

SEVEN INITIAL STEPS IN IMPLEMENTING THE CITY'S CLIMATE ACTION PLAN

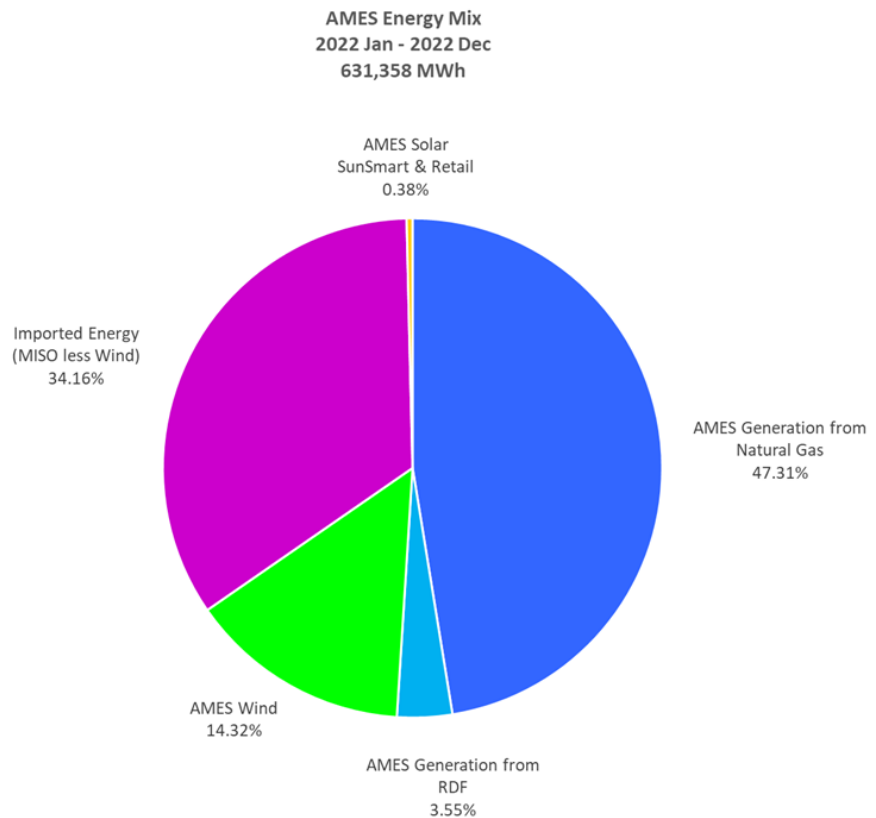
After reviewing the Six Big Moves suggested by City's Climate Action Plan (CAP) consultant, SSG, and analyzing the recommended action steps in accordance with eight evaluation criteria (cost, administrative effort needed, feasibility of achievement, legal feasibility, available funding sources, impact on property taxes and utility rates, impact on inclusion, and cost compared to the tonnage of carbon reduced), the City staff is recommending the following seven initial projects in the implementation of the City's Climate Action Plan.

STEP 1 - INCREASE WIND AND SOLAR GENERATION AS PART OF ELECTRIC SERVICES RENEWABLE ENERGY PORTFOLIO

This step reflects a lowest cost per ton of carbon removed, achieves the greatest percentage of carbon removed from all the proposed CAP action steps, requires minimal administrative burden on the existing staff, and involves projects in which staff has previous experience.

According to our Greenhouse Gas Inventory, electricity represents approximately 40% of the community's overall greenhouse gas emissions. Emissions are created by gas combustion at the Power Plant, but also indirectly created when electricity is purchased from the regional market.

Currently, Ames Electric Services has purchased 30 MWs of wind through a PPA (Power Purchase Agreement) that expires prior to 2030, and 2 MW of solar through a PPA.



Overall, approximately 14.32% of our annual electric usage comes from wind, about 0.38% from solar, and 3.55% of energy is produced from the combustion of resource derived fuel (RDF), for a total of 18.25% of renewable energy.

