



TO: Mayor and Council

FROM: Tom Crawford, Interim City Administrator
Matthew V. Horning, Interim Financial Services Area Administrator & CFO
Kim Buselmeier, Budget and Finance Supervisor
Missy Stults, Sustainability and Innovations Manager

SUBJECT: FY21 Budget: Sustainability & Innovations

DATE: April 10, 2020

Question #56: What was the material or methodology difference between the first public survey vs the second and third surveys that were conducted? (Councilmember Ramlawi)

Response: The main differences were:

- Momentum – Over time more people knew about the A²Zero initiative, so we had more people participating in events and surveys.
- Media – Similar to the above point, we got more media attention at the A²Zero initiative grew which likely encouraged more people to participate in meetings and surveys.
- Partners – Over time we recruited more partners to the initiative who helped advertise events and surveys. We believe this helped drive higher survey responses.
- Targeted Outreach – We analyzed the results of the first survey as they were coming in and noted that certain demographics, such as youth, were not responding. We used this information to strategically engage those audiences. We asked them questions to understand how we could better engage them in all areas of the A²Zero initiative. In many cases, this outreach led to new partners and supporters of the work, which likely means they helped to spread the word about the initiative with their peers.

Question #57: Are there estimated financial impacts to new development (price per square foot) if the State of MI were to adopt “Net-Zero energy development” in the 2021 State unified building code? (Councilmember Ramlawi)

Response: Please see the attached document, which is a summary from a Rocky Mountain Institute report that looks at the incremental cost to build net zero energy homes and net zero energy ready homes.

Question #58: LQ1. Ann Arbor has 2.1 million metric tons of GHG emissions. In order to obtain some perspective on that, can you please provide the comparable numbers (as available) for SE Michigan, the State of Michigan, the entire US? Also, I was surprised that stationary sources account for 80% of the GHG emissions, transportation 17%, and waste 3%. Is that mix about average for a municipality of our size or is our transportation share relatively higher because of our large number of commuters? (Councilmember Lumm)

Response: Assuming a population of 121,477 (as of 2017 per census), this gives a per capita emissions footprint in Ann Arbor of 17.2 metric tons carbon dioxide equivalent per person. The State of Michigan's per capita emissions are 15.4 metric tons carbon dioxide equivalent per person (as indicated in a 2016 Energy Information Administration report). Ann Arbor's per capita emissions are 16% lower than the national average. The Ann Arbor GHG Inventory currently only accounts for on-road transportation that is within the city boundary, and does not include the impact of those commuting to and from Ann Arbor, which we know is significant. This is likely part of the reason these emissions appear smaller than in other communities. As mentioned in the presentation, we are working on a methodology to capture the impact of the full commute in our calculations, which will see the emissions from vehicular traffic increase.

Question #59: LQ2. Roughly 1/3 of the 2.1 million metric tons is generated by UM. While that's not surprising, it does re-enforce the importance of a coordinated effort, strategies, and commitments. I recognize UM had reps on the city's working teams and advisory groups and that's a good thing and certainly would need to continue, but it's much different than actually partnering on projects and initiatives, sharing resources and costs. Have there been any discussions with UM on a potential partnership framework going forward and what do we know this point about UM's specific strategies, action plans and timelines? (Councilmember Lumm)

Response: Excellent question and the short answer is yes and much more is needed. We discussed hosting a special session with senior leadership at the University about the City's carbon neutrality work and how we can best be coordinating with the University. Dr. Stults also sits on the University's Carbon Neutrality Commission and have been keeping them informed of the project. We are also proposing a special session with their Integrated Assessment Teams (the equivalent of our Technical Advisory Commissions) to ensure their work is informed by ours (recognizing many of their IAT members were our TAC members).

In terms of a future meeting, the co-chairs of the University's Carbon Neutrality Commission are working to set-up that meeting. This could be followed by a joint meeting between the Council and the Regents to discuss in greater detail, as well as continued coordination between staff. We have involved the University in the planning of our carbon

neutrality work but as we transition into implementation, much greater partnership is going to be needed - for both parties to achieve their goals.

Question #60: LQ3. I appreciate that you've tried to quantify the costs of the strategies and actions and as you've noted, the \$1 billion in costs does not include the costs individual homeowners and businesses will incur in achieving the carbon neutrality goal. It's that cost incurred by individual residents and businesses and the cost that will be incurred by city government (and ultimately our taxpayers/ratepayers) that I'm most interested in as a council member. In terms of the costs of conversion from natural gas to electric appliances and heating/cooling systems, what does the research and benchmarking show that can help dimension this cost? Also, and perhaps more importantly, what does this plan contemplate that individual homeowners and businesses will be REQUIRED to do (if anything) that will require an expenditure on their part? (Councilmember Lumm)

Response: To residents, many of these strategies are incentivized and pay for themselves over their lifetime, or are structured in a way to not impact the energy bills residents see. For example, by participating in a community choice aggregation program, a resident would be using 100% clean and renewable electricity without needing to invest in solar on their property or paying an additional amount for voluntary green solar on their utility bill. In a similar program in Vermont that incentivized homeowners to deep retrofit their homes with energy efficient improvements and electrification, scaled to Ann Arbor with the proposed program, residents could pay an average of \$11,000 with a payback of 13 years, or a minimum of \$5,000 with a payback of 7 years. These costs would increase with the addition of onsite solar and/or a ground source heat pump, which have payback periods of 10 years and 5 – 10 years, respectively (energysage.com).

With improvements in active transportation options and public transit, a resident could be incentivized to reduce their vehicle miles traveled 50%, saving over \$1,000 a year. Or, by purchasing an electric vehicle, they could save over \$600 a year in operating costs. If similar electric vehicle ride sharing programs like those in Los Angeles were introduced to Ann Arbor, they could save over \$8,000 a year without needing to pay for and maintain a private vehicle.

Strategies that require resident participation include building code requirements and benchmarking. The Rocky Mountain Institute estimates that net zero energy ready single family homes (highly efficient homes that have low energy consumption and the remaining consumption can be offset by offsite renewable energy) have an incremental cost in Detroit of \$1,574, which meets thresholds of energy savings over the life of a mortgage, resale value, and customer willingness to pay.

