

Open Source Enterprises

Funding Strategy

- SBIR - Aug 3 Deadline - and STTR mechanics - mapping out dynamics and contacts for open source development network
 - <https://www.sbir.gov/tutorials/program-basics/tutorial-3> - Differences between SBIR and STTR
 - CEB press
 - Open Source Microfactory deployment with open source welder, CNC torch table, large high T 3D printer with plastic recycling, ironworker, CNC lathe and mill, and induction furnace + basic metal rolling, open source hydraulic motors, and open source engines. Bootstrap via Tractor, CEB press, microtractor, backhoe, implements - and moving to recursion on motors and engines. Off-grid solar + nickel-iron with open source inverters + chargers, CEB press, and concrete maker appliance for whenever there is downtime.
 - Nickel iron bats
 - Mass deployment of aquaponics-based closed loop water systems
 - Large 3D printer
 - CNC Torch Table
 - Tractor
 - Microtractor
 - 360 degree backhoe
 - MIDE - Missouri Institute of Defense and Energy
- Construction enterprise strategy - mapping out framework, intersections and leverage points of nonprofits, BNIM, Foundation for Regeneration, UMKC advanced microfab facility, affordable housing projects, veterans, training - for the purpose of a build Sep 1-14 in Kansas City or nearby
 - Focusing on partnership where we secure land for free, someone pays for materials, we donate the house, OSE captures Builder Crash Course revenue - actual Extreme Manufacturing model in practice, first time outside of OSE. Logistics need solving if we can get City to donate temporary housing to participants for a 5 day swarm of the 14 day crash course.
 - BNIM collaboration
 - Foundation for Regeneration collaboration
 - Veterans' housing collaboration
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Agriculture

-Greenhouse Aquaponics

-Greenhouse produce “Mangoes in Michigan”

Geothermal [“Greenhouse in the Snow” by Russ Finch](#) has grown organic lemons in Nebraska winter.

Construction

1. -Seed Eco Home
 - a. Goal: 500 hrs build time total, \$100K total: \$25K for labor, \$25K to org. \$50k materials
2. [Detroit Arcology “Multifamily CEB Cohousing”](#)
 - a. Townhall meet up on last Wednesday of every month
 - i. This month it's [Weds, July 21st, 2021](#)
 - o Paul has presented [this design to the City of Detroit](#) and is familiar with the pipeline to buy inexpensive land from the Detroit Land Bank.
 - Land bank is primarily repo from back taxes
 - o Typical lots are 6,400 sq.ft. for \$1.40 / sqft, or around \$9,000
 - Typically accessible in many communities
 - Has to fit in the respective neighborhood
 - Goal is to become a “partner” to the city which is working toward furthering causes of social good
 - R3 - 2091 Seward St, Detroit.
 - Have to push the city, city is not entrepreneurial, but is supportive
 - There is an auction in September, and starting price is \$1k. We can rehab it.
 - [Detroit Land Bank](#)
 - Frank Gilbreth - Cheaper by the Dozen - efficiencies of production
 - o This would be the first Seed CEB Eco-Home in the most affordable large American city, that can be toured by city officials, potential franchise builders, potential customers, potential OSE contributors, neighbors, and the wider world.
 - o CEB + geothermal would be well-suited to Detroit extremes of winter and summer temperatures, which currently only earthships have.
 - o This is meant to be a prototype to demonstrate to the above stakeholders that CEB houses can help solve affordable housing crisis.
 - o Competitor has Brick Press that costs 80K and the next size up is 150K that produces 8 bricks per minute
 - o [Detroit Arcology Funding and Investment Details](#)
 - o [Detroit Arcology Detailed Building Costs](#)
 - o If anyone wants to join our effort, determine the use for a future land or building in Detroit, become a cooperative owner and community developer in Detroit, please contact me and let's work together. paul@arcology.builders
4. Sawmill -- for making wood
 - o Currently ~1 year backlog for orders currently being fulfilled
5. Odundo - 3D forms for Rammed Earth

