Temporary Commissioner Nicole Blissenbach
Minnesota Department of Labor and Industry
443 Lafayette Road N.
St. Paul, MN 55155

Administrative Law Judge Eric L. Lipman
State of Minnesota Office of Administrative Hearings
600 North Robert Street
P.O. Box 64620
St. Paul, MN 55164

Date: September 12, 2022

From: AIA Minnesota, Fresh Energy, Green New Deal Homes SBC, Twin Cities Habitat for Humanity

Re: OAH Docket # 8-9001-38469
Possible Amendments to Rules Governing the Minnesota Residential Energy Code, Minnesota Rules, Chapter 1322

Judge Lipman and Commissioner Blissenbach:

Thank you for the opportunity to comment on Possible Amendments to Rules Governing the Minnesota Residential Energy Code. There is sufficient evidence and support for the ALJ to recommend that the Department of Labor and Industry (DLI) open the rulemaking process of the Residential Energy Code, beginning with the 2021 International Energy Conservation Code (IECC).

Among the reasons to open this rulemaking process: the cost and energy savings for consumers, the statutory requirement, the societal cost of inefficient homes, the public health cost of inefficient homes, and the greenhouse gas emissions related to inefficient homes.

DOE Confirms Both Cost and Energy Savings if Minnesota Adopts 2021 IECC
On July 28, 2021, the U.S. DOE issued an affirmative determination concerning the residential provisions of the 2021 IECC. The U.S. DOE, with Pacific Northwest National Laboratory (PNNL), concluded that the 2021 IECC residential provisions will provide statewide energy savings of

9.1% across all climate zones compared with current state energy code.[1] PNNL also found cost savings for consumers equaling $231 in energy savings in the first year. Even factoring in possible added construction costs reflected in a mortgage, consumers can expect a net savings of $76 in the first year.

Consumer Impact

Metric	Compared to the 2015 IECC with amendments
Life-cycle cost savings of the 2021 IECC	$2,772
Net annual consumer cash flow in year 1 of the 2021 IECC[2]	$76
Annual (first year) energy cost savings of the 2021 IECC ($)[3]	$231
Annual (first year) energy cost savings of the 2021 IECC (%)[4]	9.1%

Source: PNNL[2]

Updating Minnesota residential codes based on the 2021 IECC model code will save consumers energy and energy costs, ensure healthier and more comfortable indoor air, and protect low-income residents from avoidably high energy burdens.

Minnesota Statute Requires Regular Code Updates

As of 2015[3] Minnesota adopted a mandatory six-year code adoption cycle.

According to Minnesota Statutes, section 326B.106, subdivision 1, paragraph (c)

> *Beginning with the 2018 edition of the model building codes and every six years thereafter, the commissioner* ***shall review*** *the new model building codes and* ***adopt*** *the model codes as amended for use in Minnesota, within two years of the published edition date. The commissioner may adopt amendments to the building codes prior to the adoption of the new building codes to advance construction methods, technology, or materials, or, where necessary to protect the health, safety, and welfare of the public, or to improve the efficiency or the use of a building.* [Emphasis added]

The 2018 IECC is now almost five years old. To fulfill the state's legal obligation to regularly update the code, Minnesota must open the rulemaking for the 2021 IECC. February 2023 is approaching, and will mark 2 years since the publication date of the 2021 model.

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[1] Pacific Northwest National Laboratory, "Cost-Effectiveness of the 2021 IECC for Residential Buildings in Minnesota," July 2021, https://www.energycodes.gov/sites/default/files/2021-07/MinnesotaResidentialCostEffectiveness_2021_0.pdf

[2] The Consumer Impact table, copied directly from the report, should read "Compared to the 2012 IECC with amendments." The reference to 2015 was an error. Source: correspondence between Eric Fowler, Fresh Energy, and Victor R Salcido, PNNL, August 29, 2022.

