



*Climate & Equity Task Force*

# Equity Housing Sustainability



ecoCITY of MILWAUKEE

eco  
ENVIRONMENTAL  
COLLABORATION  
OFFICE

CITY OF MILWAUKEE | ALPHA GROUP

# City-County Task Force on Climate and Economic Equity

Reduce community greenhouse gas emissions 45% by 2030  
and net zero by 2050

Create green jobs and improve racial and economic equity

*Net zero energy  
housing proposal is  
one of the  
“10 Big Ideas”*

# Housing & Equity Challenges

- Energy cost burden is disproportionate for lower income neighborhoods (<50% of AMI are 27% more energy-cost burdened)
- Housing stock is deteriorating, unsafe, unhealthy with deferred maintenance, not climate resilient (e.g., basements and sewer system issues)
- Scattered site vacant lots difficult to redevelop
- Traditional construction costs too high for development in the city and difficult to finance
- High demand for affordable housing
- Lack of jobs for people of color
- Need to achieve City climate goals (2030 and 2040)



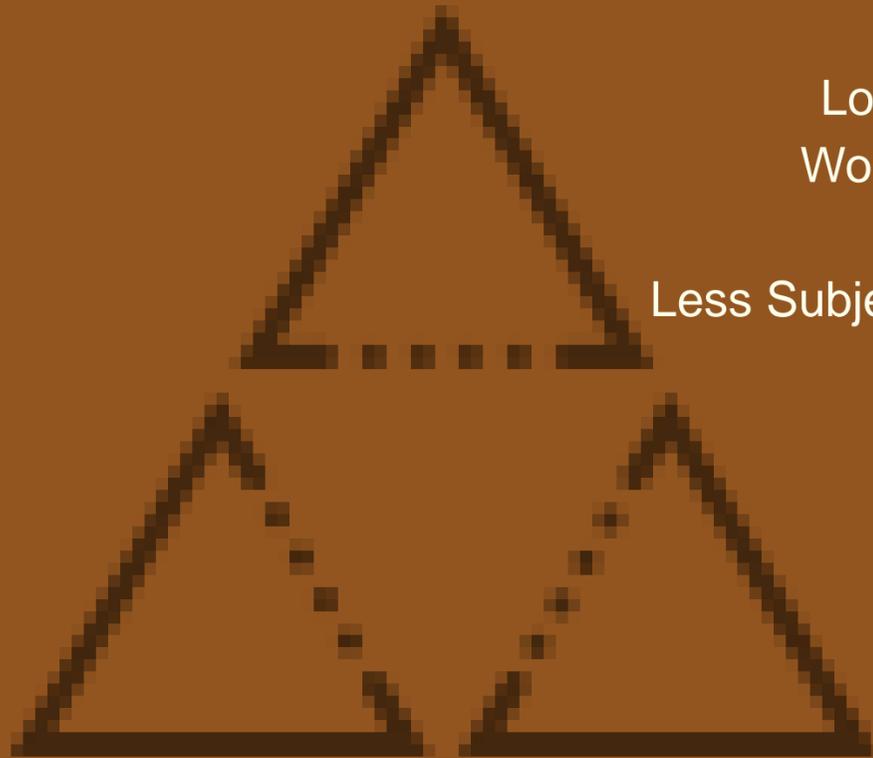
# Advanced Building Construction

Innovative low carbon, highly efficient new construction and renovation solutions that are faster to deploy, high quality, affordable, and appealing to users and owners.