- Insulated concrete forms
 - Need heavy machines to move this
 - Or something like a hammer-mill device
 - Otherwise a lot of work
 - Device or machine for filling the forms?
 - Geopolymers
 - Making concrete from Lime or gypsum - distributed concrete production
 - Technology exists, can do it solar PV -
 - “Solar concrete” - using heat from sun to burn rocks
 - Great to run off-hours when no other work is needed to keep producing resources in parallel
 - The high carbon footprint of concrete normally is due to the fuel needed to heat it
 - [“Roofless” Roof](#)
 - Difference between rammed earth and CEB
 - CEB packed into brick
 - Rammed earth is tamped into a form of a particular shape (could be 3D-printed)
 - Could print insulation into the forms
 - Print multi-cell structure that has insulating properties
 - Polycarbonate multi-wall glazing
 - Things that don’t change are high priority for opensourcing.
3. Ken
- a. Print Farm
 - b. CEB buildings - stabilized with cement
 - c. Company with different business units:
 - i. Buildings with CEB
 - ii. 3D printers
 - iii. Agricultural products -
4. Wes - wants to see housing a solved problem - as passion is not housing but living with a bunch of indie game developers
- a. Plastics recycling
 - b. Without strong financial backing - OSH will have trouble
 - i. Ex Apple - Vulcan vs OpenGLop
 - c. Earning a lot of money is important for these projects
 - d. Models: open core, crowd funding
 - i. Blender has nowhere near budget of enterprise software
 - e. Goal - every game developer has autonomy to wander
 - i. Needs latest computer. \$1k/yr. Housing - \$10k/yr
 - f. Enterprise
 - i. reducing operating margins for companies
 - ii. Need something better than GitHub
 - g. Hacker Houses

- i. Have you considered the Hacker House / Hotel / Coliving movement, as cheap communal housing for hackers, devs, and entrepreneurs?
- 5. Joshua: Eco Village
 - a. That supports unjobbing
 - b. Looking for place to build this infrastructure
 - i. Also reaching out to other intentional communities
 - c. I'm familiar with a nonprofit nearby working on giving land access for farming and building affordable homes so that farmers can live on the land, in a community with other farming families. I could see that being compatible with the ecovillages you're talking about. Let me know if you want to learn more (Matt).
- 6. Prince - CSA + Housing
 - a. CSA is \$25/week for small, \$50 for large share. 100 customers.
- 7. Jeff
 - a. "[Nickled and dined](#)" (book)
 - b. David. South - \$30k for a house. Rents \$560/month all utilities paid. Studio - bed and living room is same. 250 sf.
 - c. David South - did extended stay motels
 - i. If someone doesn't pay, they can't get back in (to protect yourself against people taking advantage).
 - d. \$50k for urethane sprayer, \$25k for concrete pump. 55 gal foam is \$500.
 - i. Alternative methods to do this
 - 1. CEB press
 - a. Could do workshops on this in which people build a home in the process
 - 2. Panelized construction (problematic w/current price of lumber)
 - e. CEB press - workshop - show them how to build a house.
 - i. Rent CEB press to people later
 - ii. Financing of land and materials and labor is hard with CEB
 - f. Machine that hooks to a skid steer - to make sandbags
- 8. Catarina
 - a. Enterprise in the middle - not DIY or full service - but DIY kits
 - i. Kit enterprise! Allows someone to build lower cost
 - b. Paul says they have kit homes for A-Frames
 - c. [Deka Homes kits](#)
- 9. Matt -
 - a. Non-Profit centered around Unschooling
 - b. Child-directed learning
 - c. Makerspace for applications
 - d. Focused on developing the next generation of makers, builders and hackers
- 10. Brian
 - a. Swarm around a business development approach
 - b. OSE is clearly an educational model
 - i. Get an educational entity to become a 'center'
 - ii. Get financial aid benefit of an existing

