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University of Dayton

Compiled Research & Materials – Whole Homes

Local Sustainability with Abundance

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EGR 320/SEE 490/RCL 595/MEE 432L/ECE 432L
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1.0 SUMMARY

This Hanley Sustainability Institute-supported initiative and course sought students interested in designing a national model for local sustainability with abundance; with abundance referring to improved opportunities for people residing in urban core communities. In this course, students were asked to apply their disciplinary perspectives and thinking to the development of a model that could work in the city of Dayton while also being capable of translation to the nation. Additionally, students were tasked with designing and developing resources and tools that could help to grow the designed model nationally. As part of this project, students helped organize a Hackathon event in February to develop software and theoretical solutions in support of the problem directions defined early.

This course utilized processes developed at the University of Dayton Institute for of Applied Creativity for Transformation (IACT) [formerly the Institute of Arts Nexus (IAN)] to promote transdisciplinary collaboration, as well as growth in critical perspective and creativity. Moreover, this course engaged students with local constituents who could help to inform the model developed.

Various for-profit and nonprofit organizations in the community could benefit from or support the shared community energy and carbon reduction assets. Additionally, the model developed might include connection to residents and businesses within the City of Dayton in order to educate them about the value of these assets.

2.0 PURPOSE

- To develop a path forward so as to positively the local and UD community through their consumption, production, and use of energy

- To jumpstart an innovative solution on UD's campus and throughout the City of Dayton that can be implemented to positively impact local job creation and skills training/education

- To create a template that can distinguish Dayton from other communities and further sustain national progress toward a revolutionizing core of sustainable practices

3.0 BACKGROUND

In the early brainstorming sessions (represented by Appendix A and Appendix B) of this class, "energy" was identified as one of the key threads constituting a network of initiatives necessary in addressing local sustainability and economic development. There were four threads (can also be described as "areas of concern") identified overall: energy, mentoring, connectivity, and food.

Food was identified as a concern due to the City of Dayton's possession of and proximity to food deserts, but was also identified as a problem affecting the health, wellness, and ability of many Daytonians to work.

Mentoring was identified as an avenue for empowerment of Dayton youth, not only in bolstering the education system and encouraging Dayton students to pursue such education, but in getting Daytonians into careers and skilled work positions regardless of education level. The benefits of health and happiness for both young mentees and potential mentors were also addressed.

Connectivity was identified as a driving force for implementing sustainable practices in local Dayton businesses, on both a waste management/waste reduction level as well as on a community engagement, social entrepreneurship level. Connecting businesses to each other and to consumers in order to close waste loops was theorized as a positive move for local sustainability.

Energy was identified as a pervasive theme in all levels of life in Dayton, from residential energy use (renting and home-owning) to the use of energy in city buildings to the energy savings available for local nonprofits working in the community directly. As a whole, energy was identified as an opportunity to efficiently and effectively mediate local job creation and enhanced living.

4.0 RESEARCH

Research primarily took direction in the areas of solar energy and tiny home design. After collaboration and thought, the team subdivided itself into two groups: the McPherson Town solar co-op initiative and the tiny home neighborhood.

For information regarding the research conducted on the Greater Cincinnati Energy Alliance (GCEA), solar energy in general, and initiatives across the country, please see Appendices C - F.

For information regarding considerations, ideas, and a survey, as they pertain to tiny homes, please review Appendix G - I.

Other valuable research materials include an article focusing on solar energy as a vehicle for economic development (Appendix J), a review of the economic impact of solar in Illinois (Appendix K), and a publication by the National Renewable Energy Laboratory on the Solar America Initiative (Appendix L).

5.0 INTERVIEWS

5.1 McPHERSON TOWN NEIGHBORHOOD

UD Participants: A. Tarutani, C. McGrail, C. Joern, M. Beban, L. Kunas
Please see Appendix M.

5.2 KEYBANK

UD Participants: A. Tarutani
Please see Appendix N.

