



Manufactured Home Contractor Research

Xcel Energy Minnesota

March 21, 2023

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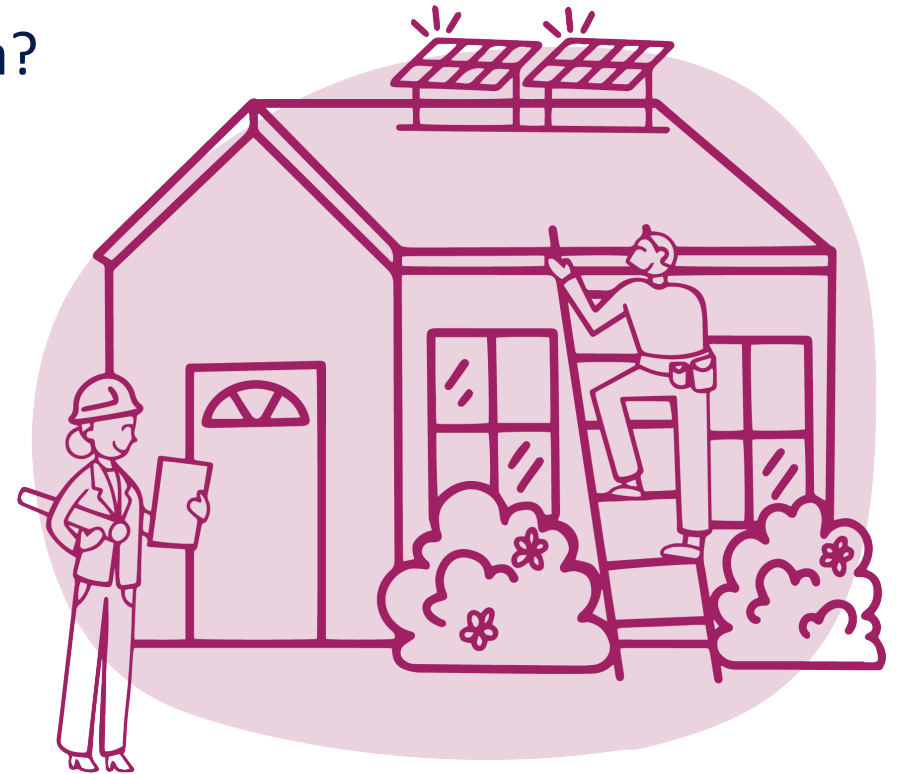
Understand ways to engage and/or build a workforce to retrofit existing manufactured homes in Minnesota

