

Reducing Residential Greenhouse Gas Emissions in the City of Bexley, Ohio

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Assessing Sustainability: Project Experience

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Executive Summary

The City of Bexley, Ohio is in the process of creating a Climate Action Plan (CAP) in response to becoming a signatory of the Cities Race to Zero campaign. This City is seeking assistance with identifying different climate adaptation and mitigation strategies to become climate-neutral and, eventually, climate-negative. These strategies should be centered on community education and engagement programs that consider Justice, Equity, Diversity, and Inclusion (JEDI) practices.

Our capstone group has responded to this need and offered to help Bexley identify these strategies. The goal of our project is to provide a set of actionable recommendations that the City can take to reduce greenhouse gas (GHG) emissions specific to the residential sector. The objective of our project is to identify specific strategies for these recommendations that will reduce residential GHG emissions from (1) electricity consumption, (2) stationary combustion, and (3) mobile combustion. These strategies are based on best practices and case study examples that may be applied in Bexley.

For electricity, the City of Bexley should learn about community solar and home energy assistance programs, offer energy-efficient products to homeowners, and hold regular community workshops focused on sustainability. For stationary combustion, the City should sponsor rebate and lending programs for electric appliances to displace fossil fuel appliances, as well as participate in public campaigns to reduce appliance use in general. For mobile combustion, the City should focus on resident education using an interactive online platform to encourage a transition to electric or hybrid vehicles, as well as redesign and develop infrastructure to aid in the transition away from single occupancy vehicle use.

For JEDI-specific strategies, we recommend Bexley focus on including the top 10% of pollution-burdened areas, youth, and low-income households in their sustainability planning. This will provide education and increase community motivation, inclusion, and representation in CAP efforts. As overarching recommendations, the City should refine its Green Bexley outreach platforms to provide a centralized location for all sustainability-related resources that relate to reducing residential GHG emissions. The City should also educate residents on opportunities with the Inflation Reduction Act.

Introduction

The City of Bexley is a mid-sized suburb of Columbus located inside the Southeast region of I-270. The City has a population of approximately 14,000 people, with a median household income of \$121,182. Despite this very high average household income, there is still a poverty rate of 4.4%. Most all of the population is white or Black or African American, which comprises 85.5% and 6.2% of the total population, respectively (United States Census Bureau, n.d.).

In 2021, Mayor Ben Kessler formally stated Bexley's intent to participate in the Cities Race to Zero campaign. As part of its commitment, Bexley pledged to reduce half of its total city greenhouse gas emissions by 2030 and reach net-zero emissions by 2040 (Cities Race to Zero, n.d.). To achieve these goals, the Bexley Sustainability Department plans to adopt a Climate Action Plan. The City is in the early stages of plan development, and it is seeking additional feedback to help it determine the most important climate adaptation and mitigation strategies that should be pursued. The City is also striving to put resident education, incentives, and JEDI practices as important components of these strategies.

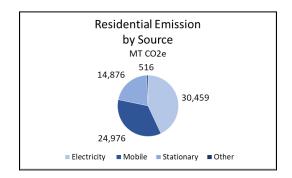
Bexley would like these strategies to be based on case study examples of other cities' CAPs and sustainability programs that have the most potential to be recreated in the City. These strategies should also consider any benefits, costs, and challenges with their implementation. Importantly, the City would like to better understand why and to what extent these strategies worked for other cities so that it can learn from these examples and maximize the benefits of applying similar strategies in its own CAP.

According to Bexley's 2019 Greenhouse Gas Inventory (Unpredictable City, 2022), residences were the leading contributor to the city's GHG emissions, making up 63% of total emissions (See Table 1). Within the residential sector, electricity use accounted for a little less than half of these emissions, mobile combustion accounted for more than a third, and stationary combustion (primarily natural gas use) accounted for a fifth (See Figure 1).

Table 1. City Emissions by Sector

2019 Gross Emissions by Sector	Total MT CO₂e	Percent of Total
Residential	70,828	63%
Commercial/Institutional	41,032	37%
Industrial	468	<1%
Energy Generation⁵	0	0%

Figure 1. Residential Emissions by Source

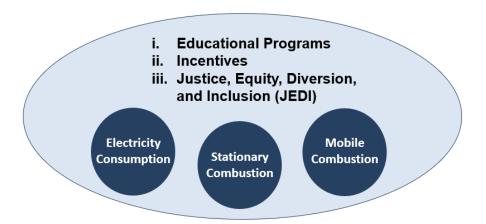


Methodology

Our capstone group has offered to help the City of Bexley identify different GHG emission reduction strategies specific to the residential sector. The goal of our capstone project is to provide a list of actionable recommendations that the City can take to reduce residential GHG emissions, with a particular interest in identifying community education, engagement, and incentive programs that also incorporate JEDI best practices. This goal will be accomplished via

the objective of identifying best practices and potential applications to the City of Bexley, with efforts across the following three focus areas: (1) electricity consumption, (2) stationary combustion, and (3) mobile combustion.