5.3 ENERGYWIZE

UD Participants: A. Tarutani, M. Beban, Dr. Hallinan

Please see Appendix O and Appendix P.

5.4 ENERGYSAGE

UD Participants: A. Tarutani

Please see Appendix Q.

6.0 PROCESS

Solar:

- Interviews were performed (see Section 5.0)
- Research was done independently on financing methods for residential solar, state of Ohio and local policies on solar installations in homes, typical payback periods, and similar considerations.
- Consistent communication with Phil Leppla of the McPherson Town neighborhood kept UD involved with the progression of the Montgomery County Solar Co-op movement.

Tiny Homes:

- Preliminary research was done on the whole home design of tiny homes.
- Interviews were conducted with business professionals regarding the promotion of tiny homes on campus.
- Establishment of final ideas and considerations for tiny homes were documented.

7.0 RESULTS

McPherson Town's progress over the course of the semester was substantial. Buy-in on behalf of the homeowners escalated quickly, and coordination with OH SUN, an organization that fosters solar co-ops, prepared to take to fruition. On Monday, May 22, 2017, Luke Sulfridge, director of OH SUN, will be speaking at the McPherson Town neighborhood association meeting to kick-off the beginning of implementation for a Montgomery County Solar Co-op. Continued progress is expected to pave the way for Dayton's first "solar neighborhood".

The work initiated on the tiny homes neighborhood concept culminated in developing a list of considerations and ideas for future projects geared towards the implementation of such a community. Communication established with Sean Geehan is anticipated to continue and perhaps further involvement with the business school could be of particular benefit. Geehan offers potential to bring the tiny home neighborhood initiative to a commercial and wide scale level. Further ideation and technical structure still has yet to be completed; however, initial groundwork has been started.

8.0 CONCLUSIONS

Solar:

There remains much work to be done in conjunction with McPherson Town and spreading the idea of solar energy generation, job creation, and skills training, throughout the Dayton community. That being said, substantial progress was made, and McPherson Town is at the point at which the Montgomery Solar Co-op is ready to become a reality. Further collaboration and communication will only foster a greater establishment of the University of Dayton in this process. Current progress is at a point where OH SUN will be coming to the Dayton area to present on their readiness to begin mobilization of Montgomery County solar projects.

Tiny Homes:

Similar to the progress made in the solar group, much work remains to be done. While initial ideation and concept research was conducted, further consolidation of solutions would foster improved direction moving forward. Contact with Sean Geehan developed a bridge with which there is much potential to expand. Additional work to begin integrating the conversation had in this class with the innovation center senior design projects will also help to move project development forward.

9.0 RECOMMENDATIONS

Solar Co-op

- Compile a comprehensive document for homeowners outlining the loans, financing methods, and funding sources available that may make solar more accessible to them.
- Assess county-wide home ownership rates and incomes, and comment on potential barriers to county-wide implementation.
- Keep record of the progress seen in McPherson Town as well as OH SUN's progress in Southwest Ohio. Maintain contact with Phil Leppla and be available to further develop the McPherson Town neighborhood.
- Connect with other Montgomery County/City of Dayton neighborhood presidents and associations to discuss solar co-op potential (Please see Appendix R).
- Reach out to local high schools and trade schools and meet with Principals to discuss the avenues available for training and local job creation.

Tiny Homes

- Remain in touch with Sean Geehan
- Look into recycled materials when creating tiny homes
 - 1) old materials are being reused
 - 2) they are cheaper/free sometimes
 - 3) overall better for the environment

- Continue working with the solar group/solar energy for the idea of “Whole homes” and hopefully net-zero carbon emissions
- Continue looking into application at the University of Dayton as well as within the city of Dayton for homeless and low-income housing

10.0 CONTACTS

Throughout the course of the class, valuable connections were made. For continued progress and continuity of work, please see the contact list developed in Appendix S. Vital contacts and students involved on the projects are documented in this list.