- iii. SBIR - do one
- iv. Kits - likes Catarina's idea
- v. Want to find a group of people that want to run the same business
 - 1. In order to really do that - we need to get out of our head and into customers
 - 2. Like prototyping hardware, we need to prototype a customer
 - 3. So - create a coop entity that develops the products, sales, etc.
 - 4. If we are really doing a business, we need a back office.
 - a. Supports builders - all the enterprise elements
- vi. SBIR + Becoming an institution for edu
 - 1. **Rapid Prototyping - evolving your product - difference between conjectures, and reality - customers -TM**
 - a. Start with a [Javelin Board](#). Tom Chi - friend of Brian
 - b. Or go to a watering pond - people who are almost captive customers
- vii. Matt sez - NSF - program for entrepreneurs - Lean Startup Process
 - 1. (Different from rapid prototyping - Tom Chi)
 - 2. Extensive interviews with potential customers
 - 3. Customer interviews would also be a natural thing to do in a swarm manner

- 11. Compressed Earth Bricks
- 12. Straw-Clay Bricks
- 13. Compressed Earth House
- 14. Rammed Earth House
- 15. Hempcrete
- 16. Hemp insulation
- 17. Partner w/Habitat for Humanity?

-3d-printed moulds (rammed earth, hempcrete, etc.)

Products

- Lumber processing equipment for sawmills
- Soil mixing for CEB press
 - This is a limiting factor. Right now it's mixed by hand?
- Lime for concrete, heated by solar powered electricity
 - Instead of burning fossil fuels, which account for majority of carbon footprint of concrete
 - No one is doing this in a distributed way
 - But limestone is widely available everywhere, including at Factor e Farm
- 3d Printers and accessories
 - Different business models for this?
 - Sell kit and offer live (or virtual) workshop for building it together
- Building and selling GVCS machines

- Greenhouse kits (aquaponics)
- biodigester

Services

- Consulting entrepreneurs in starting OSE enterprises
- Teaching
 - Workshops
 - Online courses/tutorials

Integrations between OSE and other models

- Matt: OSE with Self-Directed Learning Community Centers
 - Function-stacking:
 - Staff serving as facilitators and builders
 - Perhaps builders-in-training could be paid as staff until ready to build full-time
 - Community-building through community-based building
 - Micro factory serving as a learning space (the ultimate makerspace)
 - Motivated kids participating per their interests and abilities
 - Opportunity to experiment with different aspects of business (construction, R&D, sales, marketing, website design/maintenance, etc.)
 - Revenue complementary sources
 - Community membership/tuition
 - Revenue from regenerative businesses
 - Initially focus on Seed Eco Home
 - Then expand to other tech
 - These complementary revenue sources create a bit of a safety net for a startup trying to create this sort of community/business.
 - Other connections
 - Regenerative livelihood
 - Long-term benefits
 - Incubator for the next generation of OSE builders
 - Our attempt to do this: thisiscommunitas.org
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Questions and Answers

What is the difference between rammed earth and CEBs?

CEBs are a standardized form (6" x 12" for example) that are cured individually and stacked. They have a single form, in the brick press, which is reused. Rammed earth is poured into large forms of wood and steel that must stay in place, the size of the entire finished wall or structure, while curing.

General Resources

<https://www.entrepreneurship.org/>

<https://www.sbir.gov/tutorials>

Day 2

Joshua

- Research
 - Mondragon Company
 - Look into funding opportunities for eco-village
 - Look into partnering with other non-profits
 - Byte Back
 - Other grants and fundraising effort
- Contract-Based Enterprise Community
- Cryptocurrency backed by natural resources owned by OSE and collective movement support organizations
- Focus on Capital and acquiring economic power through natural resources, labor, technology and general support.
- Solving Pressing World Issues
- Solving for people showing up
 - Creating an interface that makes it easy for people to contribute
 - Remote individuals can make recommendations for updates to designs or even create updates themselves
- The reality of starting up distributed manufacturing
- Modular Enterprise Resources
 - Marketing
 - Websites
 - Instructionals
- How can we increase the conversion rate?
 - Improved Website
 - Podcasts or Live Streams
- To Do Now
 - Reach out to people to see if we can generate interest in the SummerX Workshop
 - BOM for Seed EcoHome