# The Triad of Benefits

Local off-site construction factory building ZE homes

Economic Development



Green Jobs  
Localized Labor Force  
Workforce Development  
Healthy Jobs

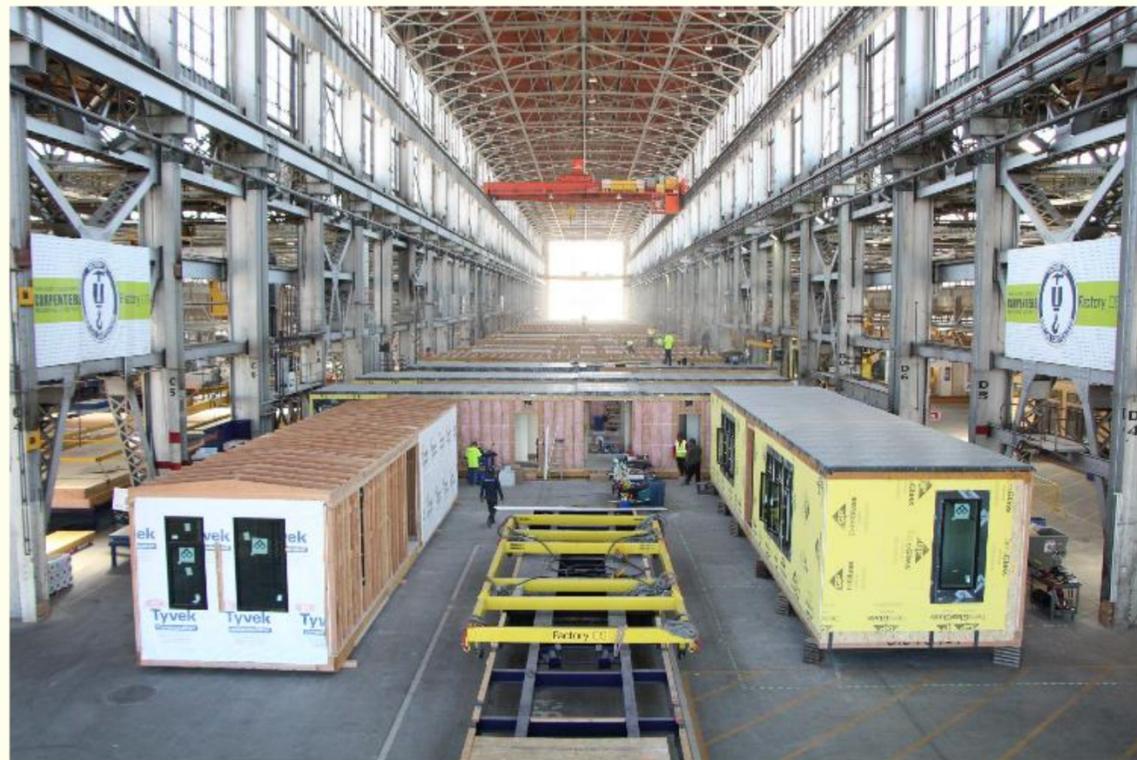
Less Subject to Global Manufacturing Pressures

Equitable Housing  
Lower Development Costs  
Rapid Deployment  
Healthy Housing  
Lower Maintenance & Energy Costs

Zero Carbon  
New Construction  
Community Scale Energy Retrofits



# Offsite Construction Benefits



- Quality control
- Weather-controlled environment
- Integrated design
- All trades under one roof
- Parallel production
- Healthy working conditions
- High indoor air quality & EE construction
- Faster deployment
- 70-90% less waste
- 5-15% cost savings
- Can be incrementally scaled over time

# DEFINITIONS

*Goals: High Quality, Code Compliant, Efficient*



## **Manufactured**

HUD Code  
Personal Property Financing  
Built on a chassis  
Lowest quality/efficiency  
Least cost



## **Panelized**

Local/State Code  
Real Property  
80% Built Onsite  
Highest Cost  
Can be wood or LG Steel  
Most flexible design

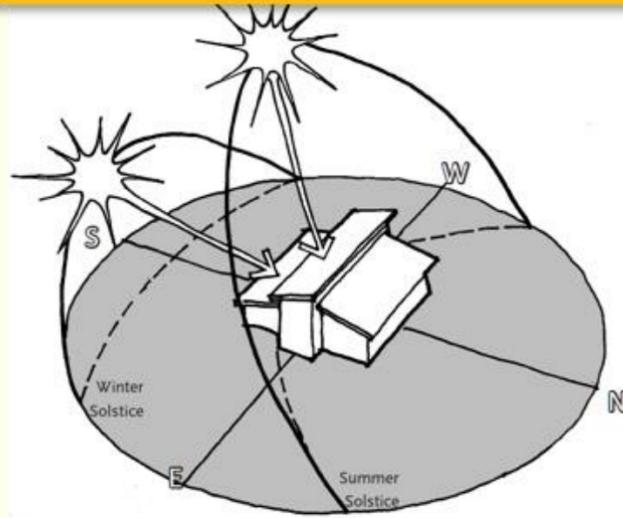


## **Modular**

**Local/State Code**  
Real Property  
80% Factory-Built  
Cost Neutral / 100% Time Savings  
Wood or Steel (higher cost)  
Flexible design within constraints