[3] https://www.revisor.mn.gov/laws/2015/0/54/

Efficient Buildings are Affordable Buildings

Improving the efficiency of our housing stock is an investment in affordability. This is why Twin Cities Habitat for Humanity, whose core mission is sustainable, affordable homeownership, builds every new home to Energy Star 3.1 standards and is the largest builder of Energy Star homes in the state.[4]

First, efficient homes reduce energy bills enough to offset possible increased construction costs. This is the experience of Green New Deal Homes, Duluth. Working with the UMD Office of Sustainability, they found that a Zero Net Energy home (a beyond-code energy efficiency standard) would cost its residents **$2.31 less** to own and operate per month than a code-built home.[5]

As noted earlier, PNNL has already affirmed the cost effectiveness of the 2021 IECC. In their determination, PNNL calculates the incremental construction cost increase Minnesotans can expect moving from current code to the 2021 IECC, comparing these figures to energy savings.

Table 2. Consumer Cash Flow from Compliance with the 2021 IECC Compared to the 2012 IECC with amendments

	Cost/Benefit	5A	6A	7	State Average
A	Incremental down payment and other first costs	$361	$351	$556	$376
B	Annual energy savings (year one)	$220	$220	$376	$238
C	Annual mortgage increase	$125	$121	$192	$130
D	Net annual cost of mortgage interest deductions, mortgage insurance, and property taxes (year one)	$31	$30	$48	$32
E = [B-(C+D)]	Net annual cash flow savings (year one)	$65	$68	$136	$76
F = [A/E]	Years to positive savings, including up-front cost impacts	5	5	4	5

Note: Item D includes mortgage interest deductions, mortgage insurance, and property taxes for the first year. Deductions can partially or completely offset insurance and tax costs. As such, the "net" result appears relatively small or is sometimes even negative.

[4] https://www.tchabitat.org/what-we-do

[5] "How Much (Better)?" Green New Deal Homes, https://www.greennewdealhomes.com/how-much-better

In every climate zone, the energy savings is greater, resulting in monthly savings for the consumer (Table 2).

Most Minnesota homeowners can expect space conditioning to make up the largest portion of their energy bills (see Figure 2, below). Much of this is wasted energy, due to underperforming building envelopes which do not sufficiently separate conditioned air from outdoor air. By increasing insulation and reducing air leakage, a key focus of the 2021 IECC, buildings can permanently lower energy costs for all future residents.

Figure 2 is based on a comparison of townhomes in Northfield, MN by the architecture firm Precipitate. Comparing standard construction with Passive House construction (another beyond-code energy efficiency standard), it illustrates how little energy a building needs for space heating when efficiency is prioritized. Both Passive House and 2021 IECC standards emphasize air sealing and insulation in building envelopes. While Passive House is a more stringent standard, the comparison illustrates the untapped potential of efficiency to reduce energy waste and costs.

