Zero Net Energy (ZNE) Companion Program

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What We'll Cover

ZNE Policy Drivers in Michigan

ZNE Companion Program

ZNE Program Case Studies

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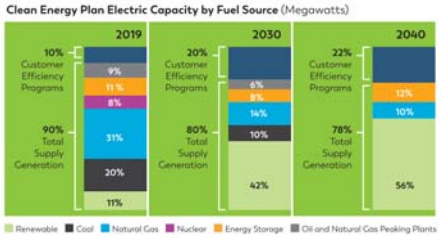
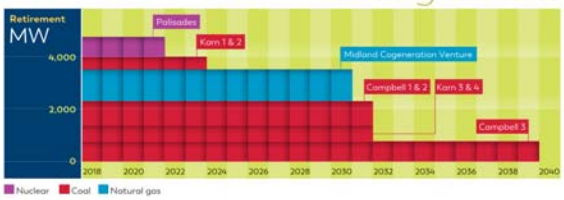
Consumers Energy's Integrated Resource Plan

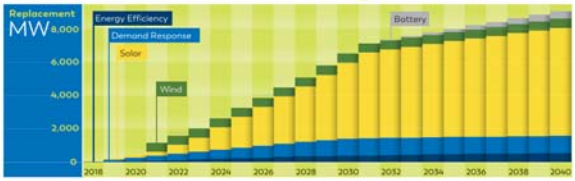
- ✓ No Coal by 2040
- ✓ 90% Carbon Reduction by 2040
- ✓ 56% Electric Capacity from Renewable Energy



Ending an Era



Powering the Future



What's Next for MI?

- 90% Carbon Reduction Goal (IRP)
- 2030 District
  - Carbon-neutral in 2030
- Jackson Smart Energy District
  - Provide an overall grid benefit
  - Satisfy 40% of the District's electricity demand with on-site renewables
  - Reduce the District's carbon emissions by 90%
- Circuit West
- Microgrids
- Demand Response
- Electric Vehicles
- Electrification of Buildings
- Increased Renewable Energy Generation
- Energy Storage
- Other Market Trends and Education

2030 DISTRICT®

An image of the Jackson Smart Energy District (courtesy of the City of Jackson)

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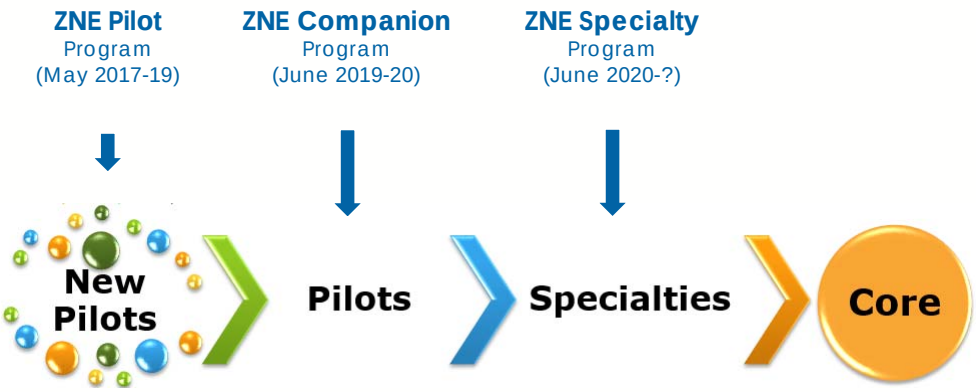
ZNE Program Status and Participants

