Rule Set 2021-49 LR

Part 10a Table of Content

LARA-BCC-Rules

From: Arn <arn@performancehomecorp.com>
Sent: Thursday, February 22, 2024 4:31 PM
To: LARA-BCC-Rules
Subject: Public comment part 10a construction code

Categories: Different

As a licensed building inspector, a licensed residential builder, certified RESNET Rater and a Michigan Real Estate Broker I would like to comment on part 10a of the residential code.

Additionally as an engineer who has been personally involved in building science research with the US DOE Building American program as well as Ferris State University I would like to comment on Table N1102.1.3.

Specifically this table calls out a wall cavity prescriptive measure of R20+R5ci. This is typically a 2x6 wall with 1" of extruded polystyrene insulation sheeting. In cold climates zone of 5, 6 and 7 our research demonstrated this wall assembly to be very problematic for moisture buildup. Our research included newly constructed houses from Grand Rapids to Petoskey to Midland, over two dozen homes. These homes were built with moisture and temperature sensors embedded in the walls and monitored for a two year period. The wall assemblies with R19 in the cavity and R5 exterior sheeting were found to have condensation build up at intermittent points in cold portions of the year. Many of these homes held moisture contents in the material of over 25% for two years. In essence in a cold climate the thicker cavity insulation isolates the condensing surface (inside of foam) from the heat of the interior and the 1" foam is insufficient to exclude the cold from the outside. This leads to a surface interior foam temperature that is below dew point at many points of time in cold weather which leads to condensation events and moisture absorption by the surrounding materials. Please consider this Michigan based research and remove this prescriptive measure from the code to help avoid moisture and mold issues in newly built homes. I am also available to discuss this research in more detail if desired.

Sincerly

Arn McIntyre MS Eng

RESNET Rater 0470413

MI Building Inspector INSP00459

MI Residential Builder 2101134992

MI Real Estate Broker 6502330007

PERFORMANCE HOME *CORPORATION*

Arn McIntyre MSEng

Rockford, MI 49341
616.292.8183 cell
616.696.1890 ph
616.884.5186 fax
arn@performancehomecorp.com

- Building Science Research
- MRC & IECC Code Compliance testing
- EPA Energy Star Certifications
- HERS Ratings
- Home performance testing & energy analysis
- EPA Indoor Air Plus Certifications
- Air infiltration testing
- Duct leakage testing
- Residential & Commercial
- RESNET Certified
- ITC Certified Thermography

LARA-BCC-Rules

From: Arn <arn@performancehomecorp.com>
Sent: Thursday, February 22, 2024 4:12 PM
To: LARA-BCC-Rules
Subject: Public Comment part 10a Construction Code

Categories: Different

As a licensed building inspector, a licensed residential builder, certified RESNET Rater and a Michigan Real Estate Broker I would like to comment on part 10a of the residential code.

Section N1102.4.1.2 of the IECC 2021 calls for an "approved third party" to test a homes air infiltration. Currently code officials are not performing these test as part of the code compliance. These test are being performed by a independent contractor that is hired by the builder. This very description can not be a third party that is independent. When a trade is hired by a builder they are dependent upon that builder who pays them. This is currently how the 2015 reads as well and I can say from what I have seen in the past several years that there have been numerous conflicts of interest. I have seen instances where a family member of the builder becomes a rater to test the builders home. Homes that have failed infiltration testing only to pass shortly there after with a different tester. I myself have been told by builders after the house failed testing that they would not pay until it passed. I have failed houses and had builders refuse to pay and hired a different rater that would pass the house. I have walked in on house infiltration testing to see all off the ductwork sealed to the interior. A blatant violation of testing procedures. There are also instances of raters running interior exhaust fans and dryers during a test in order to get the home to pass. The point is as long as the rater is working for and paid by the builder you will never have independent testing. The third party rater needs to answer and be accountable to the code official and not the builder. Preferably to work through and be paid by the code official office in order to be independent of the builder and a representative of the code.

You may have also heard from the rating industry that they use a strict quality assurance audit process. That is true for a Energy Star certification or a HERS rating both of which are code compliance methods. It is not true for simple blower door (infiltration) and duct leakage testing. These two prescriptive measures of the code do not have an quality assurance mechanism in place within the rating industry.

Sincerly

Arn McIntyre MS Eng

RESNET Rater 0470413

MI Building Inspector INSP00459

MI Residential Builder 2101134992

MI Real Estate Broker 6502330007

PERFORMANCE HOME *CORPORATION*

Arn McIntyre MSEng

Rockford, MI 49341
616.292.8183 cell
616.696.1890 ph
616.884.5186 fax
arn@performancehomecorp.com

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Mr. Andrew Brisbo
Director, Bureau of Construction Codes
Michigan Department of Licensing and Regulatory Affairs
611 W Ottawa St.
Lansing, MI 48933

Re: Michigan's 2021 Energy Conservation Code Adoption

Dear Director Brisbo,

The undersigned organizations would like to recognize the tireless work LARA has done over the past year to fix the previous drafting error and make sure Michigan adopts the 2021 IECC with no weakening amendments. While this process has taken longer than usual, we would like to thank you for your thoroughness and willingness to address this issue. We would also like to take advantage of this opportunity to give further public comments on the 2021 IECC and Michigan's adoption of updated energy codes.

The undersigned organizations would like to reaffirm our support of the inclusion of 2021 IECC and readiness provisions in the update of Michigan's energy conservation code, in line with the Administration's goals. Additionally, we support an optional net-zero compliance pathway. These provisions will lower utility costs, ensure Michiganders have more options to take advantage of technological advancements, and improve resilience and comfort in extreme weather. Alongside these benefits, the provisions will also improve indoor air quality and protect public health, create new jobs in the state, and significantly reduce climate impacts from the building sector.

Michigan will benefit from adopting the 2021 IECC alongside several readiness provisions in the base code that align with the Administration's Healthy Climate Plan.

We applaud LARA for including the 2021 IECC provisions in the initial draft of Michigan's updated energy codes. The 2021 IECC is necessary for Michigan to have modern, affordable new construction. It also helps save Michiganders money. Alongside the adoption of the 2021 IECC, we encourage LARA to consider the following amendments:

1. Require EV-, solar-, storage-, and electric-ready amendments in the base residential and commercial codes.
2. Adopt the current net zero and renewables appendices as a statewide optional compliance pathway.[1]

[1] To allow for municipalities to adopt the optional compliance pathways, Michigan can consider adding the following language as a new paragraph to R101.2.1. "*Appendix RC Zero Energy Residential Building Provisions of the 2021 IECC are adopted by reference. Provisions in the appendices are informative and may not be enforced unless specifically adopted by a local authority having jurisdiction. Locally adopted appendices are mandatory and enforceable by that local authority."* For the commercial code, similar language but for Appendix CC Zero Energy Commercial Building Provisions can be added as a new paragraph to C101.2.1.

2021 IECC Reduces Utility Bills Today

As PNNL analysis shows, adopting the 2021 IECC is cost-effective.[2] It aligns closely with the ASHRAE 90.1-2019 commercial standard, which will not only save energy compared to the prior standard but will also reduce construction costs for many commercial building types in Michigan.[3] Savings come from improvements in envelope requirements in the 2021 code, such as continuous exterior wall insulation and high air-tightness requirements. Residential provisions will provide statewide energy savings of 10.7% across all climate zones compared to the current Michigan state energy code. These energy savings translate to $327 of annual utility bill savings for the average Michigan household. **This means for every $1 invested in building a home to 2021 IECC standards, the homeowner will get $2.50 back in utility bill savings. In aggregate, adopting the 2021 IECC could have saved the approximately 20,000 residential units built in 2022 over $100 million, savings that can be invested in the local economy.[4]**

Readiness Gives Residents Access to More Affordable Options

Last year, Americans bought more heat pumps than furnaces indicating a rapid change in consumer preferences toward efficient electric appliances.[5] The transition to electric appliances will likely grow due to rising, volatile gas prices and federal incentives that make the technologies that readiness amendments support cheaper. Improvements to the energy code will help ensure Michiganders participate in and benefit from the energy transition. Without a code change, it is likely that many who lack awareness will not leverage the best technologies available.

Between winter 2022 and 2023, natural gas prices rose 24%, whereas electricity prices only rose 4%.[6] [7] Requiring readiness amendments will allow building owners to adapt to rising prices. Furthermore, readiness amendments enable building owners to install efficient electric appliances and EV charging without paying high post-construction retrofit costs. **If installed during construction, the EV-, solar PV-, electric-, and battery storage-readiness amendments cost around $1,500, which is about $10,000 less than it would be to install them after construction.[8]** Specifically, electric-readiness saves about $6,000 when installed at the time of construction compared to after. EV-readiness can save $2,000 and solar PV-readiness can save about $4,000.[9]

Not only will readiness provisions allow building owners to save money on installation costs, but they will also allow them to take advantage of federal incentives. Residential single-family

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[2]https://www.energycodes.gov/sites/default/files/2021-07/MichiganResidentialCostEffectiveness_2021.pdf
[3]https://www.energycodes.gov/sites/default/files/2021-07/Cost-effectiveness_of_ASHRAE_Standard_90-1-2019-Michigan.pdf. This analysis studied small and large office spaces, stand-alone retail, primary school, small hotels, and mid-rise apartments. All reduced construction costs except small hotels.
[4] https://www.census.gov/construction/bps/statemonthly.html&c_year=2022
[5] https://www.iea.org/commentaries/global-heat-pump-sales-continue-double-digit-growth
[6] https://www.eia.gov/dnav/ng/ng_pri_sum_a_EPG0_PRS_DMcf_m.htm
[7]https://www.eia.gov/electricity/data/browser/#/topic/0?agg=2,0,1&fuel=vtvv&geo=g&sec=g&linechart=&columnchart=ELEC.GEN.ALL-US-99.M~ELEC.GEN.COW-US-99.M~ELEC.GEN.NG-US-99.M~ELEC.GEN.NUC-US-99.M~ELEC.GEN.HYC-US-99.M~ELEC.GEN.WND-US-99.M&map=ELEC.GEN.ALL-US-99.M&freq=M&start=200101&end=202303&ctype=linechart&ltype=pin&rtype=s&maptype=0&rse=0&pin=
[8] https://newbuildings.org/resource/cost-study-of-the-building-decarbonization-code/
[9] https://newbuildings.org/wp-content/uploads/2022/04/BuildingDecarbCostStudy.pdf

homes can expect over $10,000 in tax credits to adopt a heat pump, EV, and solar PV. This number could increase when the rebates are available. Funding includes:

- Residential Energy Efficiency Tax Credit (25C) that provides up to $2,000 for heat pump appliances.[10] (Currently Active)
- Residential Clean Energy Tax Credit (25D) that provides up to 30% off solar PV, battery storage, and geothermal heat pump projects.[11] (Currently Active)
- New Clean Vehicle Tax Credit (30D) that provides up to $7,500 for new EVs.[12] (Currently Active)
- Investment Tax Credit (48) that provides up to 70% off commercial or utility-scale renewable energy systems.[13] (Currently Active)
- Home Electrification Rebate that provides up to $14,000 for electric appliances in new construction and retrofits.[14] (Expected 2024)

Robust Efficiency Measures in Building Codes Improve Resiliency and Comfort

Michigan is facing hotter summers and more extreme weather meaning utility infrastructure failures can be even more dangerous for residents when they occur. For example, in 2023, consumers experienced a gas outage from a gas line leak leaving 4,500 customers without service.[15] People were not able to heat their homes during this time. The 2021 IECC improves a building's envelope making buildings more resilient to extreme weather or utility infrastructure failures. The improved efficiency can increase the duration of safe temperatures, making homes and buildings safer to occupy for longer during extreme events.[16]

Even when the grid functions appropriately, the improved envelope upgrades of the 2021 IECC make extreme cold and hot snaps more comfortable and less expensive. Additionally, the readiness provisions enable homes to access efficient heating and cooling technology, such as heat pumps, allowing for first-time cooling access without significant retrofit costs. As temperatures rise, more communities will need access to space cooling or face a threat to human health.

2021 IECC plus readiness and optional code amendments unlock federal funding

The proposed code would allow Michigan to compete for hundreds of millions of dollars in building codes funding and set homeowners up to access thousands of dollars in tax credits and rebates. To support the implementation of the codes, the IRA has $330M in competitive grants for technical assistance. Michigan could apply for this funding if it passed the 2021 IECC without weakening amendments.

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[10] https://assets.ctfassets.net/v4qx5q5o44nj/3FYfJiYMILiXGFghFEUx0D/279f180456183d560d9c68d4de8baa67/factsheet_25C_25D.pdf

[11] https://assets.ctfassets.net/v4qx5q5o44nj/3FYfJiYMILiXGFghFEUx0D/279f180456183d560d9c68d4de8baa67/factsheet_25C_25D.pdf

[12] https://www.irs.gov/credits-deductions/credits-for-new-clean-vehicles-purchased-in-2023-or-after

[13] https://www.seia.org/initiatives/solar-investment-tax-credit-itc

[14] https://www.rewiringamerica.org/policy/high-efficiency-electric-home-rebate-act

[15] https://www.woodtv.com/news/barry-county/over-4000-customers-affected-by-gas-leak-in-barry-county/

[16] https://rmi.org/insight/hours-of-safety-in-cold-weather/

If the state or localities were able to go beyond 2021 IECC and meet the net zero and renewables appendices, it will open another $670M in competitive grants. For building owners or developers that want to go above and beyond, there is IRA funding for both residential and commercial developers. Residential developers can access up to $5,000 per unit with the New Energy Efficient Homes Credit (45L).[17] Commercial developers can access up to $5/sqft for high-efficiency builds with the Commercial Buildings Energy-Efficiency Tax Deduction (179D).[18]

Building Codes are critical to meeting the Administration's goals.

