Fresh Energy

Accelerate residential energy codes for cleaner, more efficient homes

What are building codes?

Building codes establish the minimum standards for a building's quality, safety, energy use, and construction. Minnesota's energy code is energy agnostic—it does not require homeowners to use renewable energy. Instead, it enables buildings to use less energy, regardless of the source.

Minnesota's residential building code must support state climate targets.

A carbon-free energy economy requires buildings that sip, not guzzle, energy. Minnesota's historic 2023 legislative session passed a requirement for the commercial energy code to achieve 80% or greater reduction in annual net energy consumption by 2036.

However, this does not cover smaller residential properties or single-family homes. **Minnesota's residential energy code lacks an energy savings target like the commercial energy code,** which reduces the likelihood of meeting state climate targets, and leaves residents of small and single-family buildings out of beneficial efficiency improvements.

The solution is simple, but we must act now.

Accelerate efficiency in the residential energy code to decrease energy waste, save consumers money, and help meet climate goals. This proposal will require the Department of Labor and Industry to adopt a 2036 residential energy code that achieves an 80% reduction in energy use compared to the 2006 code.

Energy-efficient housing will save money, reduce emissions, build resilience.

Energy efficient homes save homeowners and renters money. The Federal National Mortgage Association (Fannie Mae) found that utility costs are the largest non-mortgage cost to homeowners. Improving home energy efficiency reduces monthly expenses and provides comfort, health, and safety benefits, including better indoor environmental quality and increased resilience to extreme weather events.

Establishing a Residential Energy Rating Rebate Program

This bill covers the cost of energy rating services for new homes that achieve the US Department of Energy's Zero Energy Ready Home (ZERH) certification, bringing federal incentives to Minnesota and supporting builders in Greater Minnesota. The new rebate program would offer full reimbursement of energy rating services required for ZERH certification, up to $5,000 per single family home and up to $2,500 per unit in multifamily housing ($15,000 max per building).

More efficient buildings save homeowners and renters money.

More efficient buildings provide a range of additional health, safety, and welfare benefits.

Building residences to a higher standard will also increase resilience to extreme weather events.

Support stronger building codes for an efficient, resilient future.

Minnesota's buildings sector contributes to roughly 40 percent of our current greenhouse gas emissions—and that number continues to rise. Accelerating efficiency in the residential energy code is crucial to slowing and reversing this trend while **prioritizing the health and pocketbooks of all Minnesotans** by building the next generation of energy-efficient, resilient buildings.

Want to join us?

Contact Fresh Energy staff Eric Fowler, senior policy associate, buildings, at **fowler@fresh-energy.org** or Anna Johnson, senior manager, state and local affairs at **johnson@fresh-energy.org**.

Sources:
https://www.minnpost.com/environment/2023/05/minnesota-lawmakers-update-commercial-building-code-amid-flurry-of-energy-bills/
https://fresh-energy.org/improving-energy-codes-for-health-savings-and-climate
https://fresh-energy.org/whats-up-with-building-codes

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Barbara Morehead
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March 18, 2024

Minnesota House of Representatives
House Committee on Labor and Industry, Finance and Policy

Via electronic delivery c/o travis.reese@house.mn.gov

Dear House Committee Members:

I wish to offer my comments as to HF 4242 that you are scheduled to hear on Tuesday, March 19,2024. If time permits, I would also like to testify.

Prior to building our home in 2016, my husband and I spent many years doing extensive research on building an energy efficient home. We learned a lot from this research and I would love the chance to bring some of this information to the lawmaker's attention. It is my firm belief that education is the key to reaching an informed decision.

If possible, I would like to present a very short Power Point slideshow (10 slides) that I have complied on a thumb drive. I am not sure of your capabilities to present this slideshow so I will have copies of the same information available for the committee members.

See attached copies of my **Power Point Slideshow** along with my **hand outs**.

Sincerely,

Barbara A. Morehead

Dear Representatives,

I am writing to provide this written testimony in support of HF 4242 and similar efforts to drive greater energy efficiency in our homes. Minnesota's building codes have fallen far behind national and international standards, and prompt legislative action to remedy this is very important.

As a Minnesota resident, former real estate finance professor, and real estate professional with experience in commercial and residential building construction, renovation and investments, I have learned the importance of creating high-quality, energy-efficient structures. This helps our families, communities and the planet. And it has proven to be a wise financial decision.

The proposed bill would make significant progress toward aligning Minnesota's building codes with national and international standards. Current federal incentives under the Inflation Reduction Act, more favorable loans from a wide range of national lenders, and various utility company incentive programs are available if our residential structures achieve Energy Star or DOE Zero Energy Ready home certifications and other nationally recognized energy performance standards.

Let me touch first on the tax incentives topic:
- Our current energy codes are antiquated and create confusion for Minnesota homeowners and businesses when they are contemplating new home purchases or renovations. Minnesotans who complete a new home or home renovation and hope to benefit from Federal tax benefits, more favorable loans, and local utility incentives presume that if they build "to code" they have an opportunity to gain these significant financial benefits. Unfortunately, they more often hear, "sorry that's the lesser 'Minnesota code' and that isn't good enough." The current Federal standards are based on the 2021 International Energy Conservation Code (2021 IECC). Minnesota's standards are based on 2012 codes. When Minnesota homeowners learn of this discrepancy it is generally too late to do anything about it.

Next, let me comment on the broad range of loans available for energy efficient homes:
- Fannie Mae Green Rewards,
- Freddie Mac GreenCHOICE Mortgages,
- FHA's Energy Efficient Mortgage program,
- VA Energy Efficient Mortgages, and
- a wide range of private lenders provide higher loan proceeds, lower interest rates and other benefits vs. regular mortgages for "normal" homes. Making new and existing homes more energy efficient creates opportunities for Minnesotans to secure more favorable terms on their mortgages, as well as access to loans to finance energy efficiency renovations. The Minnesota Housing Fix-Up Loan Program is an example of an existing state financing program promoting energy efficiency.

Finally, let me comment on existing utility incentives:
- Xcel Energy and Centerpoint's High Efficiency New Homes Program,
- Minnesota Power's various rebates and efficiency programs,
- Rochester Public Utility's Conserve & Save Rebates, and
- The majority of other utilities serving Minnesota residential customers are linked to higher than code energy efficiencies.