Figure 2. Summary of Project Focus Areas



The recommendations in this report are based on case study research of successful GHG emission reduction programs occurring in other cities. We utilized an informal online research process to search for information about the cities' programs as they related to the three focus areas. Cities of interest were initially selected based on similarity to the City of Bexley, and additional cities were included in this research as more insight into best practices for the three focus areas was gained.

Once these initial programs were identified, our group members conducted informal interviews with city representatives to learn more about the observed impacts, challenges, and future opportunities with their program implementation. Table 2 lists the interviewees that provided information for this report. Appendix A provides a list of every city and contextual information about each examined, and Appendix B provides a concise overview of all the recommendations provided in this report.

Table 2. Interviews with Cities of Interest

Interviewee	City / Organization Main Topics Discussed		Interview Date
Kellie Benz	City of Belmont, CA	Community workshops and residential energy audits	March 23, 2023
Scott Semroc	City of Sun Prairie, WI	Focus Packs, Home Energy Assistance Programs, and No-Mow May Program	March 23, 2023
*Anonymous	City of Piedmont, CA	Induction Cooktop Lending Program	March 24, 2023
Michelle Plouse	City of Albany, CA	Heat Pump HVAC Rebate Program, Induction Cooktop Lending Program, and Home Electrification Guide	March 24, 2023
Ian Edwards	TED Renewables	Gem City Solar project in Dayton, OH	March 30, 2023

Recommendations

In addition to the various recommendations described below, our group has two overarching recommendations for the City of Bexley that would supplement the implementation of the three more targeted GHG emission reduction focus areas. First, the City should leverage its Green Bexley platform to provide a user-friendly community resource that has comprehensive information on residential GHG emission reduction strategies. Information could include (1) links to additional resources, (2) guidance on contractors and permitting, and (3) information about financing opportunities, such as the new federal tax credits for residential energy efficiency improvements. The City of Albany, California's Home Electrification Guide and the City of Concord, Massachusetts "Sustainable Concord" site offer examples of thorough online platforms that provide organized information and links to various resources about different residential GHG emission reduction strategies.

Second, we recommend that Bexley take advantage of opportunities offered by the Inflation Reduction Act (IRA). The IRA is a pivotal climate change and energy security law that

will help Ohio communities transition to a renewable energy economy, adapt to climate change, and create jobs. It also includes JEDI specific programming by offering extra support to low- and middle-income households. The City can utilize IRA programming to finance the implementation of our recommendations for the three focus areas. For electricity consumption, the IRA provides tax credits that cover up to 30% of the costs of installing both household and community solar systems projects. For stationary combustion, the IRA will offer weatherization rebates and rebates that cover between 50-100% of the costs of installing new electric and energy-efficient appliances. For mobile combustion, the IRA will provide up to \$7,500 in upfront discounts for new EV purchases and \$4,000 in tax breaks for current EV owners (IRA, n.d.).

<u>Focus Area 1 – Electricity Consumption</u>

The largest source of greenhouse gas emission for Bexley's residential sector is the consumption of electricity. People rely on electricity in everyday life for their lighting, heating, cooling, appliances, and more. There are many ways in which residences can be more energy efficient, although these are not always straightforward and affordable solutions. The City of Bexley should focus on providing accessible, cost-effective options for people to manage their electricity use, reducing GHG emissions as well as energy bills.

Recommendation 1: Community Solar

Community Solar is any project or purchasing program within a specific geographic area that allows for the benefits of a solar project to reach multiple groups, including, but not limited to individuals, businesses, and nonprofits (Community Solar Basics, n.d.). With the population of Bexley and its resultant electricity demand being relatively small, launching a community solar program will allow residents and businesses to access the benefits of such programs with more ease than in larger cities.

However, community solar is not permitted currently in the state of Ohio, as Ohio House Bill 450 (HB450) is awaiting approval. This bill is currently being introduced to the Ohio legislature, which seeks to encourage the construction of community solar projects in the state of Ohio through a variety of means. This bill will bolster Ohio's power infrastructure, improve the lives of ratepayers, and help to meet the growing demand for renewable energy.

During this waiting period for legislation approval surrounding community solar, the community should be educated to ensure an easier implementation in the future. This education should be communicated through Bexley's existing community newsletter and website. Once HB450 passes, this, coupled with up to 30% investment tax credits on community solar projects offered in the IRA, should strongly encourage a community solar program in Bexley. Such a program would likely reduce energy costs, increase energy resilience, and provide community ownership. It would also likely enhance a more equitable workforce and entrepreneurship for the City.

Recommendation 2: Offer bundles of sustainable household products

Household appliance upgrades such as new energy refrigerators, washing machines, and dishwashers are important for energy efficiency; however, buying new appliances is often costly for residents. Nonetheless, several small, lower-cost changes can be made in a home to save on electricity, reducing both bills and emissions.

