, Recycling, and Public-Private Partnership Working Group & Recommendations (2009 CAP)  
**UATD** - Urban-Area Transportation District  
**USB** - Universal System Benefit Program (supports energy efficiency, renewable energy, and low-income programs via a charge that appears on electricity and natural gas bills in Montana)  
**WECC** - Western Electricity Coordinating Council (transmission area for western U.S.)  
**WTR** - Water Working Group & Recommendations (2009 CAP)  
**WWT** - Waste Water Treatment

## **B) Sustainability Timeline**

### 2007

- Resolution 19530: Establishing a Climate Change Task Force (12/3/07)

### 2008

- Climate Change Task Force convenes (2/19/08)

### 2009

- Climate Action Plan "2009 CAP" (8/19/09)
- City-County Sustainability Coordinator (half-time, one-year position, starting October)
- Ordinance 3119: Revising Lighting Standards Ordinance, aka "Dark Skies" (12/7/09)  
amending Ordinance 2889 (1/24/00)
- 3.52 kW pole-mounted solar electric system installed at wastewater treatment plant

### 2010

- Mayors' Climate Protection Agreement signed, endorsing Kyoto goals (1/6/10)
- Helena "Green Blocks" program (City partnership with NorthWestern Energy & AERO)
- Resolution 19799: "Complete Streets" policy (10/20/10)

### 2011

- Resolution 19828: 2011 Growth Policy (5/9/11)
- Water-source heat pump installed at Ten Mile Treatment Plant (May)
- New transit facility opens (mid-2011)
- 215 Walking Mall lights converted to LED, reducing energy costs by 76% (August)

### 2012

- Helena Community Gardens 501(c)(3) established (previously WEEL, 7/13/12)

### 2014

- Resolution 20074: Permitting Incentives for Alternative Energy Projects (3/24/14)
- City-County Solid Waste Efficiency Study (Blue Ridge Services, 10/29/14)

### 2015

- Resolution 20218: Zero-Interest Renewable Energy Revolving Loan Program (10/5/15)
- 2014 Chevy Volt plug-In hybrid electric vehicle acquired for City-County mail route

## 2016

- Curbside recycling launched (Public-Private Partnership with Helena Recycling)
- Tiered water rates adopted to encourage conservation (8/22/16)
- Expanded & redesigned city transit system ("Capital T")

## 2017

- Water Supply Planning Report (HydroSolutions, 2/9/17)
- Resolution 20347: Affirming Climate Change Efforts and Paris Agreement (6/26/17)
- Resolution 20375: Establishing a Citizen Conservation Board (8/7/17)
- Resolution 20399: Supporting Passenger Rail Service (9/11/17)

## 2018

- Citizen Conservation Board (CCB) convenes (1/29/18)
- Helena achieves "SolSmart Silver" status ([www.solsmart.org](http://www.solsmart.org), 2/12/18)
- NorthWestern LED streetlight project commences (late fall)

## 2019

- Hill & Women's Parks are the first to convert to well water instead of treated water
- Sustainability Coordinator hired (regular half-time position, starting 11/18/19)
- Paperless water bill option (late fall)

## 2020

- Resolution 20592: 100% Clean Electricity by 2030 (2/24/20)
- Water bills resume including the conversion "1 CCF = 748 gallons" (February 2020)
- Grant from DEQ to fund 3 x dual-port electric vehicle charging stations (4/6/20)
- "Earth Day 50" Proclamation (4/20/20)
- Growth Policy Update (6/29/20)
- FY 2021 Budget includes funding for sustainability projects (6/29/20)
- CCB "Community Conversation on Reducing Helena's Waste Footprint" (8/18/20)
- City Engineer reports recent water projects saving more than a half-million gpd (9/10/20)
- City Parking Division staff reports LED-related savings of ~\$5000/month (9/17/20)
- Helena Police Department begins testing hybrid-electric cruisers (9/30/20 IR story)
- Helena Mayor and Commission join the "America Is All In" climate statement (12/7/20)