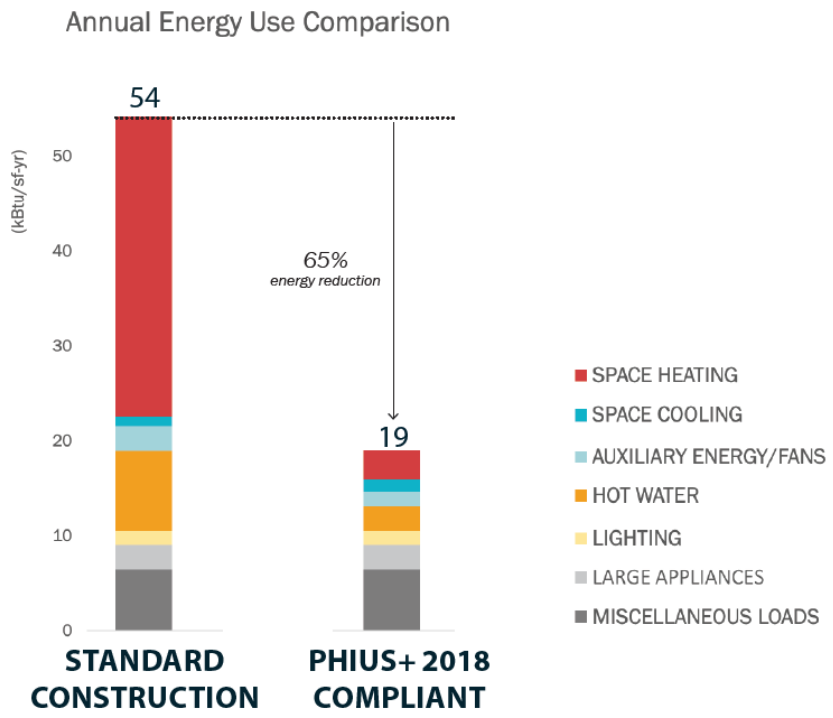
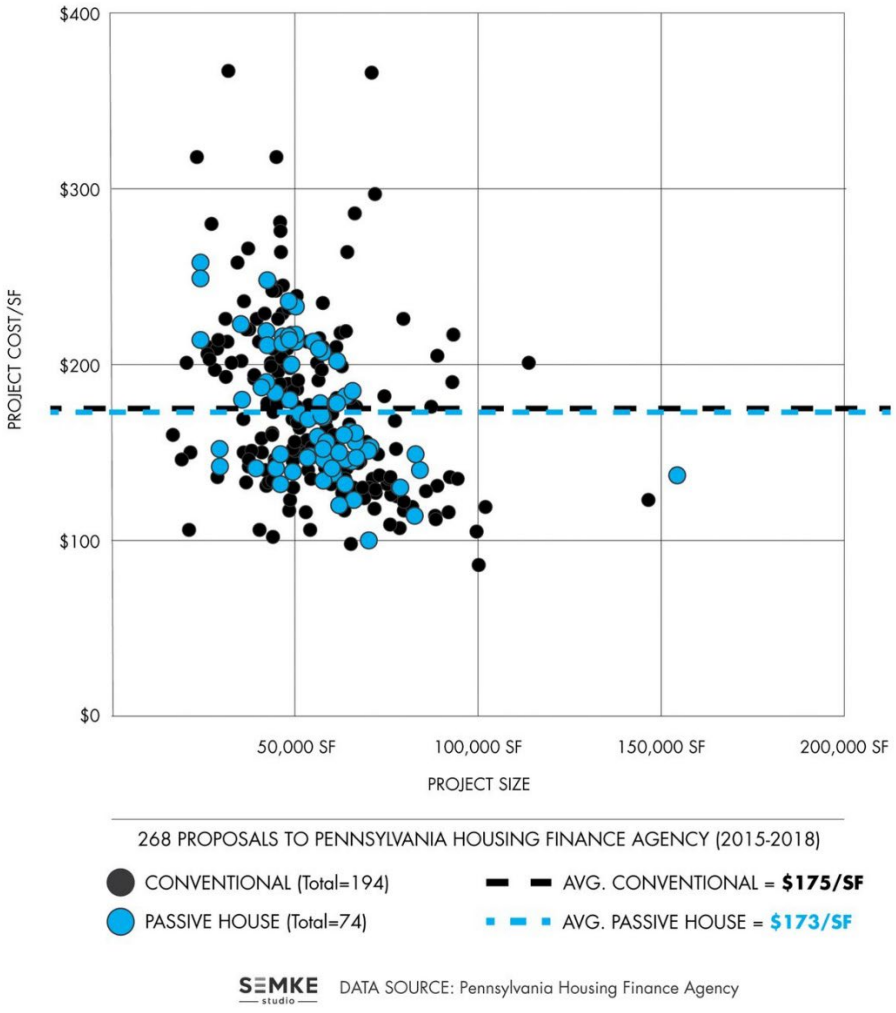


Figure 2 Annual energy use comparison for PHIUS+ 2018 compliant affordable townhomes within the Community Action Center of Northfield, MN and standard construction. Data and figure are courtesy of Precipitate.