Based on staff analysis and from data obtained for a Request for Proposal issued in late 2022, the following conclusions have been reached regarding diversification our renewable portfolio:

- 1) Presently approximately 47.31% of the City's electricity is produced by the Ames Power Plant as an indirect result of burning RDF. Given the ratio of gas to RDF that is required by our permit to be burned in our boilers, we will be prevented from achieving more than a 55% carbon reduction.
- 2) To achieve cost-competitive renewable energy, the projects must be "utility sized" (40 MW or greater). In general, individual rooftop solar installations cost 3 to 4 times more than utility-sized solar per MWh produced, and ground-mounted solar costs twice as much as utility-sized per MWh produced.
- 3) Currently, wind is only available in utility-sized projects, and is more cost effective than utility-sized solar on a per MWh basis.
- 4) Projects greater than 5 MW are required to pass through a regional transmission system review process which takes several years to complete and makes the project susceptible to transmission system improvement costs.
- 5) The Inflation Reduction Act (IRA) allows cities and municipal electric utilities to receive "direct payment" of tax credits 30% or greater for solar and wind energy projects they build and own.

STATUS:

Electric Services is pursuing the following three options to increase the amount of renewable energy in our electric mix.

1. Solar Projects within the City of Ames

At the present time, staff has a short list of vendors to install solar panels on the roofs of three city buildings, and one to two local sites. The expected nameplate capacity of these solar projects total between 7 to 15 MW, and if built, the projects would provide an additional 3% to 6% of the annual electric consumption of Ames Electric Services customers. Although the energy cost for these projects is above the current average production cost of the City's existing wholesale power supply, the projected impact on electric rates is less than a 2% increase.

One possibility of partial funding for a locally sited community solar project is the "Solar for All" program. These are federal dollars that will be administered by the State Energy Office, with a focus on using solar to lower utility bills to income-qualified households by 20% or more. Electric Services wrote a letter of support to the proposal from the State Energy Office to the Environmental Protection Agency (EPA). The proposed program would include funding that could be paired with federal tax credits to lower the cost of solar installed by the City, provided some direct utility bill credit was applied to income-qualified participants. The program would be a way to leverage additional outside funds to build more local renewable energy and help low to moderate households with their utility costs. This state program is expected to accept applications in early 2025, with funding announced by mid-year.

2. Utility-Sized Wind Projects

Staff is also developing a Memo of Understanding with a wind developer on a proposed project in the area. The estimated size of the project has a nameplate rating of 80 MW and could provide up to 50% of the electric consumption of the City. Currently, staff is reviewing the options of ownership vs. PPA to determine the impact on electric rates if this option is selected. This project has already started its review process through Mid-Continent Independent System Operator (MISO). This project already has completed its first of three reviews.

3. Customer-Owned Rooftop Solar

The last activity under this topic is customer-owned rooftop solar. Ames Electric already has a program in place and has seen nearly 200 customers taking advantage by installing solar panels on their roofs representing 1.5 MW. Through the current Cost-of-Service study, there will be some recommendations presented to the City Council in the future, suggesting changes to the program or to the rates.

STEP 2 - WASTE-TO-ENERGY IMPROVEMENTS/REDUCING WASTE EMISSIONS

In December 2022, a consulting report was presented to the City Council evaluating options to burn refuse in a separate boiler thereby significantly reducing the amount of gas that would be needed to run our Power Plant and facilitating the ability of Electric Services to take advantage of lower priced energy from the grid when it is cheaper to purchase. The report indicated that the costs associated with this strategy would range from \$120 to \$280 million.

At the same time, the City Council directed staff to explore an Organized Garbage Collection system that could facilitate the collection of organics, yard waste, and recyclables and reduce the number of truck trips and associated emissions.

STATUS:

Cardboard Recycling Has Begun

Electric Services has begun a pilot project to increase cardboard recycling. In summer 2023, six cardboard recycling bins have been situated in the Downtown area. They are emptied on a weekly basis by Metro Waste Authority, which transports the cardboard to its facilities for processing and recycling. All bins are between 75% and 100% full every week, removing more than 10 tons from the waste stream to date. By diverting this material from the waste stream, less natural gas is used by the Power Plant to dispose of the cardboard in the boilers.