## C) Progress Chart: 2009 Climate Action Plan

| <u>Recommendation</u>   | <u>Status</u> |
|---|---------------|
| 1) IMP-1: Hire Sustainability Coordinator                                     | COMPLETE      |
| 2) IMP-2: Develop Green Team  | UNDERWAY      |
| 3) IMP-3: Form a Citizen Conservation Board                                   | COMPLETE      |
| 4) IMP-4: Conduct Education & Outreach  | UNDERWAY      |
| 5) IMP-5: Systematize Data Collection, Monitoring & Reporting                 | COMPLETE      |
| 6) IMP-6: Establish a Municipal Government GHG Reduction Goal                 | COMPLETE      |
| 7) IMP-7: Sign Mayors' Climate Protection Agreement                           | COMPLETE      |
| 8) IMP-8: Develop Funding and Leveraging Resources                            | UNDERWAY      |
| 9) NRG-1: Lighting Upgrades at Ten Mile Treatment Plant                       | UNDERWAY      |
| 10) NRG-2: Water-Source Heat Pump at Ten Mile Treatment Plant                 | COMPLETE      |
| 11) NRG-3: Biomass Generator at Ten Mile Treatment Plant                      | INCOMPLETE    |
| 12) NRG-4: Efficiency Upgrades at Wastewater Treatment Plant                  | UNDERWAY      |
| 13) NRG-5: "Zero Net Energy" Target for Wastewater Treatment Plant            | INCOMPLETE    |
| 14) NRG-6: Develop a Comprehensive Energy Strategy                            | UNDERWAY      |
| 15) NRG-7: Adopt Energy Efficiency Standards for City-Owned Buildings         | INCOMPLETE    |
| 16) NRG-8: Improve Lighting Efficiency of City Buildings                      | UNDERWAY      |
| 17) NRG-9: Reduce "Plug Loads" in Buildings                                   | UNKNOWN       |
| 18) NRG-10: Work with the Utility & PSC on Clean Energy Policy                | UNDERWAY      |
| 19) NRG-11: Install Renewable Energy Systems at City Facilities               | UNDERWAY      |
| 20) NRG-12: Adopt Standards & Improve Performance of Fleet Vehicles           | UNDERWAY      |
| 21) NRG-13: Study Biodiesel Use and Supply                                    | INCOMPLETE    |
| 22) NRG-14: Street Lights, Traffic Lights, & Fire Tower                       | COMPLETE      |
| 23) NRG-15: Employee Commute & Waste  | UNDERWAY      |
| 24) WTR-1: Adopt Water Conservation Rates                                     | COMPLETE      |
| 25) WTR-2: Continue Upgrade of Water Treatment Facilities                     | COMPLETE      |
| 26) WTR-3: Adopt "Lush and Lean" Landscaping Practices                        | UNDERWAY      |
| 27) WTR-4: Study & Develop Community H <sub>2</sub> O Conservation Incentives | UNDERWAY      |
| 28) WTR-5: Develop an Education & Outreach Program on H <sub>2</sub> O Cons.  | UNDERWAY      |
| 29) WTR-6: Research & Adopt a Targeted Program to Regulate H <sub>2</sub> O   | INCOMPLETE    |
| 30) WTR-7: Pursue Water Supply / Municipal Watershed Protection               | UNDERWAY      |
| 31) TWRPP-1: Support Formation of a UATD                                      | UNDERWAY      |
| 32) TWRPP-2: Improve Non-Motorized Transportation & Infrastructure            | UNDERWAY      |
| 33) TWRPP-3: Establish a Pay-As-You Throw Solid Waste Program                 | INCOMPLETE    |
| 34) TWRPP-4: Solid Waste Reduction Goal                                       | UNDERWAY      |
| 35) TWRPP-5: Plastic Bag Fee  | INCOMPLETE    |
| 36) TWRPP-6: Back to the Tap Policy to Combat Plastic Bottles                 | INCOMPLETE    |
| 37) TWRPP-7: Green Blocks Program   | COMPLETE      |
| 38) TWRPP-8: Local Food   | COMPLETE      |
| 39) INT-1: Reduced Fees for Renewables  | COMPLETE      |
| 40) INT-2: Energy Efficient Building Codes (see NRG-7)                        | INCOMPLETE    |
| 41) INT-3: Green Team / Procurement Policy (see IMP-2 & NRG-9)                | UNDERWAY      |
| 42) INT-4: Transparency in Water Bills  | COMPLETE      |
| 43) INT-5: Stimulus Recommendations   | UNDERWAY      |
| 44) INT-6: Block Grant Recommendations  | UNDERWAY      |