The City of Sun Prairie, Wisconsin offers "Focus Packs" to residents, sponsored by their utility company (Sustainable Sun Prairie, n.d.). These packs include products such as LED light bulbs, smart power strips, and energy-efficient shower heads (S. Semroc, personal communication, March 23, 2023). Sun Prairie found that there was great interest in the initial program and has decided to continue with it. While Bexley's electric utility, AEP Ohio, does not

offer such a program, there are still ways for Bexley to achieve this. The City can bulk buy similar products and offer a Focus Pack to people at a certain cost. They may also want to explore grant options or even donations to fund such packs. This will educate residents on small energy-efficient appliances they can have in their homes, as well as encourage them to further investigate others. The convenience of this program acts as an additional incentive. Rather than buying from multiple stores, residents will be able to make a one-time purchase.

Recommendation 3: Hold community workshops on sustainability for residents

To engage residents and educate them on sustainable energy programs, it is important to offer a space and time to meet in person. The City of Belmont, California has experience hosting community workshops focused on sustainability (the City of Belmont 2017 Climate Action Plant, 2017). They have had success with hosting such events that are open to all residents. They found importance in "meeting the people where they are," whether that be holding drop-in meetings at local coffee shops and farmers markets, or offering a virtual option (K. Benz, personal communication, March 23, 2023). These workshops have been held regularly (monthly, quarterly, etc) and refreshments have been offered. Bexley could do the same and have an interactive platform to educate residents on current and new sustainability programs while offering a space for people to express ideas and concerns.

Recommendation 4: Educate homeowners on energy assistance programs

In Bexley, 11% of households are unable to pay their home energy bills each month, while another 11% find it a struggle (Unpredictable City, 2019). For these residents, buying new energy efficient appliances is generally not economically feasible. Instead, they need to be educated on assistance programs offered in the state. The Ohio Home Energy Assistance Program (HEAP) is a federally funded program that can apply for a one-time benefit directly to a

Customer's utility bill (n.d.). Another similar program is offered by Bexley's electric utility, AEP Ohio, called the *Neighbor to Neighbor Program* (AEP Ohio, n.d.). Both assistance amounts vary depending on household size and income and can be applied to electricity and heating bills. Table 3 provides detailed information on these programs.

Table 3. Assistance Program Information

Program	Amount	Qualifications	How to Apply
Neighbor to Neighbor Program	Up to \$500	 Income less than 300% the federal poverty level AEP Ohio customer Outstanding balance of \$50 and/or 30 days late Have paid \$75 in the last 3 months 	 Complete an online application at AEP Ohio Visit a community agency and complete an application in person
Ohio Heap	Up to \$930	 Income at or below 175% of the federal poverty level Both homeowners and renters are eligible 	 Complete an online application at the Ohio Department of Development Schedule appointment with your local energy assistance provider Mail in your application

The City of Bexley would benefit from educating their residents on these types of assistance programs. They currently have an active newsletter and would be able to include information and references through this platform. Many people do not want to ask for such assistance, no matter the circumstances. By highlighting the incentives and offering a contact to ask further questions, residents may feel more comfortable taking advantage of these programs.

Focus Area 2 - Stationary Combustion

The third largest source of greenhouse gas emissions for Bexley's residential sector is stationary combustion (See Figure 1). As discussed in the recommendations for electricity, home appliances are a major part of daily life and can include devices such as water heaters, furnaces

and cooling systems, kitchen and laundry appliances, and lawn equipment. Many home appliances are electric, but some (notably ovens, furnaces, and water heaters) often use fossil fuels, such as natural gas and heating oil. The City of Bexley should make the switch to electric appliances more appealing to residents, particularly heat pumps for heating applications. It should educate residents by noting energy cost savings and available subsidies that would help reduce upfront investment costs. Finally, it should consider promoting public campaigns that encourage residents to reduce their overall electricity usage. Strategies should be accessible across all income levels and for both homeowners and renters.

Recommendation 1: Establish rebate programs for electric home appliances

The City of Bexley should promote residential rebate programs that encourage appliance electrification; weatherization rebates would also be beneficial, as improved home efficiency would reduce energy usage. As discussed previously, the IRA offers opportunities for Ohio residents to reduce GHG emissions from stationary sources, with particular attention toward low-and middle-income households. Bexley should educate residents about the IRA to help them take full advantage of the financing opportunities that it offers for heat pumps and other electric and energy-efficient appliances.

In addition to leveraging federal rebates, Bexley should also consider sponsoring rebate programs. The City of Albany, California administers a residential rebate program with more than \$65,000 in city-delegated funding for heat pump HVAC systems (City of Albany, n.d.-b). These rebates are funded by the city's CAP budget, which receives funding via a 9.5% and 7.5% city utility users tax on gas/electric and water, respectively (M. Plouse, personal communication, March 24, 2023; Ballotpedia, n.d.). Since Bexley operates its water utility through the Bexley

Water and Sewer Department, the City could adopt a new utility tax to provide funding to support sustainability-related rebate programs.