Initial results from this pilot project indicate a strong demand from residents and businesses for this type of program. Therefore, Resource Recovery staff has ordered roll-off containers to be placed in locations around the community for cardboard collection. The collected cardboard will be transported by Resource Recovery staff to recycling facilities in Des Moines (multiple facilities will accept cardboard; staff will determine which facility based on the sale price of cardboard and the ability of the facility to accept it). With

Resource Recovery taking over this project with its own collection containers, the Metro Waste Authority receptacles located downtown will be phased out in early 2024.

Natural Gas Purchase Reduced

The contract cost for natural gas at the Power Plant has increased for calendar year 2024 by approximately 30% compared to 2023. To offset this cost increase, the amount of natural gas being purchased by Electric Services for 2024 has been reduced by 15%. This will decrease the amount of RDF that can be processed and will increase the need to divert solid waste from the Resource Recovery facility and to find alternative methods to dispose of recyclable materials.

Staff anticipates the natural gas reduction will require a corresponding reduction in the amount of refuse derived fuel that can be processed in the Resource Recovery Plant from the 30,000 tons per year to 27,000 tons in 2024. It is expected that this total will be further reduced to 25,000 tons in calendar year 2025, as natural gas prices are expected to continue to increase.

Increased diversion of solid waste from the Resource Recovery System to the Boone County Landfill has accelerated the consumption of usable space at this facility. While Boone County is obligated to take Story County waste through 2025, when the current comprehensive solid waste plan expires, City staff anticipates that Boone County will not wish to continue serving as the final disposition of Story County's solid waste after 2025.

Waste Disposal

Because the December 2022 study identified potential costs of a new waste-to-energy facility that are prohibitive, Staff is now exploring the following options related to the long-term future of solid waste disposal in Story County:

1. Direct Haul of Story County Waste to another Landfill or Construction of a Transfer Station in Ames

When Boone County Landfill ultimately decides to remove Story County waste from its system and a new dedicated waste-to-energy system is not constructed, then arrangements will need to be made to dispose of Story County's solid waste. This could be through direct haul of waste and recyclables to facilities in other counties for disposal (such as Marshall County, Carroll County, or Metro Waste Authority in Polk County), or it could take the form of the construction of a transfer station in Story County where haulers would drop their loads and consolidated loads then would be hauled via semi-trucks to landfill and/or recycling facilities.

The details regarding this approach, including how it would operate, the services provided, the costs, etc., are yet-to-be-determined. **Staff is consulting with Des Moines Metro Waste Authority regarding potential interest in such a transfer station (including construction, operation, and/or receiving the materials delivered there).**

2. Identify A New Partner to Jointly Fund a Dedicated Waste-to-Energy Facility

Des Moines Metro Waste Authority staff expressed a possible interest in assisting with capital costs related to a new dedicated waste-to-energy boiler. Outside financing from a

new partner could make such a project significantly more financially feasible. Staff is meeting with Metro Waste Authority to more firmly establish whether this interest is actionable.

Electric staff has been approached by a waste-to-energy consultant that believes the construction cost estimates developed in the 2022 study for a dedicated waste-to-energy boiler are substantially higher than their experience. Staff is in communication with that consultant to validate their lower construction cost estimates.

3. Organized Waste Collection System

As requested by the Council, The City Manager’s Office is working on analysis and next steps regarding an organized garbage collection system. It should be noted that a waste collection decision is entwined with the City Council’s ultimate decision regarding waste disposal. Therefore, a decision regarding moving to an organized waste collection system should be made at the same time a waste disposal strategy is adopted.

The 2023 Resident Satisfaction Survey included questions regarding interest in an organized collection system and willingness to sort materials from garbage. Survey results were collected from 596 randomly selected Ames residents.