In summary, there are many reasons that Minnesota's codes should be modernized and aligned with national and international standards.

In an ideal world, Minnesota would shift to a 3-year adoption schedule and seek to maintain alignment with the International Energy Conservation Code ("IECC") shortly after each internationally vetted and recognized version is enacted.

And also in an ideal world, if the government is to reimburse the cost of ratings reports, as is proposed in this bill, then it seems appropriate that those seeking rebates be required to provide a copy of the ratings to the Commissioner, and that the Commissioner be obligated to provide summary reports each year so the public and policy makers can monitor the actual performance of new structures, and track progress. Please consider this as a minor text amendment to the existing bill language.

Some less experienced builders assert that stronger codes and more stringent energy standards are a barrier to home construction or increase costs. I have not seen any evidence of this. In contrast, most reputable research says that sometimes modestly higher "first costs" are actually lower on a "net cost" basis when factoring in available tax and utility rebates. And "life cycle costs" are universally lower, and often much lower, for more energy efficient homes. This actually enhances affordability, because utility costs are a huge burden on all families, and especially low-income families. Even Habitat for Humanity, working with volunteer labor, is able to achieve higher building performance aligned with national standards. Please review the performance of Habitat homes before giving any credence to homebuilder association assertions that it is "too hard" or "too expensive" to build more energy efficient homes.

The vast majority of homes on the popular Parade of Homes home show already achieve the standards set forth in HF 4242 and many even achieve HERS ratings of 50 or below. Said differently, our homebuilders know how to do this and already know how to deliver high-quality, energy-efficient homes cost effectively.

I hope it is self-evident that adopting uniform standards also aligns Minnesota homebuilding with practices elsewhere and helps create broader markets, leading to greater competition, greater efficiencies and lower costs. Finally, it should also be self-evident that modern energy codes and the drive toward net zero energy use in buildings better mitigate the causes and effects of climate change.

Thank you for supporting and passing HF 4242. Please consider amendments shifting to a 3-year code adoption cycle and requiring energy ratings reports be submitted to the Commissioner as part of the proposed rebate program. Thank you.

Jamie

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AIA Minnesota

March 18, 2024

Dear members of the House Labor and Industry Finance and Policy Committee,

AIA Minnesota would like to express its support for HF4242, particularly the provisions that require the Department of Labor to act on new versions of the International Energy Conservation code editions at an accelerated pace and setting targets for energy efficiency in the residential sector.

The American Institute of Architects, both nationally and at the state level, have placed a high priority on climate action, as we know that the built environment has a significant impact on our carbon footprint. We were proud to support similar changes in the commercial sector in prior legislative sessions, and we believe that bringing the residential energy code review cycle and energy goals into alignment with the rest of our strategy to create a sustainable, resilient built environment for Minnesota will improve outcomes for all.

We applaud the preservation of the codes review process already established within the Department of Labor and Industry. The Department is well-positioned to complete an expert-driven, cost-conscious, and thorough review of model codes to make sure that what is adopted works across our state. While model codes are the starting point for creating Minnesota's code, we know that the robust and intensive process of right-sizing the code for our climate and economy will result in a code that helps us meet the climate challenge and creates resilient homes for all.

We urge you to advance this bill to bring the residential sector into alignment with advancements in the commercial building sector, and to continue to move Minnesota into a more sustainable future.

Sincerely,

Amy Kalar, AIA, NOMA

AIA Minnesota President

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March 18, 2024

Representative Michael Nelson
585 State Office Building
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Re: House File 4242

Dear Chairman Nelson and committee members,

On behalf of the Minnesota Propane Association (MPA), which represents propane marketers, wholesalers, suppliers, distributors, and equipment manufacturers across the state, we appreciate the opportunity to comment on HF 4242.

Our members provide clean-burning and critical energy to residential, commercial, agricultural, and industrial customers across the state. The state's propane industry provides thousands of good-paying jobs and contributes more than $1.5 billion in economic activity annually.

MPA supports efforts to reduce aggregate greenhouse gas (GHG) emissions from our building sector and improve air quality, but we cannot support HF 4242. Enforcing the International Energy Conservation Code statewide will needlessly restrict energy access and increase energy prices for consumers and businesses. Energy access is important to our future economic activity in the state and needs to be efficient and reliable to ensure we can grow our economy.

"A new report from the North American Electric Reliability Corporation (NERC) stresses the need to improve the reliability of North America's power grid. The report assessed the amount of generation that will be available this winter compared to the projected demand for electricity and highlighted concerns about the risk of outages due to insufficient generation . . . The warning from NERC, which oversees the reliability and security of the electric grid, comes as utilities are grappling with changes throughout the industry. Traditionally the power grid faces its greatest challenges during a few peak hours each year, but that is changing as the industry transitions to new sources of energy. Now, the report details, supply challenges can arise over more circumstances in both summer and winter months."

> **QUOTE:** "This report is a serious reminder that decisions we make today will impact our power reliability tomorrow," **Darrick Moe**, CEO of the **Minnesota Rural Electric Association** said. "According to the report, a large portion of the continent, including Minnesota, is at risk in the winter months if the weather is severe. In a state like Minnesota, having reliable power during dangerously cold winter weather can mean life or death."

The Midwest Reliability Organization (MRO) reached a similar conclusion about the dire state of grid reliability when it released its 2024 Regional Risk Assessment in February. For the first time in its history, MRO Identified an extreme risk: uncertain energy availability.

Following this report, a quote was released from Minnkota Power Cooperative which serves eastern North Dakota and northwestern Minnesota.

“Reliability needs to stay at the forefront of people’s minds as the policy framework is being defined.” Said Mac McLennan, Minnkota president and CEO. “It’s unacceptable for the people of our region to wake up in the morning and not know if they’re going to have dependable electric service. Our country is accelerating down a path where this could become our reality. We need to approach this transformation of America’s electric grid with caution and common sense. There’s simply too much at stake.”

Minnesota's energy needs and availability have always been and will continue to be different across the state. A one-size-fits-all approach will have devastating consequences.

If the Legislature is interested in reducing GHG emissions pragmatically and cost-effectively, MPA would be happy to work with legislators on legislation we can fully endorse. Thank you again for the opportunity to provide comment.

Respectfully submitted,

Dave Wager
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HF 4242 / SF 4202 - Modify building codes – new model residential energy codes

Dear Chair Nelson and Labor and Industry Committee members,

Below we list concerns with the language and ask for a sentence to be modified with our proposed language.