Rebates should be accessible to all residents to address JEDI concerns, so Bexley could consider a tiered approach that categorizes rebate availability based on household income. The Town of Concord, Massachusetts administers a weatherization rebate program that is based on both household size and income (See Table 4), with larger financial incentives being offered to lower income households (Town of Concord, n.d.). Bexley could take inspiration from this example when structuring its rebate programs to develop a tiered system that increases the amount of support offered to low- and middle-income households; in this case, Bexley could base median household income off of City estimates or estimates from the greater Columbus Metropolitan Area.

Table 4. Income Ceilings by Household Size¹

Household Size (Adults + Children)	80% of Boston Metropolitan Area Median Income	120% of Boston Metropolitan Area Median Income
1	\$78,300	\$117,768
2	\$89,500	\$134,592
3	\$100,700	\$151,416
4	\$111,850	\$168,240
5	\$120,800	\$181,699
6	\$129,750	\$195,158
7	\$138,700	\$208,618
8	\$147,650	\$222,077

¹ Information from the Town of Concord, Massachusetts (Residential Income-Based Rebates, n.d.)

As mentioned previously, the City of Albany also manages a Home Electrification Guide. This is an online platform separate from the city's government website that serves as the hub for appliance electrification efforts. Albany residents typically access this resource via links in either the city's main website or public online newsletter (M. Plouse, personal communication, March

24, 2023). The website contains information and links to rebate opportunities organized by electric appliance type (City of Albany, n.d.-c), and Bexley could consider taking a similar outreach approach for its Green Bexley platform.

Recommendation 2: Establish lending programs for electric home appliances

Converting fossil fuel appliances to electric can require high, upfront costs. The financial commitment and risk of adopting such appliances would have a disproportionate impact on low-and middle-income residents. Free appliance lending programs give residents a low-risk opportunity to test out new electric appliance technologies for themselves. By allowing residents to develop a positive, more personal user experience with these technologies, they often develop a greater desire to purchase them.

One lending program idea that the City of Bexley could administer is an induction cooktop lending program. This program would provide residents with a portable induction cooktop to act as a trial run before adopting a full induction stove. The Cities of Albany and Piedmont, California both offer examples of best practices for implementing this type of program. These cities started their lending programs through an effort by their local community choice aggregator (CCA), East Bay Community Energy (EBCE). The City of Piedmont has since used funding from its climate action plan budget (which is allocated money from its General Fund) to expand their program (*Anonymous, personal communication, March 24, 2023).

Albany and Piedmont both operate their lending programs through their municipal government office, and they have had 35 and 45 residents participate in their programs, respectively (M. Plouse, personal communication, March 24, 2023).

Another idea that Bexley could explore is an electric lawn mower lending program. The Ten Stones Village Association in the Town of Charlotte, Vermont administers a lawn mower

lending program for its residents, where sixteen households share an electric lawn mower through the use of an interactive scheduling tool that accounts for mower charging times (The Mow Electric! Campaign, n.d.). While this program is not administered by the government, the strategies that it uses to organize operating schedules and maintenance responsibilities can be used to help Bexley successfully implement a similar program.

During the interview with M. Plouse (personal communication, March 24, 2023), they suggested the possibility of administering electric appliance lending programs through the Bexley Public Library. Plouse noted that libraries have developed and administered these types of community programs. The City of Berkeley, California's Tool Lending Library is one example of a successful lending program (Berkeley Public Library, n.d.). Modcon Living also operates a paid Tool Library specific to residents in Franklin County (Modcon Living, n.d.). The City of Bexley could communicate with staff from both the Bexley Public Library and Modcon Living to explore how lending programs could be implemented.

Recommendation 3: Promote public campaigns targeted to residences

The City of Bexley should promote public campaigns that encourage residents to convert their home appliances to electric. The Switch is On is one campaign specific to the topic of appliance electrification. This campaign is led by the Building Decarbonization Coalition (BDC), which receives additional support from TECH Clean California and the California Public Utilities Commission (Business Wire, 2021). The Cities of Portland and South Portland, Maine provide another local example of an appliance electrification effort through their Electrify Everything! campaign (City of Portland, n.d.; City of South Portland, n.d.). Lastly, the Town of Charlotte also has a Mow Electric! Campaign (2023) that encourages homeowners to consider a switch to electric lawn appliances. Similar campaigns do not currently exist in the state of Ohio

or in local Ohio governments. Thus, Bexley has an opportunity to become a leader in this space; however, the City would need to design a similarly themed campaign that considers the unique context and opportunities present in its community and the broader state of Ohio.