Required benchmarking could take multiple forms. Home energy scores cost between \$100 - \$300 in cities that require these assessments. Or, benchmarking could rely on information from a local utility, not costing residents for a specific test. We are hoping to work directly with the utilities to start and then work with homeowners and businesses to do the deeper audits once they are ready to implement solutions – this was they know

exactly what to do and what incentives/rebates are available to support their improvements.

Lastly, we are proposing programs that use economies of scale to significantly reduce the costs to residents and businesses. For example, we have been piloting a solar group buy program which is bringing discounts of up to 15% to residents to invest in solar energy. This 15% is on top of the federal tax incentive (which is 26% this year), meaning that combined, residents can save over 40% off the cost of solar through this program. As the A2Zero plan notes, we are looking to scale similar initiatives in regards to other renewable energy technologies, electric appliances, more efficient appliances, electric vehicles, and batteries.

Question #61: LQ4. Obviously \$1 billion in costs is hard to get one's arms around and I recognize you indicated in your presentation that you're still working on cost modeling and projections, but can you please provide any breakdown by entity (e.g city government, county/state, UM, AAATA etc) of costs you have? (Having a sense of the relative cost breakdown would be helpful in providing context for folks). (Councilmember Lumm)

Response: Please see the attached document. Note, we did not calculate the expenses for the University of Michigan but we are working on analysis that helps homeowners, renters, and businesses understand the upfront costs as well as the incentives, rebates, and financing available to implement the solutions outlined in the A²Zero Plan.

Question #62: LQ5. The vast majority of costs (\$950M of the \$1.05 billion identified) are capital investments for infrastructure (expand local and regional transit; park & ride; electrifying buses, EV infrastructure). For AAATA's piece, CEO Matt Carpenter has indicated a millage increase will be necessary. Is it envisioned that a carbon-neutrality/ climate action millage be recommended to fund the city costs? If so, what (roughly) would be contemplated for the amount and duration? If not, how will the city government costs be funded? (Councilmember Lumm)

Response: It is envisioned that a multitude of funding sources be combined to cover the costs. We are proposing philanthropic resources, apply for state and federal grants, public-private partnerships, leveraging financing mechanisms such as green bonds, working on new incentives and rebate programs, and a millage. In terms of the millage we still have a ways to go to figure out exactly what that ask could be but there is definitely a desire to partner with TheRide so that their millage request is in full alignment with the A²Zero carbon neutrality plan.

Question #63: LQ6. As you've noted throughout the report/plan, these strategies and actions involve substantial cost and significant lifestyle/behavior changes for AA residents. Given that, I believe AA residents MUST be engaged directly – and indicate support – before embarking on this plan. The upcoming virtual town halls will help and be a first step in community dialog, but I believe the community engagement must go much further than that and that some form of citizen survey(s) or referendum on the matter is

necessary. Does staff agree? If so, what would you recommend as to the form it would take and if not, why do you not believe it is necessary/appropriate? (Councilmember Lumm)

Response: Our outreach on the plan is continuous because this a living document and will change. We hosted 2 town halls and held over 60 public events between November of 2019 and March 2020. We provided 3 surveys for resident input and those surveys indicated broad support for the final list of strategies included in the Plan. Moreover, many of the actions are already underway and what we propose is scaling them and expanding them. Others necessitate little to no costs to residents. And others would go to public vote (i.e., community choice aggregation or a millage). In addition, we are working on creating neighborhood and youth ambassadors that can help enhance resilience and sustainability throughout our entire community. These individuals will serve as information disseminators as well as receivers, helping us to continue refining our work and plans. We believe engagement should be continual, that we should refine our work based on what we learn in that engagement, and that many of the actions proposed in this plan already have broad public support. As such, we agree with the need for ongoing public engagement, but we also believe we already have the public mandate to immediately begin implementing and/or laying the foundation to implement the actions in this plan. And, as a reminder, some of the actions will absolutely come to a public vote (i.e., community choice aggregation and a millage should we pursue that option).

Question #64: LQ7. Council asked for what it would take to achieve carbon neutrality by 2030 – an aspirational goal - and that’s what you’ve provided in outstanding detail. What the report/plan doesn’t do, however, is provide a process or a framework for prioritizing actions or strategies. While I recognize it’s massively over simplistic, the strategies have widely different cost-benefit equations and that suggests there may be some value in prioritizing.

Strat #1 1% GHG benefit costs \$100K

Strat #3 1% GHG benefit costs \$1M

Strat #2 1% GHG benefit costs \$6M

Strat #4 1% GHG benefit costs \$100M

Has there been any discussion of prioritization processes or frameworks, of identifying where the maximum leverage is, or of somehow modeling these actions on a benefit vs. cost vs. difficulty basis? Does staff believe that would be a worthwhile exercise? (Councilmember Lumm)

Response: Our initial quantification focused only on quantifying the cost and the greenhouse gas reduction potential of actions. We have since integrated co-benefits associated with each action so that, at least qualitatively, we can include those in our summary statements. The problem is that, for many of these co-benefits, there is not a quantitative way to assess their value. For example, the value of equity or environmental justice is hard to quantify in the same way that physical infrastructure dollars are. To address this, we have included a column in our summary matrix that includes the various co-benefits of each proposed action so we can integrate that into decision making.

The other thing to note is that, once we do the things with lower paybacks, then we will only be left with the more expensive options. By working on them all in parallel, or at least having a comprehensive plan that shows what we intend to do in all sectors, we are far more likely to successfully lay the foundation for future implementation.

Finally, by having a comprehensive plan that outlines the holistic way we'd like to address climate change, we are more likely to secure external funding. What we mean here is that often funders need to understand that a community is committed to a holistic plan to address a problem. Knowing this often increases the likelihood that a funder will be willing in on funding a specific component of that larger initiative. In fact, some of the grants we have been exploring require that a comprehensive climate plan exists – it's a prerequisite to applying. That said, we see a holistic plan as a foundation for fundraising.