Concern 1 & 2: IECC adoption requirement without Minnesota cold climate protections & specifying 'site energy use'

Strike 3.14 - 3.15: Requirements ~~must be adopted such that electricity-only and mixed-fuel buildings attain the same site energy use intensity~~.

On line 3.14 – 3.15 insert: Requirements must not be adopted that effectively preclude electric or mixed-fuel use in residential buildings or for residential heating.

Legislation should ensure Minnesotan's have access to efficient, affordable, and reliable heating, especially during the coldest temperatures.

IECC is adopted on a national level and could ignore Minnesota's unique climate needs by banning critically important heating systems that Minnesotans depend on to heat their homes.

- The IECC 2024 process included an amendment to require full electrification of residential new construction which would have prevented natural gas furnaces. (See IECC 2024 Amendment: Residential Decarbonization [R202] – REPI-017-21)

Specifying 'site energy use' favors electricity by ignoring the efficiency losses before the energy reaches the site (i.e., the home). The 'site-to-source' energy accounting method (total system energy) is federally recognized by the DOE, EPA, and used in Energy Star's Portfolio Manager.

- MN Air Source Heat Pump (ASHP) Collaborative recommends using an ASHP until 15-25F and then switching to a secondary, or back-up heat source. This is because an ASHP's efficiency and capacity decrease with decreasing temperature, such that the ASHP alone is no longer able to meet the full heating load of the home, requiring a back-up heating system.
- The back-up heating options: an inefficient and expensive electric resistance system with a site energy efficiency of 100% but a source energy efficiency of ~33%, or a gas furnace with a site energy efficiency of 90+% and a source energy efficiency of ~85%.
- The 'G21 Report' from Minnesota based Center for Energy & Environment (CEE) and Great Plains Institute concluded the most cost effective and resilient system for Minnesota homes is hybrid heating: an ASHP paired with a natural gas furnace.

Ensuring hybrid heating provides residents with:

- Lower utility bill cost
    - Heating with natural gas consistently provides the least cost option for home heating.
    - Hybrid gas/electric heating provides flexibility for homeowners to protect against cost fluctuations over-time.
- Greater resiliency and comfort
    - Hybrid heating systems ensure home heating is available in the coldest weather and help manage potential power outages.
    - Gas systems are more reliable at maintaining healthy and comfortable temperature in cold weather.

Sincerely,
Jamie Fitzke
Director of Government Affairs, CenterPoint Energy

HF 4242 (Kraft) State Building Code; residential energy code adoption standards and timelines modified, residential energy rating rebate program created, reports required, and money appropriated.

I am submitting testimony in favor of HF 4242 to modify residential energy code adoption standards and create better access to energy rating services across Minnesota. *I especially want to underscore the need to adopt a new code revision cycle to occur every 3 years and set a finite energy reduction goal.*

I am a small business owner, multi-family property owner, developer and construction manager based in the Twin Cities. Our projects set out to obtain above code levels of energy performance due to the advantages these buildings provide us competing in the marketplace for rent and for sale. The rapid development of materials and equipment well suited for our cold climate zone over the last 10 years has been a game changer for what is financially viable and operationally proven.

It is important for our building codes to be more responsive to changes and keep pace with efficiency standards enjoyed by residential building occupants in other states. Currently, the state of Minnesota's 6 year revision cycle has left us behind, as the code in place was based on the 2012 IECC model code, adopted and put in force in 2015. The next code currently working through the state review process will not come on line until *January 2026*! All that innovation is largely on the sidelines because consumers do not know they can ask for it and the codes have not kept pace to put it in play.

One of the major challenges in getting better housing outcomes is the lack of innovation and training within the residential construction industry to adopt better methods and strategies. *As a developer and owner working achieve higher energy performance, I have been dismayed by the widespread lack of knowledge and willingness to do something different when interviewing and getting bids*. With that breeds a lot of conflicting information, especially around the idea that high performance costs too much.

For example, I recently toured a new building under construction which had both an Energy Recovery Ventilator (for recapturing energy while exchanging fresh air) and bathroom exhaust fans (which exhausts air without recovering heat) in the same structure. If you install two pieces of equipment that do similar things, the costs will obviously go up, largely because the designers and contractors did not know how the ERV could do the job by itself (and save way more energy if not undercut by the bath fans). That's a knowledge and implementation gap, not a cost driven problem.

When I meet engineers and builders with concerns about cost in higher performance buildings, they are usually stuck in this conundrum – only ADDING things and never re-balancing the strategies as a whole. For instance, a building constructed with a calibrated amount of increased insulation should result in the heating and cooling system sizing being reduced as a cost tradeoff. If there is not an energy model or heating calculations being done to figure out by how much, very often the HVAC systems put in are oversized needlessly just 'to be safe'. This sort of intellectual laziness should not be conflated with 'all higher performance buildings cost more.' Through energy modeling done on our projects, smart energy conservation measures, better air tightness and systems balancing can get a **housing unit to achieve 50-70% better than the 2006 IECC model code base line cited in the bill. Today, with off the shelf materials**.

Not only that, but we can take advantage of local utility and federal incentives to help us get there. While there are lots of ways to spend money wastefully in constructing a residential building, it need not always be that way. 14 more years (to 2038) of incremental improvements toward the ultimate energy goal reductions should be plenty of time for the industry to make adjustments to reach these goals.
An every 3 year check in to make sure we are on track isn't too much to ask.

Jim Kumon

Michael Morehead
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March 17, 2024

Minnesota House of Representatives
House Committee on Labor and Industry, Finance and Policy

Via electronic delivery c/o travis.reese@house.mn.gov

Dear House Committee Members:

I wish to offer my comments as to HF 4242 that you are scheduled to hear on 3-19-24. If time permits, I'd also like to testify. My wife and I built a net positive energy home that we call the Afton Passive House. It is PHIUS certified. The house is about 4200 sq. ft. and the adjacent hobby barn is about 2000 sq. ft. We have lived on the property for about six years. Since 2019, after solar panels were added, we produce more net energy that we use. We are not builders but are merely people with a long-time interest in the environment. We are advocates for energy efficient homes. Our home had been visited by architects, builders, building science students, legislators and people seeking information on energy efficient homebuilding.

