

Grassroots Microgrid

Bottom-up neighborhood planning, Detroit, USA



Main author

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Project data

Project group: Landscape, urban design, transportation infrastructure and public utilities
 Client: It Starts @ Home (IS@H) and Residents of Detroit/48204
 Project background: Private commission
 Planned start: August 2017

Summary and appraisal of the project by the jury

The design proposal for a neighborhood in Detroit repositions infrastructure as a civic project, under the name of The Seebaldt Pilot (TSP). Building on long-term community engagement, the large group of collaborators proposes a pilot project for local energy and food production, water and waste management, and community empowerment. Solar photovoltaic canopies, rainwater collection, geothermal wells, and community gardens are stitched through the existing neighborhood on currently empty lots. The collectively owned and managed infrastructure is both a gathering point and a new revenue stream for additional community services and an enhanced public realm.

The jury commended the proposal's fundamentally optimistic approach. Taking the pocket vacancies normally characterized as the biggest problem in Detroit, the design turns them into an opportunity to create a compelling sustainable neighborhood. The combination of solar and geothermal energy, rainwater collection, and community gardening is particularly powerful in a city that struggles to provide basic services at the municipal level. Physical investiture is complemented with education through training programs and investment through collective ownership and revenue sharing. Here, the infrastructure of energy and food production reinforces the infrastructure of community building. The strengths of the project in organization and planning are not yet matched by its architectural expression and the jury noted that the multifunctional umbrella roof being proposed will need to be refined as it moves into more detailed design phases.

Statements on the sustainability of the project by the author

Leveraging vacancy, climate and passion to form a neighborhood armature of energy avenues

Detroit's 48204 zip code is home to 27,000 low- and moderate-income residents with promising demographics: high percentage of home ownership, college degree attainment, and employment in Health/Education. The Team's pro bono commitments have been vital, but Detroit is emerging from economic decline, and 48204 is hard hit by lack of resources and opportunities, especially for youth. Our Mayor focuses on neighborhood development, so TSP can be a replicable model for stabilization and sustainable growth. Hybridized Ecosystem for Infrastructure and Renewable Systems (HEIRS) generative infrastructure and renewable systems decarbonizes and makes 48204 self-sufficient. Michigan's colder climate is ideal for solar power generation. Specified PV increases the power output 41% for every degree Celsius drop in temperature. Bloomberg/Deutsche Bank rank Michigan 14th best for return on solar dollar.

rainwater collection, and primary education and training opportunities. The HNZE MicroGrid is a "three legged stool" of solar, geothermal, and storage that will distribute energy from PV to strengthen and stabilize the grid. IS@H has established emerging partnerships with local university, banking, and utility sectors in support of their vision and program. Weatherization and efficiency programs will directly engage the community and link the enhanced public realm of the micro grid to the private realm of homeowners and constituents.

A new energy economy for Detroit via empowerment, co-production, and equitable development

TSP creates a new transactional public realm, generating ownership benefits for the 48204 neighborhood. TSP envisions distributive ownership and operations models, placing resources such as vacancy into a renewable cycle of collective use. Revenue sharing with DTE will fund an escrow account, which will allow the coop to add more infrastructure and beneficiaries. The community owned MicroGrid will be installed with the help of residents trained through local NGOs. Initially, several hundred under-served youth will be trained in the renewable energy economy. The long-term vision is a fully functional, cooperatively owned MicroGrid that will deliver both reduced energy and water costs and a revenue stream for community services, initiatives, and investments within an enhanced public realm.

Hybridized Net Zero Energy (HNZE) community-owned MicroGrid integrating infrastructure with public and private realms

IS@H wishes to secure, make stable, and sustainably grow their beloved 48204 neighborhood. Since 2014, IS@H and studioCi have collaborated to create a sustainable vision based on achieving NZE through a community MicroGrid with solar and geothermal energy,

Further authors

David Cross, Darrel West, Will Bright, Donald Carpenter, Mark Hagerty, Nathaniel Autrey, Mark Drotar, Meaghan Markiewicz, Drew Bradford, Paige Spagnuolo, Ruiyi Liu, Amin Toghiani, Yochen Pan, Tim Miller, Yu Zhu, Brandi Patterson, Cory Benjamin, Drew Mittig, Fares Ahmed, Lina Alosachie, Karl Seidman, Leigh Carroll, Grant Williams, Sam Jung, Kelly Blynn, David Musselman, Haibin Tan, all Detroit, USA



Image 3: In 2013, three young men who proudly grew up in 48204 founded the NGO It Starts at Home (IS@H).