1. Literature Review
2. Geographical Analysis
3. Contractor Outreach
4. Results

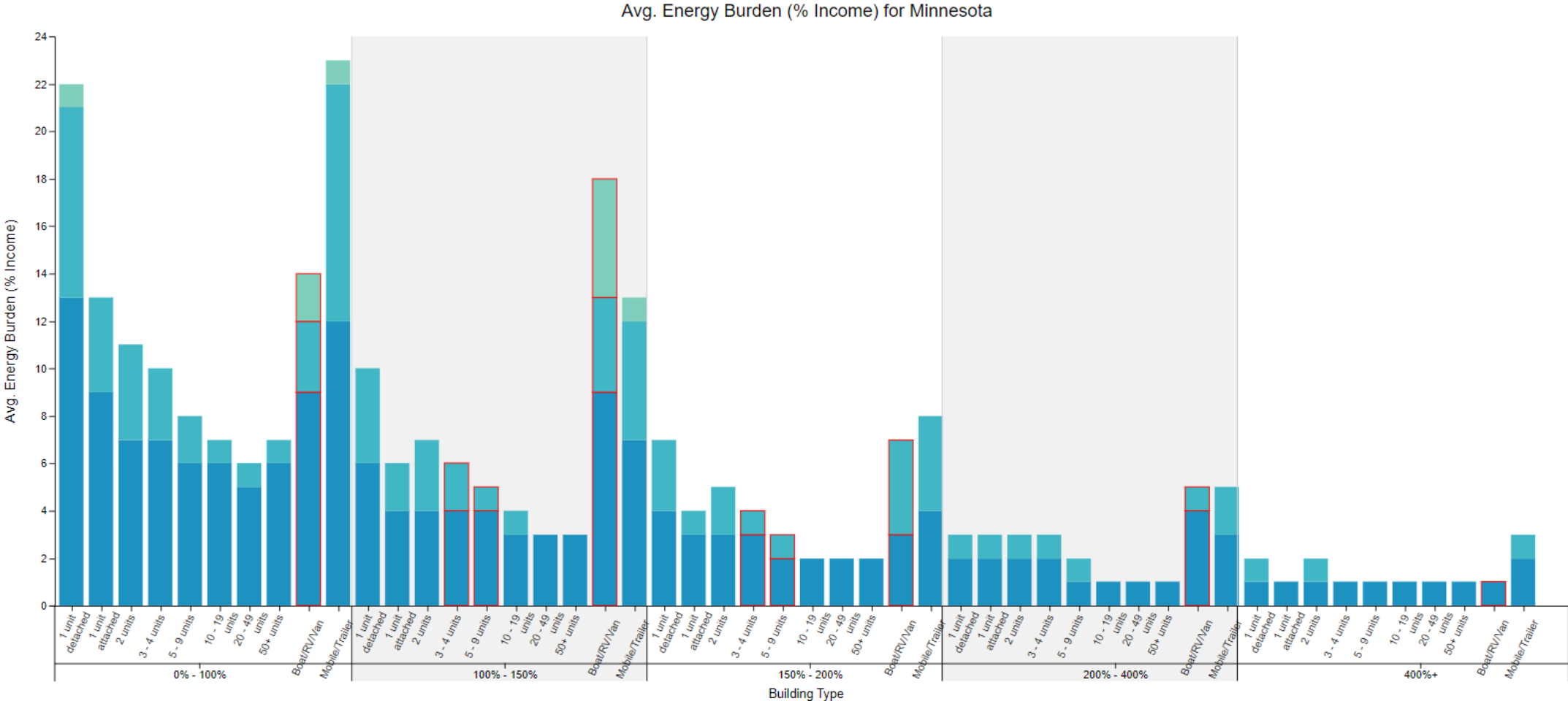


Research Questions

1. What support or resources do contractors (examples: weatherization and HVAC contractors) need to be motivated to work on retrofitting MH in Minnesota?
2. What barriers exist for contractors to perform retrofits on MH in Minnesota?
3. How could a MH retrofit program be designed to successfully engage contractors to participate?