Bexley could also promote campaigns that encourage residents to reduce their energy use in general. Bee City USA is a national-level initiative that organizes a No Mow May campaign, which incentivizes residents to reduce the amount of time spent on lawn care. Cities interested in participating can take inspiration from resources offered by Bee City USA to help them develop implementation and public outreach strategies (Bee City USA, n.d.).

Focus Area 3 – Mobile Combustion

Privately owned vehicles and single-occupancy trips are mainly responsible for mobile combustion, the second-largest source of emissions in Bexley (See Figure 1). By informing and educating residents on alternative transportation options, Bexley has the ability to lower these emissions. Moreover, investing in infrastructure, such as bike lanes and pedestrian-friendly features, as well as electric vehicle (EV) charging stations, would also contribute to the reduction of mobile combustion in Bexley. By increasing awareness and accessibility, Bexley can achieve its goal of reducing emissions and creating a more sustainable future.

Recommendation 1: Resident education

Concord, Massachusetts has invested in education and outreach efforts to promote sustainable mobility practices and raise awareness about the impacts of combustion on air quality and climate change. These methods include public forums, social media ads, and workshops. The town has also created a Clean Energy and Sustainability Committee to spearhead efforts to encourage residents to reduce their mobile combustion. So far, this method has been successful in increasing awareness about the issue of mobile combustion and its impact on the environment.

It has also helped to encourage residents to transition to EVs by offering financial incentives for purchasing them.

Following this model, Bexley could create a committee or task force dedicated to promoting cleaner mobility. This group could organize public forums and workshops to educate residents about the benefits of reducing mobile combustion and transitioning to EVs. In addition, social media ads could be used to spread the message and encourage residents to get involved.

Finally, Bexley should educate residents about financial incentives, such as tax credits or rebates, that will encourage the transition to EVs and ultimately reduce their mobile combustion. Overall, the key to success will be to engage with residents and make them feel invested in the effort to reduce mobile combustion and promote clean mobility in Bexley.

Recommendation 2: Infrastructure development

Dayton, Ohio, and Albany, California have successfully developed infrastructure and implemented policies to encourage the reduction of single occupancy travel and transition to electric or hybrid vehicles. Dayton's Climate Action Plan includes the implementation of bike lanes, shared-lane markings, and multi-use trails to promote active transportation. They also established an electric vehicle incentive program that offers rebates for the purchase of electric vehicles and the installation of charging stations. Additionally, the City has partnered with the Dayton Power and Light Company, the regional electric utility, to install more than 50 public charging stations, including Level 2 EV charging stations at its downtown parking facility.

Albany's CAP includes the development of complete streets, which prioritize the safety and accessibility of all modes of transportation and encourage the use of bike-share programs and public transportation. They also offered incentives for the installation of electric vehicle charging stations in residential and commercial areas. Additionally, their launch of a bike-share

program offers free shuttles to connect residents to local shopping areas and public transit stations.

Despite several of these methods being in the early stages of development, they serve as excellent models for the City of Bexley, Ohio, as they offer a clear and feasible path toward reducing greenhouse gas emissions from mobile combustion. The implementation of bike lanes, multi-use trails, and complete streets within the City can encourage active transportation, while the establishment of electric vehicle incentive programs and charging stations can aid in the transition to low-emission vehicles.

JEDI Specific

It is essential to combine a Justice, Equity, Diversity, and Inclusion (JEDI) specific framework with Bexley's current Environmental Sustainability Advisory Committee (ESAC) in achieving their Zero Waste Plan goals. Low-income communities and communities of color may bear a disproportionate share of climate change impacts as energy costs rise over time since monthly energy bills make up a much higher proportion of their income, than middle- and higher-income residents. Home energy and transportation burdens will increase leaving low-income communities and communities of color at a disadvantage in adapting to climate change. We recommend that Bexley focus on finding ways of community motivation, inclusion, and representation in the top 10% of pollution-burdened areas of the community.

One framework for equitable and impactful climate solutions is used in the City of Los Angeles, California by using community engagement and mobilization (See Figure 3). This model focuses on the top 10% of pollution-burdened areas, youth, labor, community leadership, and climate-health officials. This framework has been successful in reaching all aspects of JEDI initiatives and would be a good starting point for Bexley's JEDI program. By addressing and

engaging the voices of frontline communities in these burdened areas, Bexley can create equitable climate policies and initiatives that are easily adaptable to all. This could be done by starting with Bexley's ESAC and prioritizing climate policy areas with identified frontline communities and combining meaningful community engagement and mobilization, with equity as a throughline. An aware and engaged public will be key to the effective implementation of equitable climate policies and incentives that are in line with Bexley's Race to Zero goals.