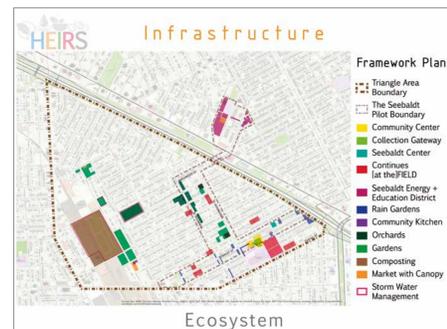


Image 4: The HEIRS framework for vacancy, NZE generative infrastructure and public realm interventions.

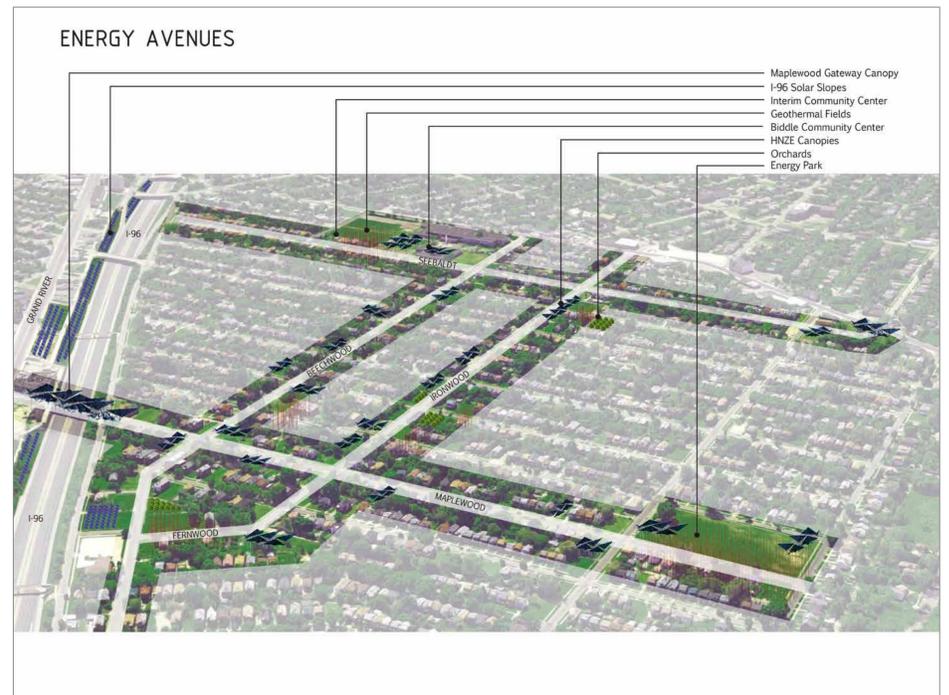


Image 1: The HEIRS framework for 48204 creates an HNZE district, anchored by a Community Center/Kitchen as the epicenter of a collectively owned MicroGrid. TSP reveals and deploys the capacities of 23 acres of publicly-owned vacancy concentrating along 3 streets, or Energy Avenues. TSP pairs HNZE Canopy with conventional PV to meet demand for electricity via solar and HVAC geothermal, and water management, food production, and waste conversion. TSP can be expanded to all of 48204 and other neighborhoods.