## D) Helena Renewable Projects, a Selected List

| APPENDIX D: SELECTED HELENA & EAST HELENA RENEWABLE ENERGY PROJECTS (34)       |                             |            |              |       |           |
|--|-----------------------------|------------|--------------|-------|-----------|
| All are PV unless otherwise indicated. Most private projects are NOT included. |                             |            |              |       |           |
| pjudge@helenamt.gov (10/02/2020)   |                             |            |              |       |           |
| Project (*indicates housing project)   | Location                    | Type       | Size (kW)    | ~Year | USB?      |
| State Capitol Building Heating Plant   | 120 N. Roberts              | PV         | 2.4          | 2001  | YES       |
| Ptarmigan Apartments (RMDC)*   | 3400 Ptarmigan Ln           | PV         | 7.8          | 2002  | YES       |
| West Valley Volunteer Fire Dept (PV+bat)                                       | 1165 Forestvale Rd          | PV+battery | 2.08         | 2003  | YES       |
| Baxendale Volunteer Fire Dept (PV+bat)   | 6000 HWY 12 West            | PV+battery | 3            | 2004  | ??        |
| eXploration Works! Science Museum  | 995 Carousel Way            | PV         | 7            | 2007  | YES       |
| Neighborhood Center (RMDC)   | 200 N Cruse Ave             | PV         | 1.92         | 2004  | YES       |
| Farm in the Dell   | 3240 York Rd                | PV         | 2.8          | 2007  | YES       |
| Helena Food Share  | 1616 Lewis St               | PV         | 2.16         | 2008  | YES       |
| Montana WILD (Wildlife Rehab Center)   | 2668 Broadwater Ave         | PV         | 3.1          | 2008  | YES       |
| Montana Youth Homes*   | 1398 Warehouse Ave          | PV         | 2.2          | 2008  | YES       |
| Eastgate Volunteer Fire Dept   | 3895 Buttercup, East Helena | PV         | 4.6          | 2009  | NO        |
| Helena Housing Authority Office*   | 812 Abbey St                | PV         | 3.04         | 2009  | NO (ARRA) |
| Helena Wastewater Treatment Plant  | 2108 E Custer Ave           | PV         | 3.52         | 2009  | YES       |
| Fort Harrison Army Base RTI Building   | 2009 Williams St            | PV         | 50           | 2010  | NO        |
| Fort Harrison Army Base Medical Building                                       | 2009 Williams St            | PV         | 36           | 2011  | NO        |
| Helena High School   | 1300 Billings Ave           | PV         | 4.7          | 2012  | YES       |
| Montana Electrical JATC (Wind)   | 2616 Bozeman Ave            | Wind       | 4            | 2012  | YES       |
| Montana Electrical JATC  | 2616 Bozeman Ave            | PV         | 2.76         | 2012  | YES       |
| Capital High School  | 100 Valley Dr               | PV         | 10           | 2013  | YES       |
| Early Learning Center (Headstart)  | 1221 Billings Ave           | PV         | 5.39         | 2013  | YES       |
| NorthWestern Energy Service Center (PV+bat)                                    | 1313 N Last Chance Gulch    | PV+battery | 10           | 2013  | YES       |
| Lewis & Clark Therapeutic Youth Homes*   | 4110 Lincoln Rd W           | PV         | 15.86        | 2014  | YES       |
| River Rock Residences (RMDC)*  | 3225 Bedrock Dr             | PV         | 84.5         | 2014  | NO        |
| Helena Aviation Readiness Center   | 3330 Skyway Dr              | PV         | 46.8         | 2016  | NO        |
| Lewis & Clark Library  | 120 S Last Chance Gulch     | PV         | 43.9         | 2016  | YES       |
| Archie Bray Ceramic Arts Foundation  | 2915 Country Club Ave       | PV         | 24.36        | 2017  | YES       |
| Green Meadow Solar   | ~7300 Green Meadow Dr       | PV         | 3,000        | 2017  | NO (QF)   |
| Carroll College Campus Center  | 1601 N Benton Ave           | PV         | 38.9         | 2018  | YES       |
| Last Chance Tennis Center  | 2910 Skyway Dr              | PV         | 23.2         | 2018  | YES       |
| Saint Mary Catholic Community  | 1700 Missoula Ave           | PV         | 23.2         | 2019  | YES       |
| Holter Museum of Art   | 12 E Lawrence St            | PV         | 14.6         | 2020  | YES       |
| Central Elementary School  | 402 N Warren St             | PV         | 50           | 2020  | YES       |
| Jim Darcy Elementary School  | 990 Lincoln Rd West         | PV         | 50           | 2021  | YES       |
| Bryant Elementary School   | 1520 Livingston Ave         | PV         | 50           | TBD   | TBD       |
| <b>TOTAL</b>   |                             |            | <b>3,634</b> |       |           |



## E) Earth Day 50 Proclamation

### CITY OF HELENA Proclamation



*WHEREAS, April 22, 2020, marks the 50th Anniversary of the original Earth Day, an event which has grown into an international celebration of major significance; and*

*WHEREAS, a healthy environment and all its natural resources is a pillar of great pride and value for the Treasure State of Montana; and*

*WHEREAS, the preamble to our state's constitution reads: "We the people of Montana grateful to God for the quiet beauty of our state, the grandeur of our mountains, the vastness of our rolling plains, and desiring to improve the quality of life, equality of opportunity and to secure the blessings of liberty for this and future generations do ordain and establish this constitution"; and*

*WHEREAS, through numerous resolutions, ordinances, and day-to-day activities, the City of Helena has demonstrated its deep concern for and ongoing commitment to environmental quality, climate resiliency, and the health of its citizens; and*

*WHEREAS, as Montana's Capital City, Helena is uniquely positioned to cultivate both leadership and partnership in the pursuit of environmental quality, climate resiliency, and public health; and*

*WHEREAS, the protection and improvement of environmental quality and public health is critical to sustaining a thriving, healthy community and economy, and to improving the quality of life for all; and*

*NOW, THEREFORE, I, Wilmot Collins, Mayor of the City of Helena, Montana, do hereby proclaim April 22, 2020 as*

**"EARTH DAY"**

*throughout Helena and encourage all citizens, businesses, and institutions to participate in programs and activities that will protect our environment and contribute to a healthy, sustainable planet and future.*

*IN WITNESS WHEREOF, I have hereunto set my hand and caused the Seal of the City of Helena, Montana, to be affixed this 20th day of April 2020.*