This year’s survey found that, overall, most respondents were more willing to sort certain products from their garbage compared to 2022. Percent increase ranged from 10% (organics) to 32% (glass). Glass is the waste product that respondents were most willing to sort (87%), followed by metal (80%) and plastic (80%). Respondents were least willing to sort organics from their garbage with 51% indicating that they were not willing to sort organic material from their garbage.

Respondent Preferences for Sorting Waste Types from Their Garbage

Waste Type	2022	2023
Glass	54.9%	87.2%
Metal	64.0%	80.3%
Plastic	64.8%	80.0%
Organics	38.4%	48.8%

Survey respondents were asked their preferred method of disposal of sorted waste, with options including: 1) no-charge centralized drop-off, 2) curbside collection for a fee, 3) willingness to participate in either program, 4) not interested, and 5) other. Almost 1/3 (31%) of the respondents would participate in either program (no charge centralized drop-off or curbside collection for a fee). Another quarter of them preferred no-charge centralized drop-off, while 26% preferred curbside collection for a fee. When asked if they currently pay for curbside recycling through their garbage hauler, 10% said yes.

Preferred Method of Disposing of Sorted Waste Items

Method	2022	2023
Would participate in either one	30.7%	30.8%
No-charge Centralized Drop-off	30.5%	26.2%
Curbside Collection for a fee	23.0%	23.1%
Not Interested	11.0%	14.3%
Other	4.8%	5.7%

It appears from these results that there is a moderate appetite among the community for additional opportunities to recycle, either through curbside collection or through a drop-off program. Staff is preparing for a report to the City Council in 2024 to seek further direction regarding these initiatives.

Ongoing Strategies to Reduce Waste

- 1) Continued outreach and education about expanded recycling drop-off options at RRP. Also, continued outreach and education about existing glass recycling and food waste recycling currently available.
- 2) Outreach and education about the true cost of garbage and the benefits of producing less waste.
- 3) Bring a long-term strategy for the collection and disposal of recyclables and solid waste to the Council for consideration within the next six months.

STEP 3 - NET ZERO AND NET ZERO-READY (NZR) NEW CONSTRUCTION

The City Council could consider 1) changing our Zoning Ordinance to include specific design features of a building that support both being Net-Zero Ready and Passive Building Design and/or 2) requiring Net-Zero Ready and Passive Building Design as part of annexation and contract rezoning.

Net Zero Ready is an interim design condition for a new building that if on-site generated renewable energy was added to the building it would have no net energy demand. However, at the time of construction it does not include the energy generation source, it would be added later.

To accomplish this standard, an energy-usage allowance is established prior to construction based upon potential of on-site generation and then the design of the building must work towards the defined cap on energy usage for heating, cooling, and plug loads. This would be accomplished by the designer through performance modeling. The building cannot use natural gas for heating. Ultimately, the on-site generation is needed for a building to become Net Zero Ready.

Passive Building Design is similar to the intended outcome of Net Zero Ready but utilizes its building design elements to manage heating and cooling needs without relying upon on site energy generation.

Designing and constructing a Net Zero Ready home would not have a substantial difference in cost since the expense of a solar system is not included up front. It does require more effort to design the home and intentionally incorporate the required features to be net zero ready, and there would be an initial learning curve in the building industry to adapt to this standard in Iowa. The cost of a passive home compared to conventional construction is unknown because it is a wholly different approach to design and is not yet common in the building industry. A Passive Building Design requirement would benefit from a pilot project approach as a learning project for designers and builders.

Both approaches result in building performance that is above and beyond energy code requirements of the City and State of Iowa. However, it must be emphasized that State law prohibits a city from establishing requirements in a local building code that exceed the State Building Code. In addition, a city cannot directly restrict the use of natural gas for any purpose.

Indirectly, the City can require through its development standards certain features such as a south facing roof that would make solar installation more feasible. Other design standards could be required regarding windows, eaves, and other building features that relate to Passive Building Design.

To make mandatory types of changes relying upon development standards, it would require a thoughtful audit and assessment of the design standards to ensure that development is still feasible and density objectives could also be accommodated when considering lot and site orientation. There is likely a difficult balance between pursuing sustainability objectives and providing for increased housing production in the City due to unknown of the sustainability requirements.

