



Low-Income Forum on Energy

Welcome!
We will be starting soon.



Low-Income Forum on Energy

The Low-Income Forum on Energy Presents:

Net Zero Energy Affordable Housing in Vermont

Elizabeth Chant and Allison Donovan
Vermont Energy Investment Corporation

November 17, 2015
1:30 p.m. – 2:30 p.m. ET



Low-Income Forum on Energy

Working to help low-income New Yorkers address energy issues.

LIFE, the Low-Income Forum on Energy, is a unique statewide dialogue that brings together organizations and individuals committed to addressing the challenges and opportunities facing low-income New Yorkers as they seek safe, affordable and reliable energy.

Supported by the New York State Public Service Commission and the New York State Energy Research and Development Authority (NYSERDA), the LIFE dialogue encourages an interactive exchange of information and collaboration among the programs and resources that assist low-income energy consumers.



Low-Income Forum on Energy

→ Monthly webinars

Wednesday, December 16, 2015 @ 1:30-2:30 p.m. ET

NY-Sun's Affordable Solar Program

NYSERDA

→ Monthly email newsletter

Sign up at lifenynews.org

→ Social media

LinkedIn: Low-Income Forum on Energy

Twitter: @LIFEnys



NEW YORK
STATE OF
OPPORTUNITY.

Low-Income Forum on Energy

Find more information on the website

www.lifenynews.org

Join the mailing list

www.lifenys.org/signup

Share article suggestions, webinar ideas, events

www.lifenys.org/share

Contact LIFE

1-877-NY-SMART, Option #5

LIFE@nyserda.ny.gov

Asking and Responding to Questions

The screenshot displays the Cisco WebEx Event Center interface. The main content area shows a presentation slide with the following text:

NEW YORK
STATE OF OPPORTUNITY.

Low-Income Forum on Energy

Welcome!
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The right-hand sidebar contains a 'Participants (1)' section with the following details:

- Speaking:
- Panelists: 1
 - NYSERDA Events** (Host, me)
- Attendees: 0 (0 displayed)

Below the participants list is a 'Q&A' section, which is circled in red. It includes a dropdown menu set to 'All (0)', a text input field, and two buttons: 'Send' and 'Send Privately...'. A red circle highlights the text input field and the 'Send' button. Two yellow arrows point from the right side of the image towards the 'Send' button and the text input field.

At the bottom of the interface, the Cisco logo is visible on the left, and the status 'Connected' is shown on the right.

Type into the text field and click “send.”

Technical Difficulties or Contacting the Host

The screenshot displays the Cisco WebEx Event Center interface. The main content area shows a slide with the text "NEW YORK STATE OF OPPORTUNITY. Low-Income Forum on Energy" and "Welcome! We will be starting soon." The right-hand sidebar contains several panels: "Participants (1)", "Speaking:", "Panelists: 1" (listing "NYSERDA Events (Host, me)"), "Attendees: 0 (0 displayed)", "Chat", and "Q&A". The "Chat" icon in the top toolbar is circled in red, and a yellow arrow points to it from the right. The "Chat" window is also circled in red, and a yellow arrow points to it from the right. The "Chat" window shows a "Send to:" dropdown menu set to "All Participants" and a "Send" button. The "Q&A" panel shows "All (0)" questions and a text input field for answers.

Click on the “Chat” icon to activate the chat function.

Zero Net Energy Affordable Housing in Vermont

Alison Donovan
Elizabeth Chant

LIFE Webinar
Nov. 17, 2015

Introduction to VEIC

- Mission-driven nonprofit
- 28 years of reducing economic and environmental costs of energy use
- Energy efficiency, renewable energy, and transportation
- Consulting and implementation
- 3 utility-scale implementation programs



VEIC's Low-Income Vision

- Mission: *Reduce the economic and environmental costs of energy use*
- Articles of Association: “...service to low-income populations and the organizations that serve them”
- Corporate goal since 2007: Carbon reduction
- Low-income goal: 20% of cost savings from carbon reduction accrue to benefit of low-income people

Manufactured Housing Terminology 101

What is a Mobile Home?

Manufactured Housing Terminology 101

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1. Any trailer that can be pulled behind a car or truck that has a kitchen, sleeping area and restroom.

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1. Any trailer that can be pulled behind a car or truck that has a kitchen, sleeping area, and restroom.
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3. A dwelling structure built before 1976 on a metal chassis fitted with wheels that is intended to be hauled to a usually permanent site.