CLIMATE EQUITY INNOVATIVE GOVERNANCE MODEL
Collaborating with Frontline Communities to Co-create equitable Climate Policy & Investments

Prioritize Climate
Policy Areas with
Frontline Communities

Community Shares
Experts a Knowledge
throughout the Climate
Equity Policy
Communities

Community Shares
Experts a Knowledge
throughout the Climate
Equity Policy
Communities

Community Shares
Experts a Knowledge
throughout the Climate
Equity IA Series

Community
Experts a Knowledge
throughout the Climate
Equity Community
Experts a Knowledge
throughout the Climate
Equity Community
Experts a Knowledge
throughout the Climate
Equity Community
Experts to Community

Figure 3. City of Los Angeles, California Climate Equity Innovative Governance Model

Limitations

There were some limitations to our project. One limitation was communication barriers between some of the cities of interest. At times, contacts were either slow to respond to emails or unresponsive. This would slow our research or require us to reach out to new contacts altogether. Another limitation was finding similar examples based in cities with similar demographics so that we could suggest the most realistic recommendations to Bexley. Our goal was to find programs in other areas that were comparable to our area of interest, but there were some

findings that used examples from cities that were not like Bexley either demographically or climatically. We also had to be aware of legislative differences between other states and Ohio, in order to make sure our recommendations could be implemented in Ohio. Our Bexley partners helped to simplify this process, as they provided advice regarding many of our findings and helped determine whether recommendations were feasible for the City.

Conclusion

The City of Bexley is making great progress in its Race to Zero initiative. Creating a CAP is the next step in ensuring a sustainable community in the future, and it is a goal that Bexley is pursuing. Our recommendations should further help Bexley reduce its greenhouse gas emissions. They focus on reducing GHG emissions for (1) electricity consumption, (2) stationary combustion, and (3) mobile combustion within the residential sector. Education, incentives, and JEDI initiatives are embedded within these findings to make them accessible to all residents in the City. Our results built upon work from past capstone groups, and it expanded the base for future research on the City's sustainability goals.

Regarding electricity consumption, we recommend Bexley pursue community solar and understand legislation and current projects already taking place in Ohio. We also recommend the City educate residents on the availability of energy assistance programs, hold community workshops to highlight the program's accessibility, and offer Focus Packs to residents that include energy-efficient products. For stationary combustion, the City should consider leveraging utility taxes to create a funding pool that would be used to sponsor rebates for appliance electrification, as well as develop electric appliance lending programs. We also recommend the City consider promoting community campaigns either independently or from already established national-level campaigns. In the mobile combustion sector, the City should focus its efforts on

improving resident education programs and developing sustainable transportation infrastructure to encourage the transition to electric or hybrid vehicles.

For JEDI-focused incentives, we recommend Bexley implement an equal representation framework in its ESAC to create a more equitable and inclusive dialogue for the City's sustainability goals. Our overarching recommendations are for the City to create a targeted public education channel by capitalizing on its Green Bexley platforms, as well as investigate opportunities with IRA fundings to support both city- and resident-led initiatives that reduce GHG emissions.

Future capstone projects should be able to build off our recommendations and further Bexley's goals, working to actively implement the programs. As the City moves forward with creating its own CAP, more research should expand upon our findings and aid in the process. We also advise the City to review our suggestions and find what will work best for the Bexley community. Beginning these programs on a small scale will be the most effective way to move forward, assessing progress along the way. If the programs prove successful in engaging the community and reducing emissions, the City can increase their scale and invest more in them. Our project findings will assist the City of Bexley as they continue to reduce GHG emissions, create a CAP, and encourage sustainability in their residential sector.

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Appendix A: Case Study Background Information

The data presented below used 2020 census information from the United States Census Bureau.

City Name & Location	Population Size ¹	Land Area (sq. mile) ¹	Population Density ^{1,2}	Median Household Income ¹
City of Albany, California	20,271	1.79	11,324.6	\$113,602
City of Belmont, California	28,335	4.63	6,119.9	\$178,125
City of Berkeley, California	124,321	10.43	11,917.3	\$97,834
Town of Charlotte, Vermont	3,900	41.30	94.5	\$111,535
Town of Concord, Massachusetts	18,491	24.51	754.3	\$169,335
City of Dayton, Ohio	137,644	55.81	2,466.5	\$37,536
City of Los Angeles, California	3,898,747	469.49	8,304.2	\$69,778
City of New Brighton, Minnesota	23,454	6.50	3,611.1	\$77,031
City of Piedmont, California	11,270	1.70	6,629.4	\$250,000+
City of Portland, Maine	68,408	21.54	3,175.4	\$66,109
City of South Portland, Maine	26,498	12.07	2,195.7	\$73,899
City of Sun Prairie, Wisconsin	35,967	12.91	2,786.2	\$83,409

¹Information derived from the 2020 US Census Data ²Population density by square mile

Appendix B: Action Summary Matrix

The data presented below is an overview of the recommendations described in this report.