*Wilmot Collins, Mayor*

**ATTEST:**

*Clerk of the Commission*

## F) City of Helena "Quick Facts"

|                              |  |
|------------------------------|--|
| • Founded:                   | October 30, 1864 <sup>75</sup>   |
| • Incorporated:              | 1881 <sup>76</sup>   |
| • Population - City, County: | 33,124; 69,432 (7/1/19 estimate) <sup>77</sup>   |
| • Persons-per-household:     | 2.11 <sup>78</sup>   |
| • Households:                | 15,700 <sup>79</sup>   |
| • Population - Metro Area:   | 77,414 <sup>80</sup>   |
| • Area:                      | 16.86 square miles <sup>81</sup>   |
| • Population Density:        | 1,965 people / square mile <sup>82</sup>   |
| • Elevation:                 | 4,068 feet <sup>83</sup>   |
| • Latitude & Longitude:      | 46.593, -112.035 <sup>84</sup>   |
| • Form of Government:        | Commission (5 non-partisan members including Mayor) <sup>85</sup><br>City Manager as the chief administrative officer <sup>86</sup><br>City Charter adopted 1976 <sup>87</sup> |
| • City Employees             | 356 (full and part-time) <sup>88</sup>   |
| • City Budget:               | \$90 million <sup>89</sup>   |
| • Median Household Income    | \$56,221 <sup>90</sup>   |
| • Median Home Value          | \$232,000 <sup>91</sup>  |
| • Median Age:                | 40.3 <sup>92</sup>   |

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<sup>75</sup> [https://en.wikipedia.org/wiki/Helena,\\_Montana](https://en.wikipedia.org/wiki/Helena,_Montana)

<sup>76</sup> [https://www.mthistory.org/grant\\_recipients/city-of-helena/](https://www.mthistory.org/grant_recipients/city-of-helena/)

<sup>77</sup> <https://www.census.gov/quickfacts/fact/table/US/PST045218>

<sup>78</sup> Growth Policy, Chapter 2:

<https://www.helenamt.gov/government/departments/community-development/planning/long-range-planning>

<sup>79</sup> Calculated from previous.

<sup>80</sup> [https://en.wikipedia.org/wiki/Helena,\\_Montana](https://en.wikipedia.org/wiki/Helena,_Montana)

<sup>81</sup> Ibid.

<sup>82</sup> Calculated from previous.

<sup>83</sup> [http://geoinfo.msl.mt.gov/geography/geography\\_facts/elevation\\_of\\_montana\\_cities.aspx](http://geoinfo.msl.mt.gov/geography/geography_facts/elevation_of_montana_cities.aspx)

<sup>84</sup> Ibid.

<sup>85</sup> [https://www.helenamt.gov/fileadmin/user\\_upload/Commission/Documents/City\\_Charter.pdf](https://www.helenamt.gov/fileadmin/user_upload/Commission/Documents/City_Charter.pdf)

<sup>86</sup> Ibid.

<sup>87</sup> [https://www.helenamt.gov/fileadmin/user\\_upload/Human\\_Resources/Employment/Recruitment\\_Brochure - Helena MT City Manager 2020 cv.pdf](https://www.helenamt.gov/fileadmin/user_upload/Human_Resources/Employment/Recruitment_Brochure_-_Helena_MT_City_Manager_2020_cv.pdf)

Much of this information is also available in the FY21 City Budget document:

<https://www.helenamt.gov/budget>

<sup>88</sup> Ibid.

<sup>89</sup> Ibid.

<sup>90</sup> Ibid.

<sup>91</sup> Ibid.

<sup>92</sup> Ibid.