I have followed with great interest efforts to improve the energy efficiency on new homes in Minnesota via higher standards in our residential building codes. The opposing sides are clearly identified. Based on my experience and research I offer the following comments:

1. Massachusetts is the hands down leader in energy efficient residential housing. Much can be learned by reviewing the rules of this cold climate state. Massachusetts has three residential building codes. A base code based on the 2021 IECC with amendments, a stretch code which sets higher efficiency standards, and a Specialized Code that requires significant energy efficiency approaching Net Zero. All cities in Massachusetts have the option of selecting a code. About 50 cities still use the base code. An estimated 272 cities, representing about 90% of the population, use the stretch code. As of December 2023, 29 cities have opted for the Specialized Code.

   Massachusetts' shift to stricter codes started as early as 2009. Organized homebuilders and others strongly opposed the new code system. Despite opposition the code changes became law years ago and the builders learned to adapt. Effective 1-1-23 the HERS ratings for stretch code new homes without solar is 52. Effective 7-1-23, three months from now, the mandated HERS rating for the same home will be 42. The DOER website states some stretch code homes can be built at a lower cost than base code homes. Massachusetts has set significant goals to reduce green house gases and energy use by 2030. I strongly suggest the committee study the Massachusetts model.

2. New York State, another cold climate state, has a voluntary stretch code. Similar to Massachusetts stretch code, it can be adopted by cities. The stretch code is estimated to save more than 19% of a homes energy costs based on 2020 estimates. An average home will save $348 in energy costs annually. Added constructions cost will be an estimated $2,057. Payback on investment will take about 5.9 years. Information about New York stretch codes is readily available on the web.
3. Minnesota needs to give local governments the ability to choose the building code they want in their jurisdiction. In essence cities already have some ability to choose. They can adopt the current code, thereby requiring enforcement, or choose to not adopt it, thus requiring little or limited enforcement. In recent years a number of Minnesota cities have supposedly expressed interest in having local building codes. By my count, cities representing perhaps as much as 30% of Minnesota's population have expressed interest in local building codes. These proposals resulted in vehement opposition from organized home builder organizations. They envisioned many different building codes scattered throughout Minnesota. They argued, rightfully so, that it would be too confusing for builders. I believe the Massachusetts model would work in Minnesota. Retain our base code, create a stretch code, and also create a specialized code. Essentially cities would have options for four codes: no code, base code, stretch code, and specialized code. All of these codes come with standards that can be met by the homebuilding industry, as proven by the Massachusetts experience. Cities would be limited to choosing only one code, something builders could easily understand.
4. The fact that nearly all of outstate Minnesota has not adopted the Uniform Building Code is a problem. Minnesota has a Climate Action Framework that includes the express need for more energy efficient buildings. The delays in advancing energy efficient building codes, as is happening with the matter before you, flies in the face of the Climate Action Framework. The failure of outstate communities to even adopt the basic code makes matters even worse. Excess greenhouse gases produced in outstate areas will blow throughout our region. Most of outstate Minnesota lacks the tools needed to adopt stricter codes. Their building inspectors either don't exist or lack training. RESNET evaluators are largely unavailable in many parts of Minnesota. Minnesota can fix these problems. Use a combination of funding and rule changes to get rural Minnesota what it so badly needs.
5. Lastly, Minnesota needs to educate home buyers. For many years, Spring and Fall, I have visited Parade of Homes model homes, especially 'Green Path Homes'. Most of the sales persons in the model homes know little to nothing about energy saving construction. Some homes have a sign with the stated HERS rating and ACH rating, but few sales people truly understand what those ratings mean. Worse yet, very few new home buyers have even the foggiest idea of questions they should be asking or upgrades they should consider. A current question they should be asking is whether the home is set up for EV charging. Adding EV charging ability after a home is built can be very costly compared to doing it new. I propose a <u>voluntary consumer orientated building code.</u> A consumer could use it to tell a builder what they want. If it was a standardized code a builder should be able to understand it. As an option, I would go so far as to require builders to provide potential buyers with information about the wide variety of energy savings options that could be built into a new home.

SUMMARY

Good laws are frequently imitated. Massachusetts and New York State have good laws that should at least be reviewed. If those who are opposed to the current bill, HF 4242, succeed in blocking it, perhaps next session a bill mimicking those states' laws should be considered.

Minnesota has a problem with rural versus metro building goals. Most of rural Minnesota lacks the ability to facilitate advanced energy saving building goals. The legislature should strive to bring rural Minnesota to an equal footing with the metro area. This will likely involve funding and rule/law changes.

Prospective new home buyers desperately need better information about new home energy efficiency. Somehow a comprehensive information packet for new home buyers needs to be developed. Once developed, I think new home sellers should be mandated to disclose it.

Minnesota needs a more energy efficient home building code. The proposed legislation before you is a start towards a better code. I ask that it be passed without amendments that would detract from its original intent.

Anyone interested in further discussing the comments in this letter are welcome to call me at 651 968-9650 or e-mail me at bmorehead7@gmail.com.

Sincerely,

Michael Morehead

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March 18, 2024

Labor and Industry Finance and Policy
10 State Office Building
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Re: MEEA's comments on the Importance of Adopting Strong Energy Codes for Minnesota's Future

Dear Chairman Nelson and Members of the Labor and Industry Finance and Policy Committee,

Thank you for the opportunity to provide comments on the proposed modifications to the state building code, particularly regarding the adoption of residential energy code standards and the establishment of programs that support the implementation of these codes. The Midwest Energy Efficiency Alliance (MEEA) is a member-based, non-profit organization promoting energy efficiency to optimize energy generation, reduce consumption, create jobs and decrease carbon emissions in all Midwest communities. MEEA works to support states and municipalities across our 13-state region to develop building energy policies and implement codes programs and trainings. We have worked in Minesota and other states to provide technical assistance and education on energy efficient building policies since 2009.

Minnesota is lagging behind in its adoption of updated energy codes, currently at a weakened version of the 2012 IECC, a code that is over twelve years old. It is imperative for Minnesota to adopt and maintain robust energy codes to ensure that its homes are safe, efficient and affordable for residents. MEEA supports adopting each newly published edition of the International Energy Conservation Code (IECC) or a more efficient standard for residential buildings.