City / Region	Focus Area	City Climate Action Plan / Sustainability Program	
City of Dayton, Ohio	Electricity Consumption	Gem City Solar Project Description Gem City Solar is a project taking place in Dayton, Ohio. This project is considered a utility scale development project, not a community solar project, as it interconnects to the transmission service, not the distribution level service. There is not currently a way for residents to opt-in to an opportunity to purchase electricity from this project, but it could be a possibility if Gem City Solar partners with AES local utility. Applicability to the City of Bexley Since community solar is not legal in Ohio, Bexley could follow and expand on Dayton's preliminary program while awaiting approval of legislation. Having a program like this already in place will make it easy to expand towards community solar, rather than having to start from the beginning when legislation passes. Implementation Considerations For now, Bexley could implement a similar program to Gem City Solar that has the ability to expand to a community solar program once legislation allows for it. Along with the IRA offering up to 30% investment tax credits on community solar projects, once legislation such as HB450 passes, Bexley should then ensure to integrate a community solar program.	
City of Sun Prairie, Wisconsin	Electricity Consumption	Wisconsin Home Energy Assistance Program	
City of Sun Prairie, Wisconsin	Electricity Consumption	Focus Packs Description - This is a package offered to residents through their local utility that include energy efficient household items. Sun Prairie includes things like LED light bulbs, energy efficient showerheads, and smart power strips. Applicability to the City of Bexley - This would be a great way for Bexley to "soft launch" energy efficient	

		appliances, even if they are just small household items. This may incentivize people to look into larger scale upgrades they can make in their house to both help the environment and save on their energy bills. Implementation Considerations - While AEP Ohio does not offer to fund such a program, bexley would still be able to bulk buy such items and offer them in a one time purchase pack. It would prove more convenient to residents and may lower the cost of items if they are bought on a larger scale. The City could also look at grant money or potential donations to pay for the packs.
City of Belmont, California	Electricity Consumption	City of Belmont 2017 Climate Action Plan / Community Workshops Description - The City of Belmont holds regular community workshops focused on sustainability in different locations around the city. All residents are welcome to attend, and many options are offered to those interested. There are often incentives for people to attend, such as free food or program information. Applicability to the City of Bexley - Given that Bexley is a smaller city, this would be a great way to engage residents and hear their ideas on sustainable programs they wish to see. The workshops would be held on a regular basis (monthly, quarterly, etc.) and advertised in the city's newsletter and/or website. Implementation Considerations - The City of Belmont emphasized "meeting people where they are" in order to achieve the most interest and diversity. They could hold the workshops at a local restaurant, park, or library, where residents can drop in whenever they are able.
Town of Concord, Massachusetts	Stationary Combustion	Residential Income-Based Rebates Description - This is a rebate program that bases rebate availability off of household income and size. Households with an income that is at or below 80% or 120% of the median income for the Boston Metropolitan Area receive larger incentives. - Household income is determined by information provided in the U.S. Individual Income Tax Return Form 1040. Applicability to the City of Bexley - Structuring appliance electrification and weatherization rebate availability so that low- and middle-income households have greater access to financing will address Bexley's JEDI concerns. Implementation Considerations - Bexley could structure its own rebate programs in a similar way. It could use median household income based off of City statistics or Columbus Metropolitan Area statistics.
Cities of Albany and Piedmont, California	Stationary Combustion	 Induction Cooktop Lending Program Description This is a free two-week test run of an induction cooking kit. These kits typically include a portable induction cooktop, induction-friendly cookware, a list of items included in the kit, and printed educational resources (e.g., instructions on how to use and clean the cooktop, recipe ideas, benefits of induction cooking). Most programs use a Google Form or a formal online interface for people to express their interest in participating in the program. Participants must sign a waiver. This should include a provision that

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		requires participants to cover the costs of any equipment loss or damage. - Asking participants to fill out a feedback survey is recommended. This can include the following prompts: (1) Whether the program impacted the participant's decision to purchase an induction stove, and if so, to what degree; and (2) whether the participant would suggest the program to friends and family. **Applicability to the City of Bexley** - Giving residents an opportunity to test out this new technology will help them develop a stronger interest in making a switch. **Implementation Considerations** - Bexley could implement this program through its municipal government office. If staffing to administer this program is an issue, the City could partner with the Bexley Public Library Green Bexley can provide a platform to advertise this program and provide online access to important program resources (e.g., program application/interest form, participant waiver, community resources to external induction stove rebates and other educational information).
Ten Stones Village Association, Town of Charlotte, Vermont	Stationary Combustion	 Electric Lawn Mower Cooperative Ownership Program Description This program is a collaboration between sixteen households in the Ten Stones Village Association. The participants share a Mean Green electric lawn mower using an online interactive spreadsheet that calculates the duration that each member can plan to use the appliance. Applicability to the City of Bexley Giving residents an opportunity to test out this new technology will help them develop a stronger interest in making a switch. Implementation Considerations Bexley could consider purchasing a city-owned electric lawn mower that could then be loaned out to residents. The City could take inspiration from the scheduling calculator used by the Ten Stones Village Association to assist with organizing loaning and mowing schedules.
Cities of Portland and South Portland, Maine	Stationary Combustion	 Electrify Everything! Campaign Description - This campaign encourages home electrification and weatherization by offering rebates to residents. - Rebates in Portland were the result of city-negotiated discounts through ReVision Energy. - Rebates in South Portland were funded through American Rescue Plan Act funds. They are available to residents with a household income of up to 100% of Area Median Income. Applicability to the City of Bexley - Rebates are a major incentive for home appliance electrification, so pairing available rebate opportunities with a community-wide campaign would assist public education and outreach efforts. Implementation Considerations - If Bexley decides to sponsor its own electric appliance rebate programs, the City could also consider a similarly themed campaign that would help advertise the rebate program.
California State	Stationary Combustion	Switch is On Campaign Description - This campaign encourages home electrification by providing comprehensive guidance for residents and contractors alike. It connects