ZNE Program Timeline

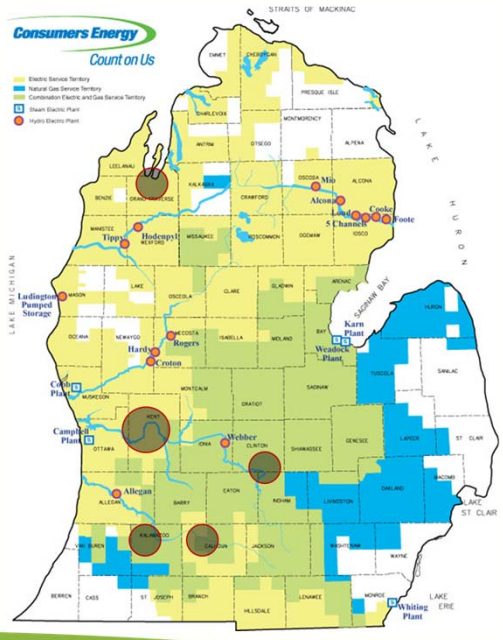


Existing Participants

11 Participants:
- 1 New Construction
- 2 Major Renovation
- 8 Retrofits

Overall Projected Savings:
- 4,227,190 kWh
- 10,098 MCF

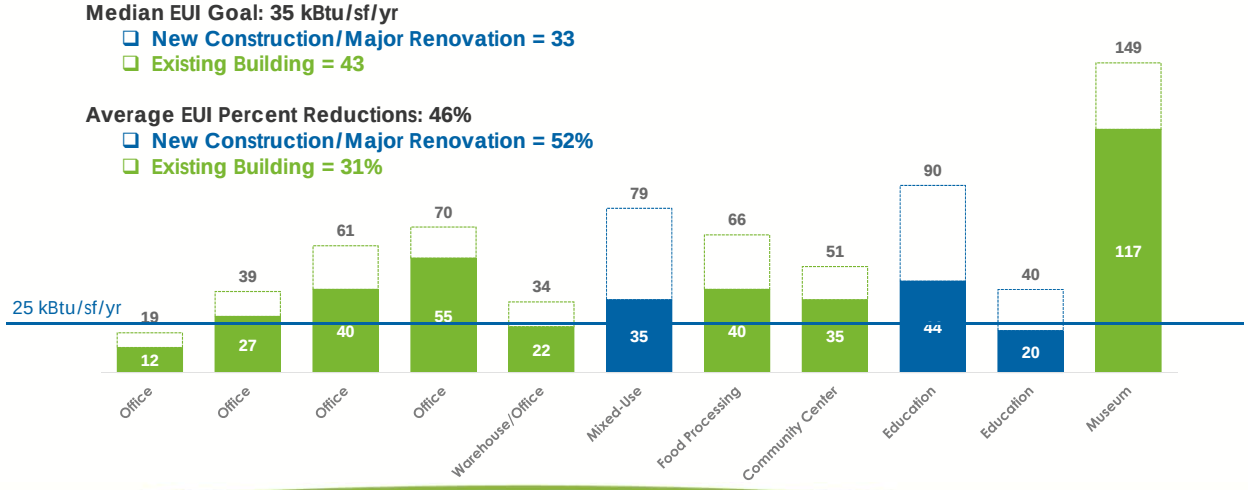
	Total	Count	Average Size
Office	279,626 sf	4 bldgs	69,907 sf
Mixed-Use	182,058 sf	1 bldgs	182,058 sf
Warehouse/ Office	159,840 sf	1 bldgs	159,840 sf
Museum	125,000 sf	1 bldgs	125,000 sf
Education	112,800 sf	2 bldgs	56,400 sf
Community Center	33,000 sf	1 bldgs	33,000 sf
Food Processing	45,934 sf	1 bldgs	45,934 sf



Existing Participants' EUI Goals (kBtu/sf/yr)

Median EUI Goal: 35 kBtu/sf/yr
- ❑ **New Construction/Major Renovation = 33**
- ❑ **Existing Building = 43**

Average EUI Percent Reductions: 46%
- ❑ **New Construction/Major Renovation = 52%**
- ❑ **Existing Building = 31%**



ZNE vs. ZNE-Ready

As an energy efficiency program, its incentives and requirements are solely based on energy reduction efforts, renewable energy generation is not required, but encouraged!

- **ZNE:** A building that generates as much energy as it uses, annually.
- **ZNE-Ready:** A building that has reduced its energy use intensity (EUI) to meet the program's EUI goal requirements.

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ZNE Companion Program Goals

EUI Goal:

- 25 kBtu/sf/yr and 20% reduction in regulated whole building energy, or
- If that cannot be reached:
  - 30% for existing buildings (compared to existing energy use).
  - 40% for new construction (over MI adopted ASHRAE 90.1 Table G3.1).

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ZNE Companion Program Eligibility Requirements

- The final design must be all-electric.
- Must be in early stage schematic design (i.e. no late "on-ramping").
- Owners are limited to 2 enrolled projects (or 1 campus).
- Commercial buildings only.
- New construction, major renovation, or retrofits.
- All deliverables are required for payment (i.e. no skipping of deliverables or associated requirements).
- A minimum of 2 whole building energy conservation measures (ECMs).

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Incentives

$1.50 per square foot
(maximum of $150,000 and minimum of $13,000 per project)

Incentives will be paid out as follows:
- **50% paid upon completion of Phase 1, 2 and 3**
- **50% paid upon completion of Phase 4 and 5**

Incentives fund a portion of the added costs to reach a ZNE-Ready target (i.e. engineering support, energy modeling, cost-benefit analysis, equipment costs and post-occupancy measurement & verification) and the energy savings associated with it.

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ZNE Companion Program Deliverables

Project Initiation

Application Questionnaire – to assess eligibility and ZNE feasibility.

Data Collection – drawings, schedules, occupancy count, building program, 3 years of the energy bills (EB), site conditions, building audit reports (EB) and other relevant documents/analysis.

ZNE Feasibility Study – performed by Consumers Energy as an initial assessment of the project's baseline energy use, viable ECM opportunities, EUI goal feasibility and solar sizing to achieve true ZNE.