Question #65: LQ8. In response to my question for the last council meeting regarding charging OSI for sustainability-related expenditures, it was indicated that “This does not represent a permanent change in our practice of charging OSI for the incremental cost in other instances and it will not interfere in our ability to measure the funds the city spends on sustainability related initiatives in any way.” I was encouraged by that response. Can you please confirm the funds the city spends on sustainability will be measured, and if so, how will the tracking be done (all in OSI; separate account or sub-account)? (Councilmember Lumm)

Response: The City will continue to monitor the funds spent on explicit sustainability-related activities. It may be more challenging as we more formally institutionalize sustainability into the work we do across the organization, to measure all the funds that advance our sustainability work, since, the hope is that sustainability becomes intrinsic to what we do. When that happens, it may be challenging to disentangle the resources we invest in sustainability versus the resources we spend in other areas of the City's work. For now, however, we are able to report the funds spent on sustainability-related activities. Most of those resources do come from the Office of Sustainability and Innovations but as that changes, we'll work to integrate that information into the City's budget performance tracking systems.

Question #66: LQ9. In terms of the GHG reduction calculations, it was mentioned in the video presentation that OSI engaged a consultant to assist in the calculations and modeling. While that makes sense as the relative reductions are key to the strategy, can you please provide a bit more detail (who's the firm or individual, experience, cost etc.)? (Councilmember Lumm)

Response: In December we released a request for quotes and received responses from four firms. The firm that was deemed the most responsive and was capable of performing the work in the very tight timeline was Elevate Energy. They worked with Farr Associates and Michigan Energy Options to assist staff with conducting the greenhouse gas and cost calculations for the various actions. The total cost for their work was \$24,900. Below are short descriptions of the each firm on the winning team, as provided in their responses to our RFQ:

Elevate Energy

Project Role: Project Management, GHG Analysis and Cost Estimation Support

Elevate Energy (www.elevateenergy.org) is a 501(c)(3) not-for-profit corporation with a mission of Smarter Energy Use for All. We design and implement energy programs that lower costs, protect the environment, and ensure the benefits of clean energy reach those who need them most. Elevate Energy (Elevate) was formed in 2000 by the [Center for Neighborhood Technology \(CNT\)](#), a 40-year old organization dedicated to promoting urban sustainability and the effective use of resources and community assets. Since its inception, Elevate has paired relevant technical solutions with community education to further the reach of clean energy strategies, creating benefits for everyone. Elevate has about 100 full-time equivalent employees and operates programs in the areas of energy planning, renewable energy, energy efficient building retrofits, and dynamic pricing programs. In its early years, Elevate pioneered the concept of hourly electricity pricing programs for residential customers, and since 2004, has been working with cities, counties, regional areas and state agencies to develop actionable climate, energy and sustainability plans to bring efficiency to scale. Elevate's robust research and analysis capabilities allow for continuous improvement for maximum impact, while building strong connections and contributing to healthy thriving communities. On this project, our longtime partner CNT will serve as QA/QC role in order to deliver GHG analysis in an accelerated timeframe.

Farr Associates Architecture & Urban Design, P.C.

Project Role: Cost Estimation, Acceleration Strategies, & Workshop Facilitation

[Farr Associates](#) is a firm of optimistic architects and planners passionate about cities, sustainability, and leadership. For 30 years we have been agile, early-adopters—pioneering cutting-edge sustainable strategies and technologies and working to overcome the technical and regulatory limits of sustainability at all scales. Located in the historic Monadnock Building in Chicago's Loop since its founding in 1990, Farr Associates' staff work in integrated design teams to create award-winning plans and designs that are sustainability-minded. This interdisciplinary approach allows us to see the big picture and translate it into actionable implementation. Our best work results from collaboration with clients on projects that aspire to attain social, economic and environmental goals, often at the crossroads of policy and design.

Michigan Energy Options

Project Role: Cost Estimation Support and Secondary Feedback on Strategies

Michigan Energy Options (MEO) is a nonprofit that has been in business since 1978. From their offices in East Lansing and Marquette, they pursue daily our mission of guiding communities toward being more sustainable and resilient through the adoption of energy efficiency and renewable energy. They do this by providing unbiased expertise, research and results-driven programs, all the while working collaboratively with local governments, businesses and community leaders.

Question #67: LQ10. Also related to GHG reduction calculations, for actions like year-round composting (which adds heavy -vehicle drive miles) and bus rapid transit (with dedicated bus lanes and increased congestion/idling) how do factor those related impacts into the analysis? (Councilmember Lumm)

Response: For the first, year-round composting, we took the numbers and research that was done as part of the Solid Waste Resource Management Plan. For Bus Rapid Transit, we calculated both the additional miles that might come onto the system from the buses themselves, as well as the reduction in VMT from a select number of vehicle drivers switching to transit.

Question #68: LQ11. Are you aware of any research done regarding the impacts on property values of electrification of homes and commercial/office buildings? If so, what were the conclusions? (Councilmember Lumm)

Response: High performance electric equipment is relatively new to the market, and there is limited data on the impact of electrification on property values. However, electrifying heating and cooking systems is likely to have a similar impact of that of roofs and appliances. In general, new roofs and appliances do not add to property values, while those requiring replacement detract from property values. The A²Zero work plan also proposed combining energy efficiency improvements with electrification; the impact of improved energy efficiency of property values is complex. Cities like Portland, OR have found that disclosing energy consumption, regardless of the intensity of use, increases property value. Lastly, heat pump technologies combine heating and cooling into a single unit, adding air conditioning to housing units that may not previously had it. The Rocky Mountain Institute estimates the net present value cost over the lifetime of a heat pump to be nearly equal to that of purchasing a new furnace and air conditioning unit.

Question #69: In the video presentation, it was mentioned that the FY21 request for OSI was tempered in recognition this was the 2nd year of a budget cycle. That's appreciated, but in deciding whether to approve this plan or not, we need to understand at least directionally what the ongoing annual costs will be both in OSI and city-wide and what the long-term funding plan would be. Anything you can provide in that regard would be very helpful. More specifically: LQ12. Is the staffing level OSI needs the next five years or so the 15 mentioned in the video or is it the 18-22 shown on the "staffing by year slide". Also, since those numbers assume additional support throughout the organization (shown on "the budget" slide), how much is that likely to add to the required resources/staffing, and if we don't know at this point, when will we know that? (Councilmember Lumm)

Response: We are proposing 15 as the stable size for the Office. The remainder of the need we believe we can fill with temporary employees or contractors. And, at this point, we anticipate that all of the additional staffing support will be available as part of existing employees jobs. There may be a point where we have to add something like a code enforcement official to the full time staff but that is not clear at this moment.

