Carbon Neutrality Recommendations for First Unitarian Universalist Congregation of Ann Arbor (UUAA)

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Executive Summary

In summer 2020, the First Unitarian Universalist Congregation of Ann Arbor declared a Vision 2050 statement which prioritizes climate justice. As a result, carbon neutrality for UUAA's facilities was identified as a goal for the coming decades. A few key best practices for sustainability initiatives in faith-based organizations were identified: (1) A team of community leaders and sustainability experts to manage initiatives; (2) Development of a culture of engagement within the congregation; and (3) Partnering with other non-profits and faith-based organizations. The Graham Scholars team applied these practices during the development of 14 action steps (Appendix A) which span four sustainability focus areas: Zero Waste, Building & Energy, Landscaping, and Education & Engagement.

The Zero Waste focus area includes three major recommendations. These are: a composting logistics recommendations, a pilot collaborative recycling hauling program, and smaller event ideas to increase zero waste behaviors at UUAA. In the Building & Energy focus area, the largest source of associated emissions are from energy purchased from DTE. To decrease the gap between energy generated from onsite renewables and UUAA's energy use, we identified sure-saver building efficiency updates and a $1.51/kWh cut-off price for these measures. Once all cost-effective efficiency improvements are completed, the rest of the energy gap should be met through the expansion of rooftop solar.

In order to offset indirect emissions from the lifecycle impact of solar panels and other activities, UUAA can leverage it's 46 acres to sequester carbon, resulting in negative emissions. Native plant species that can thrive under the heavy clay soil and in the presence of poor drainage conditions are identified in a landscaping report, which also highlights key opportunities to increase human stewardship and connection to the land. These initiatives offer co-benefits for engagement efforts. As noted previously, engagement is vital to reducing burnout in the implementation team and creating a culture of sustainability. To further this culture, we recommend a three-step engagement approach of *establish-pilot-revise* for sustainability initiatives. The team developed an Event Toolkit with resources to support this suggestion.

Several partnership opportunities were identified to obtain funding and discounts, most notably through *Michigan Interfaith Power & Light* and a *Washtenaw County Waste Reduction Sponsorship*. The overall impact of these recommendations results in substantial waste reduction in both UUAA and other houses of worship, an annual emissions reduction of 137 tons CO_{2eq} yr^{-1}, and a cultural shift wherein UUAA operations more formally reflect the prioritization of sustainability highlighted in the Vision 2050 Statement. Next steps for UUAA to take include scheduling regular meetings for the implementation team and researching additional focus areas, such as Transportation, Organizational Integration, Food, and Carbon Offsets.

Overview

In summer 2020, First Unitarian Universalist Congregation of Ann Arbor finalized its Vision 2050 statement, deciding to prioritize Climate Justice, Anti-Racism/Anti-Oppression, and Radical Welcome. The congregation specifically identified "consult[ing] with experts to create a roadmap to carbon neutrality" as a goal for the next several decades. This report reflects an early step toward actualizing this goal. As the scholars' project is a consultation for a long-term initiative, these recommendations rely on UUAA members to take an active role in their implementation. In accordance with best practices identified by *Pathways to Sustainability: The Greening of US Faith Communities* (Shattuck), an Implementation Team of UUAA stakeholders was formed over the summer of 2020 to oversee the organization's carbon neutrality efforts.

To tackle the broad array of decarbonization opportunities, eight focus areas were initially identified and four were selected for inclusion in the scope of work, in accordance with best practices showing that a "portfolio approach" to sustainability initiatives are effective mechanisms for embedding sustainability into organizational culture (Bertels). A culture of sustainability is noted by Shattuck as a powerful ally for the implementation team, as a congregation energized for sustainability can support the team and help members to avoid burnout. The four areas included in this scope are Zero Waste, Building & Energy, Landscaping, and Engagement & Education. These sectors were chosen based on a combination of potential carbon impact, urgency, and team expertise. The remaining four focus bins excluded from this scope are Transportation, Food, Carbon Offsets, and Organizational Integration, and are discussed briefly in the Next Steps section. For those focus areas included in scope, 3-5 recommendations were generated with supporting quotes, information packages, and analyses as applicable. All recommendations were then compiled into a comparison spreadsheet for ease of comparison and decision making by UUAA leadership and the Implementation Team.