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Mobile Home



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1. A home built in a factory and installed in two pieces on site.
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3. A factory built home under the HUD Code after June 15, 1976. Manufactured homes may be single- or multi-section and are built on a metal chassis.

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Manufactured Home

Southern Energy Homes

First DOE Zero Energy Ready Manufactured Home
Russellville, AL



Image Source: <http://energy.gov/eere/buildings/downloads/doe-zero-energy-ready-home-case-study-southern-energy-homes-russellville-al>

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3. Minimum prescriptive envelope standards similar to IECC 2015 for factory built homes.

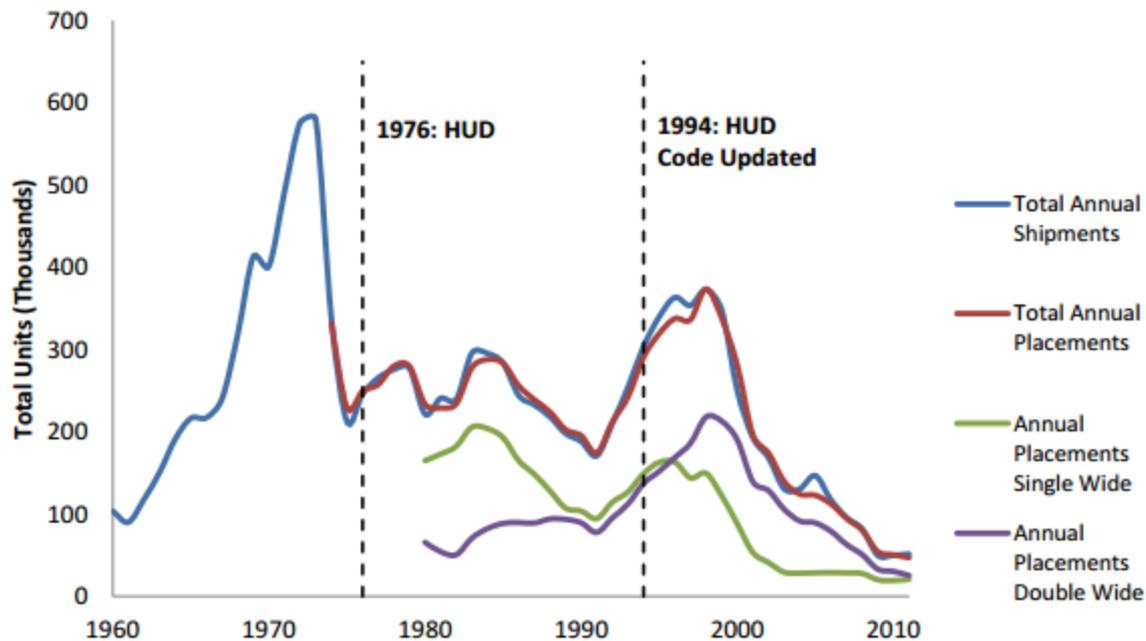
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Manufactured Housing Shipments

Figure 4: Manufactured Housing Shipments and Placements Nationally, 1959 through 2011



Source: Census 2012a

Source: Mobilizing Energy Efficiency in the Manufactured Housing Sector. ACEEE Report A124