PUDs

Using a PUD Overlay to require sustainability measures is possible because the PUD is an optional special district. The City could establish optional alternative performance requirements for implementation of certain green building or energy efficiency measures that then provides relief to other standards for setbacks, lot size, etc. While this can be done with the PUD, since it is an optional zoning tool, it may not be utilized by a developer as they may prefer to develop within base zoning standards.

Annexation and Rezoning Agreements

Separately from base zoning and PUD standards, the City of Ames could utilize its annexation and rezoning authority to set expectations for future development that exceed base zoning requirements using development agreements. To do this, the City Council would establish a policy of features or standards to be included in a development agreement that could then be agreed to through the annexation or zoning process.

The City Assessor has indicated that outfitting new buildings with more energy efficient features does not add to the assessed value. Therefore, a new tax abatement program to promote retrofitting would appear to be an ineffective incentive. Electric Services currently supports the voluntary adoption of net-zero and net-zero ready building through Smart Energy programs by offering a \$3,000 net-zero rebate on new homes, as well as other rebates. Smart Energy programs are limited to buildings served by Electric Services. This rebate incentive, at its current level, is likely not sufficient to promote voluntary participation.

Should the City Council want to explore these ideas further, a decision must be made whether this is a high priority to be included in the Planning Workplan for the coming 18 months.

STEP 4 - RETROFITTING EXISTING BUILDINGS

SSG's analysis indicates that retrofitting existing buildings generates net savings because the improvements will reduce energy consumption and costs for property owners. However, retrofitting property represents a huge initial financial investment with a payback over time. Retrofitting existing structures can reduce our community carbon footprint by 15%.

Residential, commercial, and industrial properties will require millions of dollars of upgrades to begin realizing a lower carbon footprint. The City Assessor has indicated that outfitting buildings with more energy-efficient features does not add to the assessed value. Therefore, a tax abatement program to promote retrofitting would appear to be an ineffective incentive.

STATUS:

For years, a niche group of homeowners and businesses have invested in high-efficiency upgrades like improved heating and cooling system, energy-efficient windows, increased insulation, passive lighting, and solar panels. Early adapters have been implementing these building techniques for many years. Ames recently permitted its 200th solar installation. Still, most structures being built in Ames continue to feature traditional design and mechanicals. **Retrofitting existing buildings provides the opportunity for all residents interested in energy-efficiency to implement changes through enhanced energy audits, incentives, low- and no-interest financing, and custom, prioritized work plans.**

The following are possible options to pursue under this step.

Permit Incentives

In FY22/23 there were 507 permits issued for new air handlers and 605 water heaters. The applicable mechanical fee for a new air handler is \$65.35 and the plumbing fee for a new water heater is \$56.25. The City Council could choose to reduce this fee when the appliance change is upgraded to an energy efficient appliance. Currently, there is no documentation required regarding the type or specifications of an appliance during the permitting process. To receive a credit, that information would need to be reviewed and approved by City staff. **Because waiver of permits is insignificant as compared to the total cost of retrofitting, it is unlikely that this incentive will entice a homeowner to make the needed improvements.**

Smart Energy Incentives

Electric Services' Smart Energy programs are in place today with an overall annual budget of \$1.2 million. These programs will be reviewed and tailored to encourage greater adoption of beneficial electrification and energy efficiency practices. Smart Energy rebates can be used to lower costs for some retrofit projects.

Small-Scale Pilot project

Initially, Staff considered an income-restricted, home retrofitting pilot project to serve 10-15 homes with full weatherization and electrification. However, after evaluation, staff believes a small pilot program serving less than 15 homes would take a disproportionate amount of staff time and expense for relatively small returns. Full electrification retrofits may cost in the range of \$30,000 to \$50,000 per home. Another concern is making large investments in a small number of homes for a relatively small carbon reduction.