The Michigan Administration has signaled intent for the state to join other leading states in passing modern building codes. The Michigan Healthy Climate Plan (MIHCP) states, "Adopt the 2021 Model Energy Code with provisions to support electric vehicle charging and consider incorporation of additional climate mitigating solutions such as energy storage, renewable energy, and building decarbonization." Passing the 2021 IECC with electric-, EV- and solar PV-readiness during this code cycle would put the state on the path to meeting the Governor's goals and aligning with other states to decarbonize the new construction sector. States and cities across the country are passing ambitious codes. Illinois is in the process of adopting the 2021 IECC without weakening amendments and with stretch codes for localities. Washington State passed all-electric residential and commercial codes in 2022.

Proposed Amendments Support Climate, Health, and Economic Co-Benefits

The Michigan Healthy Climate Plan (MIHCP) outlined key objectives to improve Michiganders' well-being, including reducing climate emissions, improving health outcomes, and strengthening the economy.

- **Climate:** Currently, 17% of Michigan's greenhouse gas emissions are from buildings. MIHCP outlines a goal to reduce emissions related to heating homes and businesses by 17% by 2030. By simply adopting the 2021 IECC, Michigan could expect to reduce emissions by 11.4 tons over 30 years, bringing the new construction sector closer to meeting these goals. For context, over 30 years, 2021 IECC would reduce CO2 emissions by 1.3 times the emissions produced in one year by one of the state's biggest power plants, JH Campbell.[19] **Readiness amendments will further support building's transition to climate-alignment. For example, heat pumps reduce emissions in year one by 17% compared to a gas furnace in Michigan with a 35% reduction in emissions over a 15 year lifespan.[20]** Passing electric-readiness will allow buildings to make that transition when ready. A net zero appendix would also allow buildings the freedom of choice to reach even further with their climate goals.
- **Health**: The 2021 IECC is expected to reduce hazardous pollutants like methane, nitrous oxide, and sulfur oxide emissions by 16,000 tons over 30 years.[21] These emissions contribute to increased heart and lung disease and premature death. The estimated emission reduction impacts in the first year of adopting 2021 IECC are assessed to save

[17] https://www.iea.org/commentaries/global-heat-pump-sales-continue-double-digit-growth
[18] https://www.energy.gov/eere/buildings/179d-commercial-buildings-energy-efficiency-tax-deduction
[19] https://www.epa.gov/power-sector/facility-level-comparisons#Annual
[20] https://rmi.org/now-is-the-time-to-go-all-in-on-heat-pumps/
[21]https://www.energycodes.gov/sites/default/files/2021-07/MichiganResidentialCostEffectiveness_2021.pdf

over $1.4 million in health outcome costs.[22] In addition to improved health outcomes from the 2021 IECC, the readiness amendments would prepare homes for emission-free appliances, energy generation, and transportation.

- **Jobs:** The energy efficiency sector in Michigan employs 74,000 Michiganders.[23] Investing in this sector through modern codes would support these jobs, which are inherently local and cannot be exported. Passing more modern codes can even increase the number of jobs available. 2021 IECC is expected to create more than 10,000 jobs over 30 years. Building electrification is expected to create up to 7,500 installation jobs in Michigan, and electric-readiness provisions will prepare the state for that future.[24] Additionally, Michigan is the car capital of the country. Many major companies are transitioning to EV stock. EV-readiness would create a market signal that companies should continue investing in Michigan's EVs and support Michigan's auto workers.

The proposed codes will benefit Michiganders while meeting state goals.

By adopting 2021 IECC, EV-, solar-, storage-, and electric-ready amendments, and optional net zero and renewables appendices, Michigan can join other leading states in modernizing and decarbonizing the new construction sector. The codes proposed in these comments will align the state with the Governor's goals and improve resiliency and customer choice while keeping new construction affordable.[25]

As we come closer to wrapping up the adoption of the 2021 IECC, we would like to take this moment to encourage LARA to begin the process of adopting the IECC 2024 provisions as soon as they are available. The new 2024 codes will offer additional vital energy savings to households in Michigan and should be reviewed as quickly as possible upon completion to reap the most benefits for Michiganders. The undersigned organizations appreciate the Bureau of Construction Codes' time and effort in this matter. We encourage you to reach out if you have any questions.

Sincerely,

Charlotte Jameson
Chief Policy Officer
Michigan Environmental Council

William Gallmeyer
President
Green Projects Group

José L Reyna, Executive Director
GreenHome Institute

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[22] Analysis completed used EPA's COBRA tool and PNNL air pollution emission estimates.
[23] https://www.cleanjobsmidwest.com/state/michigan
[24] https://content.rewiringamerica.org/fact-sheets/bringing-infrastructure-home/michigan-mi/bringing-infrastructure-home-fact-sheet-michigan-mi.pdf
[25] https://www.energycodes.gov/sites/default/files/2023-02/Resilience_Buildings_EE_2022.pdf

Nicholas Occhipinti
Government Affairs Director
Michigan League of Conservation Voters

Jacob Serfling
Director of Policy & Projects
Midwest Building Decarbonization Coalition

Courtney Bourgoin
Midwest Policy Manager
Evergreen Action

Charles Griffith
Climate and Energy Program Director
Ecology Center

Michael Klement, AIA, CPHC
Principal
Architectural Resource, LLC

Dr. Denise Keele
Executive Director
Michigan Climate Action Network

Tim Minotas
Deputy Legislative and Political Director
Sierra Club Michigan Chapter

Missy Stults, PhD
Sustainability and Innovations Director
City of Ann Arbor, Michigan

Ericka Lozano-Buhl
Founder + Principal Consultant
Mixto Communications

Derrell Slaughter, Michigan Policy Director, Climate & Energy
Madeline Semanisin, Building Decarbonization Advocate
Natural Resources Defense Council

Mike Berkowitz
Director, Policy
Elevate

John Freeman
Executive Director
Great Lakes Renewable Energy Association (GLREA)

David Dye, AIA
Project Architect and Owner
DFD Architecture, LLC

Em Perry
Environmental Justice Director
Michigan United

John Beeson, AIA, NCARB, LEED AP, BREEAM, BECxP
Senior Sustainability Manager/Green Mystic in Residence
Foresight Management

Isaac Elnecave
Policy Specialist
Phius

There is a total of 20 recipients who attached their signature in agreement with the submitted correspondence of Carlee Knott. See list of recipients.

1. Charlotte Jameson, Michigan Environmental Council
2. William Gallmeyer, Green Projects Group
3. Jose L, Reyna, GreenHome Institute
4. Nicholas Occhipinti, Michigan League of Conservation Voters
5. Jacob Serfling, Midwest Building Decarbonization Coalition
6. Courtney Bourgoin, Evergreen Action
7. Charles Griffith, Climate and Energy Program Director Ecology Center
8. Michael Klement, Architectural Resources, LLC
9. Dr. Denise Keele, Michigan Climate Action Network
10. Tim Minotas, Sierra Club Michigan Chapter
11. Missy Stults, PhD, Sustainability and Innovations Director City of Ann Arbor
12. Ericka Lozano-Buhl, Founder + Principal Consultant Mixto Communications
13. Derell Slaughter, Climate & Energy
14. Madeline Semanisin, Natural Resources Defense Council
15. Mike Berkowitz, Elevate
16. John Freeman, Great Lakes Renewable Energy Association
17. David Dye, DFD Architecture
18. Em Perry, Michigan United
19. John Beeson, Foresight Management
20. Issaac Elnecave, Phius

Pullum Window Corporation

415 N.Lafayette
South Lyon,Mi.,48178

Re: The Michigan Energy Code **2/15/2024**

I am the president of Pullum Window Corporation. Pullum Window Corporation is a fourth generation family owned business that has manufactured and distributed window and door products since 1921. Our business is 102 years old and our future will depend on the energy code requirements for our products.

We are a Michigan corporation with 15 to 20 Michigan employees and a marketing area exclusively within the state of Michigan. The majority of our sales are for new construction but we also sell replacement windows. How the Legislature amends the law regarding the Michigan Uniform Energy Code and the potential negative consequences of doing so are very important to our company, our employees, and our customers.

Energy Star windows should be an option, not standard!

The costs of physical testing and NFRC approval will be a major hardship on Michigan window and insulated glass manufacturers. The Michigan Uniform Energy Code took this into account when it provided for *companies to use computer simulations or have their product approved by the Bureau of Construction Codes.* This break for small Michigan companies is critical for our survival.

Michigan window and insulated glass manufactures need a Michigan energy code to understand and represent their interests. The national codes are a great advantage to the large national window manufacturers. These national companies have full time assigned personal to attend national code committee meetings, get on important committees and vote for their own interests.

The large window companies know that NFRC requirements will force Michigan's smaller window companies, out of business. The Michigan window industry which is made up of small companies is not represented in the ICC process.

I can not stress enough that is critical to have a unique Michigan energy code to address the issues important to Michigan window and glass manufacturers to avoid losing another category of jobs and businesses to other states.

Michigan window manufacturers need the code wording that I have circled on the next page.

Charlie Pullum 313-418-6116
Pullum Window Corporation

WE NEED THIS!

R 408.31097 ~~Fenestration product rating.~~ **Rescinded.**

~~Rule 1097. Section C303.1.3 of the code is amended to read as follows:~~

~~C303.1.3. Fenestration product rating. U-factors or fenestration products (windows, doors, and skylights) shall be determined in accordance with NFRC 100 by an accredited, independent laboratory, and labeled and certified by the manufacturer. Products lacking a labeled U-factor shall be assigned a default U-factor from Table C303.1.3(1) or C303.1.3(2).~~

~~Exception:~~

~~1. Computer simulations by independent NFRC certified laboratories or approval under the Stille-Derossett-Hale Single State Construction Code Act, 1972 PA 230, MCL 125.1501 to 125.1531, is considered in compliance with this section.~~

~~2. Where required, garage door U-factors shall be determined in accordance with either NFRC 100 or ANSI/DASMA 105.~~

~~U-factors shall be determined by an accredited, independent laboratory, and labeled and certified by the manufacturer.~~

~~Products lacking a labeled U-factor shall be assigned a default U-factor from Table C303.1.3(1) or C303.1.3(2). The solar heat gain coefficient (SHGC) and visible transmittance (VT) of glazed fenestration products (windows, glazed doors, and skylights) shall be determined in accordance with NFRC 200 by an accredited, independent laboratory, and labeled and certified by the manufacturer. Products lacking such a labeled SHGC or VT shall be assigned a default SHGC or VT from table C303.1.3(3).~~

R 408.31098 ~~(C506.1) Envelope alterations.~~ **Rescinded.**

~~Rule 1098. Section 5.1.3 of the standard is amended to read as follows:~~

~~(5.1.3). Alterations to the building envelope shall comply with the requirements of section 5 for insulation, air leakage, and fenestration applicable to those specific portions of the building that are being altered.~~

~~Exceptions:~~

~~1. Installation of storm windows or glazing panels over existing glazing, provided the storm window or glazing panel contains a low-emissivity coating. However, a low-emissivity coating is not required where the existing glazing already has a low-emissivity coating. Installation may be either on the inside or outside of the existing glazing.~~

~~2. Replacement of glazing in existing sash and frame, provided the U-factor and SHGC will be equal to or lower than before the glass replacement.~~

~~3. Alterations to roof or ceiling, wall, or floor cavities that are insulated to full depth with insulation having a minimum nominal value of R-3.0/in.~~

~~4. Alterations to walls and floors, where the existing structure is without framing cavities and no new framing cavities are created.~~

~~5. Roof recovering.~~

~~6. Removal and replacement of a roof membrane where there is existing roof insulation integral to or below the roof deck.~~

~~7. Removal and replacement of a roof membrane where the insulation is installed entirely above the roof deck, a minimum of R-20 insulation shall be permitted where the placement of additional insulation greater than R-20 insulation would require either of the following:~~

Submitted via Email

February 22, 2024

Tony Williamson
Bureau of Construction Codes
P.O. Box 30254
Lansing, MI 48909

RE: Pending Rule Set #2021-48 LR and #2021-49 LR, Comments of the Responsible Energy Codes Alliance (RECA) Supporting the Adoption of the Unamended 2021 *IECC* as the Michigan Uniform Energy Code Parts 10 and 10a

Dear Mr. Williamson,

As we noted in previous letters submitted to the Bureau of Construction Codes, **RECA supports the adoption of the 2021 *IECC* for residential construction and the 2021 *IECC*/*ASHRAE* Standard 90.1-2019 for commercial construction, with no weakening amendments.** Although we generally support the Rule Sets published in the February 15, 2024 Michigan Register,[1] we encourage the Bureau to eliminate the few remaining weakening amendments that were not rescinded by the proposed Rule Sets. In any case, we urge the Bureau to move forward as quickly as possible to finalize the update to the Michigan Uniform Energy Code Parts 10 and 10a.