DOE LEAD Tool Summary



Summary of Potential Contractors

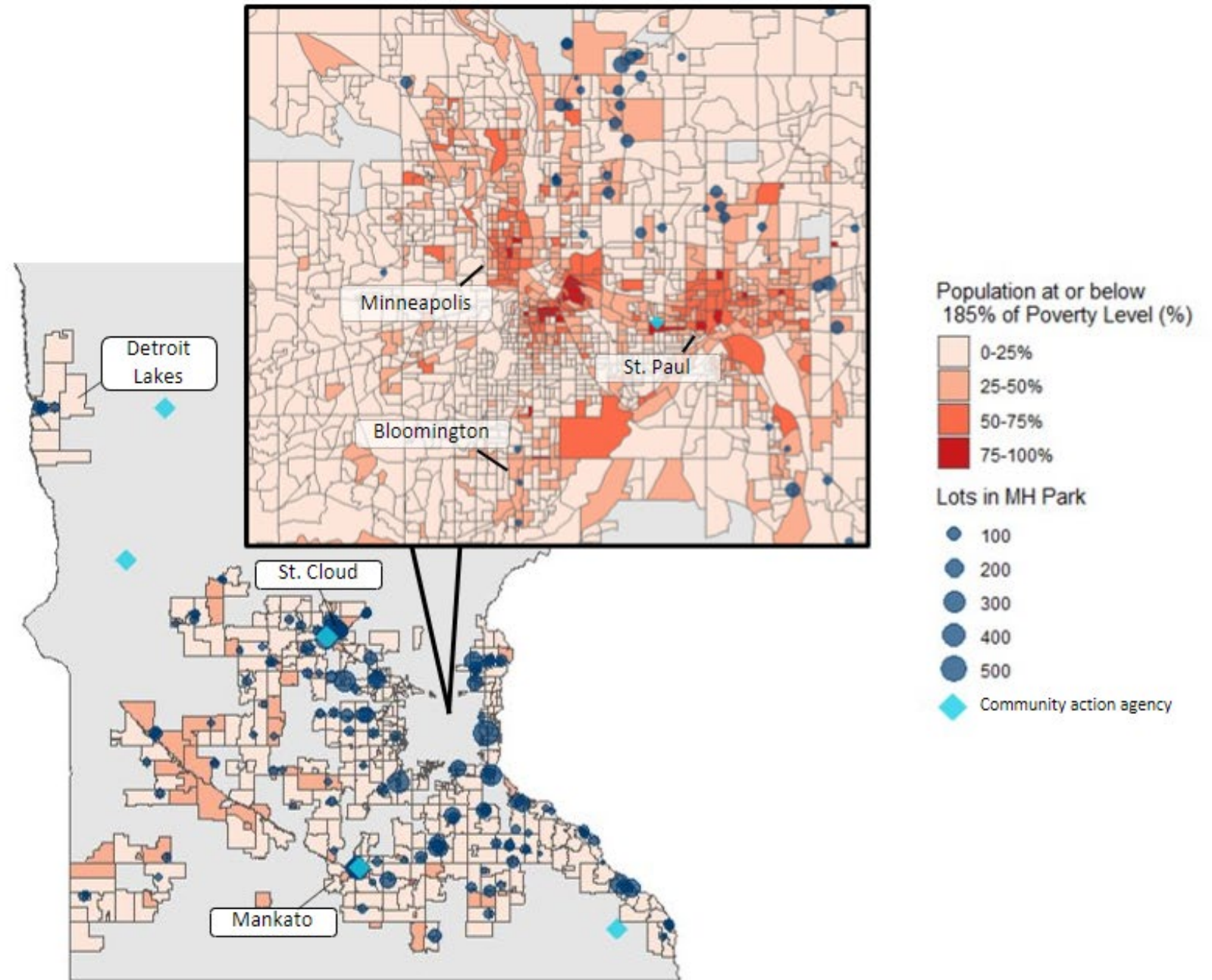
- 15 manufactured homes service contractors, two-thirds in the Twin Cities area
- 66 insulation contractors on the approved Xcel Energy contractor list, around half in the Twin Cities
- 1,371 HVAC contractors on the approved Xcel Energy contractor list, around 60 percent in the Twin Cities
- 28 manufactured homes dealers, majority outside of the Twin Cities area