Another option to improve energy-efficiency for low-income Ames Electric Services customers would be to partner with Mid-Iowa Community Action (MICA). MICA administers the federally funded Weatherization program. However, MICA cannot use Weatherization funds to reshingle a roof or fix an asbestos issue within a home. The need for these types of projects can prevent a low-income resident from accessing Weatherization funds for energy upgrades. The City could pursue the use of CDBG funds to improve structural issues for homes owned by income-qualified residents. This step is key because it could unlock additional funds to make energy improvements. This would address a need within the community and put low-income residents on the path to energy reduction.

An alternative option to improve energy-efficiency for low-income Ames Electric Services customers would be to **assist Mid-Iowa Community Action (MICA) in their backlog of eligible Weatherization participants.** This would address a need within the community and put low-income residents on the path to energy reduction. The additional funding to MICA could be earmarked for projects that align with the Climate Action Plan and include an emphasis on electric service upgrades, heat pump water heaters and heat pump HVAC.

Community-Wide Retrofit Option

One program that would assist all households in Ames in reducing energy costs is no or low-interest funding repaid through a customer's monthly utility bill. On-bill financing, sometimes known as PAYS (Pay As You Save), can help fund energy upgrades that result in long-term savings to customers, making energy-efficient upgrades more accessible to a wide range of households and incomes.

This idea has been successfully implemented in communities across the country. The first step for the homeowner is a comprehensive energy audit that measures a home's existing conditions and models potential energy savings. The audit identifies the most cost-effective efficiency upgrades and develops a plan of action. Although the Smart Energy program currently offers energy audits, this new program requires an enhanced audit that provides homeowners a detailed roadmap for recommended upgrades.

The second step would be to provide low- and no-interest financing to enable residents to invest in their homes and directly reduce their carbon footprint. The final step is a repayment plan tied to the utility account that stays with the address regardless of who owns the home.

To assist homeowners, there are newly expanded energy efficiency tax credits and to-be-announced federally funded, income-qualified rebate programs (HOMES and HEERA) that can help to buy down the upfront cost of upgrades.

There are funding streams, called “green banks,” that could provide with zero- or low-interest loans to the City to enable financing to homeowners. For example, the City could secure a loan in the needed amount from the Rural Energy Savings Program (RESP). These funds can be borrowed at rates as low as 0%. Revenues received from the customers’ monthly payments would pay for the City’s loan obligation to RESP.

A possible budget for this program for 300 houses could be:

\$ 250,000 Performance of enhanced energy audits

\$ 25,000 Marketing of Program

\$ 50,000 Part-time Program Administrator

\$325,000 Estimated First Year Costs.

Not all homeowners who receive an enhanced energy audit will go forward with implementation. For those who do, the City could borrow funds from a “green bank” to administer an energy-efficiency funding pool for residents.

Projects financed through an on-bill financing program would benefit customers by lowering their energy costs and may benefit the budget of Electric Services as well. Projects that lower summer peak demand help keep electricity rates low. Beneficial electrification projects, like heat pump water heaters, air source heat pumps, or geothermal heat pumps can also benefit the utility through increased energy sales during off-peak periods or seasons.

As indicated above, an on-bill finance program for three hundred houses, coupled with increased energy audits and guidance for homeowners would require increases in the existing Smart Energy programs budget. However, preliminary analysis indicates that a program could be implemented while keeping the overall Smart Energy programs budget close to historical limits. For reference, in FY2017/18 the program spent just over \$1.5 million compared to the current \$1.2 million budget.

STEP 5 - RETROFIT MUNICIPAL BUILDINGS

An initial step for this project will be to hire a consultant to conduct a detailed study of each building with recommendations for needed retrofit elements, cost of the elements, funding strategy for each element, and timing for implementation of each element.

STATUS:

Electric Services has compiled a list of City buildings and gathered utility bill history for each. This will help prioritize buildings with larger energy usage or a higher energy use per square foot than expected.