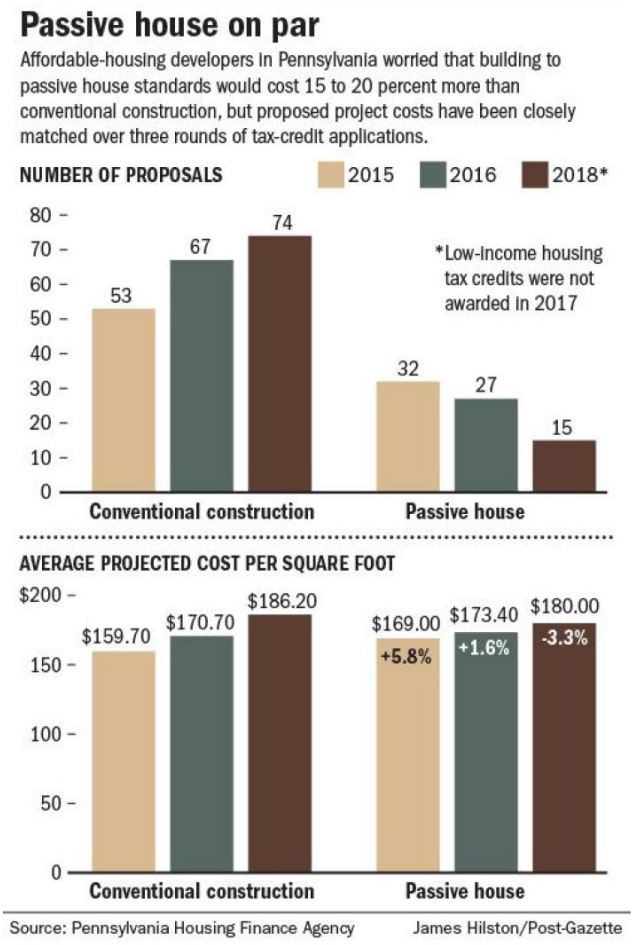
So far, this section has argued that even if construction costs are higher when efficiency standards are higher, the energy savings makes up for the difference. However, the assumption that more efficient buildings come at a higher cost is not a given.

Second, the construction industry can build high performing buildings at similar cost to current and previous code buildings. Builders following Passive House standards (which far exceed code requirements even in the IECC 2021 model code) have demonstrated this clearly in Pennsylvania. The Pennsylvania Housing Finance Agency (PHFA) encourages affordable housing developers to design their buildings to Passive House standards. Comparing 268 project proposals between 2015 and 2018, PHFA found that Passive House project budgets had a slightly **lower cost per square foot**, at $173 compared to $175 for the traditional construction.[6]



[6] "Low Income Housing Credit: A Sleeper PH Catalyst," Passive House Accelerator, https://passivehouseaccelerator.com/articles/low-income-housing-tax-credits-the-sleeper-passive-house-catalyst

Perhaps even more interesting is the improvement over time: Passive House projects went from 5.8% above conventional construction to 3.3% below.[7]



These examples make clear that high performing buildings are not inevitably more expensive, and that the construction industry can learn to increase the efficiency of project budgets over time when held to a high standard.

Inefficient Homes Cost All Taxpayers

It is far more cost-effective to build efficient buildings during initial construction than it is to weatherize and retrofit them in the future. When they are inefficient, buildings become expensive to residents as well as to society. Our State and Federal governments invest significant resources in weatherization, retrofits, and energy bill assistance. Improving the efficiency of our codes is a cost-effective way to reduce these future expenses.

[7] "How a Pa. affordable housing agency is making ultra-efficient buildings mainstream," Pittsburgh Post-Gazette, https://www.post-gazette.com/business/development/2018/12/31/pa-affordable-housing-tax-credits-pennsylvania-housing-finance-agency-passive-house-design/stories/201812190012

The Minnesota Department of Commerce administers the Low-Income Heating Assistance and Weatherization Assistance Program, which served 285,000 Minnesotans with a budget of $127 million in FY 2020.[8]

While significant, these investments do not come close to meeting the need for weatherization. In 2019, the Department of Commerce estimated that at funding levels at the time, it would take 291 years to serve all income-eligible households.[9]

Additional costs are borne by public health systems, and the state and federal taxpayers bearing the burden of illness and death from excess air pollution exacerbated by unnecessarily inefficient buildings. These health impacts are discussed further in the next section.

Minnesotans cannot afford to expand the stock of inefficient homes by holding efficiency standards intentionally below nationally recognized best practices. These best practices are codified in the IECC by a deliberative, consensus-based process involving experts in construction, HVAC technology, code enforcement, and more. To delay adoption of these provisions any further would represent a failed commitment to residents and homebuyers, and an unnecessary liability to taxpayers across our state and country.

Efficient Homes are Healthier Homes

Adopting the residential provisions of the 2021 IECC will have important benefits to Minnesotans' health, comfort, and wellbeing. The improved energy efficiency and higher standards for ventilation lead to healthier indoor air quality for all residents.

