ITEM #__26___

Staff Report

U.S. MAYORS CLIMATE PROTECTION AGREEMENT AND CITY OPERATIONS CARBON FOOTPRINT

November 28, 2017

BACKGROUND:

At the June 13, 2017, City Council meeting, the City Council directed staff to schedule a workshop to discuss specific goals that could assist the City in meeting the 2014 U.S. Mayors Climate Protection Agreement standard. Additionally, the City Council directed that a proposal to sign on to that agreement should be placed on a future agenda.

GREENHOUSE GAS TREATIES AND AGREEMENTS:

City staff believes it may be helpful to review the history of the standards that have been proposed and implemented related to climate change and carbon footprint in the past several years. In 1997, the United Nations Framework Convention on Climate Change adopted the **Kyoto Protocol**. The Kyoto Protocol set greenhouse gas emission reduction targets for ratifying nations. It established a system to measure and report emissions, and required implementation of policies that would result in reduced greenhouse gas emissions. A "carbon market" was established among ratifying nations, to allow nations that were below their emissions targets to sell this capacity to nations that were over their targets.

Although the United States is a signatory to the Kyoto Protocol, the U.S. has not ratified the agreement. In 2005, the U.S. Conference of Mayors endorsed a **U.S. Mayors Climate Protection Agreemen**t, which sought to implement the goals of the Kyoto Protocol on a city-by-city level in the U.S. This agreement has over 1,000 signatories. The agreement commits cities to three actions:

1) Urging the federal and state governments to enact policies and programs to reduce global warming pollution levels by 7% below their 1990 levels by 2012.

2) Urging Congress to pass greenhouse gas reduction legislation, including emissions limits and a market-based greenhouse allowance trading system.

3) Striving to meet or exceed Kyoto Protocol targets for greenhouse gas reduction in city operations.

In 2007, the City Council approved a resolution endorsing this agreement. The Council later adopted a set of carbon reduction goals and procedures that it felt were in the spirit of the agreement. These are described in detail in the section that follows.

In 2011, efforts were initiated to develop a successor agreement to the Kyoto Protocol, since the Kyoto Protocol's scope ends in the year 2020. This led to the adoption of the **Paris Climate Accord**. The goal of the accord is to hold the global average temperature increase to no higher than 2°C above pre-industrial levels. The agreement requires countries to establish emissions reduction plans, but does not differentiate the responsibility between developed nations and the developing world, as the Kyoto Protocol did. The United States is a signatory to the Paris Climate Accord, but indicated its intent in summer 2017 to withdraw from the accord, which can occur no earlier than the year 2019.

In 2014, the U.S. Conference of Mayors developed a revised Climate Protection Agreement. This agreement proposed a national greenhouse gas emission reduction target of 17% by the year 2020, and for an ambitious subsequent goal to be developed after 2020. Locally, the agreement encouraged actions such as:

1. Developing an energy plan, including an inventory of emissions
2. Adopting land-use policies that reduce sprawl, preserve open space, and enhance walkability
3. Promoting transportation options (bike trails, carpooling, transit)
4. Increasing alternative energy use
5. Prioritizing energy efficiency through building code improvements, energy efficiency upgrades to City facilities, and conservation
6. Increasing the fuel efficiency of City vehicles
7. Increasing energy efficiency of water and wastewater operations
8. Increasing community recycling rates
9. Promoting tree planting and maintaining healthy urban forests
10. Educating the community about the importance of energy efficiency and renewable energy.

The agreement also encouraged cities to invest in climate preparedness strategies to plan for the effects of climate change. Finally, the agreement committed cities to support conservation initiatives such as Arbor Day, Earth Day, and community events, as a way to reaffirm a public commitment to conservation.

CITY OPERATIONS CARBON FOOTPRINT:

In 2007, the City Council approved a resolution endorsing the U.S. Mayors Climate Protection Agreement. At that time, the City Council also committed to identifying baseline carbon emission levels for City operations, establishing carbon reduction goals, and developing a plan to achieve these carbon reduction goals.