The updated Regulatory Impact Statement and Cost-Benefit Analysis submitted in relation to these Rule Sets, along with a substantial number of letters and analysis submitted in support of previous iterations of the Rules, provide adequate support for the adoption of the latest model energy codes. However, in the interest of providing a more complete record on these specific Rules, we are re-submitting copies of RECA's previous letters supporting the 2021 *IECC*/*ASHRAE* Standard 90.1-2019, demonstrating clear cost-effectiveness and a range of other benefits for residential and commercial building owners in Michigan.

Since RECA submitted its previous comments, several additional developments offer support for the adoption of the 2021 *IECC* with no weakening amendments.

[1] *See* 2024 MR 2 at 7 (Feb. 15, 2024) and 2024 MR 2 at 25 (Feb. 15, 2024).

1. **Adoption of the latest model energy codes with no weakening amendments will help Michigan achieve the efficiency and carbon-reduction goals outlined in recent legislation that codifies Executive Directive 2020-10 and the Michigan Healthy Climate Plan.**

Executive Directive 2020-10, which committed Michigan to achieving "economy-wide carbon neutrality no later than 2050" and a "28% reduction below 2005 levels in greenhouse gas emissions by 2025"[2] was later codified—and strengthened—by the Michigan Legislature via a series of bills in the 2023 Legislative Session.[3] **The 2022 Michigan Healthy Climate Plan specifically recommends adopting the 2021 Model Energy Code (the 2021 *IECC*) with no weakening amendments.**[4] It is well-established that residential and commercial buildings account for a significant portion of the nation's wasted energy and greenhouse gas emissions, and the 2021 *IECC* is the next logical step for Michigan's building efficiency standards.

2. **Michigan builders, homeowners, and the owners of commercial buildings stand to benefit from Federal grants, tax credits, and other programs that are centered around the 2021 *IECC* and *ASHRAE* 90.1-2019.**

- **Inflation Reduction Act** - U.S. DOE has announced up to $400 million in formula allocations available through the Inflation Reduction Act to states that adopt the 2021 *IECC*, *ASHRAE* 90.1-2019, and/or net-zero codes with no weakening amendments.[5]
- **Infrastructure Investment and Jobs Act** - U.S. DOE has also begun awarding competitive grants to state partnerships focused on building energy code updates, part of $225 million available through the Infrastructure Investment and Jobs Act.[6]

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[2] *See* Building a Carbon-Neutral Michigan, Executive Directive 2020-10, *available at* https://www.michigan.gov/whitmer/0,9309,7-387-90499_90704-540278--,00.html.

[3] *See* Michigan Department of Environment, Great Lakes, and Energy, *Michigan Healthy Climate Plan, 2023 Report*, at 5-6 (Dec. 2023).

[4] *See* Michigan Department of Environment, Great Lakes, and Energy, *Draft MI Healthy Climate Plan*, *available at* https://www.michigan.gov/documents/egle/Draft-MI-Healthy-Climate-Plan_745872_7.pdf. *See also Michigan Council on Climate Solutions: Buildings and Housing Workgroup Recommendations*, at 9 (Sep. 2021), *available at* https://www.michigan.gov/documents/egle/Workgroup-Recommendations-Buildings-Housing_739165_7.pdf.

[5] *See* https://www.energy.gov/scep/technical-assistance-adoption-building-energy-codes. We note that these and other federal incentives are cited in the Michigan Healthy Climate Plan 2023 Report. *See* Michigan Department of Environment, Great Lakes, and Energy, *Michigan Healthy Climate Plan, 2023 Report*, at 10 (Dec. 2023).

[6] *See* https://www.energycodes.gov/RECI#:~:text=As%20outlined%20in%20Section%2040511,years%20(FY22%2DFY26).

- **Homebuilder Tax Credits** – Under Internal Revenue Code § 45L, homebuilders may claim tax credits of up to $2,500 for constructing dwellings that meet the Energy Star Homes program criteria[7] and up to $5,000 for dwellings that meet the U.S. DOE Zero Energy Ready Homes Program.[8] Both of these programs will include envelope backstops based on the 2021 *IECC*.
- **Homeowner Tax Credits** – Under Internal Revenue Code § 25C, tax credits up to $1,200 are available to homeowners that install certain insulation products that meet the requirements of the 2021 *IECC*.[9] Unlike other credits listed above, these credits apply to existing buildings, the requirements for which would also be updated through the Pending Rules.
- **Free Compliance Software** – The most widely-used free software developed by the U.S. DOE—REScheck and COMcheck—are now available for the 2021 *IECC* and *ASHRAE* 90.1-2019.[10]

3. Michigan will join a substantial number of states and cities that have adopted (or will soon adopt) the latest model energy codes.

Since Michigan began the process of reviewing the 2021 *IECC* and *ASHRAE* Standard 90.1-2019, several additional states and cities have adopted these codes (or are currently in the process of doing so) for residential and/or commercial construction. The following are states that have already finalized their code updates, along with the effective dates:

- Connecticut (2021 *IECC*) – 10/1/2022
- New Jersey (2021 *IECC* and *ASHRAE* 90.1-2019) – 3/6/2023
- Maryland (2021 *IECC*) – 5/29/2023
- Utah (2021 *IECC*) – 7/1/2023
- Louisiana (2021 *IECC*) – 7/1/2023
- Oregon (2021 *IECC*-based 2023 ORSC) – 10/1/2023
- Florida (2021 *IECC*) – 12/31/2023
- Illinois (2021 *IECC*) – 1/1/2024

[7] See https://www.energystar.gov/about/federal_tax_credits/federal_tax_credit_archives/tax_credits_home_builders.

[8] See https://www.energy.gov/eere/buildings/section-45l-tax-credits-zero-energy-ready-homes.

[9] See https://www.energystar.gov/about/federal_tax_credits/insulation.

[10] See https://www.energycodes.gov/rescheck and https://www.energycodes.gov/comcheck.

- Minnesota (*ASHRAE* 90.1-2019) – 1/5/2024
- Virginia (2021 *IECC*) – 1/18/2024
- New Mexico (2021 *IECC*) – 1/30/2024
- Washington (2021 *IECC*-based 2021 WSEC) – 3/15/2024
- Ohio (2021 *IECC*) – 3/1/2024
- Vermont (2021 *IECC*-based 2023 RBES and CBES) – 7/1/2024

The 2021 *IECC* and *ASHRAE* Standard 90.1-2019 are also under consideration in about a dozen other states and in many cities in states without the ability to adopt statewide codes.

4. **The Department should eliminate the remaining weakening amendments in the Michigan Uniform Energy Code Part 10 to ensure a clean adoption of the 2021 *IECC* and *ASHRAE* Standard 90.1-2019.**

We have identified several weakening amendments that should be deleted from the Michigan Uniform Energy Code in order for Michigan to achieve all the energy and cost savings of the latest model energy codes. Although we do not intend to slow down the current rulemaking progress, we recommend the following changes to Part 10 Michigan Energy Code:

- **Delete the outdated references to "above code programs" in R 408.31060 and R 408.31092 that would allow compliance via ICC-700 (2012) and Energy Star for Homes Version 3.** Both of these voluntary programs are well behind the level of efficiency required by the 2021 *IECC* and are not viable alternatives to the proposed Rules. In fact, the U.S. EPA no longer supports the use of Energy Star for Homes Version 3. (Since January 1, 2023, only Version 3.1 or 3.2 are supported, depending on the state.[11]) While it is not clear whether this was an intentional omission, either standard could become a significant loophole to the updated code, and we strongly recommend deleting the references to these obsolete programs.

- **Remove the exemption from duct testing for systems located entirely inside conditioned space.** One key change in the 2021 *IECC* that saves energy and improves the quality of new homes is the requirement that all duct systems in new homes—even when located inside the conditioned space—be tested for total leakage. For several years, the *IECC* provided an exception for these systems. However, based on

[11] *See* U.S. EPA, *Energy Star Residential New Construction Program Requirements*, available at https://www.energystar.gov/partner_resources/residential_new/homes_prog_reqs/national_page.

information collected from residential field studies conducted in recent years, it is now clear that even systems with ducts located inside conditioned space can be constructed in ways that fail to deliver conditioned air to the intended locations. Uncomfortable occupants tend to adjust the thermostat in response, using more energy than necessary to heat or cool the building. Thus, this exception was removed in the 2021 *IECC*, and a duct test is now required for all new homes. We recommend removing this exception from R 408.31066.

- **Prohibit the use of building cavities as ducts.** R 408.31066 appears to allow building cavities located within the conditioned space to be used as ducts or plenums. This practice, which has historically produced very inefficient duct systems, in combination with the duct testing exception detailed above, could lead to inefficient duct systems that will negatively affect occupant comfort and the long-term durability of homes. We recommend eliminating this exception.

Conclusion

We encourage the Bureau to move quickly to finalize the incorporation of the unamended 2021 *IECC* and *ASHRAE* Standard 90.1-2019 into the Michigan Uniform Energy Code. Please contact us if you have any questions or would like to discuss how RECA can be of assistance.

Sincerely,

Eric Lacey

RECA Chairman

Enclosures:

- *Comments of the Responsible Energy Codes (RECA) Supporting the Adoption of the 2021 IECC as the Michigan Construction Code Parts 10 and 10a* (July 16, 2021).
- *Supplemental Comments of the Responsible Energy Codes Alliance (RECA) Supporting Adoption of the 2021 IECC as the Michigan Construction Code Parts 10 and 10a* (March 16, 2022)
- *Additional Comments of the Responsible Energy Codes Alliance (RECA) Supporting the Adoption of the 2021 IECC as the Michigan Construction Code Parts 10 and 10a* (July 5, 2022)

RECA is a broad coalition of energy efficiency professionals, regional organizations, product and equipment manufacturers, trade associations, and environmental organizations with expertise in the adoption, implementation and enforcement of building energy codes nationwide. RECA is dedicated to improving the energy efficiency of buildings throughout the U.S. through greater use of energy efficient practices and building products. It is administered by the Alliance to Save Energy, a non-profit coalition of business, government, environmental and consumer leaders that supports energy efficiency as a cost-effective energy resource under existing market conditions and advocates energy-efficiency policies that minimize costs to society and individual consumers. Below is a list of RECA Members that endorse these comments.

Air Barrier Association of America

Alliance to Save Energy

American Chemistry Council

American Council for an Energy-Efficient Economy

CertainTeed LLC

EPS Industry Alliance

Extruded Polystyrene Foam Association

Institute for Market Transformation

Johns Manville Corporation

Knauf Insulation

National Fenestration Rating Council

North American Insulation Manufacturers Association

Owens Corning

Polyisocyanurate Insulation Manufacturers Association

LARA-BCC-Rules

From: Fabrice Smieliauskas <fab.smieliauskas@gmail.com>
Sent: Wednesday, February 21, 2024 1:13 PM
To: LARA-BCC-Rules
Subject: Comment on 2021 Michigan Uniform Energy Code; Administrative Rules Part 10a

Categories: Different

Dear Bureau of Construction Codes,

Thank you for moving forward the adoption of the 2021 IECC and the 2019 ASHRAE standard 90.1 for energy efficiency of buildings, not including residential buildings. As a Michigander eager to reduce the carbon footprint of new construction, I applaud these changes, in particular the edit to include appendix CB to REQUIRE the addition of solar-ready zones on no less than 40 percent of the roof area of most new commercial construction, which will go a long way towards increasing rooftop solar installations in the state.

Please do not let the construction lobby water down these requirements. As reported in the Washington Post today (https://wapo.st/3T24asV), your Board has watered down requirements in the 2021 Residential and Building codes to appease the lobbyists. This puts at risk millions of dollars in federal funds only available to states that adopt the 2021 ICC standards with all energy efficiency-related Appendices. The draft Energy code revisions you propose are commendable, but I will call out any backsliding on the other codes at the time of their Public Hearings.

Fabrice Smieliauskas
Troy, MI

Department of Licensing and Regulatory Affairs
Bureau of Construction Codes
Administrative Services Division
P.O. Box 30254
Lansing, MI 48909
LARA-BCC-Rules @michigan.gov
(517) 482-5519

February 22nd, 2024

Dear Director Brisbo,

Thank you for the opportunity to comment regarding the proposed rule sets (2021 – 48 LR & 2021 – 49 LR) to amend the Michigan Energy Code. The Michigan Energy Innovation Business Council (Michigan EIBC) is a business trade association representing over 160 companies across a full range of advanced energy industries, including energy efficiency, electric vehicles (EVs), renewables, demand response technologies, energy storage, and others. Michigan EIBC's mission is to grow Michigan's advanced energy economy by fostering opportunities for innovation and business growth for the advanced energy industry in the state.

Overall Comments

Updating our building codes is one of the greatest tools the State of Michigan holds to make necessary advancements in energy efficiency and advanced mobility. Michigan EIBC strongly supports the Michigan Department of Licensing and Regulatory Affairs (LARA)'s Bureau of Construction Codes (BCC)'s decision to include significant and necessary energy efficiency improvements in the residential and commercial energy code drafts. Implementing these code updates will save Michigan residents and business owners money on their energy bills, continue to support the growing energy efficiency industry, and advance the work in futureproofing Michigan's building stock.