## G) Selected City Properties & Associated Energy Use

| APPENDIX G: SELECTED CITY PROPERTIES & ASSOCIATED ENERGY USE - 2019                |                                   |                        |                     |
|--|-----------------------------------|------------------------|---------------------|
| Note: many of these locations include multiple meters, which have been aggregated. |                                   |                        |                     |
| pjudge@helenamt.gov (10/04/2020)   |                                   |                        |                     |
| Property   | Address                           | Electricity (kWh)      | Natural Gas (therm) |
| Wastewater Treatment Plant   | 2108 E Custer Ave                 | 3,232,720              | 70,560              |
| Missouri River Treatment Plant   | 2560 Canyon Ferry Rd              | 1,294,815              | 23,959              |
| Ten Mile Treatment Plant   | 1115 Rimini Rd                    | 643,008                | 0                   |
| City-County Building   | 316 N Park Ave & 316 N Benton Ave | 509,689                | 59,287              |
| Civic Center & Kay McKenna Park  | 340 Neill Ave                     | 325,350                | ??                  |
| Getchell St Parking Garage   | 801 Getchell St                   | 234,800                | 1,156               |
| 6th Ave Parking Garage   | 39 W 6th Ave                      | 214,000                |                     |
| Vehicle Maintenance Shop   | 3001 E Lyndale Ave                | 187,496                | 18,765              |
| Bill Roberts Golf Course & Muni's Sports Grille                                    | 2201 N Benton Ave                 | 179,321                | 11,557              |
| Memorial (pool, bandshell, warming house, etc.)                                    | 1200/1201 N Last Chance Gulch     | 167,592                | 36,161              |
| Transfer Station   | 1995 N Benton Ave                 | 166,011                | ??                  |
| Jackson St Parking Garage  | 201 N Jackson St                  | 122,320                |                     |
| Memorial Park (including Kindrick Legion Field)                                    | 1101 N Last Chance Gulch          | 74,479                 | 417                 |
| Chamber of Commerce Building   | 225 Cruse Ave                     | 73,640                 | 4,159               |
| Wastewater Maintenance Shop  | 2218 E Custer Ave                 | 66,800                 | 10,243              |
| Batch Fields   | 2101 N Benton Ave                 | 55,942                 |                     |
| Eastside Fire Station  | 650 N Hannaford St                | 49,540                 | 4,884               |
| Walking Mall / Downtown Mall / Fountain  | 21 S Last Chance Gulch            | 38,839                 |                     |
| "Parking Lot Lighting"? (721955)   | ??                                | 31,432                 |                     |
| "Parking Ramp at Walking Mall"?  | 125 N Last Chance Gulch           | 23,120                 |                     |
| "Mt Helena Park by City Res Emergen"? (725193)                                     | ??                                | 18,696                 |                     |
| Former Bus Depot (HATS) & South Garage   | 628/630 N Last Chance Gulch       | 13,265                 | 3,610               |
| 15th St Parking Garage   | 15 W 15th St                      | 8,796                  |                     |
| Fire Tower Park  | 111 S Cruse St                    | 1,396                  |                     |
| Fire Station   | 300 Neill Ave                     | billed with Civic Ctr. | ??                  |
| Capital Transit Bus Depot  | 1415 N Montana Ave                | ??                     | ??                  |
| Law & Justice Center   | 404/406 Fuller Ave                | ??                     | ??                  |
| Parks Maintenance Shop   | 1201 N Ewing St                   | ??                     | ??                  |
| <b>TOTAL</b>   |                                   | <b>7,733,067</b>       | <b>244,758</b>      |

## H) City of Helena Recycling Guide

| CITY OF HELENA - RECYCLING GUIDE 2020 (pjudge@helenamt.gov) |                      |                      |              |                   |                   |
|---|----------------------|----------------------|--------------|-------------------|-------------------|
| MATERIAL (recyclables should be clean & dry)                | TRANSFER STATION (1) | REMOTE ROLL-OFFS (1) | CURBSIDE (2) | PACIFIC STEEL (3) | 406 RECYCLING (4) |
| Aluminum Cans   | YES                  | YES                  | YES          | YES               | NO                |
| Cardboard (Corrugated)                                      | YES                  | YES                  | YES          | YES               | NO                |
| Paper (Mixed)   | YES                  | YES                  | YES          | YES               | NO                |
| Steel / Tin Cans  | YES                  | YES                  | YES          | YES               | NO                |
| Glass Containers  | YES                  | NO                   | YES          | NO                | NO                |
| Plastic (#1 & 2 Only)                                       | YES                  | NO                   | YES          | NO                | NO                |
| Automotive - Antifreeze                                     | YES                  | NO                   | NO           | NO                | NO                |
| Automotive - Batteries                                      | YES                  | NO                   | NO           | YES               | NO                |
| Automotive - Oil / Gasoline                                 | YES                  | NO                   | NO           | NO                | NO                |
| Automotive - Junk Vehicles                                  | YES (L&C County)     | NO                   | NO           | YES               | NO                |
| Scrap Metal / White Goods                                   | YES                  | NO                   | NO           | YES               | NO                |
| Yard Waste (branches separated for chipping)                | YES                  | NO                   | NO           | NO                | NO                |
| Electronic Items (aka "E-Waste")                            | YES                  | NO                   | NO           | YES               | YES               |
| Cardboard - Paperboard (Cereal Boxes, etc.)                 | NO                   | NO                   | YES          | NO                | NO                |
| Food Waste (Compost)  | NO                   | NO                   | NO           | NO                | YES               |

Note: Many of these items have additional restrictions. Check with providers for current guidelines and recent updates.

### PROVIDER

- 1) City of Helena
- 2) Helena Recycling
- 3) Pacific Steel
- 4) 406 Recycling

### LOCATION

- 1995 N Benton Ave  
 3 Industry Loop, E. Helena  
 1530 National Ave  
 Call for drop-off appt.