Upon endorsing the agreement, City staff reviewed the available records and learned that complete data regarding City operations energy consumption (which is used to calculate carbon emissions) was only available back to the year 2001. **Therefore, the**

City Council adopted a goal to reduce the carbon footprint of City operations by 15% from its 2001-2006 average levels by the year 2014.

Efforts to achieve the City Council's goal in years leading up to 2014 were assisted in two significant ways. One was through the City Council allocating $400,000 in the Capital Improvements Plan to implement energy efficiency projects in City facilities. City staff obtained a comprehensive energy audit of City facilities, prioritized potential projects based on their carbon footprint reduction and payback period, and exhausted the available funding by implementing dozens of the proposed projects. The second way in which the City's efforts were assisted was through the widespread availability of energy efficiency grant funding as part of the American Recovery and Reinvestment Act of 2009. The City received $624,920 in grants for seven projects to replace interior lighting, heating and cooling equipment, traffic signal, streetlights, and pumps and motors. Since then, grants for energy efficiency projects have become scarce.

As City staff reviewed the carbon footprint of City operations, the City was organized into three major sectors: 1) the Building sector, 2) the Fleet sector (including the Cy-Ride and non-CyRide fleet), and 3) the Miscellaneous sector. The City utilities (Electric Plant, Resource Recovery, Water Plant, Water Pollution Control Facility, and their related pumping stations) were measured, but not counted against the City's baseline or goals. This is because the demand placed on those facilities (and how much energy must be used to respond to that demand) is significantly affected by factors outside the control of City staff.

In the **Building sector**, electric and natural gas consumption were measured. By 2014, the energy efficiency improvements implemented at City facilities caused the following reductions compared to the measurement period baseline:

- Natural Gas usage decreased 18.2%
- Electrical usage decreased 17.9%
- CO2 emissions decreased 17.9%

In the **Fleet sector**, total emissions increased during the measurement period, because the quantity of fuel consumed has increased. However, the number of miles driven has also increased. Comparing the fuel consumption and the miles driven, by 2014, the efficiency of the non-CyRide fleet increased significantly, and the number of passengers traveling on the CyRide system also increased significantly:

Non-CyRide Fleet	**CyRide Fleet**
5.2% emissions increase	33.6% emissions increase
26.6% increase in miles driven	31.3% increase in miles driven
20.3% more efficient (CO2/mile)	**1.7% less efficient (CO2/mile)**
	63% ridership increase over baseline
	18.3% decrease in CO2 per rider

In the **Miscellaneous sector**, the key drivers of CO2 emissions are light fixtures such as streetlights and traffic signals. This sector saw a measureable decrease in CO2 emissions during the period when traffic signals were converted to LED fixtures. However, the continued growth of the City has caused an increase in the electrical consumption related to streetlights. **In 2014, the CO2 emissions related to the Miscellaneous sector were up 10.6% compared to the baseline.** City staff is now in the second year of a six-year, $1.9 million project to convert the City's streetlights to LEDs. Since streetlights are the largest driver of the carbon footprint in this sector, this project should cause a sizeable decrease in the CO2 emissions of the Miscellaneous sector. **However, as the City continues to grow and add additional lights, the carbon footprint may again increase in the future.**

COMMUNITY SUSTAINABILITY EFFORTS:

In 2010, the City entered into an agreement with Iowa State University to share a portion of ISU Sustainability Coordinator Merry Rankin's time for City activities. The City has contracted with ISU for $25,000 per year since then for these services. Ms. Rankin has been focused on sustainability initiatives that affect the Ames community, while City staff has evaluated the sustainability of City operations.

Through this initiative, the Sustainability Coordinator has led a Sustainability Task Force and developed a community sustainability plan. The City Council provided direction in 2012 to focus efforts on reducing electrical energy consumption in the community. These efforts included a review of the City's Smart Energy Program, developing communication materials for local businesses related to energy conservation, and creating an award and recognition for those businesses that led efforts in reducing electrical consumption.