Research completed by the Pacific Northwest National Laboratory showed that updating the residential code to the 2021 IECC is cost-effective. The 2021 residential edition of the International Energy Conservation Code (IECC) represents approximately a 10.7% improvement in efficiency through more efficient thermal envelopes, improved mechanical system efficiency, improved lighting, and other cost-effective improvements compared to the 2015 model code,

which is similar to Michigan's current code.[1] A 10.7% improvement in energy efficiency equates to $327 in annual utility bill savings for the average Michigan home, and the study showed that the average life-cycle cost savings of implementing the 2021 IECC is over $4,000.[2] This study appropriately balances both incremental costs of construction against longer-term energy savings over a 30-year period. Additionally, the research suggests that, in just its first year of implementation, the 2021 IECC will save Michigan homes statewide about $3.8 million in energy cost savings.[3] Updating to more energy efficient codes is cost-effective and will result in increased affordability in terms of year-to-year household costs rather than solely the initial sale.

The 2021 commercial code aligns closely with ASHRAE 2019, and according to an analysis on the commercial code from the Pacific Northwest National Laboratory, this update is also cost-effective for Michigan. For the average commercial building required to be built to these improved standards, the research found that the simple payback in Michigan would be immediate when considering reduced energy costs.[4] Additionally, the analysis found that the average life-cycle cost savings of implementing this commercial energy code update is $4.22 per square foot for publicly-owned buildings and $3.70 per square foot for privately-owned buildings.[5] Implementing the updated commercial energy code will save both Michigan businesses and renters in larger multi-family housing units money on their energy bills, and Michigan EIBC supports the BCC's decision to include these important updates.

Michigan EIBC is also strongly supportive of the BCC's decision to pull back last year's code from the Joint Committee on Administrative Rules (JCAR) to fix a drafting error in the originally proposed Michigan Energy Code Rule (R408.31059 of the Michigan Administrative Code). In the draft that was previously sent to JCAR, the rule failed to rescind two sections from a previous Michigan code: R 408.31066 Systems and R408.31071 Simulated performance alternative in Part 10. Michigan Uniform Energy Code. If not resolved, these requirements create an unintended alternative performance pathway that would allow homes to be an estimated 15% less energy efficient when compared to the 2021 IECC. Resolving this discrepancy and eliminating this unintended alternative pathway is critical to enable the full benefits of the improved energy efficiency requirements of the 2021 IECC. Michigan EIBC appreciates the BCC's attention to resolving this important issue.

In addition to updating to the full 2021 IECC, Michigan EIBC urges LARA to push further to ensure that Michigan continues on a track toward futureproofing Michigan's building stock. Specifically, Michigan EIBC recommends including amendments to require EV charging readiness, solar readiness/nominal solar requirements, and storage readiness in the residential and commercial codes, and building electrification and demand response readiness in the residential code. These additions will ensure new homes and buildings are equipped for

[1] Pacific Northwest National Laboratory. July 2021. "Cost-Effectiveness of the 2021 IECC for Residential Buildings in Michigan." Available at https://www.energycodes.gov/sites/default/files/2021-07/MichiganResidentialCostEffectiveness_2021.pdf#page=20&zoom=100,92,96
[2] Ibid.
[3] Ibid.
[4] Pacific Northwest National Laboratory. July 2021. "Cost-Effectiveness of ANSI/ASHRAE/IES Standard 90.1-2019 for Michigan." Available at https://www.energycodes.gov/sites/default/files/2021-07/Cost-effectiveness_of_ASHRAE_Standard_90-1-2019-Michigan.pdf
[5] Ibid.

Michigan's electrified future. Please see the below reason statements and suggested code language for each recommended amendment.

Finally, upon the conclusion of the 2021 IECC code update, Michigan EIBC strongly encourages LARA to move quickly to open both the residential and commercial energy codes again for the 2024 update. Following a number of delays in updating to the 2021 IECC, it's critical that Michigan move toward updating on a regular, 3-year code update cycle to continue to build new homes and buildings that reduce energy bills for Michigan residents and businesses.

EV Readiness

Michigan EIBC strongly urges the BCC to include language requiring that all new homes are EV ready and commercial buildings/multi-family housing with parking include EV ready spaces. Both of these recommendations were included in the MI Healthy Climate Plan and the Michigan Council on Future Mobility & Electrification's 2021 Report.[6, 7] Additionally, cities in Michigan are already moving in this direction: Ann Arbor adopted an EV charging and readiness ordinance for new developments in 2021, and Lansing is currently considering a similar ordinance.[8, 9] These additions will not only support Michigan's advanced mobility future and economy, but also, they will save residential customers and commercial building owners money and they will help to protect public health.

Due to improved technology and increased consumer demand, the transition to EVs is well underway, and Michigan's future buildings should be ready for this shift. Auto manufacturers are embracing the transition to EVs. For example, both General Motors and Ford made announcements in the past year regarding their plans to switch their manufacturing to EVs.[10, 11] Across the U.S., EV sales increased by 80 percent from 2017 to 2018, and the number of EVs on U.S. roads is projected to grow from 1 million vehicles at the end of 2018 to 18.7 million by 2030. To charge these new EVs, the U.S. will need 9.6 million charging ports -- a substantial portion of which will be installed where they are most useful for consumers: at homes and businesses.

Unfortunately, it can be costly and challenging to install charging stations at existing residential and commercial structures due to the potential need for extensive electrical upgrades. This often requires the installation of conduit through existing concrete or drywall to connect the electric

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[6] Michigan Department of Environment, Great Lakes, and Energy. "MI Healthy Climate Plan." April 2022. Available at https://www.michigan.gov/egle/-/media/Project/Websites/egle/Documents/Offices/OCE/MI-Healthy-Climate-Plan.pdf?rev=d13f4adc2b1d45909bd708cafccbfffa&hash=99437BF2709B9B3471D16FC1EC692588.

[7] Michigan Department of Labor and Economic Opportunity. "Council on Future Mobility and Electrification 2021 Report." Available at https://www.michigan.gov/documents/leo/CFME_Report_2021_738091_7.pdf.

[8] Stanton, Ryan. MLive. "Ann Arbor council Oks ordinance requiring EV parking for new developments." January 19, 2021. Available at https://www.mlive.com/news/ann-arbor/2021/01/ann-arbor-council-oks-ordinance-requiring-ev-parking-for-new-developments.html#:~:text=For%20multi%2Dfamily%20housing%20developments,and%2065%25%20EV%2Dcapable.

[9] Wiewgorra, Luisa. Fox 47 News. "Lansing could adopt requirements for EV charging stations." Available at https://www.fox47news.com/neighborhoods/downtown-old-town-reo-town/lansing-could-adopt-requirement-for-ev-charging-stations.

[10] Eisenstein, Paul A. "GM to go all-electric by 2035, phase out gas and diesel engines." Available at https://www.nbcnews.com/business/autos/gm-go-all-electric-2035-phase-out-gas-diesel-engines-n1256055.

[11] Wayland, Michael. "Ford ups EV investments, targets 40% electric car sales by 2030 under latest turnaround plan." Available at https://www.cnbc.com/2021/05/26/ford-ups-ev-investments-targets-40percent-electric-car-sales-by-2030-under-latest-turnaround-plan.html#:~:text=Ford%20Motor%20said%20Wednesday%20it,than%20%2430%20billion%20through%.

vehicle supply equipment (EVSE) to electrical service. According to research from the New Buildings Institute, making homes EV ready at the time of construction can save customers $1,000 to $2,500 in retrofit costs, if they choose to install a charger at a later time. For commercial buildings and multi-family residences, EV ready construction can save about $7,000 to $8,000 in retrofit costs according to a study conducted by the California Air Resources Board.[12] Therefore, it is more cost-effective to ensure a new home or commercial building is EV ready when it is being built or undergoing major renovations than to conduct these extensive electrical upgrades when a charger is later installed.

More accessible EV charging infrastructure is also necessary to reduce carbon emissions and local air pollution. In 2018, the transportation sector was the second largest source of Michigan's greenhouse gas emissions, representing 28 percent of total emissions.[13] In order to meet Governor Whitmer's goal under Executive Directive 2020-10 of 100 percent carbon neutrality in Michigan by 2050, policies must be put in place to reduce transportation sector greenhouse gas emissions and to support the transition from gas-powered vehicles to EVs in the state. Additionally, according to the Health Effects Institute, "air pollution is one of the top-ranking factors for death and disability, with vehicle emissions [being] the main contributor to outdoor air pollution."[14] To both improve air quality and reduce emissions, it is necessary that Michigan prepares its future homes and businesses with the infrastructure needed to switch to EVs.

Michigan EIBC recommends the following EV readiness language be added to the residential code, including new definitions, and new Section R404.5 and revisions to Table R405.2 and Table R406.2:

Add new definitions as follows:

> **ELECTRIC VEHICLE (EV).** An automotive-type vehicle for on-road use, such as passenger automobiles, buses, trucks, vans, neighborhood electric vehicles, electric motorcycles, and the like, primarily powered by an electric motor that draws current from a rechargeable storage battery, a fuel cell, a photovoltaic array, or another source of electric current. Plug-in hybrid electric vehicles are electric vehicles having a second source of motive power. Off-road, self-propelled electric mobile equipment, such as industrial trucks, hoists, lifts, transports, golf carts, airline ground support equipment, tractors, boats and the like, are not considered electric vehicles.
>
> **ELECTRIC VEHICLE SUPPLY EQUIPMENT (EVSE).** The conductors, including the ungrounded, grounded, and equipment grounding conductors and the *electric vehicle* connectors, attachment plugs, and all other fittings, devices, power outlets, or

[12] California Air Resources Board. "EV Charging Infrastructure: Nonresidential Building Standards." November 15, 2019. Available at ww2.arb.ca.gov/sites/default/files/2020-08/CARB_Technical_Analysis_EV_Charging_Nonresidential_CALGreen_2019_2020_Intervening_Code.pdf.

[13] Michigan Department of Environment, Great Lakes, and Energy. "Draft MI Healthy Climate Plan." January 14, 2022. Available at https://www.michigan.gov/documents/egle/Draft-MI-Healthy-Climate-Plan_745872_7.pdf.

[14] GreenBiz. "Electric bus fleets are the latest tool for improving air quality." Available at https://www.greenbiz.com/article/electric-bus-fleets-are-latest-tool-improving-air-quality.

apparatus installed specifically for the purpose of transferring energy between the premises wiring and the *electric vehicle*.

LEVEL 2 ELECTRIC VEHICLE SUPPLY EQUIPMENT (Level 2 EVSE). *Electric Vehicle Supply Equipment* capable of providing AC Level 2 EV charging.

EV READY SPACE. A designated *parking space* that is provided with an electrical circuit capable of supporting an installed *Level 2 EVSE* in close proximity to the proposed location of the EV parking space.

Add new section as follows:

R404.5 Electric vehicle charging infrastructure. Electric infrastructure for the current and future charging of *electric vehicles* shall be installed in accordance with this section. *EV ready spaces* are permitted to be counted toward meeting minimum parking requirements.

R404.5.1 One- and two- family dwellings and townhouses. One- and two-family dwellings and townhouses with a dedicated attached or detached garage or on-site parking spaces and new detached garages shall be provided with one *EV ready space* per *dwelling unit.* The branch circuit shall meet the following requirements:

1. A 208/240-volt circuit installations, including panel capacity, raceway wiring, receptacle, and circuit overprotection devices that are able to provide Level 2 charging
2. Terminates at a junction box or receptacle located within 3 feet (914 mm) of the parking space, and
3. The electrical panel directory shall designate the branch circuit as "For electric vehicle charging" and the junction box or receptacle shall be labelled "For electric vehicle charging".

R404.5.2 Group R occupancies. Parking facilities serving Group R-2, R-3 and R-4 occupancies shall comply with Section C405.15.

Revise table as follows:

TABLE R405.2
REQUIREMENTS FOR TOTAL BUILDING PERFORMANCE

SECTION [a]	TITLE
Electrical Power and Lighting Systems	
R404.1	Lighting equipment
R404.2	Interior lighting controls
R404.5	Electric vehicle charging infrastructure

Revise table as follows:

TABLE R406.2
REQUIREMENTS FOR ENERGY RATING INDEX

SECTION [a]	TITLE
Electrical Power and Lighting Systems	
R404.1	Lighting equipment
R404.2	Interior lighting controls
R404.5	Electric vehicle charging infrastructure
R406.3	Building thermal envelope

Michigan EIBC recommends the following EV readiness language be added to the commercial code, including new definitions, revisions to C401.2.2 and and Table C405. 12.2, and new section C405.14:

Add new definitions as follows:

AUTOMATIC LOAD MANAGEMENT SYSTEMS (ALMS). A control system that allows multiple connected *EVSE* to share a circuit or panel and automatically reduce power at each charger, reducing the total connected electrical capacity of all *EVSE*.

ELECTRIC VEHICLE (EV). An automotive-type vehicle for on-road use, such as passenger automobiles, buses, trucks, vans, neighborhood electric vehicles, electric motorcycles, and the like, primarily powered by an electric motor that draws current from a rechargeable storage battery, a fuel cell, a photovoltaic array, or another source of electric current. Plug-in hybrid electric vehicles are electric vehicles having a second source of motive power. Off-road, self-propelled electric mobile equipment, such as industrial trucks, hoists, lifts, transports, golf carts, airline ground support equipment, tractors, boats and the like, are not considered electric vehicles.

ELECTRIC VEHICLE SUPPLY EQUIPMENT (EVSE). The conductors, including the ungrounded, grounded, and equipment grounding conductors and the *electric vehicle* connectors, attachment plugs, and all other fittings, devices, power outlets, or apparatus installed specifically for the purpose of transferring energy between the premises wiring and the *electric vehicle*.