# WHAT'S IN A NET ZERO ENERGY HOUSE?

Efficient form &  
orientation



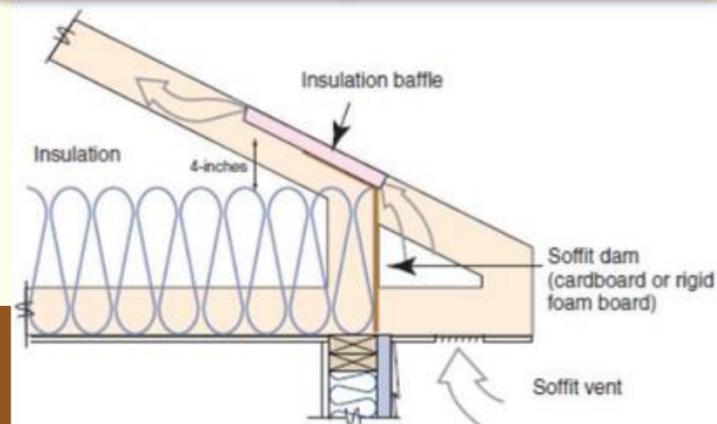
Small HVAC  
(sized to load)



Renewable  
energy



A really good  
thermal enclosure



Best-in-class  
plug loads



ZERO

# Zero Energy Off-site Examples



**Zero Energy Modular  
Affordable  
ZETA Communities (CA)**



**Zero Energy Modular  
Affordable  
Vermod - Public/Private  
partnership (VT)**



**Zero Energy Modular  
Market Rate  
BrightBuilt Homes (NE)**



**Zero Energy Panel /  
Timber Frame  
Market Rate  
Unity Homes (MA)**

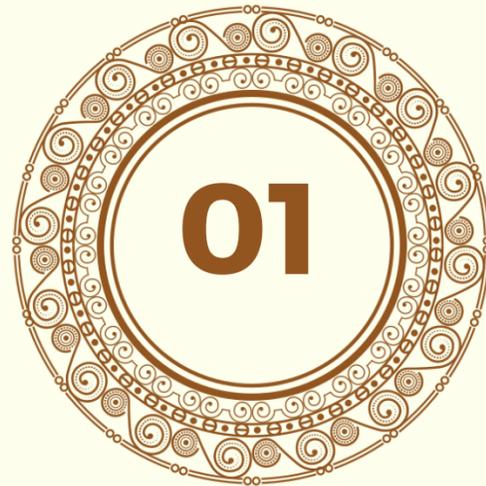
# PARTNERSHIPS & ALIGNMENT

*National Scope & Example*



# 3-LEGGED STOOL

*Not a Project: A Sustainable Business Model*



**Integrated A&E /  
Factory /  
General Contractor**



**Committed Pipeline**



**Leading City Vision,  
Policy, Codes**



# Factory

Support hyper-local jobs for neighborhoods that need it

30th Street Corridor location

Underutilized industrial facilities

Existing buildings match many factory design requirements

Potential funding availability

Revitalize district

Future vision - Attract adjacent related sustainable construction industry businesses



# Timeline & Progress



- June '21 - Issued Request for Information (RFI)
- July '21 - Reviewed responses, conducted interviews, engaged with companies
- **September: Demand-side finance planning**
- **Q4 '21- Council vote on ARPA funds**
- **Q4 '21 - Issue RFP**
- **Q4**
- **'21 - Evaluate Proposals**
- **Q1 '22 - Finalize partnership**
- **Q2-Q4 '22 - Build demonstration unit(s) and build factory**
- **2023 - New factory begins production**

# RFI Results



- 7 Responses from manufacturing companies, plus additional interest from several more
- Mostly panel companies (2 modular)
- Respondents are based in Maryland, Maine, Texas, Pennsylvania, Kansas, Illinois, and the UK
- All are planning a new factory in the Midwest
- Most use sustainable products
- All demonstrated commitment to the broader mission to some degree

# Here's why companies from London and Chicago are eyeing Milwaukee to build modular housing



MILWAUKEE  
BUSINESS JOURNAL



By Sean Ryan – Reporter, Milwaukee Business Journal  
Aug 10, 2021, 11:40am EDT

A rendering of Chicago-based Inherent LC3's modular home concept

INHERENT



# EPA Grant: Demand –side Finance Strategy



*\$25,000 grant to develop a demand-side financing plan that will allow low to moderate income Milwaukee residents to purchase these homes and support a steady “pipeline” of housing orders for the factory.*

# Next Step: RFP

## Selection Criteria

- Manufacturing expertise
- Pipeline
- Financing capacity
- Alignment with mission
- Commitment to zero energy

## Trade-Off's

- Years of manufacturing experience vs. more leading edge tech
- Single vs multifamily vs commercial experience
- Turnkey vs open (unfinished) panels
- Modular vs panel
- Degrees of energy performance
- Pipeline and development capacity vs. no local pipeline but manufacturing expertise