Fleet and Facilities partnered with Electric staff on a grant application with the U.S. Department of Energy’s [Clean Energy to Communities](#) (C2C) program. The City applied for and was accepted into the Evaluating and Prioritizing Municipal Buildings for Energy Efficiency and Decarbonization Investment program. With this approved, we are placed

in a cohort of cities with similar goals. One of the deliverables is a draft Request for Proposal (RFP) for an energy audit of municipal buildings. **Once the audit is completed, the information will be used to set a plan and timeline for retrofitting municipal buildings.**

Electric Services will support retrofits of City-owned buildings by paying for an energy audit on each building, if needed. Additional support can be provided through existing Smart Energy rebates available to all Electric customers.

STEP 6 - ELECTRIFY THE MUNICIPAL FLEET (NON-CYRIDE)

When available and capable of meeting the needs of the required work, the Staff will purchase electric vehicles.

It should be reminded that this project excludes CyRide. Given the cost of electric buses – more than \$1 million vehicle – the CyRide Board has committed to purchasing 17 of the 95 buses in the fleet by 2050. CyRide recently purchased five more battery-electric buses.

STATUS:

For several years, Fleet Services has been committed to green vehicles when they are available and can meet the needs of the department. Examples include the use of B100 in heavy duty vehicles and hybrid vehicles. To speed up the implementation of electric vehicles (EVs), Fleet has appropriated funds to help departments buy the first replacement EV or hybrid vehicles. This approach assisted in the purchase of two all-electric and two hybrid pickups to replace regular gas vehicles. The additional cost to purchase a hybrid is approximately an increase of \$5,000 and all-electric is \$10,000. However, we expect to see a reduction in maintenance and fuel costs of the vehicles.

Currently, hybrid vehicles in the City fleet see a reduction of 50% in fuel usage and lower maintenance costs due to fewer oil changes and brake repairs.

EVs traditionally have lower maintenance costs with the equivalent mileage, so overall they should experience a significant reduction in the costs of operating. The goal is to purchase EVs, when possible, but availability and the type of work needed may necessitate going to hybrids. This will continue to lower our greenhouse gas emissions while moving towards all-electric.

Staff will also continue to look for opportunities to lower greenhouse gas emissions in vehicles and equipment where all-electric or hybrid vehicles are not possible. This will include looking at bio and alternative fuels. As we move towards all-electric, it will be important to have the proper EV charging in place at City buildings.

Electric Services will support the conversion to electric vehicles by supporting EV charging infrastructure. Some projects may be supported through existing Smart Energy rebates, funds dedicated in the CIP for EV charging, and/or through several grant funding opportunities.

Electric Services offers rebates for customers to install chargers at their homes and businesses through its Smart Energy rebates. Homeowners can receive a rebate of up to \$500 for the installation of a Level-2 charger, and businesses can receive a rebate of up to \$1,500. Additionally, Electric Services is willing to partner with business and community organizations to host public EV chargers at their locations. Three of the ten locations in

the city are examples of this type of public partnership. Electric Services is pursuing grant opportunities that may result in many more public EV charging throughout the community. Electric Services' five-year CIP reflects \$200,000 each year for new EV charging infrastructure.

STEP 7 - CREATE A MAYOR'S CLIMATE ACTION PLAN LEADERSHIP TASK FORCE

It is believed that a task force, comprised of community leaders from the various public and private entities that are crucial to meeting the City Council's community-wide carbon reduction goals, should be created. While many public and private organizations throughout the community have expressed interest in carbon reduction, there is a vast difference in the level of commitment and implementation strategies. Larger organizations, like Iowa State University, have had a working carbon reduction plan in place for years. Other organizations are just beginning to express an interest.

A CAP Leadership Task Force could serve as a carbon reduction resource with members identifying their carbon reduction goals and planned action steps, sharing their expertise, and looking for ways to work together to reduce our community carbon footprint.

One model could be to use Smart Business Challenge (SBC) membership as the basis for selecting task force members, since several of the nearly 40 participants have been active since 2014 when the SBC was formed. Another model would open task force membership to those who self-select and appoint members to serve. This model was used to form the Supplemental Input Committee for the Climate Action Plan.