ELECTRIC VEHICLE SUPPLY EQUIPMENT (EVSE) SPACE. A parking space that is provided with a dedicated *EVSE*.

EV CAPABLE SPACE. A parking space that is provided with some of the infrastructure necessary for the future installation of an *EVSE* – such as conduit, raceways, electrical capacity, or signage – or reserved physical space for such infrastructure.

EV READY SPACE. A parking space that is provided with an electrical circuit capable of supporting an installed *EVSE*.

Revise text as follows:

C401.2.2 ASHRAE 90.1
Commercial buildings shall comply with the requirements of ANSI/ASHRAE/IESNA 90.1 and Section C405.14.

Revise table as follows:

TABLE
C405.12.2 ENERGY USE CATEGORIES

LOAD CATEGORY	DESCRIPTION OF ENERGY CUSE
Total HVAC system	Heating, cooling and ventilation, including but not limited to fans, pumps, boilers, chillers, and water heating. Energy used by 120-volt equipment, or by 208/120-volt equipment that is located in a building where the main service is 480/277-volt power, is permitted to be excluded from total HVAC system energy use.
Interior lighting	Lighting systems located within the building.
Exterior lighting	Lighting systems located on the building site but not within the building.
Plug loads	Devices, appliances and equipment connected to convenience receptacle outlets.
Process load	Any single load that is not included in HVAC, lighting or plug load category and that exceeds 5 percent of the peak connected load of the whole building, including but not limited to data centers, manufacturing equipment, and commercial kitchens.
Electric vehicle charging	*Electric vehicle* charging loads.

Building operations and other miscellaneous	The remaining loads not included in this table, including but not limited to vertical transportation systems, automatic doors, motorized shading systems, ornamental fountains, ornamental fireplaces, swimming pools, in-ground spas and snow-melt systems.

Add new sections as follows:

C405.14 Electric vehicle charging infrastructure. Parking facilities shall be provided with electric vehicle charging infrastructure in accordance with this section and Table C405.14 based on the total number of parking spaces and rounded up to the nearest whole number. *EVSE, EV ready spaces* and *EV capable spaces* may be counted toward meeting minimum parking requirements. *EVSE spaces* may be used to meet requirements for *EV ready spaces* and *EV capable spaces. EV ready spaces* may be used to meet requirements for *EV capable spaces.* An *ALMS* may be used to reduce the total electrical capacity required by *EVSE spaces* provided that all *EVSE spaces* are capable of simultaneously charging at a minimum rate of 1.4 kW. Where more than one parking facility is provided on a building site, the number of parking spaces required shall be calculated separately for each parking facility.

Exception: In parking garages, the conduit required for *EV capable spaces* may be omitted provided the parking garage electrical service has no less than 1.8 kVA of additional reserved capacity per *EV capable space.*

TABLE C405.14
ELECTRIC VEHICLE CHARGING INFRASTRUCTURE REQUIREMENTS

OCCUPANCY	***EVSE SPACES***	***EV READY SPACES***	***EV CAPABLE SPACES***
Group B Occupancies	15%	NA	40%
Group M Occupancies	25%	NA	40%
R-2 Occupancy	NA	100%[a]	NA
All other Occupancies	10%	NA	40%

a. Or one *EV ready space* per *dwelling unit.*

C405.14.1 EV Capable Spaces. *EV Capable Spaces* shall be provided with electrical infrastructure that meets the following requirements:

1. Conduit that is continuous between a junction box or outlet located within 3 feet (914 mm) of the parking space and an electrical panel serving the area of the parking space

2. The electrical panel to which the conduit connects shall have sufficient dedicated physical space for a dual-pole, 40-amp breaker
3. The conduit shall be sized and rated to accommodate a 40-amp, 208/240-volt branch circuit and have a minimum nominal trade size of 1 inch
4. The electrical junction box and the electrical panel directory entry for the dedicated space in the electrical panel shall have labels stating "For future *electric vehicle* charging"

C405.14.2 EV Ready Spaces. The branch circuit serving *EV Ready Spaces* shall meet the following requirements:

1. Wiring capable of supporting a 40-amp, 208/240-volt circuit,
2. Terminates at an outlet or junction box located within 3 feet (914 mm) of the parking space,
3. A minimum capacity of 1.8 kVA.
4. The electrical panel directory shall designate the branch circuit as "For electric vehicle charging" and the junction box or receptacle shall be labelled "For electric vehicle charging,"

C405.14.2 EVSE Spaces. The *EVSE* serving *EVSE spaces* shall be capable of supplying not less than 6.2 kW to an electric vehicle and shall be located within 3 feet (914 mm) of the parking space.

Solar Readiness and Renewable Requirements

Jobs in the solar industry are growing rapidly, and an advancement in clean energy through the state's building codes would help to keep those jobs in Michigan and continue to spur economic development. The proposed amendments, which would require new homes in the state to be solar ready and require new commercial buildings to have renewable energy generation onsite with a rate capacity of 0.25 Watts/square foot, would help to support this growing industry, reduce energy costs for homeowners and business owners across the state, and reduce carbon emissions.

If a residential home is not built to be "solar ready," it can be technically infeasible or economically prohibitive to install solar at a later date. The cost of adding the infrastructure to make a home solar ready using data from RSMeans is estimated to cost $435 or $0.17 per square foot at the time of construction. According to an NREL report, if a home is not made solar ready but chooses to add solar at a later date, the cost of the retrofit (if the retrofit is feasible) is $4,373 or $1.75 per square foot.[15] Therefore, adding the infrastructure to make a home solar ready saves $3,938 or $1.58 per square foot for homeowners who choose to add solar at a later date.

[15] Assumes the single-family home is 2,500 square feet, the average size of a single family home built in the U.S. *Solar Ready: An Overview of Implementation Practices.* National Renewable Energy Laboratory. Jan. 2012. Available at www.nrel.gov/docs/fy12osti/51296.pdf.

Both of these additions would increase the costs of construction modestly. However, without the code change, it may not be technically possible or it may be economically prohibitive to add solar to a home or commercial building in the future. The amendments will support businesses and families by lowering energy bills and providing increased reliability and resiliency. On-site solar plus storage is a critical component for achieving the administration's climate goals, and these requirements in the building code will help to ensure that distributed generation resources are more accessible.

Michigan EIBC recommends the following solar readiness language be added to the residential code, including revisions to R103.2.2, R105.2.3, R105.2.5, R401.3, Table R405.2 and R406.2, a new definition, and new section R404.4:

Add new text as follows:

> **R103.2.3 Solar-ready system**. The construction documents shall provide details for dedicated roof area, structural design for roof dead and live load, and routing of conduit or pre-wiring from *solar-ready zone* to electrical service panel or plumbing from *solar-ready zone* to *service water heating* system for the *solar-ready zone* shall be represented on the construction documents.

Revise text as follows:

> **R105.2.3 Plumbing rough-in inspection.** Inspections at plumbing rough-in shall verify compliance as required by the code and approved plans and specifications as to types of insulation and corresponding R-values and protection and required controls. Where the solar-ready zone is installed for solar water heating, inspections shall verify pathways for routing of plumbing from solar-ready zone to service water heating system.

Add new text as follows:

> **R105.2.5 Electrical rough-in inspection.** Inspections at electrical rough-in shall verify compliance as required by the code and the approved plans and specifications as to the locations, distribution, and capacity of the electrical system. Where the solar-ready zone is installed for electricity generation, inspections shall verify conduit or pre-wiring from solar-ready zone to electrical panel.

Revise numbering as follows:

> ~~**R105.2.5**~~ **R105.2.6 Final inspection.**

Add new definitions as follows:

SOLAR-READY ZONE. A section or sections of the roof or building overhang designated and reserved for the future installation of a solar photovoltaic or solar thermal system.

Revise text as follows:

R401.3 Certificate. A permanent certificate shall be completed by the builder or other approved party and posted on a wall in the space where the furnace is located, a utility room or an approved location inside the building. Where located on an electrical panel, the certificate shall not cover or obstruct the visibility of the circuit directory label, service disconnect label or other required labels. The certification shall indicate the following:

8. Where a *solar-ready zone* is provided, the certificate shall indicate the location, dimensions, and capacity reserved on the electrical service panel.

Add new text as follows:

R404.4 Renewable energy infrastructure. The building shall comply with the requirements of R404.4.1 or R404.4.2

R404.4.1 One- and two- family dwellings and townhouses. One- and two-family dwellings and townhouses shall comply with Sections R404.4.1.1 through R404.4.1.4.

Exceptions:

1. A *building* with a permanently installed on-site renewable energy system.

2. A *building* with a solar-ready zone area that is less than 600 square feet (55 m^2) of roof area oriented between 110 degrees and 270 degrees of true north.

3. A *building* with a solar-ready zone area that is shaded for more than 70 percent of daylight hours annually.

R404.4.1.1 Solar-ready zone area. The total solar-ready zone area shall be not less than 300 square feet (28 m^2) exclusive of mandatory access or set back areas as required by the International Fire Code. Townhouses three stories or less in height above grade plane and with a total floor area less than or equal to 2,000 square feet (186 m^2) per dwelling shall have a solar-ready zone area of not less than 150 square feet (14 m^2). The solar-ready zone shall be composed of areas not less than 5.5 feet (1676 mm) in width and not less than 80 square feet (7.4 m^2) exclusive of access or set back areas as required by the International Fire Code.

R404.4.1.2 Obstructions. Solar-ready zones shall be free from obstructions, including but not limited to vents, chimneys, and roof-mounted equipment.

R404.4.1.3 Electrical service reserved space. The main electrical service panel shall have a reserved space to allow installation of a dual pole circuit breaker for future solar electric installation and shall be labeled "For Future Solar Electric." The reserved space shall be positioned at the opposite (load) end from the input feeder location or main circuit location.

R404.4.1.4 Electrical interconnection. An electrical junction box shall be installed within 24 inches (610 mm) of the main electrical service panel and shall be connected to a capped roof penetration sleeve or a location in the attic that is within 3 feet (914 mm) of the *solar ready zone* by one of the following:

1. Minimum ¾-inch nonflexible conduit
2. Minimum #10 Metal copper 3-wire

Where the interconnection terminates in the attic, location shall be no less than 12" (35 mm) above ceiling insulation. Both ends of the interconnection shall be labeled "For Future Solar Electric".

R404.4.1 Group R occupancies. Buildings in Group R-2, R-3 and R-4 shall comply with Section C405.13.

Revise table as follows:

TABLE R405.2 REQUIREMENTS FOR TOTAL BUILDING PERFORMANCE

SECTION	TITLE
Electrical Power and Lighting Systems	
R404.1	Lighting equipment
R404.2	Interior lighting controls
R404.4	Renewable energy infrastructure

Revise table as follows:

TABLE R406.2 REQUIREMENTS FOR ENERGY RATING INDEX

SECTION	TITLE
Electrical Power and Lighting Systems	
R404.1	Lighting equipment
R404.2	Interior lighting controls

R404.4	Renewable energy infrastructure
R406.3	Building thermal envelope

Michigan EIBC recommends the following renewable requirement language be added to the commercial code, including new definitions, new section C405.13, and revision to C406.5:

Add new definitions as follows:

RENEWABLE ENERGY CERTIFICATE (REC). An instrument that represents the environmental attributes of one megawatt-hour of renewable electricity; also known as an energy attribute certificate (EAC).

Add new text as follows:

C405.13 On site renewable energy. Each building site shall have equipment for on-site renewable energy with a rated capacity of not less than 0.25 W/ft² (2.7 W/m²) multiplied by the sum of the gross conditioned floor area of the three largest floors.

Exceptions:

1. Any building located where an unshaded flat plate collector oriented towards the equator and tilted at an angle from horizontal equal to the latitude receives an annual daily average incident solar radiation less than 3.5 kWh/m²·day (1.1 kBtu/ft²·day).
2. Any building where more than 80 percent of the roof area is covered by any combination of equipment other than for on-site renewable energy systems, planters, vegetated space, skylights, or occupied roof deck.
3. Any building where more than 50 percent of roof area is shaded from direct-beam sunlight by natural objects or by structures that are not part of the building for more than 2,500 annual hours between 8:00 AM and 4:00 PM.

C405.13.1 Renewable energy certificate documentation. Documentation shall be provided to the code official that indicates that renewable energy certificates (RECs) associated with the on-site renewable energy will be retained and retired by or on behalf of the owner or tenant.

Revise text as follows:

C406.5 Onsite renewable energy. The total minimum ratings of on-site renewable energy systems, not including onsite renewable energy system capacity used for compliance with Section C405.13, shall be one of the following:

Storage Readiness
Similar to both EVs and solar, battery storage is an emerging industry that is growing substantially in Michigan. While Michigan is becoming a leader in energy storage, the industry needs more opportunities for growth through behind-the-meter storage in order to address resiliency and reliability issues. Michigan has some of the worst reliability in the country. According to the Citizens Utility Board of Michigan, "in 2017, Michigan was the 6th highest nationwide in minutes of outage per customer when compared to other states" and "the 4th worst nationwide in time to restore power when a customer experienced an outage."[16]

Requiring energy storage readiness in homes gives homeowners the option to install batteries in the future, thus protecting families from power outages. Storage solutions will not only benefit residents in helping to decrease demand charges, but also contribute to the vision of grid-interactive buildings and vehicles, where all pieces of the energy system are working in coordination.