Zero Waste

There are three main suggestions for UUAA in the zero waste focus area all encompassed in the **Zero Waste Guide for UUAA** document. The first suggestion relates to composting logistics. I recommend that the congregation utilizes the WeCare Denali composting facility to drop off their compost from events. As an extension of this, I recommend that the congregation switches to compostable serveware, specifically by World Centric, to cut down on 3,650 disposable products from going to the landfill each month (Appendix B). To share the cost of waste hauling, increase recycling (paper, plastic, glass), and share best practices and information with partners; and reduce waste among faith-based organizations, I recommend that UUAA form a pilot collaborative recycling hauling program with local religious organizations outside the boundaries of Ann Arbor recycling services. This program would cost around $340 a year in total, split amongst the participants of the program. Finally, UUAA should continue to build a zero waste culture and practice material mindfulness within the congregation. This can be done by

implementing a series of smaller actions, such as a “Free Table” or shared resources program. Creating a zero waste environment at UUAA is key to working towards carbon neutrality.

Building & Energy

The first step in becoming carbon neutral is having an energy neutral building: having all energy demand satisfied by renewables. To do so, UUAA must close their current energy gap—the difference between energy used and energy produced by renewables. We found the building’s energy gap to be 142,000 kWh per year by referencing energy consumption data provided by UUAA. This corresponds to emissions of 137 tons of CO_2 per year, an emissions load that contributes to hazardous climate change (Appendix C). To reduce this environmental impact, we identified what energy saving upgrades and renewable energy additions could be economically implemented to close this gap.

By looking at the cost of installing more solar panels, we defined a cut-off price for implementing sure-saver technologies (technology upgrades that reduce building energy consumption). If a sure-saver measure substantially decreases energy usage at a cost of $1.51/kWh or less (the price of solar panel energy generation), it should be implemented prior to more solar panels being installed. This cut-off price was determined based on an estimate provided by Dave Friedrichs of Homeland Solar, UUAA’s current solar panel provider. The Graham team has identified lighting and appliance use improvements that meet this criteria, which are provided in the recommendations table in Appendix A. Beyond lighting and appliances, UUAA should receive a building envelope audit from a recommended outside consultant and evaluate whether their recommended changes meet the cost cut-off criteria. Once the building envelope evaluation is complete, UUAA can implement the sure-savers meeting the cut-off criteria, prioritizing those with the lowest price per kWh savings, and eventually close the remaining energy gap with solar panels.

A report including a detailed list of recommendations and detailed explanation of the analysis conducted is provided to UUAA as a deliverable titled “Building and Energy Analysis.” The recommendations provided give UUAA a path to energy, and therefore carbon, neutrality.

Landscaping

The sprawling land behind the church can be a haven for both people and native species. The main obstacle is the poor drainage that creates saturated soil areas. The landscaping report outlines plants that are best suited for these wet soil conditions. Trees suited for the poorly draining soils will also help with overall soil health and manage the water runoff from the church and the stream. There is already a robust plant ecosystem at UUAA, so most of the recommendations are to support the current ecosystems, for example by means of prescribed burns. The projects will help to bring people closer to nature and to engage with the land.

Landscaping is key to reaching carbon neutrality and creating positive stewardship with the land. The land ties the people to the place, and the landscaping needs to reflect the people's values and make them feel welcome. Planting native species that will grow robust root systems will last decades and sequester carbon into the soil. By planting the species best suited for the land, it naturally creates a carbon sink in which plants draw carbon back into the ground and their roots. In addition to a carbon sink creating a healthy landscaping plan relies on solid biodiversity. Creating a haven for insects, birds, mammals, and many other creatures is key to obtaining a robust and healthy landscape. The following report outlines soil needs, plant basics, and projects to take place at UUAA. These are long-term goals and provide information to help the congregation and the landscape grow. Beyond carbon neutrality, a secondary aim in this focus area is to foster a want to care and nurture for the land by developing a healthy, interactive and beautiful space for people to exist in.