Project Initiation

Design Team Procurement

- Design Architect
- Mechanical, Electrical and Plumbing (MEP) and Civil Engineer(s)
- Energy Modeler
- Lighting Designer
- Contractor
- Commissioning Agent
- Green Building and Solar/Renewable Energy Consultant(s) (optional)

Kickoff Meeting

- Walkthrough of building and/or site.
- Owner, design team, Consumers Energy rep. and additional stakeholders.
- Review program requirements/deliverables and discuss ZNE vision for the project.

Reoccurring Monthly Meetings

- Customer, design team and Consumers Energy rep. attend throughout the project
- Assign actionable tasks to project team in preparation for the design charrette

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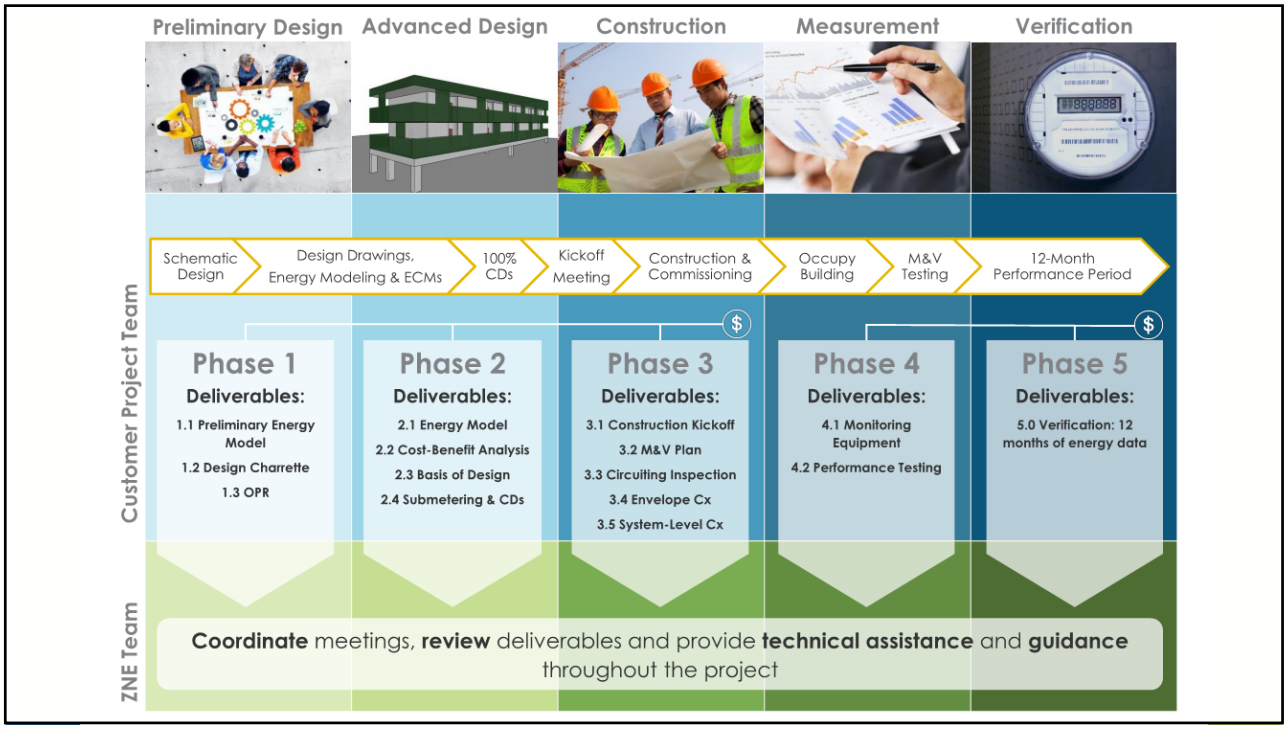


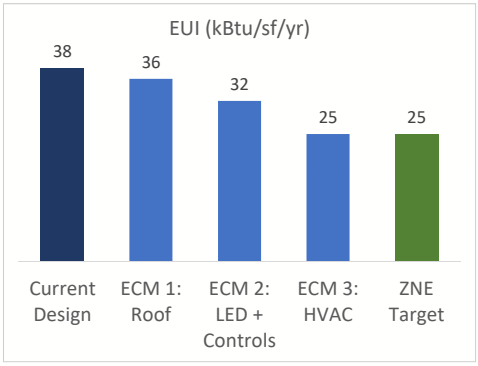
Phase 1: Preliminary Design

Schematic Design → Design Drawings, Energy Modeling & ECMs

1.1 Preliminary Energy Model

1.2 Design Charrette

1.3 OPR



Phase 2: Advanced Design

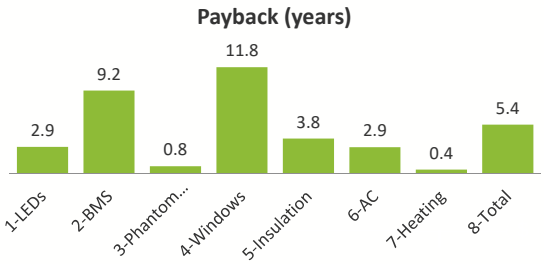
Design Drawings, Energy Modeling & ECMs → 100% CDs