1. Strong energy codes are the most cost-effective way to ensure lower utility bills.

Strong energy codes are the most cost-effective way to ensure lower utility bills for homeowners. By reducing energy consumption through efficient building practices, residents can enjoy significant savings on their monthly energy expenses. The adoption of updated energy codes, such as the latest published edition of the IECC, presents an opportunity for Minnesota to enhance affordability and promote long-term financial stability for homeowners. Adopting each new published edition presents a cost-effective way to reduce the energy consumption of homes in Minnesota and save residents money. In fact, the International Code Council (ICC) assesses cost-effectiveness whenever it updates each model energy code, and each development is intended to be a steady, incremental change for the building industry. Skipping code cycles means increasing first-time construction costs for builders when the codes are finally brought up to date on current building practices and standards.

2. Stronger building energy codes affect the lifetime of a building – not just its initial construction.

The life of a building does not end as soon as it has been constructed. A builder touches a home one time – families live in a home for years, and those families deserve a safe, efficient, cost-effective building in which to live. It is essential to recognize that the impact of energy codes extends beyond the initial construction phase of a building. Building owners and occupants bear

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the long-term consequences of inefficient homes, including higher energy bills and increased maintenance costs. Alternatively, homeowners see long-term savings and safety improvements when homes are built to adequate energy standards. By prioritizing energy efficiency in building codes, Minnesota can ensure that homes are built to high performance standards, providing lasting benefits to residents and contributing to a sustainable built environment.

3. Updated codes improve construction quality and provide opportunities for designers and builders to utilize current techniques and technologies.

Like all industries, building construction techniques and technologies are updated over time. Newer building energy codes leverage the latest building science and technology while also providing various building professionals with valuable educational opportunities to learn and utilize these new techniques and technologies. By adopting and implementing the most up-to-date editions of the IECC, the state will see increased economic development and technical innovation within the construction industry, enhancing the skills and competitiveness of the Minnesota workforce. The state should continue regular updates to minimize the chance of an undertrained workforce and an out-of-date building stock that wastes energy and money.

4. There are utility programs and assistance available to offer code compliance support.

With federal funding dollars and a statewide utility-funded energy code compliance program, education and technical assistance are about to be at an all-time high for construction trades in Minnesota. Municipalities and stakeholders can leverage these utility programs and assistance to facilitate code compliance and implementation. These resources, including educative materials, incentives and plan review assistance, play a vital role in supporting designers and builders as they navigate energy code requirements. MEEA utilizes federal resources to also provide support, including analysis of energy savings and cost impacts associated with code adoption, comparative analysis of future code options, customized educational materials, web-based or in-person training programs, and compliance resources and software tools (like COMcheck and REScheck). Collaboration between utilities, local jurisdictions and state agencies can strengthen compliance efforts and promote the widespread adoption of energy-efficient practices.

5. Stronger residential energy codes will bring Minnesota closer to its energy savings and climate goals.

Stronger residential energy codes are instrumental in advancing Minnesota's climate and sustainability objectives. The adoption of energy-efficient building practices aligns with initiatives such as Minnesota's Climate Action Framework, in which Improving energy efficiency in buildings and industrial processes is a top priority.[1] Section 4.2 of the Climate Action Framework states that in order to maintain clean energy and efficient buildings, Minnesota "must update building codes and construction standards to mandate net-zero energy construction," recognizing that incorporating energy efficiency in new buildings is much less expensive than retrofitting existing structures.

Reducing energy consumption in residential buildings would help make significant progress towards Minnesota's climate goals. The Minnesota commercial energy code is implementing a standard to meet 80 percent reduction in annual net energy consumption or greater by 2036, as

[1] Climate Action Framework | Our Minnesota Climate (state.mn.us)

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compared to a 2004 model code baseline.[2] If the residential energy code aligned with the commercial code to achieve the same 80 percent reduction rate by 2038, it would ensure that all Minnesota buildings are operating as efficiently as possible. These measures would align with the Department of Labor and Industry's goal of "conducting a rulemaking process to adopt the most current building codes for commercial and large multi-family residential dwellings, which will improve the energy efficiency of these buildings."[3]

In conclusion, Minnesota should prioritize systematic updates of strong energy codes for Minnesota's residential buildings. By embracing energy efficiency as a cornerstone of its building practices, Minnesota can enhance affordability, promote workforce development and accelerate progress towards the state's climate and sustainability goals.

If you have any questions about these comments, noted reports and references or general impact and analysis of building energy codes, please contact Isabella Gross, MEEA's Building Codes & Policy Associate, at igross@mwalliance.org. Thank you for your consideration.

Sincerely,

Paige Knutsen

Paige Knutsen, Executive Director

[2] SF 3035A Conference Committee Report - 93rd Legislature (2023 - 2024) (mn.gov)

[3] Minnesota's Climate Action Framework (state.mn.us)

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Washington, DC 20036

Committee:	**Labor and Industry Finance and Policy Committee**
Testimony on:	**HF 4242, "State Building Code; residential energy code adoption standards and timelines modified, residential energy rating rebate program created, reports required, and money appropriated."**
Position:	**Support**
Hearing Date:	**March 19, 2024**

RMI is a nonpartisan, nonprofit organization working to transform global energy systems and secure a clean, prosperous, zero-carbon future for all. RMI supports HF 4242 with the sponsor's amendments, as it would support energy-efficient, safe, healthy homes for all Minnesotans in alignment with the state's climate goals.

Parties with an interest in this bill's companion in the Senate have submitted testimony that includes misleading statements about the bill's possible impact, especially the impact of the provision "Requirements must be adopted such that electricity-only and mixed-fuel buildings attain the same site energy use intensity [EUI]" ("same-site-EUI provision"). This testimony aims to clarify pertinent facts regarding Minnesota energy codes, the International Energy Conservation Code (IECC), and related topics.

In summary: HF 4242 would require high efficiency without precluding the use of gas in buildings.