Manufactured Housing Terminology 101

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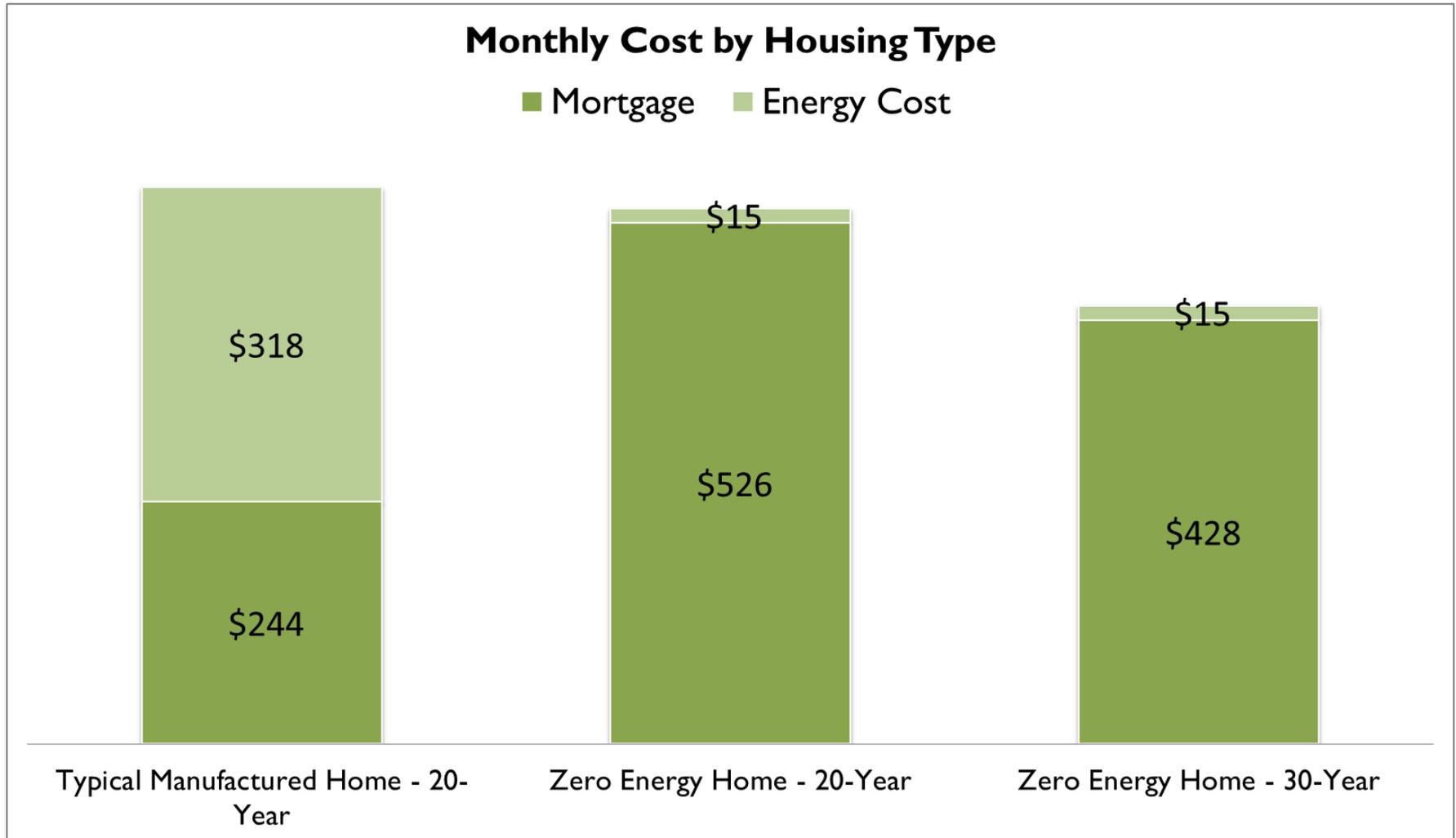
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Manufactured Housing Terminology 101

How are manufactured homes usually financed?

1. Conventional, long term (>20 years) fixed low rate mortgages
2. **Chattel loans (personal loan) short term (<15 years) high rate (8-15%)**
3. HUD financed at 0% for 30 years

Vermod Cash Flow Example



Manufactured Housing Terminology 101

What is a typical land lease agreement and conditions in a manufactured home community?

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What is a typical land lease agreement and conditions in a manufactured home community?

1. Long-term lot lease and stable park ownership, low rent with updated infrastructure.
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3. “Mom and Pop” owned park, short term lease, little restrictions on rent increases or eviction, out-of-date infrastructure.

Manufactured Housing Terminology 101

What is a typical land lease agreement and conditions in a manufactured home community?

1. Long term lot lease and stable park ownership, low rent with updated infrastructure.
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3. **“Mom and Pop” owned park, short term lease, little restrictions on rent increases or eviction, out of date infrastructure.**

Manufactured Home Community



Manufactured Housing Terminology 101

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What is a modular home?

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2. A home that is built in a factory, transported on a trailer and placed on a permanent foundation by a crane that qualifies for a traditional mortgage.