The below code proposals require residential and commercial buildings to have the physical space and equipment for a future energy storage system. The increased costs for ensuring buildings are energy storage ready are minor compared to the retrofit costs for adding storage at a later date in buildings that are not "storage ready." It is critical that the State use all of its tools for improving energy resilience and reliability, including in future homes and buildings.

Michigan EIBC recommends the following storage readiness language be added to the residential code, including a revision to R405.2 and R406.2 and new sections C103.2.4 and R404.7.

Add new text as follows:

> **R103.2.4 Energy storage-ready system.** The construction documents shall provide the location of pathways for routing of raceways or cable from the electrical service panel and energy storage system area and the location and layout of a designated area for electrical energy storage system.

Add new text as follows:

> **R404.7 Electric infrastructure for energy storage.** Each *building site* shall have a dedicated location for the installation of future on-site energy storage. The floor area shall be not less than 2 feet (610 mm) in one dimension and 4 feet (1219 mm) in another dimension and located in accordance with Section 1207 of the International Fire Code and Section 110.26 of the NFPA 70.
>
> > **Exception:** Where an onsite electrical energy system storage system is installed.

[16] Citizens Utility Board. "Energy Affordability in Michigan." Available at https://www.cubofmichigan.org/issues.

R404.7.1 Electrical service reserved space. The main electrical service panel shall have a reserved space to allow installation of a two-pole circuit breaker for future electrical energy storage system installation. This space shall be labeled "For Future Electric Storage." The reserved spaces shall be positioned at the end of the panel that is opposite from the panel supply conductor connection.

Revise table as follows:

TABLE R406.2 REQUIREMENTS FOR ENERGY RATING INDEX

SECTION [a]	TITLE
Electrical Power and Lighting Systems	
R404.1	Lighting equipment
R404.2	Interior lighting controls
R404.7	Electric infrastructure for energy storage
R406.3	Building thermal envelope

Michigan EIBC recommends the following storage readiness language be added to the commercial code, including a revision to C103.2 and new section C405.15:

Revise as follows:

C103.2 Information on construction documents. Construction documents shall be drawn to scale upon suitable material. Electronic media documented are permitted to be submitted when approved by the code official. Construction documents shall be of sufficient clarity to indicate the location, nature and extent of the work proposed, and show in sufficient detail pertinent data and features of the building, systems and equipment herein governed. Details shall include the following as applicable:

14. Location of pathways for routing of raceways or cable from the electrical service panel and electrical energy storage system area.

15. Location and layout of a designated area for electrical energy storage system.

Add new text as follows:

C405.15 Electric infrastructure for energy storage. Each building site shall have equipment for on-site energy storage not less than 2 feet (610 mm) in one dimension and 4 feet (1219 mm) in another dimension and located in accordance with Section 1207 of the International Fire Code and Section110.26 of the NFPA 70.

Exception: Where an onsite electrical energy system storage system is installed.

> **C405.15.1 Electrical service reserved space.** The main electrical service panel shall have a reserved space to allow installation of a two-pole circuit breaker for future electrical energy storage system installation This space shall be labeled "For Future Electric Storage." The reserved spaces shall be positioned at the end of the panel that is opposite from the panel supply conductor connection.

Building Electrification and Demand Response

Michigan EIBC encourages LARA to include readiness provisions for building electrification and important building-grid integration technologies, including smart thermostats, into the residential code to further save Michigan residents money, achieve Michigan's carbon reduction goals, and reduce indoor air pollution. An analysis from Rocky Mountain Institute found that all-electric new construction is more economical to build than homes with gas appliances, with lower upfront costs on devices, installation, and gas interconnection.[17] The study also found that all-electric homes resulted in far fewer carbon emissions than mixed-fuel homes overall, which is important for reaching the administration's goal of 2050 carbon neutrality. Additionally, gas appliances are a primary source of pollution inside homes and switching to electric appliances and heating can reduce respiratory symptoms.[18]

Smart thermostats are another tool that is relatively inexpensive and a proven technology for reducing emissions while further ensuring the efficient operation of a building. As Michigan continues to move its sources of energy toward renewables, buildings must be prepared to aid in this transition by not just reducing baseline energy use but reducing energy use at key times during the day to match grid needs, which will also help reduce utility costs for Michigan residents. In particular, the MI Healthy Climate Plan recommends the state adopt a renewable portfolio standard of 50% by 2030, with a plan to end its use of coal-fired power by 2035. It is critical that new buildings be ready to support this increase in intermittent resources by using demand response and smart thermostats to effectively manage load. Smart thermostats also can save customers money on their utility bills, with potential savings of approximately $140 – $200 per year, possibly in addition to monetary utility incentives paid to the customer.[19]

Michigan EIBC recommends the following electric readiness language be added to the residential code, including new definitions, revisions to R401.2.5, R401.3, R402.1, R405, R406, and new section R404.6:

Add new text as follows:

> **R103.2.4 Electrification system.** The construction documents shall provide details for additional electric infrastructure, including branch circuits, conduit, or pre-wiring, and panel capacity in compliance with the provisions of this code.

Add new text as follows:

[17] McKenna, Shah, & Louis-Prescott. RMI. "All-Electric New Homes: A Win for the Climate and the Economy." October 15, 2020. Available at https://rmi.org/all-electric-new-homes-a-win-for-the-climate-and-the-economy/.
[18] Asthma Initiative of Michigan. "Indoor Air Quality." Available at https://getasthmahelp.org/indoor-air-quality.aspx.
[19] Smart Energy Consumer Collaborative. "Is a smart thermostat a worthwhile investment for your home?" Available at https://www.whatissmartenergy.org/featured-article/is-a-smart-thermostat-a-worthwhile-investment-for-your-home.

R105.2.5 Electrical rough-in inspection. Inspections at electrical rough-in shall verify compliance as required by the code and the approved plans and specifications as to the locations, distribution, and capacity of the electrical system.

Revise numbering as follows:

~~**R105.2.5**~~ **R105.2.6 Final inspection.**

Add new definitions as follows:

ALL-ELECTRIC BUILDING. A *building* that contains no *combustion equipment*, or plumbing for *combustion equipment,* installed within the *building,* or *building site.*

APPLIANCE. A device or apparatus that is manufactured and designed to utilize energy and for which this code provides specific requirements.

COMBUSTION EQUIPMENT. Any *equipment* or *appliance* used for space heating, *service water heating*, cooking, clothes drying, or lighting that uses *fuel gas* or *fuel oil*.

EQUIPMENT. Piping, ducts, vents, control devices and other components of systems other than appliances that are permanently installed and integrated to provide control of environmental conditions for buildings. This definition shall also include other systems specifically regulated in this code.

FUEL GAS. A natural gas, manufactured gas, liquified petroleum gas or a mixture of these.

FUEL OIL. Kerosene or any hydrocarbon oil having a flash point not less than 100°F (38°C).

MIXED-FUEL BUILDING. A *building* that contains *combustion equipment* or includes piping for *combustion equipment*.

Revise text as follows:

R401.2.5 Additional energy efficiency. This section establishes additional requirements applicable to all compliance approaches to achieve additional energy efficiency.

1. For *all-electric buildings* complying with Section R401.2.1, one of the additional efficiency package options shall be installed according to Section R408.2.

2. For mixed-fuel buildings complying with Section R401.2.1, the building shall be required to install either R408.2.1 or R408.2.5 of the additional efficiency package options, and any two of R408.2.2, R408.2.3, or R408.2.4 of the additional efficiency package options.

~~2~~3. For buildings complying with Section R401.2.2, the building shall meet one of the following:

~~2~~3.1. *All-electric buildings* shall have ~~O~~one of the additional efficiency package options in Section R408.2 ~~shall be~~ installed without including such measures in the proposed design under Section R405; or

~~2~~3.2. The proposed design of the *all-electric building* ~~building~~ under Section R405.3 shall have an annual energy cost that is less than or equal to the 95 percent of the annual energy cost of the standard reference design~~.~~; or

3.3 Mixed-fuel buildings shall have either R408.2.1 or R408.2.5 of the additional efficiency package options, and any two of R408.2.2, R408.2.3, or R408.2.4 of the additional efficiency package options installed without including such measures in the proposed design under Section R405; or

3.4 The proposed design of the mixed-fuel building under Section R405.3 shall have an annual energy cost that is less than or equal to 85 percent of the annual energy cost of the standard reference design.

~~3~~4. For buildings complying with the Energy Rating Index alternative Section R401.2.3, the Energy Rating Index value shall be at least 5 percent less than the Energy Rating Index target specified in Table R406.5.

The option**s** selected for compliance shall be identified in the certificate required by Section R401.3.

Revise text as follows:

R401.3 Certificate. A permanent certificate shall be completed by the builder or other approved party and posted on a wall in the space where the furnace is located, a utility room or an approved location inside the building. Where located on an electrical panel, the certificate shall not cover or obstruct the visibility of the circuit directory label, service disconnect label or other required labels. The certification shall indicate the following:

4. The types, sizes, fuel sources, and efficiencies of heating, cooling and service water heating equipment. Where a gas-fired unvented room heater, electric furnace or baseboard electric heater is installed in the residence, the certificate shall indicate "gas-fired unvented room heater," "electric furnace" or "baseboard electric heater," as appropriate. An efficiency shall not be indicated for gas-fired unvented room heaters, electric furnaces and electric baseboard heaters.

8. The fuel sources for cooking and clothes drying equipment.

9. Where combustion equipment is installed, the certificate shall indicate information on the installation of additional electric infrastructure including which *equipment* and/or *appliances* include additional electric infrastructure, capacity reserved on the electrical service panel for replacement of each piece of combustion *equipment* and/or *appliance*

R402.1 General. The building thermal envelope shall comply with the requirements of Sections R402.1.1 through R402.1.5.

Exceptions:

1. The following low-energy buildings, or portions thereof, separated from the remainder of the building by *building thermal envelope assemblies* complying with this section shall be exempt from the building thermal envelope provisions of Section R402.
    1. Those containing no *combustion equipment* with a peak design rate of energy usage less than 3.4 Btu/h·ft2 (10.7 W/m2) or 1.0 watt/ft2 of floor area for space conditioning purposes.
    2. Those containing no *combustion equipment* that do not contain *conditioned space*.

Add new text as follows:

R404.6 Additional electric infrastructure. *Combustion equipment* shall be installed in accordance with this section.

R404.6.1 Equipment serving multiple units. *Combustion equipment* that serves multiple *dwelling units* shall comply with Section C405.16.

R404.6.2 Combustion water heating. Water heaters shall be installed in accordance with the following:

1. A dedicated 240-volt branch circuit with a minimum capacity of 30 amps shall terminate within 3 feet (914 mm) from the water heater and be accessible to the water heater with no obstructions. Both ends of the branch circuit shall be labeled with the words "For Future Heat Pump Water Heater" and be electrically isolated.
2. A condensate drain that is no more than 2 inches (51 mm) higher than the base of the installed water heater and allows natural draining without pump assistance shall be installed within 3 feet (914 mm) of the water heater.
3. The water heater shall be installed in a space with minimum dimensions of 3 feet (914 mm) by 3 feet (914 mm) by 7 feet (2134 mm) high.
4. The water heater shall be installed in a space with a minimum volume of 700 cubic feet (20,000 L) or the equivalent of one 16-inch (406 mm) by 24-inch (610 mm) grill to a heated space and one 8-inch (203 mm) duct of no more than 10 feet (3048 mm) in length for cool exhaust air.

R404.6.3 Combustion space heating. Where a building has combustion equipment for space heating, the building shall be provided with a designated exterior location(s) in accordance with the following:

1. Natural drainage for condensate from cooling equipment operation or a condensate drain located within 3 feet (914 mm), and
2. A dedicated branch circuit in compliance with IRC Section E3702.11 based on heat pump space heating equipment sized in accordance with R403.7 and terminating within 3 feet (914 mm) of the location with no obstructions. Both ends of the branch circuit shall be labeled “For Future Heat Pump Space Heater.”

Exception: Where an electrical circuit in compliance with IRC Section E3702.11 exists for space cooling equipment.

R404.6.4 Combustion clothes drying. A dedicated 240-volt branch circuit with a minimum capacity of 30 amps shall terminate within 6 feet (1829 mm) of natural gas clothes dryers and shall be accessible with no obstructions. Both ends of the branch circuit shall be labeled with the words "For Future Electric Clothes Drying" and be electrically isolated.

R404.6.5 Combustion cooking. A dedicated 240-Volt, 40A branch circuit shall terminate within 6 feet (1829 mm) of natural gas ranges, cooktops and ovens and be accessible with no obstructions. Both ends of the branch circuit shall be labeled with the words "For Future Electric Range" and be electrically isolated.

R404.6.6 Other combustion equipment. *Combustion equipment* and end-uses not covered by Sections R404.6.2-5 shall be provided with a branch circuit sized for an electric *appliance*, *equipment* or end use with an equivalent capacity that terminates within 6 feet (1829 mm) of the *appliance* or *equipment*.

Revise table as follows:

TABLE R405.2 REQUIREMENTS FOR TOTAL BUILDING PERFORMANCE

SECTION [a]	TITLE
Electrical Power and Lighting Systems	
R404.1	Lighting equipment
R404.2	Interior lighting controls
R404.6	Additional electric infrastructure

Revise table as follows:

TABLE R406.2 REQUIREMENTS FOR ENERGY RATING INDEX

SECTION [a]	TITLE
Electrical Power and Lighting Systems	
R404.1	Lighting equipment
R404.2	Interior lighting controls
R404.6	Additional electric infrastructure
R406.3	Building thermal envelope

Revise text as follows:

R406.5 ERI-based compliance. Compliance based on an ERI analysis requires that the rated *proposed* design and confirmed built dwelling be shown to have an ERI less than or equal to the appropriate value for the proposed *mixed-fuel building* or the proposed *all-electric building* as indicated in Table R406.4 when compared to the *ERI reference design*.