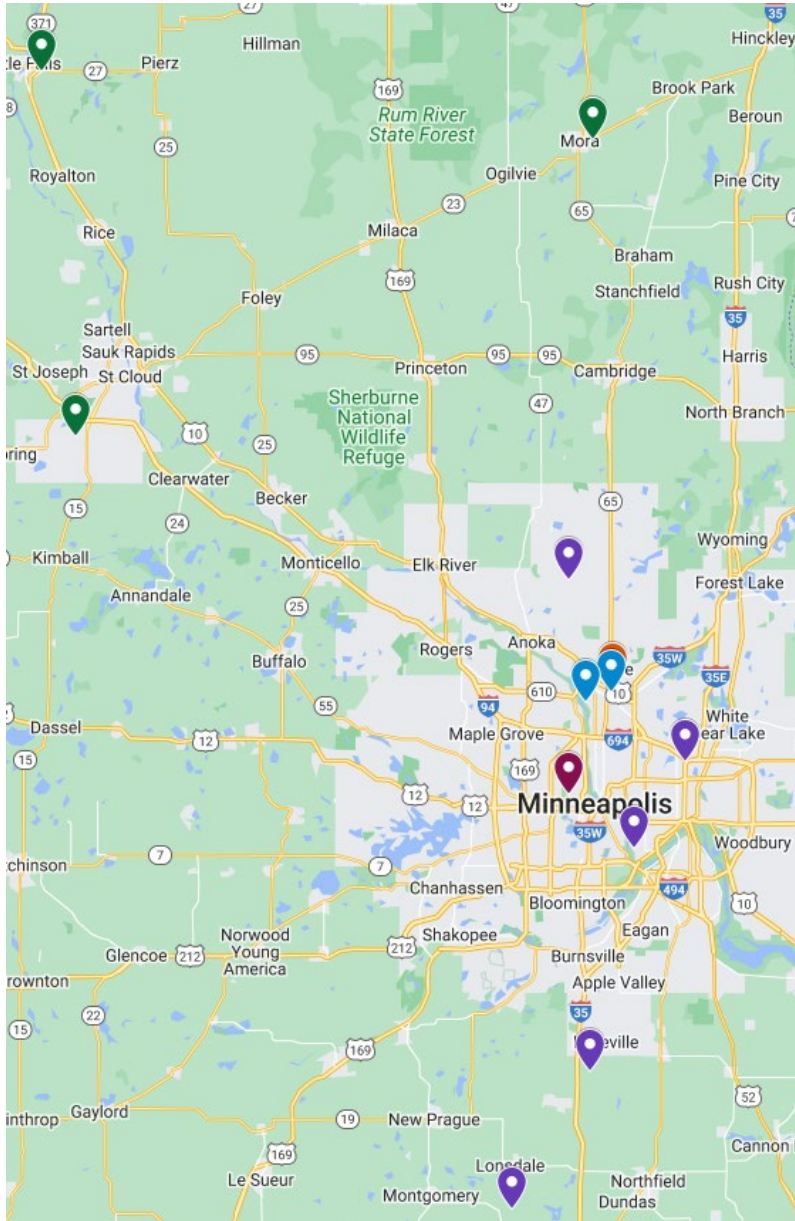


Community Action Agencies (in territory)

| Community Action Agency | Serve MH? |
|--|------------------------------|
| Community Action Partnership of Ramsey and Washington Counties (CAPRW) | No |
| Community Action Partnership of Scott, Carver & Dakota Counties | Unable to reach |
| Lakes and Pines Community Action Council | Yes |
| Lakes and Prairies Community Action | (Wx is through West Central) |
| Minnesota Valley Action Council | Yes |
| Three Rivers Community Action | Yes |
| Tri-County Action Program (Tri-Cap) | Yes |
| Tri-County Community Action Partnership | Yes |
| United Community Action Partnership | Unable to reach |
| West Central Minnesota Communities Action | Unable to reach |
| Southeast Minnesota Citizens Action Council (Semac) | Yes |

Xcel Energy electric territory - manufactured home parks and poverty levels





Contractors Interviewed

- HVAC (1)
- Wx agency/contractor (3)
- MH service company (3)
- Insulation contractor (5)
- General contractor (1)

MH Insights

- Home setup – used to have to be licensed MH installer to install a home. Now all general contractors can do it, but have to take a little test.
- One of the contractors owns 50-100 MH and two MH parks
- A contractor owns MH to teach rehab. When you own the home to sell, then you do it right.
- MH service companies have decades of experience.