		these stakeholders to different financial, educational, and consulting resources across the state to assist with the process of electrification. Applicability to the City of Bexley - Bexley residents and businesses would benefit from a centralized platform that provides resources on financing opportunities and professional services available for home electrification. Implementation Considerations - The scope of this campaign would be too large to replicate in Bexley. Instead, the City could focus on providing residents with information as it relates to its local community context.
Bee City USA	Stationary Combustion	No Mow May / Mow Less May Campaign Description This campaign encourages residents to reduce the amount of time spent mowing their lawns during the month of May. Participants typically commit to leaving their lawn alone for the entire month of May, but more practical variations of the campaign include mowing every other week or only mowing certain sections of the lawn. Applicability to the City of Bexley The majority of housing units in Bexley are owner-occupied, so this campaign would have a significant impact on GHG emissions from private lawn care activities. Implementation Considerations Bexley would need to adopt a temporary variance to its Housing Code that prohibits lawns from exceeding eight inches in height. Bee City USA provides resources that would help the City with this process.
Concord, Massachusetts	Mobile Combustion	 Sustainable Concord Description Education and outreach efforts help promote sustainable mobility practices and raise awareness about the impacts of combustion on air quality and climate change. These methods include public forums, social media ads, and workshops. Applicability to the City of Bexley Creation of a committee or task force dedicated to promoting cleaner mobility. Utilize social media ads could be used to spread the message and encourage residents to get involved. Offer ways for residents to learn about financial incentives, such as tax credits or rebates for the transition to electric vehicles. Implementation Considerations Engaging residents is key and will make them feel invested in the effort to reduce mobile combustion and promote clean mobility in Bexley
Dayton, Ohio	Mobile Combustion	Strategy for a Sustainable Dayton Description - Planning for the disposal of unneeded internal-combustion vehicles as well as plans for the disposition of obsolete gas stations - Implementation of bike lanes, shared-lane markings, and multi-use trails to promote active transportation. - Partnership with the Dayton Power and Light Company to install more than 50 public charging stations Applicability to the City of Bexley - These approaches are fairly cost-effective and primarily require further development of already existing infrastructure

		Implementation Considerations - Bexley should consider what regional utility providers are available for partnership in the development of charging stations
Albany, California	Mobile Combustion	City of Albany Climate Action and Adaptation Plan Description - "Complete Streets": redesigning priority streets, sidewalks, bikeways, and pedestrian safety features around the City to encourage the utilization of driving alternatives - Offer a program to incentivize the installation of electric vehicle charging stations in residential and commercial areas. - Bike share program offers free shuttles to connect residents to local shopping areas and public transit stations. Applicability to the City of Bexley - Cost effective way to encourage alternative methods of transportation - Aiding with the development of charging infrastructure will reduce resident apprehension to the transition to EVs Implementation Considerations - Bexley should consider what incentives they can provide residents for the installation of EV charging stations - Identify potential "complete streets"
Los Angeles, California	JEDI Specific	City of Los Angeles Climate Emergency Mobilization Office Description - The Office of Climate Emergency Mobilization's collaborative approach combines meaningful community engagement & mobilization, as per our CEMO Blueprint, with Equity as a throughline. Our goal centers on equitable climate solutions and the creation of a healthy, thriving, resilient Los Angeles. Our blueprint includes the activation of a community-led Climate Emergency Mobilization Commission (CEMC), ongoing community assemblies, and virtual events, since we believe an aware and engaged public will be key to the effective implementation of equitable climate policies and in line with LA's Green New Deal. Applicability to the City of Bexley - Focusing on the top 10% of pollution burdened areas, youth, labor, climate-health experts, and community leadership to cover all aspects of JEDI areas. Implementation Considerations - Focusing on addressing and engaging the voices of frontline communities in these burdened areas can create a dialogue, and mobilize their voices to create equitable climate policies and initiatives easily adaptable to all. Beginning with Bexley's ESAC and prioritizing climate policy areas with identified frontline communities and combining meaningful community engagement and mobilization, with equity as a throughline.