### PHONE

- 406-447-8084  
 406-457-2437  
 406-442-7851  
 406-449-6008

### WEB

- <https://www.helenamt.gov/government/departments/public-works/solid-waste/recycling>  
<https://www.helenarecycling.com/>  
<https://www.pacific-steel.com/helena/>  
<http://406recycling.com/>

### REMOTE ROLL-OFFS

- Safeway  
 Dale Harris Park  
 L&C County Fairgrounds  
 Boeing  
 Grub Stake  
 Mini-Basket

### LOCATION

- 611 N Montana Ave  
 Intersection of Cruse & Park  
 98 W Custer Ave  
 3200 Skyway Dr  
 1450 Lincoln Rd E  
 3012 Canyon Ferry Rd

## I) Methodology

### General Conventions

- energy use & cost data used in this 2020 report: calendar year 2019
- software: ICLEI ClearPath (updated from the CACP software used in the 2009 CAP)
- GWP values: IPCC 5<sup>th</sup> Assessment (most recent), 100 Year Values
- carbon emissions expressed as “U.S. tons of CO<sub>2</sub>e” for consistency with 2009 CAP

The outputs generated by ClearPath are in metric tons (MT). These are converted to U.S. tons (aka "short tons") by multiplying by the following conversion factor:

$$(2204.6 \text{ lbs per MT} / 2000 \text{ lbs per short ton} = 1.1023)$$

### City Government Analysis (“Government Track” in ClearPath)

- electricity (kWh) and natural gas (therm) usage and cost data from DEQ (Dave LeMieux)
- for simplicity, group all natural gas accounts under “buildings & facilities” in ClearPath
- enter electricity accounts under the following ClearPath categories:
  - buildings & facilities
  - streetlights & traffic signals
    - include SILDs, parking garages, park lighting, scoreboards, etc.
  - water & wastewater treatment facilities (electricity only)
    - include reservoirs, lift stations, wells, pumps, ponds, headgates, etc.
- vehicle fuels (gasoline and diesel) - usage and cost data from Fleet Coordinator JD Foreman
  - combine fleet AND transit (although they could be analyzed separately in ClearPath)
  - percent biofuel: assume E-10 for gasoline (10% ethanol blend)
- to convert energy totals to common units of mmBtu . . .

multiply kWh by 0.003412

multiply THERM by 0.1

multiply gasoline gallons by  $\approx 0.120286$

multiply diesel gallons by  $\approx 0.137381$

- electricity factor set: WECC NWPP eGrid 2018
- city government waste (e.g. waste generated by city employees in their offices)

Due to unknowns regarding how the waste figures were calculated in the 2009 CAP, the current analysis substitutes a simple linear extrapolation of the growth that occurred in this category between 2001 and 2007. While less-than-ideal, this approach seemed acceptable due to the relatively minor role played by this sector in the overall inventory in the previous analysis.

Linear equation used for calculating emissions from City govt waste category:  
tons of CO<sub>2</sub>e = (2)(Year) - 3900

This formula yields the following values:

102 tons in 2001, 114 tons in 2007, and 138 tons in 2019.

The first two values are indeed in agreement with the 2009 CAP (page 10).

City Government – Employee Commute

**From:** Patrick Judge <pjudge@helenamt.gov>

**Sent:** Monday, May 18, 2020 12:10 PM

**To:** !All City Employees <!AllCityEmployees@helenamt.gov>

**Subject:** employee commute survey - please respond - thank you!

Greetings,

As part of the effort to update the City's energy use assessment and greenhouse gas inventory, please complete the following "Employee Commute" survey. It was modeled after a similar survey taken 10+ years ago, and should take less than 5 minutes. Individual responses will remain private. The survey asks for your name only to ensure data quality and completeness. Note that the analysis is focused on calendar year 2019. If you have any questions, please don't hesitate to contact me.

Thank you for your cooperation!

<https://www.surveymonkey.com/r/FVZ2PYH>

P.S. The results will be part of the "Annual Sustainability Report," which will be published on the Citizen Conservation Board webpage, where you can also view the 2009 Climate Action

Plan: <https://www.helenamt.gov/government/departments/citizen-conservation-board>

P.P.S. A special thank-you to Engineering Intern Travis Ball for assisting with this effort.

--

- On June 22, 2020, Engineering Intern Travis Ball reported the following (Calendar Year 2019):

|   |         |
|---|---------|
| employees who participated in the survey:   | 80      |
| commute miles driven in a GASOLINE vehicle: | 194,270 |
| %VMT in Passenger Cars:                     | 54%     |
| %VMT in Passenger Light Trucks:             | 43.6%   |
| %VMT in Passenger Heavy Trucks:             | 2.4%    |
| commute miles driven in a DIESEL vehicle:   | 13,984  |
| %VMT in Passenger Light Trucks:             | 16.4%   |
| %VMT in Passenger Heavy Trucks:             | 83.6%   |
| commute miles driven in a ETHANOL vehicle:  | 12,880  |
| %VMT in Passenger Cars:                     | 100%    |

- Also on June 22, 2020, Michele Shepherd in H.R. reported the following:

|                 |     |
|-----------------|-----|
| employee count: | 329 |
|-----------------|-----|

- Scaling-up the data by a factor of 4.1125 (329/80) yields the following:

|   |         |
|---|---------|
| commute miles driven in a GASOLINE vehicle: | 798,935 |
| commute miles driven in a DIESEL vehicle:   | 57,509  |
| commute miles driven in a ETHANOL vehicle:  | 52,969  |

|               |                |
|---------------|----------------|
| <b>TOTAL:</b> | <b>909,413</b> |
|---------------|----------------|