The Sustainability Coordinator has also worked on efforts to develop a residential energy comparison tool and waste reduction efforts with Water & Pollution Control and Resource Recovery, including exploring composting and the coordination of the Rummage RAMPage.

ACTIVITIES AND GOALS IN OTHER COMMUNITIES:

Staff has investigated the efforts of other communities and the goals they have adopted related to energy efficiency and carbon footprint. A summary of several cities with readily available goals and actions is below:

City	Goal	Actions (actual and proposed)
Cedar Rapids	By 2020, reduce energy use in City facilities to 26% below 2008 levels	LEED standards for all new City buildings, energy efficiency projects at City facilities (lighting upgrades, vehicle idling reduction, pump and motor upgrades, geothermal heating/cooling, solar-powered buildings/fixtures)
Iowa City	By 2025, reduce community-wide greenhouse gases 26-28% below 2005 levels, and reduce 80% below 2005 levels by year 2050. (No specific goal for municipal operations)	Community greenhouse gas inventory (including analysis of local utility generation portfolio), consolidation of City facilities, lighting/equipment upgrades at City facilities, coordination of traffic signal timing, installation of electric vehicle charging stations, LRTP and bike master plan focus on energy efficiency.
Dubuque	By 2030, reduce community-wide greenhouse gases 50% below 2003 levels.	Community greenhouse gas inventory, efforts to reduce greenhouse gases in energy generation, the built environment, waste reduction and resource management, and transportation
Columbia, MO	By 2020, reduce community-wide greenhouse gases 20% below 2012 levels.	Community greenhouse gas inventory, implement anti-sprawl land-use policies, provide transportation alternatives, invest in renewable energy, retrofit City facilities and equipment, purchase only Energy Star equipment for City use, construct LEED facilities, improve vehicle fuel efficiency, increase community recycling, promote tree planting.
Duluth, MN	By 2050, reduce greenhouse gases from city operations 80% below 2008 levels.	Installation of solar panels, electric vehicles and charging stations, equipment upgrades at water treatment facility.
St. Cloud, MN	By 2019, 25% reduction in energy purchased compared to 2014; by 2024, 50% reduction in energy purchased; by 2034, 75% reduction in energy purchased	Substantial investment in solar energy, energy generation from wastewater facility, replacement of street lights and traffic lights with LEDs.

It should be noted that several of these communities consider how electricity generation sources (e.g., coal, gas, wind, solar) have changed over time when calculating their community carbon footprints. **During Ames' efforts to evaluate its carbon footprint, City staff has only evaluated the demand side of the electrical energy equation, even though the fuels used to power the City have changed. If staff was to adjust the carbon footprint calculation based on the actual source of electricity, the City's carbon footprint now would likely be significantly smaller than a decade ago because of the replacement of coal with natural gas at the Power Plant, the addition of wind energy into the City's energy portfolio, and the planned addition of solar energy into the City's energy portfolio.**

OPTIONS:

The City Council has requested to have approval of the 2014 Mayors Climate Protection Agreement on a future agenda. That option, along with others the City Council may wish to consider, appear below. The City Council could choose to implement one or a combination of the following:

1. **Sign on to the 2014 U.S. Mayors Climate Protection Agreement**
   The text of the revised agreement is attached to this staff report. It should be noted that the agreement itself is primarily a statement advocating general action related to climate change; although example actions are provided in the agreement, it does not commit the City to taking any specific actions. City staff has reviewed the list of encouraged actions and believes many, if not all of the listed actions are being addressed through the City's existing efforts, such as: Sustainability Coordinator activities, the EcoSmart umbrella of programs, the SunSmart Ames community solar initiative, the emphasis on multi-modal transportation in the Long-Range Transportation Plan, the Complete Streets initiative, the development of a new Land Use Policy Plan, efforts at CyRide and Fleet Services to purchase fuel efficient, hybrid, and flex-fuel vehicles, the Rummage RAMPage repurposing event, and the hiring of a City Forester and implementation of an urban forest management plan.