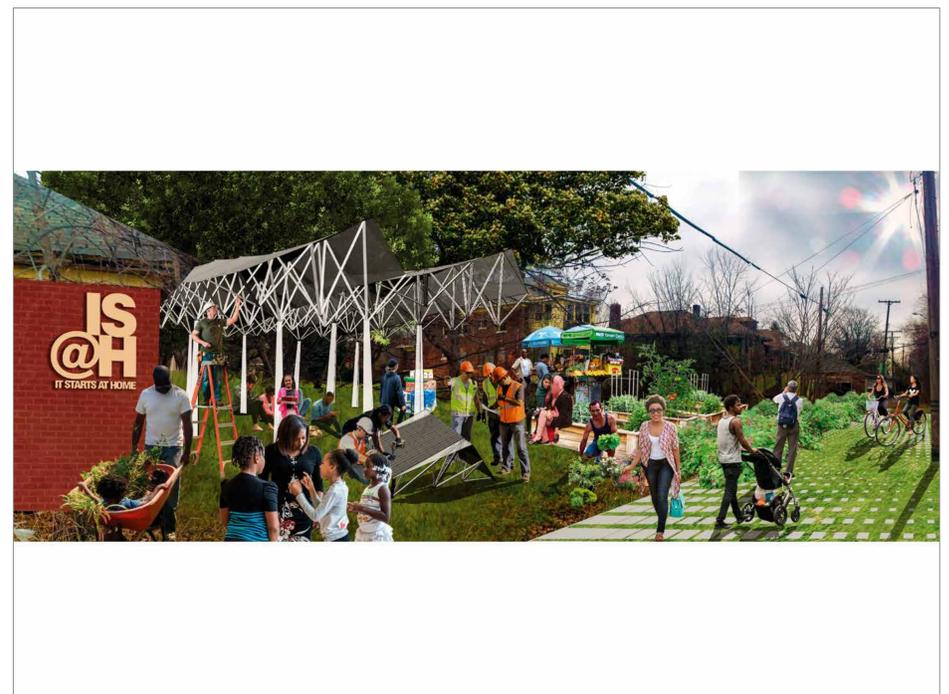


Image 2: TSP Phase 1 signals a return to 48204 traditions and a new economic trajectory. An interim Community Center/Kitchen and adjacent residences benefit from NZE MicroGrid production. A public realm between two IS@H buildings is activated by HNZE 18-Quad Canopies and enables education, youth programs, training, entrepreneurship, and work force development for living wage jobs. Success is measured by reduced utility costs, improved formal and aesthetic conditions, and generation of cooperative wealth.



Image 7: TSP collective MicroGrid will be a large endeavor on a scale that has not yet been seen in the USA.



Image 8: The HNZE Canopy captures and stores rainwater for irrigation of gardens throughout the study area.

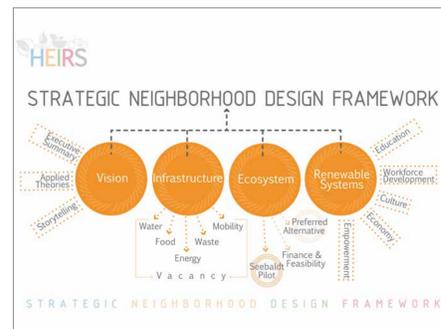


Image 5: TSP is Phase 1 of a larger design framework to revitalize Detroit's historic Old Westside - 48204.

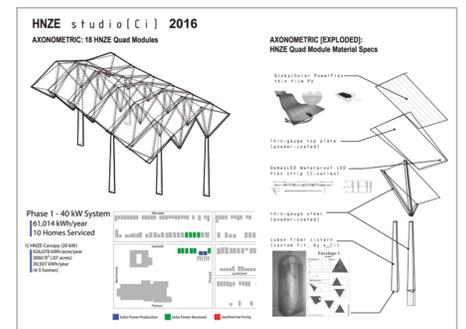


Image 6: HNZE canopy computational design/digi fab methods meeting performative, cost, and aesthetic metrics.

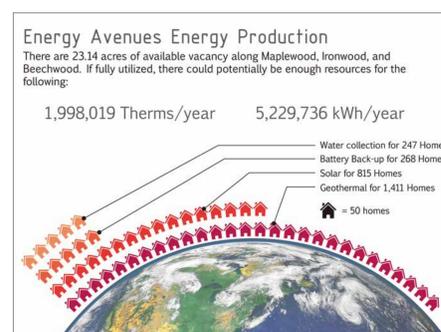


Image 9: The Energy Avenues have the potential to serve at least half the homes and residents in TSP boundary.

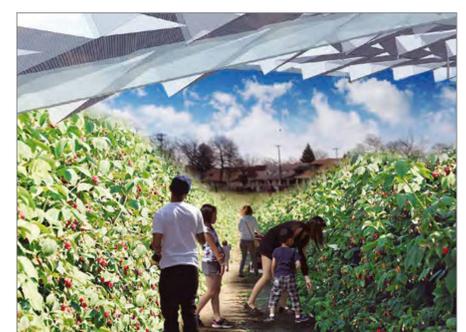


Image 10: Berry bushes planted as green infrastructure without the fruit absorbing toxins from storm water runoff.