- These figures were then entered into ClearPath, and resulted in the following gallon estimates:

|   |        |
|---|--------|
| gallons of fuel use by GASOLINE vehicles: | 41,270 |
| gallons of fuel use by DIESEL vehicles:   | 8,262  |
| gallons of fuel use by ETHANOL vehicles:  | 3,033  |
| (assume E-85)                             |        |

**TOTAL: 52,565**

- These figures were then entered into ClearPath, and resulted in the following emissions;

|   |        |
|---|--------|
| metric tons of CO2e from GASOLINE vehicles: | 365.76 |
| metric tons of CO2e from DIESEL vehicles:   | 84.425 |
| metric tons of CO2e from ETHANOL vehicles:  | 4.887  |
| (assume E-85)                               |        |

**TOTAL: 455 MT (502 U.S. tons)**

- ClearPath Transportation Factor Set -- selected "2019 US National Defaults (updated 2020)"

|                        |                     |
|------------------------|---------------------|
| Gasoline Passenger Car | 24.37713 mpg        |
| Gasoline Light Truck   | 17.86788 mpg        |
| Gasoline Heavy Truck   | 5.371652 mpg        |
| Diesel Light Truck     | 17.86788 mpg (same) |
| Diesel Heavy Truck     | 6.392468 mpg        |

and a bunch of other data (except ethanol?)

| <b>Commute Summary</b> | <b>gallons</b> | <b>mmbtu</b> | <b>co2e (MT)</b>           |
|------------------------|----------------|--------------|----------------------------|
| • Gasoline             | 41,270         | 5,159        | 366                        |
| • Diesel               | 8,262          | 1,141        | 84                         |
| • Ethanol              | 3,033          | 273          | 5                          |
| <b>TOTAL</b>           | <b>52,565</b>  | <b>6,573</b> | <b>455 (502 U.S. tons)</b> |

### ClearPath Reports

The following report options proved to be the most useful:

- Report 1 - Inventory by Scope (graph)
  - Scope 1 = Gas (combustion within city boundary)
  - Scope 2 = Electricity (grid-delivered electricity, district heating, etc.)
  - Scope 3 = Emissions not under the control of the City (employee commute, waste)
- Report 2 - Inventory by Scope and Sector (graph)
  - Scope 1 = Gas (combustion within city boundary)
  - Scope 2 = Electricity (grid-delivered electricity, district heating, etc.)
  - Scope 3 = Emissions not under the control of the City (employee commute, waste)
- Report 3 - Inventory by Sector (graph)
- Report 5 - Detailed Report (data)

## ClearPath Training Resources

### 1) General ClearPath

<http://icleiusa.org/clearpath/>

### 2) Inventory Module User Guide

<https://clearpath.icleiusa.org/>

### 3) ClearPath online training modules (password required)

<http://icleiusa.org/member-resources/>

"ClearPath is built for ease of use, but as part of ICLEI membership, ICLEI provides additional support through in-depth training on each step of ClearPath's setup and use. These trainings are delivered through both live webinars and through online, self-paced learning modules that you can access at any time."

## Community Analysis ("Community-Scale Track" in ClearPath)

- as a first time analysis, carbon emissions were expressed in the preferred unit of:  
"metric tons of CO<sub>2</sub>e" (aka "tonnes" or "MT")
- for this first analysis, everything was grouped together (under the "residential energy" tab)  
(a more granular analysis could be performed in the future, analyzing by sector)
- electricity (kWh) and natural gas (therm) usage and cost data from NorthWestern Energy  
contact: Howard Skjervem ([howard.skjervem@northwestern.com](mailto:howard.skjervem@northwestern.com))
- transportation data (gasoline & taxable diesel sold in Helena) from MT Dept of Transportation  
contact: the Motor Fuel Section can be reached at: [mdtfueltax@mt.gov](mailto:mdtfueltax@mt.gov)
- solid waste tab:  
waste characterization factor set: 100% mixed municipal solid waste (2019)  
landfill methane collection scenario: none  
landfill moisture content: national average (for now)  
waste type to calculate emissions for: all (for now)  
disposal location: outside the jurisdiction
- all other factor sets are the same as for City Government Analysis, except:  
electricity factor set: NorthWestern Energy specific data (instead of regional data)  
In its most recent "ESG/Sustainability Template" filing (2018), NorthWestern Energy reported a carbon intensity of **0.49 metric tons CO<sub>2</sub>e / megawatt-hour** (490 kg / MWh) for its Montana operations. Look for "EEI/ESG" under the "Clean Air" heading:  
<http://www.northwesternenergy.com/environment/our-environment>  
And then find: "Total Owned + Purchased Generation CO<sub>2</sub>e Emissions Intensity" under "Montana Generation Statistics" on page 5.  
Note that 490 kg / MWh converts to 1080 lb / MWh (conversion factor of 2.205 lb / kg).