   In 2007, the City Council adopted the original U.S. Mayors Climate Protection Agreement and then adopted policies and goals the Council felt were in the spirit of that agreement. If the City Council wishes to commit the City to additional actions to reduce the City's carbon footprint, specific direction to City staff would be required.

2. **Establish a new carbon footprint reduction goal in the spirit of the 2014 U.S. Mayors Climate Protection Agreement**
   The City Council's original goal timeframe has now passed. Two of the three areas of measurement have reduced their overall carbon footprint or increased their overall efficiency by greater than 15%, and one sector has become more than 10% more carbon intensive as of 2014.

   a. **One option available to the City Council would be to could commit to meeting the original goal in all three sectors by a specified time.** City staff could evaluate the Miscellaneous sector and return to the City Council with what it believes is a realistic timeframe to achieve a 15% carbon footprint reduction in that sector.

   b. **Alternatively, the Council could choose to establish a new goal. As a first step, City staff recommends that the City Council direct staff to evaluate the carbon footprint of City operations in consideration of the changes in fuels used to generate electricity in the past decade.** This appears to be how many other communities evaluate their carbon

footprint. The carbon footprint assessments the City Council has received from staff since 2007 have all focused on the consumption of energy, and have not allowed changes in the source of the energy to be considered. Although this has been helpful to focus efforts on energy reduction, it does not give the City credit for investments in lower carbon and renewable energy. Since the City's electrical generation portfolio has changed substantially in this period of time with the addition of wind and natural gas power (and the planned addition of solar energy), the carbon output from City operations has also changed. In not considering the source of the energy, it is difficult to compare the overall carbon footprint of City operations with other communities.

Once City staff completes this assessment, the City Council could be provided with a clearer comparison of the City of Ames' efforts compared to other communities. **The Council could then proceed with establishing a new carbon footprint goal. A new goal could be related to City operations or could be focused on the entire community's carbon footprint.** A carbon footprint inventory of the community would need to be developed if the goal was related to the entire community rather than City operations. Staff has more readily available information and greater control over City operations. However, many examples exist from other cities regarding how to approach a community-wide goal.

If the new goal was related only to City operations, the City Council would need to decide whether it should attempt to achieve an absolute decrease in the City operations carbon footprint compared to where it was at some point in time, or if it should be related to increasing the efficiency of City operations. Since Ames is a growing community, achieving an absolute reduction would be very challenging and expensive if the expectation was to maintain the same level of service to the community. For example, opening a new Healthy Life Center would require not only that such a facility be extremely energy efficient, but also that any increase in carbon footprint associated with it be offset by additional carbon decreases in other City facilities. This could be very difficult to achieve.

As an alternative, the City Council could choose to adopt a goal to increase the efficiency of City operations (e.g., City vehicles are measured not by total fuel consumed, but by miles driven per gallon. In facilities, rather than measuring total carbon output, the average carbon intensity per square foot could be measured and reduced over time).

A new goal would need an achievable target and timeframe. Staff has provided examples of carbon reduction goals and timeframes from other communities in this report. The timeframe of any goal would need to allow for staff to develop a strategy to achieve the goal and make progress

towards it. **The City Council should note that the round of equipment replacement that occurred in the past 5-10 years has addressed most of the cost-effective energy efficiency upgrades known to City staff. Reducing energy consumption in those facilities further may either be infeasible or extremely costly to do. The City Council may have to commit significant funds to energy efficiency projects if further reductions are desired.**

The U.S. Mayors Climate Protection Agreement

(As presented to the 82nd Annual U.S. Conference of Mayors Meeting, Dallas, 2014)