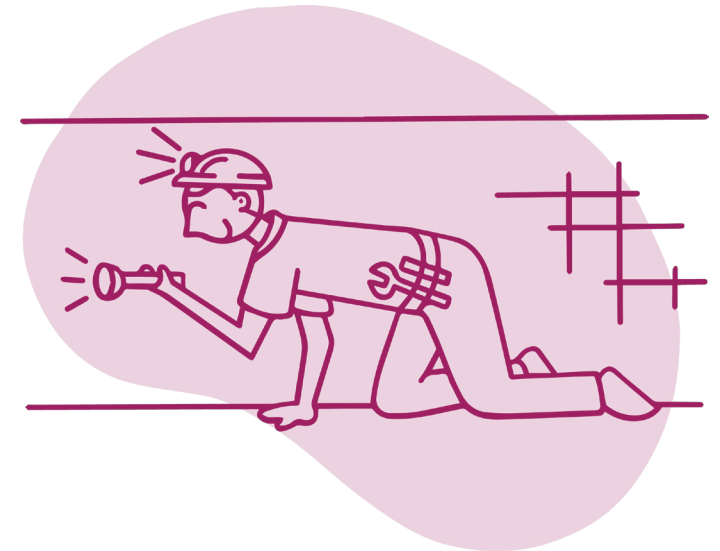
Contractor reasons to not work in MH

Access - more space to work in stick-built home, more restrictive in MH

- Water pipes: basement vs. under the home
- MH furnace is in a small closet

Stigma

- People don't want to do it
- Negative perspective before show up



Contractor reasons to not work in MH

Materials and products

- Plumbing uses different products (not copper) and needs some different tools
- Water heater doesn't vent same way and with different materials – different code requirements
- Repairs can require specialized (costly) materials
- Newer furnaces can't easily connect with older home duct work
- If there is not enough MH work it is prohibitive for a contractor to make an investment and it is inconvenient when working on SF.

Contractors and Staffing

- Challenge finding people willing to do the work – it's not easy work
- Important to set expectations
- Success finding people through online services like Indeed and through work release
- Training – hands on, on the job; need to learn the equipment and computer skills



Contractors and Staffing – Wx Agencies

- There is a market! There is a waitlist for Wx work. Could serve more MH with more people doing the work.
- Would like there to be more funding for critical repairs like torn belly insulation.
- Would like things like heat tape and skirting repairs to be funded.
- Training is mostly on the job. Even if you come to Wx with construction work it takes time to learn the equipment and how to problem solve on MH.



Contractors and Staffing – HVAC and Insulators

- Demand - Is there a market? How many homes?
- Ability for MH owners to pay for work out of pocket?
- Training would be needed
- Insulators felt additional pay would be needed for them to work in more homes
- MH HVAC contractor views Xcel Energy's furnace service program a competitor

MH Measures

How the work is done is important.

“If you don’t know what you are doing it can create more problems than good.”

Need more money in the “right” places.

People agree it is important to “do it right.” But don’t agree on what is “right.”

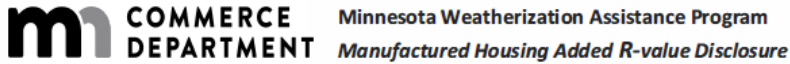
MH Measures

| Measure | MH Service Contractor | Weatherization Agency/Building Science |
|-----------------------------|--|--|
| Attic insulation | If you fill attic full of insulation, then no place for the house to breathe. Can over do it and ceiling caves in. | Don't dense pack fiber glass because it reduces R value and may be too heavy for the ceiling. |
| Belly insulation and repair | Fiber glass insulation attracts animals. If fill too full of fiberglass insulation it can change the structure of house and cause pipes to freeze. | <p>Dense packing fiberglass insulation too tight can cause issues like pipes freezing. If thoughtful and leave some air space where there is piping (plumbing, tub accesses, etc.), then less likely to have issues.</p> <p>State regulates how much can be added. And what materials are allowed to be used when adding insulation and making repairs.</p> <p>Needs to meet SIR requirements and often there is \$4k of repairs needed but only \$2k allowed.</p> |

MH Measures

| Measure | MH Service Contractor | Weatherization Agency/Building Science |
|--------------------|--|--|
| Duct sealing | Don't seal ducts. Duct leakage is needed to keep pipes from freezing. | Duct sealing is an effective way to save energy in MH. |
| Heat tape | Needed to keep pipes from freezing. | Needed to keep pipes from freezing. Not an allowable Wx measure. Energy savings when you turn it off in the summer. |
| Insulated skirting | You can do it, but the belly of the home is meant to breathe – skirting has venting for a reason. If close it up with insulated skirting then moisture from the ground rots away the floors. | Insulating the skirting makes it the thermal/pressure boundary. Recommend installing a vapor barrier over the dirt floor to prevent bulk moisture intrusion. |
| Windows | | Must be rated for use in mobile homes. Often must order from out of state – expensive shipping costs. There is an exception for a state approved window or door but no one at the state knows about this when asked. |