Question #70: LQ13. The “FY21 budget” slide shows \$1.4M budgeted and a “gap” of \$25.6M to a \$27M need. What does that gap represent and what is included in the \$27M? (Councilmember Lumm)

Response: The \$27 million includes (highlighted in yellow are the gaps and grey are unclear):

- Staff time to initiative the work around Community Choice Aggregation (\$49,000)
- Staff time to initiative the bulk purchase of renewables (\$55,000)
- Staff time to initiative a community solar program (\$18,640)
- Staff time to advance the landfill solar project (\$27,000)
- Resourced to immediately scale-up electrification of City buildings and to initiate public electrification program (\$1,254,000)
- Electrification of all buses (\$6,890,000)
- Staff time and program resources to initiate bulk buy of electric vehicles (\$153,000)
- Staff time to initiative private EV fleet transitions (\$24,500)
- Resources to more rapidly transition City fleet to EV (\$660,000 – we only have a portion of these resources)
- Investment in large-scale electric vehicle charging infrastructure (\$4,200,000)
- Staff time and program resources to initiate bulk purchase of energy efficiency equipment (\$275,000)
- Staff time and resources to advance at adoption of a more aggressive building code (\$255,000)
- Equipment costs to transition lights to LEDs (\$361,760)
- Staff time, resources, and technical platforms to launch benchmarking (\$408,000)
- Money for a loan loss reserve (\$1,052,500 – one time influx plus some staffing support to advertise and administer)
- Resources to implement net zero energy affordable housing program (\$200,000)
- Staff time and outreach materials to initiate green rental housing program (\$53,000)
- Staff time and outreach materials to initiate aging in place efficiently program (\$15,000)
- Staff time and resources to launch energy concierge and community education (\$74,550)
- Financial resources to expand weatherization program in A2 to serve more families as well as educational and outreach materials (\$152,500)
- Physical infrastructure costs to put fill sidewalks and bike lane gaps (\$300,000)
- Physical infrastructure and operational costs to expand local and regional transit (\$3,080,000)
- Staff costs associated with designing, implementing, and negotiating the purchase of land for park and rides (\$200,000)

- Staffing costs associated with researching, analyzing, and drafting policy related to allowing ADU's, Duplexes, Triplexes, etc., in more areas of the City (\$72,100) (unclear if these resources are available)
- Staffing costs associated with researching, analyzing, and drafting policy related to mixed use zoning updates (\$50,000) (unclear if these resources are available)
- Modest staffing support but primarily the physical infrastructure and technology to implement a tiered parking rate system (\$2,221,000)
- Labor and infrastructure costs associated with moving to year round composting (\$2,600,000)
- Labor and infrastructure costs associated with expanded commercial recycling (\$1,840,000)
- Staff time and training materials/outreach materials related to sustainable material use and reuse (\$27,000)
- Staff time and outreach materials related to moving towards a circular economy (\$27,000)
- Support for research and outreach related to plant-based diets (\$20,840)
- Physical infrastructure and educational materials related to refrigerant recycling (\$10,440)
- Staffing support and outreach materials related to resilience hubs (\$25,000)
- Staffing support, materials, and stipends for youth and neighborhood ambassador program (\$35,000)
- Physical costs to purchase and maintain trees (\$116,000 – assumed covered already through forestry)
- Physical materials, some staffing support, and training related to emergency preparedness and emergency kits (\$35,000)
- Physical infrastructure and technology costs related to sensors and data monitoring (\$101,300)
- Staffing support and training dollars related to expanding equity programs in the City and community (\$20,000)
- Support for neighborhood grants through the Sustaining Ann Arbor Together grant program (\$100,000)
- Physical infrastructure improvements at city facilities through the internal carbon tax (\$52,500)
- Staffing support to initiate carbon offset program (\$12,000)

Question #71: LQ14. The projected FY21 OSI expenditures in the adopted FY20 budget book were \$1.67M and that was with 5 FTEs. The “FY21 budget” slide now shows \$1.39M for FY21 (or about \$280K less), yet that’s with 9 FTEs (6 now authorized + 3 more) as well as \$125K or so of new spending for the Fellow, part-time office manager, and contractor. Can you please reconcile these? Also can you please provide for OSI a high-level year-to-year (FY21 vs FY20) comparison of expenditures. Finally, if any

expenditures have been moved to different departments or deferred, please identify what they are and the amounts? (Councilmember Lumm)

Response: First, we apologize as we made a mistake. We only included the funding allocated from the general fund and the county rebate in our calculations. We have since updated this slide to show the full range of funding proposed for OSI for FY21: \$1,851,953. In terms of the staffing, we are proposing funding the three new FTEs through the rebate resources. While not ideal, we acknowledge that exceptional times call for exceptional measures and bringing on the staffing support to immediately begin this work was clearly the most important need we have so proposed using the rebate resources to cover the staffing needed to immediately jump start this work. For the Fellow, Office Manager, and Contractor, we are proposing the general fund as the impact to the general fund was less by including these staffing resources as opposed to the three FTEs.

In terms of expenditures moved to different departments, the ones to note are:

1. \$200,000 to the AAHC, which we release as we work with them on energy efficiency and renewable energy projects
2. \$100,000 one-time moved to the Energy Fund to help replenish the revolving energy fund.
3. \$100,000 allocated for the Sustaining Ann Arbor Together Grant program.