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Vermod



Current Deficiencies

Manufactured Housing

- Federal Code
- Lower quality, short life
- High energy bills
- Energy cost uncertainty

Location

- Unstable community ownership
- Short-term land leases
- Possibly outdated infrastructure

Financing

- Financed as personal property
- Short terms, high rates
- Depreciates

Present Opportunities

Net Zero Modular

- Local code
- High quality, long life
- Energy efficient
- Renewable energy

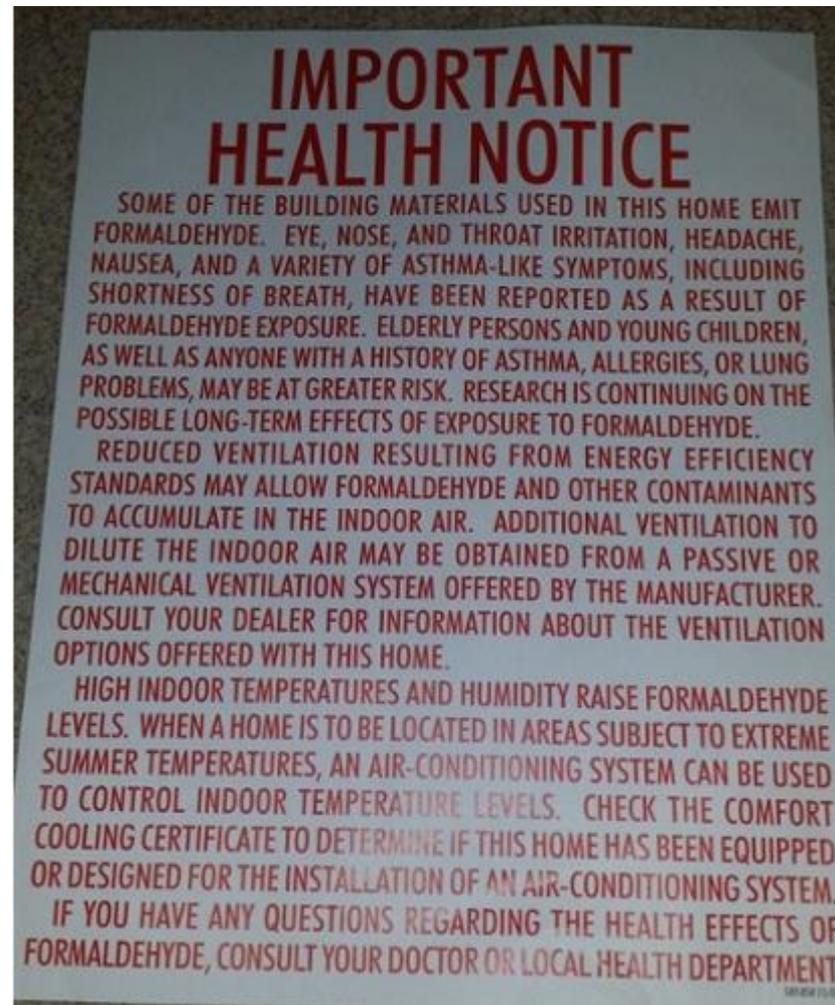
Location

- Stable community ownership
- Long-term security
- Modern infrastructure

Financing

- Financed as real estate
- Long term, low rates
- Retains value

Oh yeah, we haven't mentioned health and safety



VEIC Implementation Recognized as Exemplary

**Leverage
existing
resources**

**Strong
partners**

**Responsive to
local conditions**

Efficiency Vermont

- Created by Vermont Legislature and Vermont Public Service Board (PSB)
- Competitively bid contract to provide electric efficiency services to all ratepayers
- Performance-based contract
 - PSB sets goals and budget
 - PSB establishes performance indicators
 - Allows response to changing conditions
- Now operate under PSB Order of Appointment
- 15% of funds to low-income programming



Tropical Storm Irene

- 17 severely flooded mobile home parks
- 15% of MHs in state damaged

How to Replace Vermont's Affordable Manufactured Housing

- Let's rebuild better
 - More resilient
 - More affordable
 - Create an asset that appreciates
- Original partners
 - Efficiency Vermont
 - Vermont Housing and Conservation Board
 - High Meadows Fund

Vermont Mobile Home Replacements

- Effects of Tropical Storm Irene on low-income people
 - Siting of mobile home parks
 - Durability of standard mobile homes
- Net zero mobile home
- Durable & efficient



Details, Details...