Specifically:

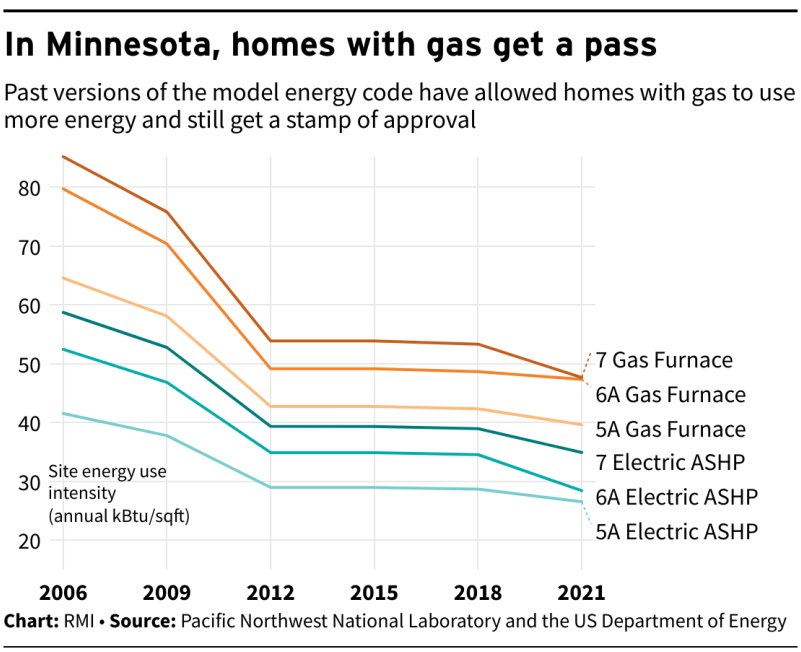
1. The same-site-EUI provision would not prohibit mixed-fuel new residential construction.
2. The same-site-EUI provision would level the playing field and correct past codes' bias favoring less efficient appliances.
3. The model code used as a starting point for Minnesota energy code, the IECC, includes 15 climate zones across the lower 48 states, including three climate zones in Minnesota alone, and provides appropriately tailored recommendations for each climate zone.
4. No edition IECC includes mandatory provisions to prohibit mixed-fuel new residential construction, including the draft 2024 IECC.
5. The Department of Labor and Industry (DLI) would have a large amount of flexibility in developing code provisions that would meet both the target to reduce net energy use by 80% compared to the 2006 IECC ("80% target") and the same-site-EUI provision.
6. Other states, such as Maryland, New Jersey, Oregon, Washington, New York, and Illinois, have statutes that require minimum energy code performance improvements over time.
7. Other states, including Washington and California, have adopted energy codes that result in the same performance across electric and mixed-fuel new residential construction.

8. In homes built to modern energy codes, cold-climate air source heat pump technology provides excellent heating to extremely low temperatures with minimal or no need for backup heat.
9. In the Center for Energy and Environment and Great Plains Institute co-authored report referenced in other parties' testimony, the least-cost scenario entails all-electric new construction.

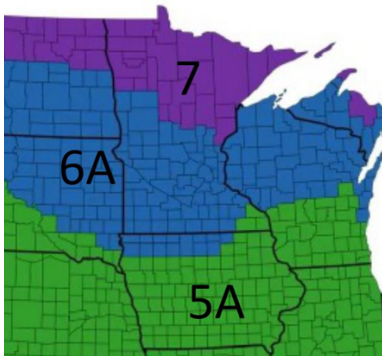
Details follow on the above claims.

Points 1-3: What the same-site-EUI provision would and would not do; what modeled site EUI from past codes can tell us about fuel type bias and climate zone appropriateness

The bill language plainly does not prohibit any appliance type. It instead requires that the same level of efficiency be met through energy code compliance for all homes regardless of fuel type. Historically, the Minnesota energy code and the model code (IECC) have resulted in differing performance across fuel types, reflecting the differing efficiency of oil, propane, natural gas, electric resistance, and electric heat pump appliances that meet federal minimum efficiency standards. Specifically, the US Department of Energy's models of home performance under varying IECC editions show the following different site EUI outcomes for electric air source heat pump (ASHP)-heated and gas-heated homes with heated basements in Minnesota climate zones (5A, 6A, and 7):



Minnesota IECC climate zone map:



As shown here, a home using an electric ASHP uses significantly less energy than an otherwise similar home using a gas furnace under all historical model energy codes in all Minnesota climate zones. In other words, energy codes of the past have set unequal standards for energy efficiency for homes depending on what type of appliances they use. ***For example, in climate zone 6A, covering most of southern Minnesota including the Twin Cities metro area, gas furnace homes have not yet caught up to heat pump homes' efficiency from the 2009 model code.*** For greater fairness and an even playing field, Minnesota's next energy code should instead reward all energy efficiency measures in proportion to their effectiveness.

On the Minnesota climate: Other parties' testimony has also alleged that "IECC is adopted on a national level and could ignore Minnesota's unique climate needs." Different climate zones have different

modeled site EUI outcomes across every version of the IECC. This reflects the IECC's differing requirements and US DOE's context-sensitive modeling of outcomes in varying climates. While DLI retains authority to amend the IECC to address any Minnesota-specific energy needs, the IECC provides a well-considered starting point for continuously advancing energy code provisions.

No edition of the International Energy Conservation Code (IECC) includes mandatory provisions to prohibit mixed-fuel new residential construction, including the draft 2024 IECC.

The draft 2024 IECC's primary text does not include any provisions that would prohibit gas connections to homes, nor any provisions related to promoting electric heat or discouraging gas heat in homes. It includes provisions that would make it easier for homeowners to install electric water heaters, dryers, and ranges in homes that currently use gas for those appliances. While provisions encouraging further building electrification have been included in optional appendices, HF 4242 would in no way require their adoption.

The Department of Labor and Industry (DLI) would have a large amount of flexibility in developing code provisions that would meet both the 80% target and the same-site-EUI provision.

DLI and the volunteer technical advisory groups that assist in code development have ample expertise to implement this bill's provisions into enforceable code language. While they could choose between many options to do so, one option would be to allow builders to choose from a long menu of "credits" to reach the performance required by code. The draft 2024 IECC for homes uses this option, and includes diverse credits, including renewable energy credits. Because this bill requires a reduction in annual net energy use, these credits could be designed so that builders may, but would not be required to, use renewable energy credits to meet part of the code's efficiency requirements.

Other states, such as Maryland, Oregon, Washington, New York, and Illinois, have statutes that require minimum energy code performance improvements over time.