Question #72: LQ15. On the FY21 Impacts slide, there is \$50K shown for a “contractor to jump start solarize and energy efficiency bulk buys”. Can you please elaborate on how the program would work and what the contractor would be doing? (Councilmember Lumm)

Response: The solarize program helps lower the soft costs associated with solar by bringing together multiple individuals interested in purchasing solar with a chosen solar installer. The solar installer is chosen by someone in the group (and must be a Michigan Saves verified solar installer). By bringing these individuals together with a single solar installer, we are lowering the soft costs the solar installer has to recruit / engage folk in purchasing solar. This means that the solar installer can then pass those savings along to the individuals pursuing solar. We’ve piloted this program twice now and in both situations we were able to secure discounts of 15% off the cost of solar for all households that signed up for solar- because the demand was so great. This means that all those individuals who pursued solar through the program got the 30% federal tax incentive (for 2019; it’s 26% for 2020) and then got an additional 15% off the cost! This program has a lot of potential and so we are proposing hiring a solar contractor to help us scale this program. This individual would work with the solar installers to design the program, help manage the logistics, ensure the quotes and site visits go smoothly, and help recruit new individuals into the program.

Question #73: LQ16. Of the \$1.39M FY21 expenditure budget, how much will be funded by the General Fund, the county millage fund, and by other funds? (Councilmember Lumm)

Response: There was an error on the slide shown in the presentation which we have since fixed. The funding for staff within OSI proposed for FY21 is \$1,851,953 and breaks down as follows: \$940,000 from the county millage rebate, \$549,045 from the general fund, \$159,819 from the Energy Fund, \$65,181 from the Water Supply System, \$53,336 from the Stormwater Sewer System Fund, \$48,486 from the Sewage Disposal System, and \$46,086 from the Solid Waste fund. We also have two outstanding grants that we are waiting to hear about which may become available in FY20 or FY21 if we are successful: \$25,000 for energy improvements and \$200,000 for Aging in Place Efficiently.

The amended budget for FY20 is almost \$2.1 million and that's primarily due to one-time budget amendments throughout this current fiscal year.

Question #74: LQ17. The "electrification" of city facilities is recommended as an action and that the city should be a "leader" in the conversion of buildings from natural gas to electricity. The cost estimate is shown as \$5.7M. Is it expected any of that will be included in the FY21 capital or operating budget proposal and if so, roughly how much and for what purpose? (Councilmember Lumm)

Response: Yes, it is anticipated that the majority of these resources will be integrated into the CIP. What we presented in the Plan was the estimate for conversion based on our existing knowledge of the City's natural gas infrastructure. As we move forward with energy efficiency audits (which we will be proposing in the coming weeks), we'll gain a deeper understanding for exactly how much it will cost to replace major pieces of inefficient infrastructure and make the transition to electric. Those costs will be integrated into the CIP. We will also continue to fundraise to help support transitions, whenever applicable. At this point, we've estimated approximately \$1,000,000 per year in additional funding, for 5 years, to transition the majority of the City's operations to electric.

Question #75: LQ18. The part-time office manager is recommended to free up Dr. Stults' time for fundraising and that makes sense. Can you please broadly outline your fundraising strategy and more specifically, can you please elaborate on the EV charger and Aging in Place grant requests that were mentioned in the video presentation. (Councilmember Lumm)

Response: Right now the funding approach of the office has been opportunistic. As we hear about grants that seem like a good fit, we pursue. We have not had a chance to do a holistic analysis of the funding landscape, curate the relationships necessary to apply, and then submit applications in a comprehensive manner. As such, the funding approach we are proposing would start with a comprehensive assessment of the landscape, including an analysis of federal funding opportunities (like the Connected Communities grant from DOE we just discovered), philanthropic sources, state grants, nonprofit grants, and innovative financing opportunities such as green bonds and power purchase agreements. Next, we'll map these funding opportunities to the A2Zero plan to identify where we have good fits. Then we'll begin applying for grants that are strongly aligned with our work and for which we believe we have a good chance of success. This will

sometimes mean partnering with external entities to apply (such as the 2030 District if applying for work in the commercial sector).

In terms of our active grant applications, we have two active and are working on a third. We have a grant for \$200,000 to jump start a pilot of the Aging in Place Efficiently grant. This is a two-part grant that necessitates a match from a local foundation and a private foundation. We've heard that our local foundation has agreed to the grant but we are just waiting on the national funder. Staff asked questions from them last week so I know we are still in the running it's just a question of how we fare against dozens of other applicants.

The second active grant is \$25,000 from the State of Michigan to do some energy efficiency work at City facilities and create some additional outreach materials related to A2Zero. We anticipate hearing about this grant in the next month or two (depending on the Pandemic).

Finally, we are working on a grant for a significant amount of EV charging infrastructure at both City facilities and in the public space. We are finishing the preliminary electric analysis needed to apply and once done, we'll submit our application. This has taken longer than anticipated, partly due to the pandemic. Our hope is to have this grant submitted as soon as possible.

Question #76: L19. Community Choice Aggregation (CCA) is the single most impactful action on the list by a pretty significant margin, but as noted, there's no enabling legislation at the State level. In your presentation, you mentioned that Ohio and Illinois have adopted CCA enabling legislation. Can you please provide a high-level summary of their legislation, and specifically, whether they require public votes and whether the structures include opt-outs? (Councilmember Lumm)

Response: In Ohio, local communities are allowed, by law, to join their citizens together to buy natural gas and/or electricity as a group through governmental aggregation. Their legislation allows opt-in aggregation, requiring a resolution in support of the program, a plan, two public hearings, and certification by their Public Utility Commission. Their legislation allows opt-out aggregation, requiring a majority of voters to authorize opt-out aggregation in an election, a plan from the local government, and two public hearings. Each customer must be notified that they will be automatically enrolled unless they choose to opt out.

In Illinois, legislation allows for the aggregation of electric load by municipalities and counties through government aggregation. It allows for both opt-out and opt-in aggregation. Opt-out aggregation requires a vote to pass a referendum that automatically combines the electric load of customers except for those who opt out. Opt-in aggregation requires an ordinance to combine the electric load for only those customers that take action to opt in.

Community Choice Aggregation is also enabled in New York, California, and Massachusetts, among others. Numerous reports have been written about these programs so we'll continue to analyze those reports and work with our elected leaders on a model for Michigan.