	Typical New MH	HPMH
Conditioned Area / Vol	1050 sf / 8400 cf	1050 sf / 8400 cf
Infiltration	7 ACH 50	0.66 ACH 50
Duct Leakage	100	n/a
Floor Insulation	R30	R45
Wall Insulation	R20	R45
Attic Insulation	R30	R61
Door	R4.4	R7
Windows	U 0.35	U 0.19
Ventilation	Exhaust only	Heat Recovery
Heat	LP	ASHP
Hot water	Elec (resist)	HPWH
Appliances / Lighting	Std	Upgrade to HE

What does that mean for energy use?

	Typical New MH	HPMH
Heating	62.6	6.0
Water Heating	12.6	4.7
Appliances / Lighting	17.3	11.3
Total MMBtu	92.5	22.0
Barrels of oil?	10	3.25
HPMH w/ PV		1.0

Construction

Seeking:

Partner committed
to high-quality
affordable, durable,
efficient housing.

Willing to work together
to make it right.



Construction & Siting



Construction & Siting



Construction & Siting



Construction & Siting



Construction & Siting



Construction & Siting



Construction & Siting



Construction & Siting



Building Certifications for High Performance Modular Home



Building the Financial Package

- Establish as real property
- Credit-worthy customers have qualified for reasonable financing using standard underwriting
- 4.875% (fixed) for 25 years
- Compare to 8-12% for 20 years
- Efficiency Vermont provides \$2,000 in energy incentives for market-rate purchases

And, for low-income people

- VHFA: 0% deferred down-payment loans on new mfd & mod homes in parks for eligible borrowers
 - \$25,000 for new homes
 - \$35,000 for HPMD
- USDA pilot program (June 2015): provide access to 30-year mortgage at 3.25% for HPMH in park for LI; VLI potentially eligible for subsidy to bring interest to 1%
- Efficiency Vermont: \$8,000 incentive

Other Necessary Market Supports

- Efficiency Vermont has worked with the Vermont Chapter of the Appraisal Institute (AI) to
 - Expand the number of certified green appraisers
 - Educate local appraisal community on the value of HPMH
- Efficiency Vermont has provided incentives for appraisers to complete required courses for inclusion in AI's *Valuation of Sustainable Buildings Professional Registry*

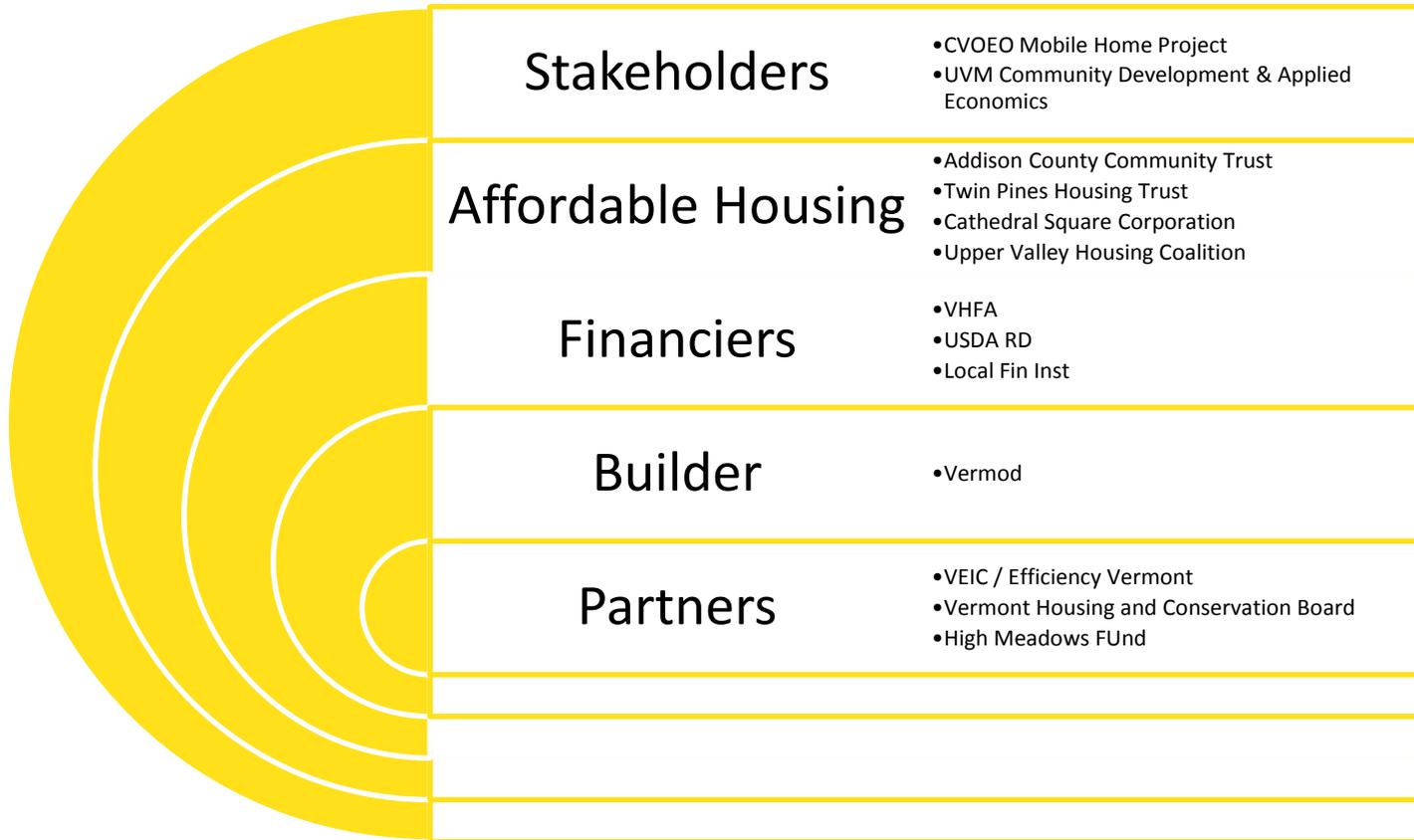
Moving the Model into Other Jurisdictions