Manufactured Housing Added R-value Disclosure



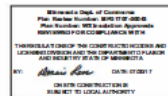
REQUIRED INFORMATION

| | | | |
|-----------------------|--|---------------------------------|--|
| DATE | | MANUFACTURED HOME MODEL NUMBER | |
| CONTRACTOR NAME | | MANUFACTURED HOME SERIAL NUMBER | |
| WEATHERIZATION AGENCY | | DATE OF MANUFACTURE | |
| SITE ADDRESS | | HUD CLIMATE ZONE | |
| COUNTY | | | |

DESCRIPTION OF WORK PERFORMED: *Fill out all applicable information*

| ADDED INSULATION LOCATION (Cellulose not allowed) | ADDED INSULATION TYPE | ORIGINAL R-VALUE | ADDED R-VALUE | TOTAL POST RETROFIT R-VALUE | COVERAGE AREA (ft. 2) | INSULATION THICKNESS (in) | BAG COUNT |
|---|-----------------------|-----------------------|--------------------------------|---|-----------------------|---------------------------|-----------|
| ATTIC 1 | | | | | | | |
| ATTIC 2 | | | | | | | |
| FLOOR 1 | | | | | | | |
| FLOOR 2 | | | | | | | |
| BELLY REPAIR LOCATION | BELLY MATERIAL TYPE | MATERIAL BURST RATING | SQUARE FOOTAGE OF BELLY REPAIR | ADDED ATTIC VENTILATION (Do not add venting to sealed cavity roof design) | | | |
| REPAIR 1 | | | | ADDED VENTING TYPE | | | |
| REPAIR 2 | | | | In. 2 OF ADDED VENTING | | | |

| | Location | Original U value | Installed U value | | Location | Original U value | Installed U value |
|----------|----------|------------------|-------------------|-----------|----------|------------------|-------------------|
| Window 1 | | | | Door 1 | | | |
| Window 2 | | | | Door 2 | | | |
| Window 3 | | | | Door 3 | | | |
| Window 4 | | | | Window 9 | | | |
| Window 5 | | | | Window 10 | | | |
| Window 6 | | | | Window 11 | | | |
| Window 7 | | | | Window 12 | | | |
| Window 8 | | | | | | | |



Signature of Installer _____

85th 7th Place East – Suite 280 – Saint Paul, MN 55101 |
 P: 651-539-1500 | F: 651-539-1547 mn.gov/commerce

Updated July 2021

Form for MN WAP allowing the R-value of insulation to be greater than what was on the original data plate.

Only fiberglass insulation should be used (no cellulose).

Program Considerations

- Avoid doing work in the winter – risk of pipes freezing if belly is exposed during repair in extreme cold. (Note: CAP agencies do not do Wx work on MH in the winter)
- Audit – check out the scene for safety and work to be done. Could identify homes where cleaning out under the home is needed (typically for smaller and older homes with less storage inside)
- Park visit could help understand community needs and approach to maintenance.

Program Considerations - Contractors

- Turn around time to pay contractors
- Consistent opportunities/work
- Incentivize contractors to make it worth it – pay employees more to work on MH
- Targeted marketing campaign by utility/program rather than contractor – HVAC contractor unlikely to target serving MH.

Conclusion

There is a market and need for contractors who are willing to and have the knowledge to work on manufactured homes!

- Could Xcel Energy fund training for contractors on MH systems and try to decrease the stigma of working on MH?
- Could Xcel Energy provide program funding for measures that WAP can't (e. g. heat tape)?
- Could an Xcel Energy program provide additional funds for belly repairs or additional insulation?



Appendix

Slipstream Michigan MH retrofit story

Couple with limited income and 75 years old living in a double-wide MH with extremely high energy bills.

- Home moved 8 years ago and the crossover ductwork between the sections of the home were never connected. They used four electric space heaters to heat half of their home for that time leading to high electricity bills.
- Belly cut open by a plumber with insulation removed and road barrier damage to a 35 ft x 8 ft section under the home.
- Customer feedback: “If this program had not come and found these issues and fixed them, our water pipes would have burst and our electric bill would have been so high we would have lost our home and been homeless at 75 years of age.”