TABLE R406.4 MAXIMUM ENERGY RATING INDEX

Climate Zone	~~Energy Rating Index~~ All-Electric Building	Mixed Fuel Building
5	55	47
6	54	46
7	53	46

Add new text as follows:

R408.2.3 Reduced energy use in service water-heating option. The hot water system shall meet one of the following efficiencies:

4. Greater than or equal to 82 EF instantaneous fossil fuel service water-heating system and drain water heat recovery unit meeting the requirements of Section R403.5.3 installed on at least one shower.

Michigan EIBC recommends the following demand response language be added to the residential code, including new definitions and new Section C403.4.1.6:

Add new definition as follows:

DEMAND RESPONSIVE CONTROL. An automatic control that can receive and automatically respond to demand response requests from a utility, electrical system operator, or third-party demand response program provider.

Revise text as follows:

R403.1.1 Thermostat ~~Programmable thermostat~~. The thermostat controlling the primary heating or cooling system of the dwelling unit shall be capable of controlling the heating and cooling system on a daily schedule to maintain different temperature setpoints at different times of the day. This thermostat shall include the capability to set back or temporarily operate the system to maintain zone temperatures of not less than 55°F (13°C) to not greater than 85°F (29°C). The thermostat shall be programmed initially by the manufacturer with a heating temperature setpoint of not greater than 70°F (21°C) and a cooling temperature setpoint of not less than 78°F (26°C). The thermostat shall be provided with a d*emand responsive control* capable of increasing the cooling setpoint between 1°F (0.56°C) and 10°F (5.56°C) in response to a demand response request from a utility, electrical system operator, or third-party demand response program provider.

Add new standard as follows:

CTA *Consumer Technology Association*
1919 S. Eads Street
Arlington, VA 22202

Standard reference	*Title*	*Referenced in code*

number		*section number*
ANSI/CTA-2045-B	*Modular Communications Interface for Energy Management . . . . . .*	*. R403.5.4*

Conclusion
Thank you for the opportunity to comment in support of the 2021 Michigan Energy Code. To reiterate, Michigan EIBC is supportive of the BCC's interest in updating to the 2021 IECC without weakening amendments, as well as adding strengthening amendments to require EV charging readiness, solar readiness/nominal requirements, and storage readiness in the residential and commercial codes, and building electrification and demand response readiness in the residential code. Please do not hesitate to reach out if you have any questions, and we look forward to working with you and your team during the remainder of the process.

Thank you,

Michigan EIBC

20 N. Wacker Drive, Suite 1301
Chicago, Illinois 60606
312.587.8390 Main Line
312.587.8391 Fax
www.mwalliance.org

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Isabella Gross & Paige Knutsen
Midwest Energy Efficiency Alliance
Pages 44-48

Tony Williamson, Bureau of Construction Codes
Michigan Bureau of Construction Codes
P.O Box 30254
Lansing, MI 48933
Lara-bcc-rules@michigan.gov

Re: MEEA Public Comments on Michigan's Adoption of the Residential & Commercial Building Energy Efficiency Codes

Dear Mr. Williamson,

Thank you for the opportunity to speak on the current Michigan Building Energy Code update. 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. We have worked in Michigan on energy code adoption since 2009.

As proposed, the rules to update the Michigan Building Energy Code contain a few amendments that weaken the 2021 International Energy Conservation Code (IECC). The amendments primarily affect the residential requirements for duct testing and the commercial requirements for lighting alterations. If these changes remain in the code as passed, Michiganders will not realize the full benefits of the 2021 IECC.

Thus, MEEA recommends the adoption of the 2021 IECC without weakening amendments as the statewide minimum building energy code for residential and commercial buildings. Adopting the 2021 IECC without weakening amendments is cost-effective, will reduce utility bills, opens new federal funding streams for the state, municipalities and businesses, and cuts greenhouse gas emissions.

The Michigan Cost-Effectiveness Criteria is Widely Misunderstood

Michigan is the only Midwestern state with requirements in statute regarding cost-effectiveness, but those requirements are widely misunderstood and commonly misstated. While the Michigan Stille-Derossett-Hale Single State Construction Code Act ("Act") does require that the state adopt codes that are "cost-effective," the statute does not require a seven-year simple payback analysis to determine what is "cost-effective."[1] Rather, the Act requires that the "benefits and costs over a 7-year time period" simply be *considered*.[2] A life-cycle cost method, which considers both the costs and benefits as experienced by a homeowner, is the more appropriate perspective and is the method used by the U.S. Department of Energy (DOE) and the Pacific Northwest National Laboratory (PNNL) to calculate the cost-effectiveness of

[1] *MCL 125.1502a, 125.1504*
[2] *MCL 125.1502a(1)(p)(ii)*

MEEA
MIDWEST ENERGY EFFICIENCY ALLIANCE
20 N. Wacker Drive, Suite 1301
Chicago, Illinois 60606
312.587.8390 Main Line
312.587.8391 Fax
www.mwalliance.org

Michigan's current residential code update. Moreover, the life-cycle cost method has become a common practice in code adoption considerations across the country.

Adopting Unamended Energy Codes is Cost-Effective

Buildings have long-term impacts beyond their initial construction costs, and energy codes play a crucial role in providing monetary payback to owners or renters. The adoption of the 2021 IECC can significantly reduce energy consumption and lower utility costs for residents and businesses.

According to a cost-effectiveness study conducted by PNNL for the state using methodology widely accepted across the country, an average Michigan homeowner would see positive cash flow within four years[3] with a home built to the full 2021 IECC over the current Michigan code. According to another analysis conducted by PNNL for DOE, "adopting the 2021 IECC in Michigan is expected to result in homes that are energy efficient, more affordable to own and operate, and based on current industry standards for health, comfort and resilience."[4] More specifically, the residential 2021 IECC will provide Michigan-specific ***energy savings of 10.7%*** compared to the current state energy code, equating to about $327 of annual utility bill savings for Michigan households. Statewide, Michigan homeowners will collectively save nearly ***$4 million within the first year of adoption***, resulting in almost ***$1.3 billion in energy savings*** over the next 30 years.[5]

Adopting unweakened model energy codes ensures cost-effectiveness while minimizing potential impact on the building industry. The International Code Council (ICC) considers cost-effectiveness with each update of the model energy codes, and each development is intended to be an incremental change for the building industry. In delaying or weakening adoption of the 2021 IECC, the state risks having an undertrained workforce that falls behind neighboring jurisdictions and an out-of-date building stock that wastes energy and money. Skipping or weakening the model energy codes makes it less likely that cost-effectiveness can be achieved, effectively leaving the Michigan building industry and Michigan citizens behind. With the four-year life-cycle payback analysis, Michigan should therefore feel confident that ***the unweakened 2021 IECC is cost-effective***.

Funding and Resources to Implement the 2021 IECC are Available

Now is prime time for Michigan to adopt the unweakened 2021 IECC. Federal funding and technical assistance resources are becoming available for state's adopting the unamended 2021 IECC and some Michigan utilities are poised to implement residential energy code assistance programs upon its adoption, supplementing upcoming state compliance efforts.

[3] *Pacific Northwest National Laboratory, Cost-Effectiveness Analysis of the 2021 IECC for the State of Michigan, August 2023*
[4] *Pacific Northwest National Laboratory, Cost-Effectiveness of the 2021 IECC for Residential Buildings in Michigan, July 2021*
[5] *Pacific Northwest National Laboratory, Cost-Effectiveness of the 2021 IECC for Residential Buildings in Michigan, July 2021*

MEEA
MIDWEST ENERGY EFFICIENCY ALLIANCE
20 N. Wacker Drive, Suite 1301
Chicago, Illinois 60606
312.587.8390 Main Line
312.587.8391 Fax
www.mwalliance.org

Adoption of the unamended 2021 IECC would position Michigan to leverage millions of dollars in funding opportunities, bolstering the state's capacity to advance its clean energy and sustainability objectives. In particular, the DOE State and Community Energy Programs (SCEP) office recently announced that it will provide up to $400 million to support states in adopting and implementing the latest model energy codes (i.e., the 2021 IECC).[6] ***Over $8.5 million of this funding is available to Michigan alone,*** and it may be used for workforce development, implementation, compliance training, weatherization and more. The Bipartisan Infrastructure Law also provides $225 million for resilient and efficient codes implementation. States are eligible to receive this money if they update to more recent model energy codes, or if they conduct studies, training and implementation of more efficient codes or building policies.

There are also local resources available and ready to use for training and education of the 2021 IECC. Consumers Energy, DTE Energy and Michigan's Department of Environment, Great Lakes, and Energy (EGLE) are currently prepared to provide technical assistance and support to the state's residents and workforce in order to achieve compliance with the 2021 IECC. Indeed, MEEA (a project partner) has already conducted similar code training that has improved compliance in Nebraska, Kentucky and Missouri.

The Building Industry is Ready for the 2021 IECC

A field study conducted in Michigan throughout 2022 and 2023 concluded that many measures of the residential 2021 IECC are already being practiced by Michigan builders. The study, in its final evaluation phase, was conducted by MEEA on behalf of the U.S. DOE and Michigan's Department of Licensing and Regulatory Affairs (LARA), with BER providing the site visits and data collection. The study used a random-sampling methodology[7] developed by DOE that is widely considered the standard for residential field studies, and in short was conducted to determine the typical building construction methods utilized across Michigan. The following information is not the full scope of the report (which is still in development by PNNL) but offers some preliminary trends according to observable data:

- The prescriptive path is the least utilized compliance path according to our field study, with only 6% of participants included. The two performance path options, which have efficiency targets but allow designers and builders flexibility in choosing and trading off provisions to meet them, are the most utilized in Michigan. The most used compliance path was the UA Performance Path at 75%, with the ERI Performance Path the second-used at 19%. This shows the UA Performance Path, and or the latest preposed energy code, is currently the main performance path used by builders. This highlights the state's building industries' readiness and ability to update Michigan's building energy code to the 2021 IECC.
- Michigan builders are building with most of their ducts inside conditioned space, with around 79% of observed homes with all ducts located in conditioned space. Of our

[6] *Technical Assistance for the Adoption of Building Energy Codes | Department of Energy*
[7] *EERE Technical Report Template (energycodes.gov)*

MEEA
MIDWEST ENERGY EFFICIENCY ALLIANCE
20 N. Wacker Drive, Suite 1301
Chicago, Illinois 60606
312.587.8390 Main Line
312.587.8391 Fax
www.mwalliance.org

sample, that number increases to 93% when considering 85% or more of the ducts located in conditioned space.

- Around 20% of homes in the study included the use of continuous insulation for above-grade wall assemblies, which is significantly higher than other Midwest states.

Based on these trends, Michigan builders should feel confident about their ability to meet the full 2021 IECC. The most common code change concerns are usually related to the additional efficiency requirements and the use of continuous insulation in the prescriptive path. It appears that Michigan builders can easily meet the "100% of ducts in conditioned space" option of the additional efficiency requirements, and that one in five homes are already using continuous insulation. With 94% of participating homes using a performance path, it also seems that builders are very familiar with how to trade off envelope provisions, meaning that they would not even need to adhere to the continuous insulation requirements of the prescriptive path option if they did not want to. For these reasons, ***there is no need for the state to weaken the prescriptive path or any other provisions of the 2021 IECC.***

Adopting the 2021 IECC Will Significantly Help the State Achieve its Climate Goals

Lastly, the adoption of the 2021 IECC codes aligns with the broader environmental and economic goals set forth for the state and is crucial to achieving the objectives laid out in Governor Whitmer's MI Healthy Climate Plan. The Michigan Healthy Climate Plan (MIHCP) outlined key objectives to improve Michiganders' well-being, including reducing climate emissions, improving health outcomes and strengthening the economy. Specified goals include reducing energy consumption by 30% by 2030 and reaching net-zero greenhouse gas emissions by 2050[8]. These targets underline the urgent need for comprehensive measures to enhance energy efficiency and curb emissions. Implementing energy-efficient building practices not only reduces energy bills for residents and businesses, but also decreases carbon emissions, improves indoor air quality, and bolsters resilience to climate change. Moving to the commercial 2021 IECC will reduce statewide CO_2 emissions by 10.0 MMT (30 years cumulative), equivalent to the emissions of about two million cars driven for one year and stimulate the creation of high-quality jobs across the state.[9] ***By adopting efficient energy codes like the unweakened 2021 IECC, Michigan can significantly contribute to meeting these targets.***

The 2021 IECC Brings Benefits to Michigan

The adoption of the unweakened 2021 IECC is a cost-effective way to gradually increase the level of efficiency of residential and commercial buildings. The 2021 IECC will reduce long-term energy use and costs for residents and businesses, advance Michigan's workforce and economy and ensure that new construction in the state meets high standards of sustainability and resilience. Updating Michigan's energy codes would be particularly beneficial for local governments and community partners, especially towards ensuring that newly constructed

[8] *MI Healthy Climate Plan (michigan.gov)*
[9] *Cost-Effectiveness of ANSI/ASHRAE/IES Standard 90.1-2019 for Michigan, 2021*

MIDWEST ENERGY EFFICIENCY ALLIANCE
20 N. Wacker Drive, Suite 1301
Chicago, Illinois 60606
312.587.8390 Main Line
312.587.8391 Fax
www.mwalliance.org

affordable housing in underserved communities is healthier, safer, more comfortable, resilient, and efficient.