Fossil-fired appliances in homes are responsible for significant harms to air quality. In fact, gas appliances can lead to indoor pollution levels "that would be illegal outdoors," where air quality standards are established.[10] Evidence of the harms and costs of indoor and outdoor air pollution continues to grow.[11]

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[8] Commerce Department, 2022-23 Biennial Budget, November 2020, State of Minnesota, https://mn.gov/mmb-stat/documents/budget/2022-23-biennial-budget-books/base-budget-november/commerce.pdf

[9] https://www.cleanenergyresourceteams.org/sites/default/files/2020-08/WeatherizationWorks_MNFacts_0.pdf

[10] "Gas Stoves: Health and Air Quality Impacts and Solutions," Brady Seals, Andee Krasner, 2020, https://rmi.org/insight/gas-stoves-pollution-health

[11] "Combustion of fuels for energy also contributes to the major air pollutants, PM2.5 (particles with aerodynamic diameter below 2.5 μm) and ozone, which have a substantial burden on public health [3–5]. Exposure to PM2.5 and ozone has been found to lead to a variety of health impacts, such as cardiovascular and respiratory disease, stroke, asthma, autism spectrum disorder, and premature mortality [3, 4, 6–8]. These pollutants come from a number of sources, including combustion of fossil fuels, which emits PM2.5, along with PM2.5 precursors including sulfur dioxide (SO2), nitrogen oxides (NOx), and volatile organic compounds (VOCs) [5]. Many studies have evaluated the burden of different sources of air pollution in the U.S., including a recent study finding approximately 100 000 premature deaths due to PM2.5 exposure, with a mixture of sources contributing [9]." Buonocore, JJ; Salimifard, P; Michanowicz, DR; et al. Historical

One can begin imagining the cost to residents as well as society with the example of asthma: "children living in a home with gas cooking have a 42% increased risk of having current asthma, a 24% increased risk of lifetime asthma and an overall 32% increased risk of having current and lifetime asthma."[12] While not estimated in these comments, these health risks come with costs to finances and wellbeing, both for individual families, as well as our society and public institutions.

The 2021 IECC residential requirements will lead to reduced fuel use through efficiency, and improved air quality through better ventilation, both major factors in the health and wellbeing of families who live in Minnesota homes. For our public health budgets, individual health budgets, and the comfort and wellbeing of everyone who lives in a home in Minnesota, we encourage the ALJ to recommend opening this adoption process.

Energy Codes Are Critical to Meeting Climate Commitments

The adoption of the residential provisions of the 2021 IECC is essential for the state of Minnesota and many of its cities to meet established energy and climate goals. The Next Generation Energy Act set statewide greenhouse gas emission reduction goals of at least 15% below 2005 levels by 2015, 30% by 2025, and 80% by 2050.[13] Currently, we are off track, with the building sector still **increasing** its emissions.

The building sector accounts for roughly 40 percent of greenhouse gas emissions, and the trend continues in the wrong direction. According to the 2021 Biennial report to the Minnesota Legislature,[14] residential emissions have increased to "an alarming *32% above* the 2005

Reconstruction of the Reductions in the Public Health Burden of Energy (2021) https://iopscience.iop.org/article/10.1088/1748-9326/abe74c#erlabe74cs3

See also:
Michanowicz, DR; Dayalu, A; Nordgaard, CL; et al. Home is Where the Pipeline Ends (2022) https://www.psehealthyenergy.org/our-work/publications/archive/home-is-where-the-pipeline-ends/