Some states, such as Maryland, require that the latest edition of the IECC be adopted without weakening the code, ensuring that as the IECC continues to improve its efficiency level, those states will have progressively more efficient new homes as well. Some states have taken additional steps to bolster efficiency improvements. For example, Illinois law requires the development of a higher efficiency stretch code, which localities may optionally adopt to enforce instead of the statewide code, and sets out site energy index requirements for each successive version of the stretch code in statute. New York requires that its energy code council "shall use its best efforts to adopt provisions for residential buildings that achieve energy savings greater than energy savings achieved by the then most recently published International Energy Conservation Code."

Other states, including Washington and California, have adopted energy codes that result in the same performance across electric and mixed-fuel new residential construction.

The State of Washington's energy code requires that builders incorporate additional efficiency measures into buildings that do not include heat pumps so that their performance matches buildings that use heat pumps.

California's Title 24 energy code requires that builders not including heat pumps perform energy modeling to demonstrate that their building will perform as well as a building with heat pumps.

RMI is developing a code that will take a simplified approach to efficiency on a level playing field, compared to the approaches used by Washington and California.

In homes built to modern energy codes, cold-climate air source heat pump technology provides excellent heating to extremely low temperatures with minimal or no need for backup heat.
AND: In the Center for Energy and Environment and Great Plains Institute co-authored report referenced in other parties' testimony, the least-cost scenario entails all-electric new construction.

Certain other parties' testimony cites reports on building energy use in Minnesota out of context to make misleading arguments that conflate new construction and existing homes. It is far simpler and more cost-effective to build an efficient electric home from the start than it is to retrofit an existing home to rely solely on electricity. In fact, both sources they cite support efficient electric new construction as one viable pathway toward high-performance homes:

- The Minnesota Air Source Heat Pump Collaborative states that "Very energy efficient homes are the best candidates for all-electric systems. These homes need little heat to stay comfortable, which makes it much more viable for most or all heating needs to come from a heat pump." Homes built to up-to-date codes are far more efficient than the average existing home and are excellent candidates for heat pumps.
- The cited report co-authored by the Center for Energy and Environment and the Great Plains Institute describes three scenarios prioritized for study by a diverse working group: a high-electrification scenario, a hybrid scenario, and a high-decarbonized-gas scenario. The hybrid scenario touted by other parties' testimony as least-cost adopts hybrid heat approaches for existing buildings only. In both the high-electrification scenario *and the hybrid scenario,* new construction is modeled to be all-electric.
- This report also models commodity cost changes in each scenario and demonstrates the stark possibility of out-of-control gas prices in a high-gas-utilization future. In the high-decarbonized-gas scenario, gas commodity prices are estimated to be seven times higher than present-day prices. By contrast, in the high-electrification scenario, electricity prices are only two times higher than present-day prices. Continuing to rely on energy codes that unfairly advantage gas could have dire long-term consequences for Minnesota families.

Appendix

Chart data:

US DOE Modeled Home Site Energy Use Intensity Per Conditioned Square Foot (annual kBtu/ft^2) for Varying Heating Fuel Types and IECC Editions in Minnesota Climate Zones

Climate Zone	Climate Zone 5A (Southeast)		Climate Zone 6A (Central)		Climate Zone 7 (North)	
Fuel type > IECC Edition v	Electric ASHP	Gas	Electric ASHP	Gas	Electric ASHP	Gas
2006	41.53	64.56	52.43	79.71	58.71	85.18
2009	37.77	58.07	46.82	70.36	52.76	75.78
2012	28.96	42.74	34.88	49.15	39.35	53.86
2015	28.95	42.73	34.87	49.13	39.33	53.85
2018	28.67	42.34	34.54	48.65	38.96	53.32
2021	26.52	39.62	28.41	47.34	34.90	47.65

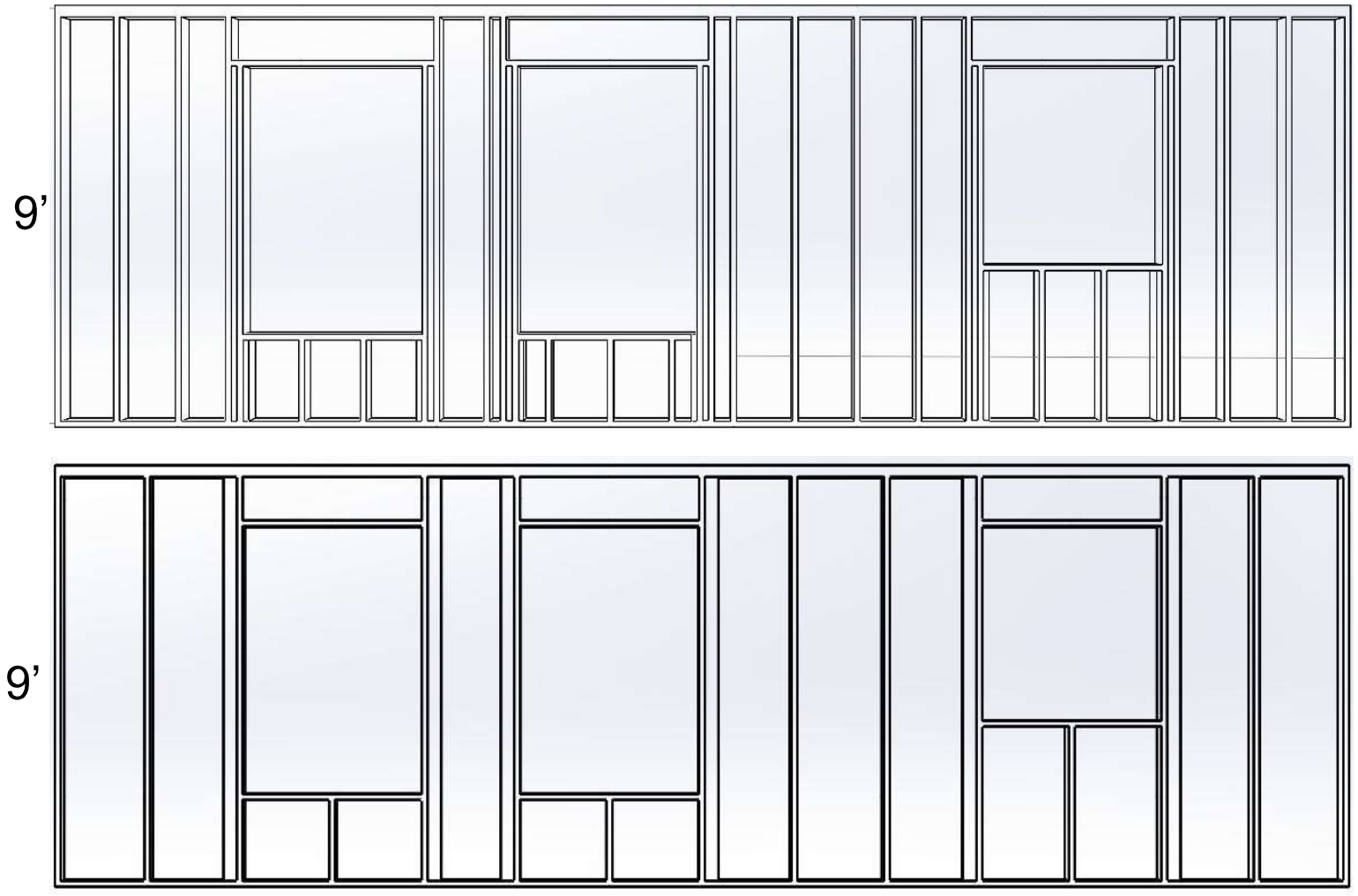
High Efficiency Can Cost the Same as Traditional Wall