I. **National Action:** As leaders of the nation's cities, we continue to urge the federal and state governments to enact bipartisan legislation, policies and programs to assist mayors in their efforts to lead the nation toward energy independence, create American jobs that can't be shipped overseas, and protect our environment, eliminate waste, and fight climate change. Such efforts will help achieve the national target of reducing greenhouse gas emissions in the range of 17 percent by 2020 and urge the United States to adopt an ambitious post 2020 target. We urge congress to enact policies and programs that:

   a. Promote greater energy independence and reduce the United States' dependence on fossil fuels;

   b. Accelerate energy efficiency and the development of clean, economical and renewable energy technologies such as cogeneration, LED/other energy-efficient lighting, methane recovery for energy generation, waste to energy, wind and solar energy, fuel cells, efficient motor vehicles, and biofuels; and

   c. Adapt city buildings, homes, facilities and infrastructures to address changing climatic conditions.

   We urge the federal government to reduce carbon pollution through existing authorities such as the Clean Air Act, Appliance Efficiency Standards, Federal Transportation Investments, and Renewable Energy and Energy Efficiency loan and grant programs, including refunding of energy block grant program, and by proposing new legislative initiatives.

II. **Local Action:**

   a. Mitigation: We will strive to establish and meet or exceed locally-established targets for reducing energy use, especially fossil fuels, by taking actions in our own operations and throughout our communities, placing particular emphasis on engaging the community – citizens, businesses, schools and organizations – in a concerted campaign to set and achieve such targets through actions such as:

      i. Develop an energy plan that addresses and includes water, wastewater and stormwater runoff, heat island effects, preservation of open space and an inventory of emissions from fossil fuels for city operations and for the community using established metrics, set reduction targets and adopt elements that address how to harden and adapt city systems and infrastructures to climatic events;

      ii. Adopt and enforce land-use policies that reduce sprawl, preserve open space, and create compact, walkable urban communities;

      iii. Promote transportation options such as bicycle trails, commute trip reduction programs, incentives for car pooling and public transit;

iv. Increase the use of clean, alternative energy by supporting the development of renewable energy resources, building the renewable energy technology manufacturing capacity of cities, recovering landfill methane for energy production, and supporting the use of waste to energy technology;
v. Make energy efficiency and resilience a priority through building code improvements, retrofitting city facilities with energy efficient lighting, urging employees to conserve energy and save money and other actions to maximize the performance of the city buildings;
vi. Increase the average fuel efficiency of municipal fleet vehicles, reduce the number of vehicles, launch an employee education program including anti-idling messages, and convert diesel vehicles to bio-diesel;
vii. Evaluate opportunities to increase energy efficiency in water and wastewater systems, recover wastewater treatment methane for energy production, and harden these systems to respond to sea level rise and other climatic events threatening the delivery of these services;
viii. Increase recycling rates in city operations and in the community;
ix. Maintain healthy urban forests; promote tree planting to increase shading and to absorb CO2; and
x. Help educate the public, schools, other jurisdictions, professional associations, business and industry about the importance of energy efficiency and renewable energy development in reducing carbon and actions necessary to adapt buildings, systems, and infrastructures to respond to changing climate conditions.

b. Resilience: We support investment in climate preparedness strategies that implement the use of green infrastructure to increase resilience of city water systems, encourage preparedness policies that take into account a city's most vulnerable populations and disproportionately affected citizens, and work with state and federal officials to have disaster response systems in place to deal with acute stresses to a city or region. We pledge further to increase community preparedness by assessing and addressing projected impacts such as sea level rise, increased storm surge, extreme heat, drought, floods, and wildfires.

III. Advocacy: We pledge to support a grassroots movement, engaging young people especially, in support of conservation initiatives, such as Arbor Day, Earth Day, community events, locally-established conservation corps and other activities, and to recognize "conservationists" in our city as part of a systematic campaign over time to renew and reaffirm public commitments to long-established conservation values in our city, state and nation. We further pledge to work as global ambassadors to share best practices with mayors everywhere.