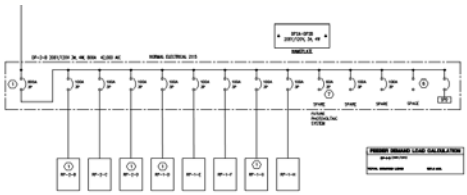
2.1 Energy Model

2.2 Cost-Benefit Analysis

2.3 Basis of Design

2.4 Submetering & CDs





Phase 3: Construction

Kickoff Meeting → Construction & Commissioning

3.1 Construction Kickoff

3.2 M&V Plan

3.3 Circuiting Inspection

3.4 Envelope Cx

3.5 System-Level Cx

IV. Scope of commissioning services

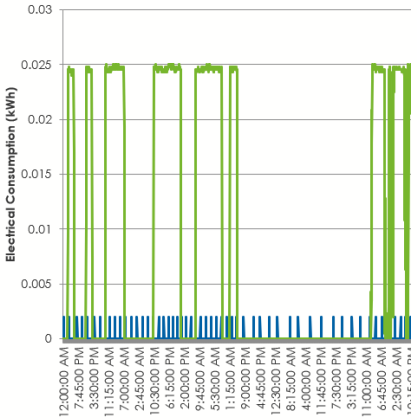
- Construction document review and comment
  - Pre-installation & Pre-Startup Verification (PIV & PSV) – "off-the-truck" and "static installation checks":
    - 100% verification of central equipment & terminal devices (by CxA)
  - Startup Testing & Verification – manufacturer / contractor startup verifications:
    - 100% verification of central equipment & terminal devices (by CxA)
  - Systems Ready To TAB Verification – work with TAB contractor to resolve any issues prior to the onset of HVAC testing/adjusting/balancing activities.
    - Verification of final TAB report – a 10% random "spot-check" under documented modes of operation for demonstration of system capacities prior to initiation of FPT scope of Cx (by CxA)
  - Functional Performance Testing – demonstrate operational consistency with intended sequence of operations
    - 100% verification of central equipment and terminal devices (by CxA)

Phase 4: Measurement

Occupy Building → M&V Testing → 12-Month Performance Period

4.1 Monitoring Equipment

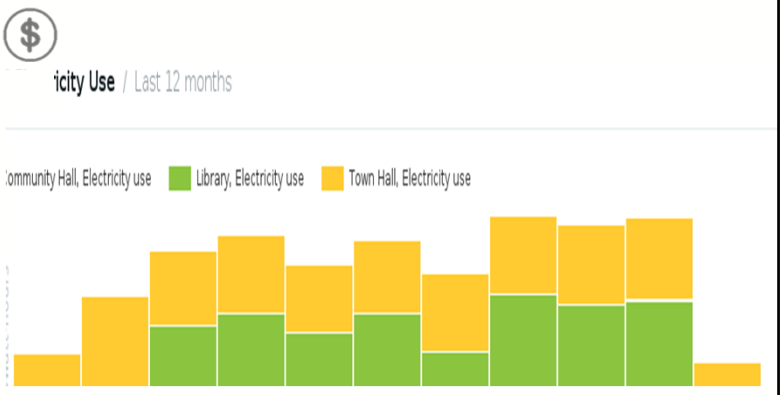
4.2 Performance Testing



Phase 5: Verification

12-Month Performance Period

5.0 Verification: 12 months of energy data



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ZNE Program Case Studies

Kalamazoo Nature Center

Existing Building
Status: Advanced Design Phase

EUI Baseline: 51
EUI Goal: 35 (31% reduction)

ECMs

- Added Roofing Insulation
- Minor Window Replacement
- Interior & Exterior LED's & Controls
- Heat Pump with Water Side Economizer
- Energy Recovery Unit (ERU)
- Building Monitoring System (BMS)
- Energy Star Appliances
- Replace Green Roof
- Replacing Dome (?)

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WMU Aviation Education Center

Major Renovation & Addition
(16,000 sf to 69,000 sf)
Status: Construction Phase

EUI Baseline: 90
EUI Goal: 40 (51% reduction)

ECMs

- Ultra Efficient Envelope (roof & walls)
- High Efficiency Windows
- Water Source Heat Pumps
- Interior and Exterior LEDs

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Thank you!

Interested in signing up?

Contact us for more information on eligibility:

Benjamin.Glendening@cmsenergy.com

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