Question #77: LQ20. Also on Community Choice Aggregation, the presentation slide indicates that CCA could lead to parity (or savings) compared to existing electrical costs. What data (benchmarks or research) supports that statement, and who sets the prices individual customers pay in a CCA? (Councilmember Lumm)

Response: The National Renewable Energy Laboratory reports that, to date, most CCAs have offered rates lower than utility rates. Many CCAs have used the cost advantage to offer low-cost voluntary green power at a discount to basic service. The rate is determined through negotiations of the government aggregator with the supplier, and is able to leverage orders-of-magnitude higher buying power than that of a single customer. Additionally, typical opt-out rates are on the order of 5-15%, meaning 85-95% of eligible customers participate. This compares to 5-20% participation rates in top-performing utility green pricing programs. A CCA in Massachusetts opt-out program offering 100% renewable energy increased their purchasing power nearly 200-fold compared to the existing opt-in structure in 2017.

Question #78: LQ21. For the landfill solar project, the 2020 workplan (assuming feasibility confirmed) includes issuing an RFP and "safe harboring of equipment". Is the RFP for just construction or would it be for other services, and what does "safe harboring of equipment" mean? (Councilmember Lumm)

Response: The RFP would most likely just be for construction of the asset, although we will be writing the RFP with DTE so we'll have the chance to shape that RFP. In terms of safe harboring, it refers to locking in the federal tax incentive (which is 26% this year for solar) by purchasing a percentage of the solar equipment in a given year. By purchasing some of the solar equipment this year, we'll be able to lock in the 26% solar tax incentive and apply that to the full project. This is important because next year the solar tax incentive falls to 22%.

Question #79: LQ22. For strategy 2 (switching appliances and vehicles to electric), I'd appreciate more information on a few of the 2020 workplan items: Action 1 references "finalizing the Electric Vehicle readiness ordinance" – what is the scope of the ordinance and what are the requirements being contemplated? (Councilmember Lumm)

Response: The Electric Vehicle Readiness Ordinance has been in the works for nearly 18 months and focuses on updating our parking requirements to ensure that ample EV parking spaces are available. In its current draft format, it has guidance about when spots need to be made EV capable versus EV ready. The planning commission, energy commission, and many members of the public have been working on this for a long time and we anticipate bringing this forward to Council in the coming months.

Question #79: LQ22. Action 2 focuses on electrifying buses – what are the current AAATA and UM plans to replace traditional buses with electric over the next 10 years? (Councilmember Lumm)

Response: The earliest AAATA might deploy electric buses is likely in the mid-2030s or 2040, not within the next 10 years.

Question #79: LQ22. Action 3 (community electric vehicle and solar bulk buys) references a 2020 action “OSI and DTE kick-off a group buy program for city staff with one or two OEM’s participating.” Can you provide more detail on that program including why just city staff and how the OEM’s will be engaged and selected? (Councilmember Lumm)

Response: We have already started to lay the foundation for this work by hosting calls with DTE and three major OEMs to which DTE has an existing relationship. Through these conversations, it was recommended we start a bulk buy with staff to test the model, work out and kinks, and then scale to the community. That is what we proposed in the plan. In terms OEM’s, so far we have been in various levels of discussion with GM, Ford, and Tesla. We’d be willing on working with any OEM that wanted to engage so if folk have contacts, please let us know.

Question #79: LQ22. Action 4 (electrifying city fleet) has a cost projection of \$4M over 10 years. Can you please provide the detail for the \$4M and does that cost include both the incremental cost of electric vs gas as well as the incremental cost of replacing vehicles earlier than they otherwise would have been replaced? (Councilmember Lumm)

Response: This action models the transition to a 90% all electric City fleet by 2030. The only exceptions are heavy duty trucks for which an electric alternative might not be possible. As such, the calculations include replacing most vehicles on their normal replacement rate, with exceptions of sedans, which we propose having a full replacement of by 2025. This also includes the operation and maintenance savings associated with electric vehicles as well as some revenue generated from selling the ICE vehicles on the market.

Question #79: LQ22. Action 5 (electrifying private fleets) references in the 2020 workplan creating a MOU with ridesharing companies. What would be the scope of that MOU and what would be the responsibilities of the companies and the city? (Councilmember Lumm)

Response: This is all to be determined but the model we are looking at is what the City of Denver has done with Lyft (<https://www.lyft.com/blog/posts/lyft-denver-ev-2019>). We welcome any and all suggestions on which a collaboration of this nature might look like.

Question #80: LQ23. The city’s acquiring streetlights from DTE is action 3 in strategy 4. This came up when council passed the resolution asking DTE to step up its game in terms of maintenance. Can you please remind me of the financials associated with re-

purchasing including the number of streetlights, the incremental up-front costs associated with purchase (both the cost to re-purchase and cost to re-place w/LED), and the incremental ongoing costs (if any) of maintenance and powering? (Councilmember Lumm)

Response: The assumptions we've used, is that it will cost \$250 per streetlight to acquire it from DTE and then \$230 per streetlight to convert to LED (total cost per light for the purchase and conversion is therefore \$480). This assumes that DTE will actually sell us the assets at a reasonable price and allow us to continue to use/co-locate on DTE poles (this is based on cost models we've see in the Northeast). If they do not sell their assets at a reasonable price, we may be forced to install our own poles, which would raise the cost to something akin to \$5,000-\$8,000 (cobra head and downtown globe, respectively) per streelight. Our estimate assumes that we are able to collaboratively work with DTE.

Also, we modeled the energy costs and maintenance costs associated with current lighting and with LEDs. LEDs have lower energy costs and lower maintenance costs which both create savings for the City over time.

Question #81: LQ24. For the Green Business Challenge, the 2020 workplan calls for launching a stakeholder committee. Has that committee been established? If so, who is on it and if not, what criteria will be used to determine the members of the committee? (Councilmember Lumm)

Response: We have just started this work. We had a group of students from the Planet Blue Ambassador program who worked over the school year to research Green Business Programs in the State and across the country. They delivered their preliminary findings to OSI and CM Ramlawi. Based on those findings, we had intended to form an official stakeholder committee to start working on a Green Business Challenge. Unfortunately, the Pandemic has slowed this work down. As such, no formal stakeholder committee yet exists. We do anticipate, however, reinvigorating this work once we are back into a more "normal" work environment.