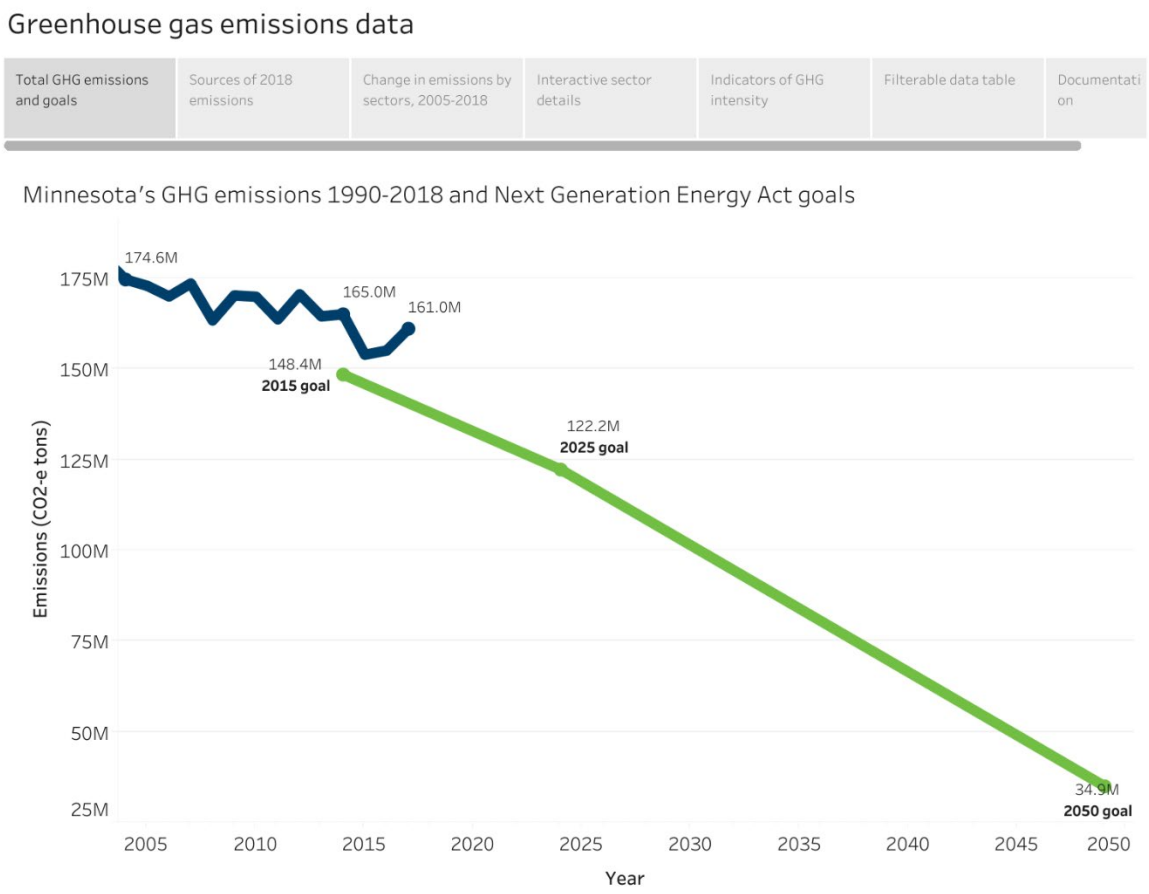
Lebel, ED; Finnegan, CJ; Ouyang, Z; et al. Methane and NOx Emissions from Natural Gas Stoves, Cooktops, and Ovens in CA Residential Homes (2022) https://pubs.acs.org/doi/10.1021/acs.est.1c04707

Tan, YA; Jung, B, Seals, BA; et al (RMI). Decarbonizing Homes- Improving Health in Low-Income Communities (2021) https://rmi.org/?attachment_id=29968

Zhu, Y; Connolly, R; Lin, Y; et al (UCLA Fielding). Effects of Residential Gas Appliances on Indoor and Outdoor Air Quality and Public Health in California (2020) https://coeh.ph.ucla.edu/effects-of-residential-gas-appliances-on-indoor-and-outdoor-air-quality-and-public-health-in-california/

[12] Weiwei Lin, Bert Brunekreef, Ulrike Gehring, Meta-analysis of the effects of indoor nitrogen dioxide and gas cooking on asthma and wheeze in children, International Journal of Epidemiology, Volume 42, Issue 6, December 2013, Pages 1724–1737, https://doi.org/10.1093/ije/dyt150
[13] Minn. Stat. 216H.02 Subdivision 1, https://www.revisor.mn.gov/statutes/cite/216H.02
[14] https://www.pca.state.mn.us/sites/default/files/lraq-1sy21.pdf

baseline…Increasing GHG emissions indicate that this sector is heading in the exact opposite direction needed to make progress toward our Next Generation Energy Act goals."