The next steps for landscaping will be conclusive soil tests in areas where projects will be laid and new plants will be rooted. This information is in the landscaping report document, which provides more detailed direction on what to plant and how to maintain the soil on the property.

Engagement

In order to optimize outreach and engagement opportunities, it is imperative to integrate sustainability into the culture and goals of UUAA. This can be achieved using a three-step programmatic approach 1) establishing plans 2) piloting ideas and 3) reflecting and revisiting what was completed. This method of engagement prepares UUAA to meet and understand the needs of their community, set sustainability-driven goals, and align their goals with the practices of their community. In using the Graham Scholars Event Toolkit, resources on how to plan engaging sustainability events can guide users on the UUAA implementation team as they set out to achieve their organization's goals.

This toolkit identifies resources including "the basics" of sustainable outreach and engagement (i.e. what is sustainability? Why is it important? How can we structure sustainable events from the start? What is the preliminary information we should know before implementing sustainability events and programming?), a checklist of tips specific to UUAA for sustainable events, tips on sustainability events key practices (i.e. identifying the 5 W's: who, what, where, when, why), programming ideas, incentive ideas, additional recommendations, and contact information for the Graham Scholars team. These resources can be used as a guide during the implementation process to support UUAA with integrating sustainability as an integral part of their work, with ease. With this said, it takes time to see change and sustain change and we are so grateful to UUAA for prioritizing sustainability within their community.

Funding Opportunities & Partnerships

Michigan Interfaith Power & Light

UUAA is a member organization with M-IPL and as such is eligible to utilize M-IPL's discounts, resources, and programs. We recommend that one or more members of the UUAA Implementation Team connect with a representative from M-IPL to stay updated on cost-effective climate action opportunities. For example, M-IPL has a program entitled *Light the Way* that can help congregations save money on lighting and appliance upgrades. These deals can be compared to the recommended work and associated quotes from the lighting audit conducted in January to identify possible cost-saving mechanisms. Another more broadly applicable funding opportunity from M-IPL are the *Carbon Fund Mini Grants*, which can allocate $2,000 - $5,000 to congregations with financial need for projects to reduce their carbon footprints.

Faith-Based Organization Collaborations

The Recycling Hauling Collaboration document outlines ten faith based organizations nearby UUAA that may be interested in a joint recycling effort. We suggest that UUAA reach out to these churches to gauge interest in the recycling initiative described in the Zero Waste section and any future partnerships surrounding sustainability programs or projects.

Washtenaw County Waste Reduction Sponsorship

The county offers funding for local organizations seeking money for projects that reduce waste or increase education surrounding waste. These sponsorships will match 50% for funding said projects. We strongly suggest reaching out to Isabella Garramone at Washtenaw County for additional support for both the sponsorship and with future zero waste planning.

Anticipated Impacts

Upon implementation of the recommended action steps, we anticipate the following impacts:

- Formalized team and framework to implement carbon neutrality goals
- Shift in congregational culture to prioritize sustainability within UUAA events and activities
- Diversion of approximately 3,650 disposable materials from landfills each month
- Diversion of recyclable materials from landfill from UUAA and partner organizations (quantity dependent on size of Recycling Hauling Collaboration)
- Increased carbon sequestration activity on UUAA property
- Emissions reduction of 137 tons CO_{2eq} yr^{-1} from sure-savers and expanding rooftop solar

Next Steps

To ensure that momentum can be sustained in this effort, we recommend that the Implementation Team meet quarterly, at minimum. We also recommend that UUAA continue to research opportunities for improved sustainability that are beyond the scope of this analysis. In particular, the focus areas of Transportation, Organizational Integration, Food, and Carbon Offsets should be investigated further by the Implementation Team. See Appendix E for more information.