- Delaware Sustainable Energy Utility
 - Conducted preliminary market analysis
 - Now developing pilot program
- Interest from other states and jurisdictions
 - High numbers of MHs
 - High energy costs
- Share what we have learned

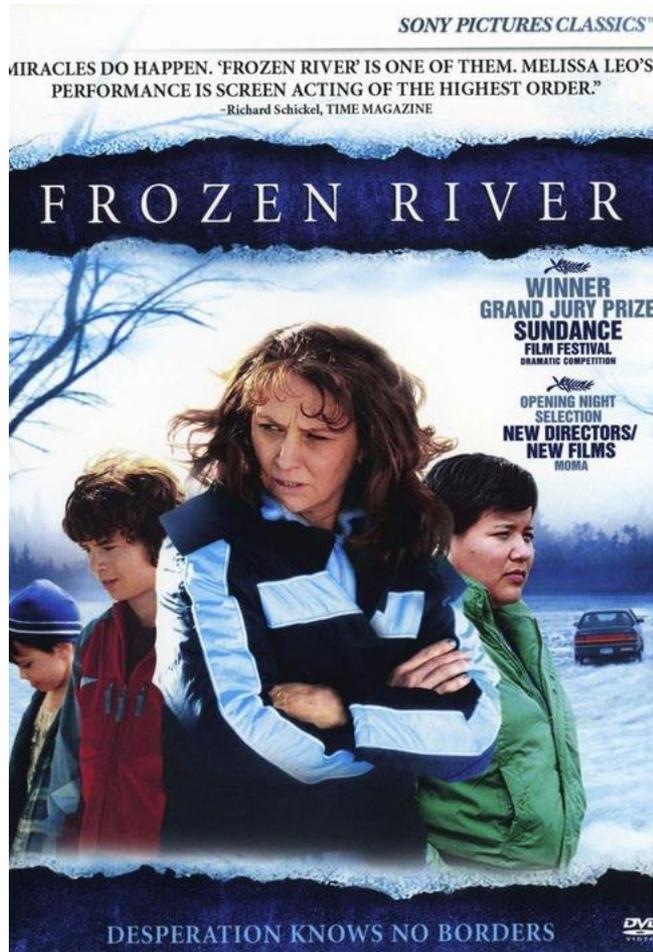
Key Lessons

- Know and be realistic about the market
 - Not yet developed funding / financing model for very and extremely low-income homeowners
- Be honest about and ready for barriers
 - Leased land
 - High first cost
 - Confidence in energy savings
- Develop funding, including soft sources, for pilot program work

Partners & Stakeholders: Keep Widening the Circle



And, now, I leave you with....
a movie recommendation! Really?



Really!

And a quote...

*It always seems
impossible,
until it is done.*

Nelson Mandela

Contacts

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Thank you!



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NY-Sun's Affordable Solar Program

NYSERDA

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