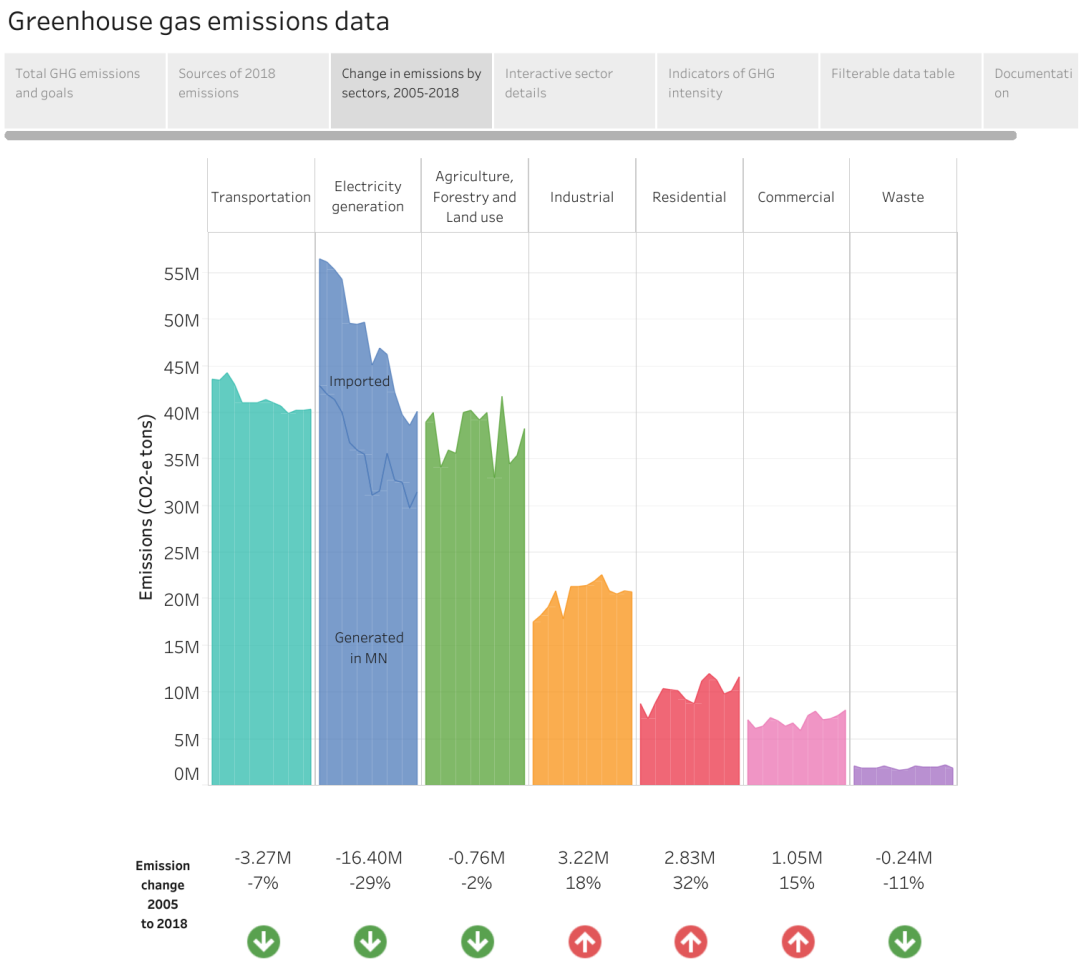


Source: Minnesota Pollution Control Agency[15]

The need to curb emissions through efficiency in buildings is one reason why Green New Deal Homes SBC, Duluth, was founded and supports adoption of the 2021 IECC. As a designer of zero energy homes in one of the coldest parts of the country, Green New Deal Homes knows first hand that the limits to super efficient buildings are not technical or economic. The building industry faces social and coordination challenges for which energy codes are an ideal policy tool.

Energy conservation is a core purpose of the energy code, and a core part of mitigating climate change, as well as preparing homes to be resilient in the face of climate change. The professionals in this sector already know how to build homes to dramatically reduce energy consumption and CO2 emissions.

[15] https://www.pca.state.mn.us/air/greenhouse-gas-emissions-data



Source: Minnesota Pollution Control Agency[16]

Conclusion

There is sufficient evidence upon which the Department of Labor and Industry should open the rulemaking process of the Residential Energy Code to adopt the 2021 IECC.

Adoption of the 2021 IECC residential provisions will reduce energy costs, protect public health, keep Minnesota in line with best practices, and reduce the need for expensive, invasive building energy retrofits in the future.

Sincerely,

AIA Minnesota
Fresh Energy
Green New Deal Homes SBC
Twin Cities Habitat for Humanity

[16] https://www.pca.state.mn.us/air/greenhouse-gas-emissions-data