## J) Resources & References

### **City of Helena - General**

- City of Helena - Charter (1977)  
[https://www.helenamt.gov/fileadmin/user\\_upload/Commission/Documents/City\\_Charter.pdf](https://www.helenamt.gov/fileadmin/user_upload/Commission/Documents/City_Charter.pdf)
  - City of Helena - Codes  
[https://codelibrary.amlegal.com/codes/helenamt/latest/helena\\_mt/0-0-0-1](https://codelibrary.amlegal.com/codes/helenamt/latest/helena_mt/0-0-0-1)
  - City of Helena - Ordinances & Resolutions (2010-2020)  
<https://www.helenamt.gov/government/departments/city-commission/ordinances-resolutions>
  - City Commission - Agendas  
<https://helena.novusagenda.com/agendapublic/>
  - City of Helena - Position Descriptions  
<https://www.helenamt.gov/government/departments/human-resources/position-descriptions>
  - City of Helena - "Quick Facts" (Population, Elevation, etc.)  
[https://en.wikipedia.org/wiki/Helena,\\_Montana](https://en.wikipedia.org/wiki/Helena,_Montana)  
<https://www.census.gov/quickfacts/fact/table/US/PST045218>
  - City of Helena - Facebook  
<https://www.facebook.com/CityOfHelena/>
- ### **City of Helena - Sustainability**
- City of Helena - Citizen Conservation Board, and 2009 Climate Action Plan  
<https://www.helenamt.gov/government/departments/citizen-conservation-board>
  - City of Helena - Recycling  
<https://www.helenamt.gov/government/departments/public-works/solid-waste/recycling>
  - City of Helena - Water Rates, Water Conservation Tips, etc.  
<https://www.helenamt.gov/government/departments/finance/utility-customer-service/utility-faqs>  
<https://www.helenamt.gov/public-works/drinking-water>
  - City of Helena Growth Policy  
<https://www.helenamt.gov/government/departments/community-development/planning/long-range-planning>
  - Helena Community Gardens & 6th Ward Garden Park  
<http://helenagardens.org/>  
<https://6thwardgardenpark.com/>

- Helena Farmers' Markets  
<https://www.helenafarmersmarket.com/>  
<https://www.facebook.com/CapitolSquareFarmersMarket/>  
<https://www.facebook.com/meadowlarkmusicfest/>

- Helena Recycling  
<http://www.helenarecycling.com/>

- 406 Recycling (and Composting)  
<http://406recycling.com/>

- Pacific Steel & Recycling  
<https://www.pacific-steel.com/helena/>

- Resilient Helena  
<https://resilient-helena.org/>

### **Lewis & Clark County**

- Lewis & Clark County - Solid Waste Division (Landfill, etc.)  
<https://www.lccountymt.gov/public-works/solid-waste.html>

### **Montana State Government**

- Montana Code Annotated (MCA)  
<https://www.leg.mt.gov/bills/mca/index.html>
- Administrative Rules of Montana (ARM)  
<http://mtrules.org/>
- Montana Legislature - Bill Lookup  
<https://www.leg.mt.gov/bill-info/>
- Montana DEQ - Energy Division  
<http://deq.mt.gov/Energy>
- Montana DEQ - Recycling and Waste Reduction, Diversion Statistics, 2018 IWMP  
<http://deq.mt.gov/land/recycle>

### **Other Montana Resources**

- Bozeman - City Sustainability  
<https://www.bozeman.net/government/sustainability>
- Bozeman - MSU Sustainability  
<https://www.montana.edu/sustainability/>

- Energy Corps  
<https://www.energycorps.org/category/montana/>
- Missoula - City Sustainability, and Zero Waste Plan  
<http://www.ci.missoula.mt.us/956/Energy-and-Climate-Action>  
<https://www.zerobyfiftymissoula.com/>
- Missoula - UM Sustainability  
<https://www.umt.edu/sustainability/>
- NorthWestern Energy - Environmental Information (including EEI/ESG emissions)  
<http://www.northwesternenergy.com/environment/our-environment>
- NorthWestern Energy - Energy Saving Tips  
<https://northwesternenergy.com/save-energy-money/energy-efficiency>

### **National Resources**

- EPA "eGrid" Database (used to obtain emissions factors for the regional electricity grid)  
<https://www.epa.gov/egrid>
- ICLEI - Local Governments for Sustainability, and the "ClearPath" Tool  
<https://icleiusa.org/>  
<https://icleiusa.org/clearpath/>
- League of American Bicyclists - Bicycle Friendly Communities  
<https://www.bikeleague.org/community>
- Mayors Climate Protection Agreement, Climate Mayors, and "America is All In"  
<https://www.usmayors.org/programs/mayors-climate-protection-center/>  
<http://climatemayors.org/>  
<https://americaisallin.com/>

- SolSmart  
<https://solsmart.org/>

### **International Resources**

- Intergovernmental Panel on Climate Change - Special Report: Global Warming of 1.5°C  
<https://www.ipcc.ch/sr15/>
- The Greens (Australia) - Waste Management Hierarchy Image  
<https://greens.org.au/sites/default/files/inline-images/hierarchy.png>