Many efficiency measures also save costs–they are not always more expensive and many have great ROI.

Code Traditional Wall: developed in 1830-1850 not well suited for modern homes.

Advanced 2x10 framed wall: Well suited for modern homes and construction.

~10% more board ft of materials
~30% less parts to assemble.
Saves labor to offset material increase. Good for labor shortage as well.
~ R34-R38 Cavity Insulation - R25-27 Effective R VAlue



Sam Friesen - 3/18/2024

Talking points & Education HF 4242 for Residential House Building Code Improvement:

1. Minnesota is **currently** using the **2012 Minnesota Residential Building Code**. This is a modified version of ***2009 IECC***. We are currently using ***technology*** that is well over a decade old. This "***current code***" is supposed to be used statewide but it is neither adopted nor enforced in most out-state areas due to the lack of critical resources.

2. **Improvements that could be made to the "Envelope" (*outside of the house*):**

a. Continuous outside insulation- (*Most important improvement needed*)

b. Add a rain screen under the siding to prevent moisture problems

c. **Using Energy Heel Trusses creates more room for insulation to prevent heating or cooling losses.**

d. **Increase Insulation in the attic** (*42"of blown in insulation*)

e. **Increase Insulation under the basement slab** (*12" Geo Foam total*)

f. **Place most of the windows on the south side of the house to take advantage of solar gain. Pay attention to the angle of the sun and the amount of roof overhang so as to not block the sun in the winter or keep the sun from heating the house in the summer.**

g. **Require windows that have a U Factor of at least 0.19**
***(Many double-hung windows leak & do not meet this standard*)**

h. **Improve window & door bucks to prevent thermal bridging** (*heat or cooling loss*)

i. Rent a Flir Camera to find leaks in the house. Seal the leaks before having the final Blower Door Test done.

3. Tight houses need an Air Exchange System to breath and prevent mold.

4. Evaluate the latest Heat Pump Technology for use with current multi-fuel technology.

Disclosure: Most of the above mentioned examples do add some costs to the building of a house. However, they add much to the amount of energy savings associated with heating, cooling and comfort.

Talking Points & Education-HF4242 for Residential House Building Code Improvement:

Minnesota is currently using the **2012 Minnesota Residential Building Code** that is a modified version of the ***2009 IECC***.

We are currently using ***technology that is well over a decade old***.

This "***current code***" is supposed to be used **statewide** but is **neither adopted** nor ***enforced*** *in most out-state areas due to the lack of critical resources.*

Improvements that could be made to the "Envelope" *(outside of the house)*:

1. Continuous Outside Insulation *Most important improvement needed*

2. Rain screen under the siding to prevent moisture problems

3. Using **Energy Heel Trusses** creates more room for insulation to prevent heating or cooling losses.

4. **Increase Insulation in the attic** (*42”of blown in insulation*)

5. Increase Insulation under the basement slab (*12”Geo Foam total*)

6. **Place most of the windows on the south side of the house to take advantage of solar gain. Pay attention to the angle of the sun and the amount of roof overhang so as to not block the sun in the winter or keep the sun from heating the house in the summer.**

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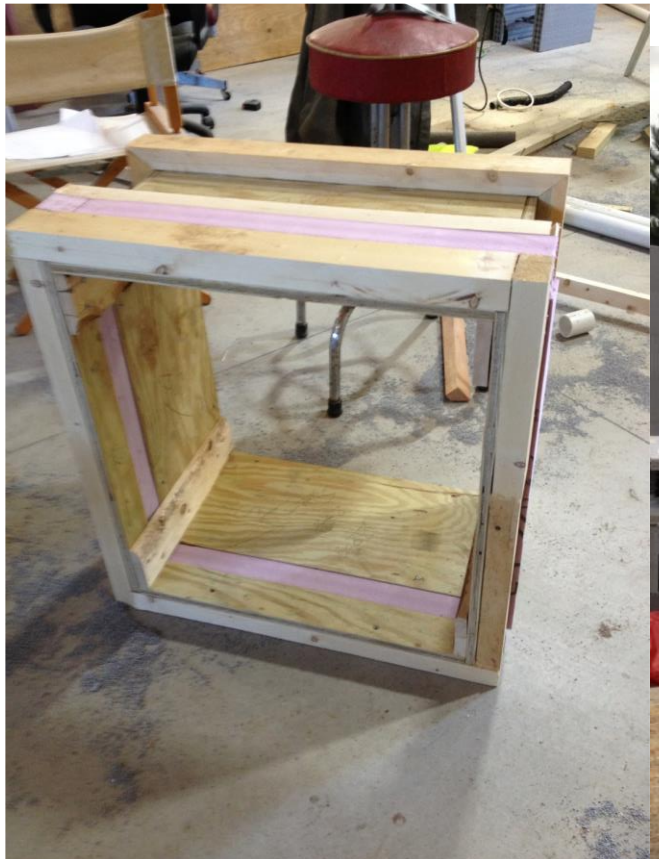

9. Rent a Flir Camera to find leaks in the house. Caulk the leaks before having the final Blower Door Test done.

10. Tight houses need an Air Exchange System to breath & prevent mold.

11. Evaluate the latest heat pump technology for use with current multi-fuel technology.

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