Question #82: LQ25. Strategy 4 includes Action 5 "Increase the diversity of housing allowed by right" which allows up to 4 unit residential buildings in single-family neighborhoods and Action 6 "mixed-use neighborhoods" which allows grocery stores, coffee shops, breweries etc in neighborhoods. Given that these zoning-related actions have negligible impact on GHG emissions (0.1% reduction for action 5 and included elsewhere for action 6), but could have a significant impact on neighborhood character and quality of life, why are they included here? Wouldn't it make more sense to focus this carbon neutrality plan on strategies and actions that have the highest leverage impacts on GHG emissions and discuss controversial zoning changes like this (with minimal GHG impact) separately and elsewhere? (Councilmember Lumm)

Response: While our Plan is primarily focused on drastically reducing carbon emissions, equity is a central tenet in our work. As we invest in carbon-reducing and climate-resilient infrastructure, property values are expected to increase. Without steps to prioritize and

address vulnerable communities, this could exacerbate issues of housing affordability within our community. Thus, increasing the diversity of housing and promoting mixed-use development ensures that all our neighbors and neighborhoods equitably experience the many benefits of this Plan. Moreover, having walkable neighborhoods is critical to achieving the necessary VMT reductions that are needed to achieve carbon neutrality. Plus, the ability to have more people in the City of Ann Arbor, where our carbon footprint is lower than the surrounding areas, primarily due to lower transportation-related emissions for our city dwellers, helps to reduce global greenhouse gas emissions, which we consider part of our overall charge.

Question #83: LQ26. Action 7 in strategy 4 is tiered parking rates which would raise parking rates generally to discourages vehicle use, but discounts rates to low-income drivers, disabled drivers, and EV drivers. Can you please comment on the legality of this? (The reason I ask is that during the discussions on water rates, it was stated clearly that fees/rates must reflect the cost of service and nothing else.) (Councilmember Lumm)

Response: Multiple cities, like Cincinnati and Los Angeles, have offered free parking passes for all-electric vehicles since as early as 2008. Many cities and states have provided free parking to accessibility permit holders so we believe there are opportunities to at least creatively explore this option. We have modeled some legal costs in this strategy, however, to ensure that the approach we ultimately pursue is well grounded.

Question #84: Q27. Regarding strategy 5 (use, re-use, disposal of materials), it was indicated in the video presentation that if strategy 5 wasn't done, the benefits of everything else falls dramatically. Can you please explain how that happens? (Councilmember Lumm)

Response: This might have been a mistake on our end as we meant this comment to refer to Strategy 4.

It's an excellent question and one that will depend on many factors, including our fundraising success, to the extent to which we are able to integrate sustainability into other initiatives (e.g., TheRides millage), and whether or not we chose to pursue a carbon neutrality millage. We hope to work very closely with Council to figure out how best to fund this work.

The Rocky Mountain Institute 2019 Economics of Zero Energy Homes estimates the incremental cost of building zero energy (highly efficient homes that produce as much energy as they use) and zero energy ready single family homes (highly efficient homes that have low energy consumption and the remaining consumption can be offset by offsite renewable energy).

The report considered four cost thresholds:

- **Mortgage Threshold:** If the monthly mortgage payment increase is less than or equal to the monthly energy bill savings, assuming a 30 year mortgage.
- **Resale Threshold:** Considering the average stay in a home (12 years), compares the incremental cost to build with the net-present value of anticipated energy savings.
- **Consumer Willingness to Pay Threshold:** According to the latest NAHB research, 42% of consumers are willing to pay a 4% premium for a green home.
- **First Cost Threshold:** If the cost to build is the same as a code-complaint home, represents elimination of cost barrier.

Results:

The report calculated the incremental costs for Detroit, MI. For Detroit, MI *Zero Energy Ready Homes*:

- Zero Energy Ready Incremental Cost: \$1,574
- Energy Savings: \$909
- Meets Mortgage Threshold, Resale Threshold, and Consumer Willingness to Pay Threshold

For Detroit, MI *Zero Energy Homes*:

- Zero Energy Incremental Cost: \$19,753
- Energy Savings: \$2,508
- Meets Mortgage Threshold and Resale Threshold

Comparing to Ann Arbor:

These factors would influence the incremental cost and energy savings:

- Climate zone: Same as Detroit, MI
- Utility rate: Same as Detroit, MI
- Labor and material cost: Not available, assumed to be the same as Detroit, MI
- Baseline code: Same as Detroit, MI
- Incentives: Not included
- Solar resource: Same as Detroit, MI
- Solar cost: Same as Detroit, MI

Accounting for incentives, a maximum of \$1,450 is available from DTE for energy efficient appliances, and the Federal Tax Credit for solar and geothermal systems are 26% and 22% for 2020 and 2021, respectively.