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Appendix

Appendix A: Recommendation Comparison Tool
View in GoogleSheets here

Appendix B: Price Comparison of Disposable and Compostable Products

DISPOSABLE PRODUCTS USED AT UUAA			
Product	**Average Monthly Used**	**Average Monthly Cost $ (Disposable)**	**Average Monthly Cost $ (Compostable)**
Dinner Plates	200	14	28.37
Medium Plates	100	5	-
Dessert Plates	100	5	5.68
Bowls	100	5	30.49
Forks	250	5	15.76
Knives	250	5	14.27
Spoons	250	5	15.73
Napkins	800	8	8
Hot/Cold Cups	900	23	100.98
Cold Cups	300	12	38.19
Cup sleeves	400	12	22.67
Totals:	**3650**	**99**	**280.14**

Appendix C: Table 1 from Building Analysis

Energy Used Year Ending July 2019[1]	168,000 kWh
Energy Produced Year Ending July 2020	26,458 kWh
Energy Gap	**141,542 kWh**
$CO_{2,e}$ Emissions due to Energy Gap[2]	137 tons

[1] We took the energy used from July 2018 - July 2019 as the baseline energy consumption rather than that for the year ending July 2020 so that lower energy use that occurred as a result of the COVID-19 pandemic did not affect the energy consumption measurement.

[2] CO2,e emissions = Energy Gap (kWh)*Regional Avg. CO2,e emissions (lb/MWh) * (1 MWh/1000 kWh)
CO2,e emissions = 142,000 kWh * 1,927 lb/MWh*(1 MWh/1000 kWh)=281,342 lb=137 tons CO2,e
Regional Avg. CO2,e emissions taken from DTE website

Appendix D: Short, Medium, and Long Term Goals for Education & Engagement

Short Term	***Medium Term***	***Long Term***
Get congregants involved in these projects to get bulbs changed or plant carbon uptake plants, etc..	Identify ways to engage the community through incentives, aligning events with the goals of certain members or groups.	Work with daycare and special events that rent space/facility to promote sustainable practices with all UUAA occupants.
Establish engagement / outreach / education plans for when UUAA is functioning in-person again.	Attempt certain engagement / outreach / education plans to see what the community is and is not interested in.	Evaluate the effectiveness of engagement / outreach / education opportunities to determine what events or techniques are effective in accomplishing the goals of the organization.
Identify the who, what, where, when, and why with each event being planned. Who is the individual or team planning/implementing this event? For whom is this event being held? And so on...	Connect to the moving pieces of the who, what, where, when, and why. Put these ideas into action.	Follow up & reflect. What went well? What could be improved upon? This step is incredibly important because it lays the groundwork for allowing successful initiatives in the future.

Appendix E: Next Steps Matrix

Opportunity	***Priority***	***Comments***
Food	Low	The Mindful Eating Team's activities intersect heavily with carbon neutrality efforts that consider indirect emissions. **Promoting low-carbon foods** at social hour is an area for further research by the implementation team.
Transportation	Medium	Decarbonization in the transportation sector is a central goal for climate action on a global scale, and UUAA as a community may find that offering Electric Vehicle-friendly infrastructure such as **solar carports or charging stations** contributes to this goal. Another opportunity worth investigation is facilitating an **EV Group Buy**. This can lower per-vehicle costs and reduce barriers to EV adoption, which will aid in offsetting the emissions associated with congregant travel to the church. Group buys are a component of the A2 Carbon Neutrality Plan, and the UUAA implementation team may find this a helpful starting point for research. The emissions avoided by switching to hybrid or electric vehicles would not contribute to UUAA's direct

		emissions reduction. However, these actions still have overwhelmingly positive climate justice impacts. Studies indicate that EV-adoption over the next decade is vital to 1.5℃ with limited or no overshoot, so near-term actions in this focus area are valuable for broader climate goals (Alarfaj et al).
Carbon Offsets	Low	Once the building energy gap has been reduced to zero, there are still greenhouse gas emissions associated with UUAA's energy production and use. To offset these emissions, UUAA can participate in **established offset programs or** continue to initiate **ecological restoration** projects on the church property (Bastin).
Organizational Integration	Medium/ High	Organizational integration of sustainability and emissions conscientiousness is a best practice for ensuring effective and lost lasting projects. Ensuring a **voice for sustainability at every level of decision making** will promote this culture, hopefully leading to easier financing and greater volunteer support. **Engaging the youth, board members, and lessees** will contribute to this goal. Some suggestions for imbedding sustainability into UUAA culture include: - Including sustainability themes in **sermons** - Hosting **dialogues**, **speaker events**, and **documentary screenings**