SUMMARY

		Total Costs	GHG Reduction	% total emissions	\$/ton	Party Primarily Responsible for Implementation	Co-Benefits
Strategy 1	Community Choice Aggregation	\$3,245,000	784,000	35.8%	\$ 4.14	City of Ann Arbor	AIR; \$\$; EQU; SCALE
	Bulk Purchase of Renewables	\$605,000	85,000	3.9%	\$ 7.12	City of Ann Arbor and \$66k for community liaison stipends	LOCAL; NRG; AIR; JOBS; RES; \$\$; SCALE
	Community Solar Program	\$205,000	11,500	0.5%	\$ 17.83	City of Ann Arbor	LOCAL; NRG; AIR; JOBS; RES; \$\$; EQU; SCALE
	Landfill Solar Project	\$80,000	23,000	1.1%	\$ 3.48	City of Ann Arbor	LOCAL; NRG; AIR; SCALE
Strategy 2	Electrification	\$7,100,000	362,200	16.5%	\$ 19.60	City of Ann Arbor with outside legal support	LOCAL; AIR; JOBS; HEALTH; SCALE
	Electrify All Buses	\$86,000,000	13,800	0.6%	\$ 6,231.88	TheRide	LOCAL; AIR; RES; HEALTH; EQU
	Bulk Purchase EVs	\$700,000	122,900	5.6%	\$ 5.70	City of Ann Arbor and \$66k for community liaison stipends	AIR; JOBS; RES; HEALTH; \$\$; SCALE
	Private EV Fleets	\$123,000	0	0.0%		City of Ann Arbor	AIR; RES; \$\$; HEALTH; SCALE
	City EV Fleet	\$4,000,000	1,100	0.1%	\$ 3,636.36	City of Ann Arbor	AIR; JOBS; RES; HEALTH; \$\$; SCALE
	EV Infrastructure	\$42,000,000	0	0.0%		City of Ann Arbor and DDA	AIR; JOBS; Health; SCALE
Strategy 3	Bulk Purchase of Energy Efficiency	\$950,000	242,500	11.1%	\$ 3.92	City of Ann Arbor and \$66k for community liaison stipends	LOCAL; AIR; JOBS; HEALTH; \$\$; EQU; SCALE
	Building Code Requirements	\$1,935,000	48,300	2.2%	\$ 40.06	City of Ann Arbor	LOCAL; JOBS; RES; \$\$; EQU; SCALE
	LED Lighting	\$3,140,000	2,600	0.1%	\$ 1,207.69	City of Ann Arbor	AIR; \$\$
	Benchmarking	\$2,370,000	0	0.0%		City of Ann Arbor	JOBS; \$\$; SCALE
	Loan Loss Reserve	\$1,578,000	0	0.0%		City of Ann Arbor	LOCAL; JOBS; RES; HEALTH; \$\$; EQU; SCALE
	Energy Concierge & Community Education	\$820,000	0	0.0%		City of Ann Arbor	JOBS; \$\$; EQU; SCALE
	Net Zero Energy Affordable Housing	\$800,000	400	0.0%	\$ 2,000.00	City of Ann Arbor	LOCAL; NRG; AIR; JOBS; RES; HEALTH; \$\$; EQU
	Green Rental Housing Program	\$530,000	0	0.0%		City of Ann Arbor	LOCAL; AIR; JOBS; RES; HEALTH; \$\$; EQU; SCALE
	Green Business Challenge	\$700,000	0	0.0%		City of Ann Arbor and 2030 District	LOCAL; NRG; AIR; JOBS; RES; \$\$; SCALE
	Aging in Place Efficiently	\$150,000	0	0.0%		City of Ann Arbor	LOCAL; JOBS; RES; HEALTH; \$\$; EQU
	Weatherization Expansion	\$1,550,000	0	0.0%		Washtenaw County	LOCAL; JOBS; RES; HEALTH; \$\$; EQU
	Strategy 4	Non-Motorized Plan	\$2,400,000	60,400	2.8%	\$ 39.74	City of Ann Arbor and DDA
Expand Local and Regional Transit		\$656,780,000	93,200	4.3%	\$ 7,047.00	TheRide with support from the City of Ann Arbor	LOCAL; AIR; JOBS; RES; HEALTH; \$\$; EQU
Park and Ride		\$170,000,000	28,400	1.3%	\$ 5,985.92	City of Ann Arbor, TheRide, and MDOT	AIR; EQU; SCALE
Duplex/Triplex/ADUs		\$250,000	2,200	0.1%	\$ 113.64	City of Ann Arbor	LOCAL; AIR; RES; SCALE
Mixed-Use Zoning		\$365,000	0	0.0%		City of Ann Arbor	LOCAL; AIR; RES; HEALTH
Parking Rates		\$4,500,000	0	0.0%		City of Ann Arbor	LOCAL; AIR
Strategy 5	Year Round Composting	\$26,000,000	400	0.0%	\$ 65,000.00	City of Ann Arbor	LOCAL; NAT; JOBS; SCALE
	Expand Commercial Recycling	\$18,400,000	5,600	0.3%	\$ 3,285.71	City of Ann Arbor and/or Contractor	JOBS; SCALE
	Sustainable Material Use and Reuse	\$270,000	0	0.0%		City of Ann Arbor	LOCAL; ERS; HEALTH; \$\$; NAT; EQU
	Circular Economy	\$270,000	0	0.0%		City of Ann Arbor	LOCAL; JOBS; RES; HEALTH; \$\$; NAT
	Plant-Based Diets	\$208,400	0	0.0%		City of Ann Arbor	HEALTH; NAT
	Refrigerant Recycling	\$179,400	0	0.0%		City of Ann Arbor	JOBS; HEALTH
Strategy 6	Resilience Hubs	\$5,025,000	2,500	0.1%	\$ 2,010.00	City of Ann Arbor	LOCAL; NRG; RES; HEALTH; EQU; SCALE
	Neighborhood and Youth Ambassadors	\$350,000	0	0.0%		City of Ann Arbor	LOCAL; JOBS; RES; HEALTH; EQU; SCALE
	Tree Canopy	\$1,160,000	450	0.0%	\$ 2,577.78	City of Ann Arbor	AIR; RES; HEALTH; NAT; EQU; SCALE
	Neighborhood Asset Mapping	\$300,000	0	0.0%		City of Ann Arbor	LOCAL; RES; EQU; SCALE
	Emergency Kits	\$350,000	0	0.0%		City of Ann Arbor	RES; HEALTH; EQU; SCALE
	Sensors and Data Monitoring	\$300,000	0	0.0%		City of Ann Arbor	RES; HEALTH; \$\$; NAT; EQU; SCALE
Strategy 7	Equity Programs	\$200,000	0	0.0%		City of Ann Arbor	LOCAL; RES; EQU
	SA2T Grant Program	\$1,000,000	0	0.0%		Pass through to community	LOCAL; RES
	Internal Carbon Tax	\$75,000	0	0.0%		City of Ann Arbor	LOCAL; NRG; RES; \$\$; SCALE
	Offsets	\$9,440,000	298,500	13.6%	\$ 31.62	City of Ann Arbor and Offset Organization	SCALE

Total	\$ 1,056,403,800
Total City of Ann Arbor and DDA	\$ 140,375,800
Total AAATA / RTA	\$ 742,780,000
Total Other Organizations (e.g., County, Community Liaisons, 2030 District, community (grants))	\$ 3,248,000
Unclear Breakdown (park and ride)	\$ 170,000,000