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, Building Codes & Policy Associate for MEEA, at igross@mwalliance.org. Thank you for your consideration.

Sincerely,

Paige Knutsen

Executive Director

MICHIGAN CHEMISTRY COUNCIL

620 S Capitol Ave
Lansing, MI 48933
517.487.8557
michiganchemistry.com

February 7, 2024

Mr. Tony Williamson
Bureau of Construction Codes
Michigan Department of Licensing and Regulatory Affairs
Administrative Services Division
P.O. Box 30254
Lansing, MI 48909

Re: Support for Adoption of the 2021 International Energy Conservation Code

Mr. Williamson,

The Michigan Chemistry Council appreciates the opportunity to submit a letter in support of adopting the 2021 International Energy Conservation Code (IECC).

The Michigan Chemistry Council serves as the voice of a sector that supports more than 80,000 jobs in our state. The chemical industry is one of Michigan's largest manufacturing sectors and is an essential contributor to every facet of the state's economy. Over 96% of all manufactured goods are directly touched by the business of chemistry. In Michigan, the automotive, agricultural, and construction sectors, in particular, all depend heavily on the chemical industry's products and innovations.

We share the following reasons provided by our partner organization, the American Chemistry Council, for supporting the adoption of the 2021 International Energy Conservation Code:

The energy savings that are realized by the people who live and own businesses in the state. The Department of Energy (DOE) determined the 2021 energy codes provide **cost-effective levels of energy efficiency** and performance for residential and commercial buildings in Michigan. Based on housing starts in Michigan the adoption of the 2021 Residential IECC would save $3,873,000 in the first year alone.[1] Likewise, based on new commercial construction numbers in Michigan the adoption of the 2021 IECC with reference to ASHRAE 90.1-2019 for commercial buildings would save $1,587,000 in the first year alone.[2]

This is especially important in order to address the **environmental justice issue of the affordable housing** needs of lower income households. According to the U.S. Energy Information Administration:

Across the United States, high utility bills are costing homeowners a significant portion of their monthly incomes. According to the most recent EIA Residential Energy Consumption Survey,[3] about one in five households reported reducing or forgoing basic necessities like food and medicine to pay an energy bill. Stronger energy codes and more widespread code compliance can help change the tide on this type of energy poverty. Improving compliance with residential energy codes opens up an array of economic and health

[1] See Cost-Effectiveness of the 2021 IECC for Residential Buildings in Michigan (energycodes.gov)
[2] See Cost-Effectiveness of ANSI/ASHRAE/IES Standard 90.1-2019 for Michigan (energycodes.gov)
[3] See Residential Energy Consumption Survey (RECS) - Energy Information Administration (eia.gov)

benefits for homeowners, residents, local governments, and building officials, including:

- Reduced energy costs that yield monthly savings for owners and occupants, helping to boost the local economy and improving housing affordability by reducing utility costs.
- More comfortable and durable homes that better shield people from outdoor temperature extremes.
- Better protected occupant health from improved efficiency and indoor air quality.
- Greater market certainty for the building design and construction industry due to consistent implementation across jurisdictions.
- A level playing field for manufacturers, builders, and other building related industries.

Beyond the obvious energy savings benefits there are many other important reasons for Michigan to update their building energy codes:

- **Job creation,** based on U.S. Census data on residential housing permits, it is estimated that over 80,000 residential one- and two-family homes have been permitted in Michigan since the last energy code update in late 2017.[4]
- **GHG emission reductions,** DOE estimates that the 30-year cumulative reduction of CO_2 emissions that Michigan would realize with the adoption of the 2021 residential provisions is equivalent to 11,460,000 metric tons.[5]
- **Resilience,** in a 2021 report the National Institute of Building Sciences found that adopting the latest building code requirements is affordable and saves $11 per $1 invested. Building codes have greatly improved society's disaster resilience, while adding only about 1% to construction costs relative to 1990 standards. The greatest benefits accrue to communities using the most recent code editions.[6]
- **Energy Security,** the International Energy Agency recognizes that energy efficiency can bolster regional or national energy security. By reducing overall energy demand, efficiency can reduce reliance on imports of oil, gas and coal. Energy efficiency can therefore play a crucial role in ensuring both long- and short-term energy security in a cost-effective manner.[7]

Thank you for the opportunity to issue our support for Michigan's adoption of the 2021 IECC.

Sincerely,

Jami Des Chenes
Executive Director
Michigan Chemistry Council

[4] See U.S. Census Bureau, Building Permits Survey, available at https://www.census.gov/construction/bps/
[5] See Cost-Effectiveness of the 2021 IECC for Residential Buildings in Michigan (energycodes.gov)
[6] See Mitigation Saves: Mitigation Saves up to $13 per $1 Invested (nibs.org)
[7] See Energy security – Multiple Benefits of Energy Efficiency – Analysis - IEA

MICHIGAN 2030 DISTRICTS
GRAND RAPIDS, DETROIT, ANN ARBOR/WASHTENAW, LANSING

February 22, 2024

Mr. Andrew Brisbo
Director, Bureau of Construction Codes
Michigan Department of Licensing and Regulatory Affairs
611 W Ottawa St.
Lansing, MI 48933

Re: **2021 Michigan Uniform Energy Code; Administrative Rules Part 10a**

Dear Director Brisbo,

The Michigan 2030 Districts support adoption of the proposed Michigan Uniform Energy Code, Part 10a with the inclusion of IECC Appendix CC. Appendix CB is an important addition from the last draft, however, including appendix CC will improve building efficiency, resilience and is easier to implement due to recent legislation and utility renewable power programs.

On-site renewable energy increases building efficiency. Source energy represents the total amount of raw fuel that is required to operate the building. It incorporates all transmission, delivery, and production losses. By taking all energy use into account, using source energy provides a complete assessment of energy efficiency in a building. The source energy factor used by Energy Star Portfolio Manager for grid power is 2.8 vs 1.0 for on-site renewable power. That means 2.8 times the energy goes into generating and transmitting utility provided power. As the grid becomes more renewable, that factor will decrease, but on-site generated power will always be more efficient source energy.

Appendix CC does NOT require all-electric buildings. It does require that the total energy use of a building, whether natural gas or electricity, be procured from renewable sources. Table 103.3.3 provides ways that requirement can be met.

Since the last energy code public hearing, several important pieces of legislation have been passed that promote on-site solar:

- The distributed energy cap has been increased from 1% to 10%, enabling the growth of on-site solar.
- The amount of on-site solar generation has been increased to 110% of the building's annual energy use, enabling larger systems.
- System size eligible for the Distributed Generation Program has increased from 150KW to 550KW. Enabling larger systems for larger users.

Utilities are offering a range of renewable power options. MIGreen Power, DTE's program, reduces the KWH price from their standard pricing. Contracts offer additional savings.

In addition, ASHRAE 90.1 2022, now published, includes an on-site solar prescriptive requirement:

10.5 Prescriptive Compliance Path

10.5.1 Renewable Energy Resources. *Buildings* shall be served by *renewable energy resources* complying with Section 10.5.1.1.

10.5.1.1 On-Site Renewable Energy. The *building site* shall have *equipment* for *on-site renewable energy* with a rated capacity of not less than 0.50 W/ft^2 or 1.7 Btu/ft^2 multiplied by the sum of the *gross conditioned floor area* for all floors up to the three largest floors.

Exceptions to 10.5.1.1:

1. Any *building* located where an unshaded flat plate collector oriented toward the equator and tilted at an angle from horizontal equal to the latitude receives an annual daily average incident solar radiation less than 1.1 kBtu/ft^2-day.
2. Any *building* where more than 80% of the *roof* area is covered by any combination of *equipment* other than for *on-site renewable energy systems*, planters, vegetated *space*, *skylights*, or occupied *roof* deck.
3. Any *building* where more than 50% of *roof* area is shaded from direct-beam sunlight by natural objects or by *structures* that are not part of the *building* for more than 2500 annual hours between 8:00 a.m. and 4:00 p.m.
4. New *construction* or *additions* in which the sum of the *gross conditioned floor area* of the three largest *floors* of the new construction or *addition* is less than 10,000 ft^2.

Michigan will be eligible for over $1.5M in additional federal funds for code implementation and education with the adoption of appendix CC. These funds are available specifically for appendix CC. **

For Commercial Systems installers in SE Michigan are reporting the following financial results:

- Energy or time-of-use rate with Distributed Generation
- Pitched, Ballasted, or Ground-mount
- 6-8 Year Payback
- Levelized Cost of Energy - $0.04/kWh, compared to $0.15/kWh for utility power
- 8%-15% Internal Rate of Return (IRR) over 25 years

On-site solar systems can be financed with low interest loans through Michigan Saves or installed through a power purchase agreement with no capital cost.

Below is our specific proposal for the adoption of Appendix CC:
Proposed Change Language
CC103.3.1 Qualifying off-site procurement methods.
The following are considered qualifying off-site renewable energy procurement methods:
1. Community renewables: an off-site renewable energy system for which the owner has purchased or leased renewable energy capacity along with other subscribers.
2. Renewable energy investment fund: an entity that installs renewable energy capacity on behalf of the owner.
3. Virtual power purchase agreement: a power purchase agreement for off-site renewable energy where the owner agrees to purchase renewable energy output at a fixed price schedule.
4. Direct ownership: an off-site renewable energy system owned by the building project owner.
5. Direct access to wholesale market: an agreement between the owner and a renewable energy developer to purchase renewable energy.
6. Green retail tariffs: a program by the retail electricity provider to provide 100-percent renewable energy to the owner.
~~7. Unbundled Renewable Energy Certificates (RECs): certificates purchased by the owner representing the environmental benefits of renewable energy generation that are sold separately from the electric power.7. Unbundled Renewable Energy Certificates (RECs): certificates purchased by the owner representing the environmental benefits of renewable energy generation that are sold separately from the electric power.~~

TABLE CC103.3.3
DEFAULT OFF-SITE RENEWABLE ENERGY PROCUREMENT METHODS, CLASSES AND COEFFICIENTS

CLASS	PROCUREMENT FACTOR (PF)	PROCUREMENT OPTIONS	ADDITIONAL REQUIREMENTS (see also Section CC103.3.2)
1	~~0.75~~ **1.0**	Community solar	—
		REIFs	Entity must be managed to prevent fraud or misuse of funds.
		Virtual PPA	—
		Self-owned off-site	Provisions shall prevent the generation from being sold separately from the building.
2	~~0.55~~ **1.0**	Green retail tariffs	The offering shall not include the purchase of unbundled RECs.
		Direct access	The offering shall not include the purchase of unbundled RECs.
~~3~~	~~0.20~~	~~Unbundled RECs~~	~~The vintage of the RECs shall align with building energy use.~~

Reasons

Problem/Rationale:

Table CC103.3.1 is a default table and as such, should be straightforward and simple for local AHJs to enforce. We are proposing a 1.0 procurement factor and to eliminate the option for unbundled RECs. Local AHJs are still able to modify Table CC103.3.1 if they choose additional procurement options or different procurement factors.

Renewable energy certificates (RECs) represent the environmental attributes or benefits associated with renewable energy. For most off-site procurement methods, RECs are used for tracking and verification of the renewable energy purchased. However, the RECs can be separated from the underlying renewable energy they are associated with and sold separately from the electricity, typically in increments of one MWh.

The options for off-site solar procurement in Michigan are limited. Equalizing on-site and offsite renewable power production still promote installations of on-site renewables and increased off-site procurement options while not penalizing predominately urban buildings that can only generate a small portion of their power requirements with on-site solar. By eliminating the unbundled RECs, the lowest value off-site option is eliminated.

Unbundled RECs in the United States with no restrictions are underpriced. The average cost of a REC (with no restrictions) is less than $1, or less than 5% of its true value to society. At a price this low, it is highly unlikely that the market will respond by installing new renewable energy generating capacity. The prospect of impact/additionality is extremely low. In addition, durability requires a forward contract for long-term purchase. The type of renewable energy generators used to back unbundled RECs can vary considerably from wind and solar at one extreme to biomass at the other. Renewable energy generators backing the claim may not be new and not always carbon free.

Additional Resources link: https://zero-code.org/wp-content/uploads/2018/04/Zero-Code-TSD-OffSiteRenewables.pdf

Proposed New Language to clarify scope of Appendix CC

Appendix CC shall apply to new buildings and additions over 3,500 SF. In the case of an addition, Appendix CC shall be applied to the addition only.

Problem/Rationale:

The Michigan Rehabilitation Code references the Michigan Energy Code, but could be confusing to apply to Appendix CC. This proposed wording would make the application of the appendix clear.

A small addition (under 3,500 SF) has a negligible impact on the total energy use of the building and application of Appendix CC would have limited impact in the transition to renewable energy. The intent of Appendix CC is to apply to new construction.

Thank you for your consideration of including Appendix CC in the current Commercial Energy Code update.

Sincerely,

Jan K. Culbertson, FAIA
Ann Arbor/Washtenaw 2030 District

Additional Signatories:
Cheri Holman, Executive Director
Grand Rapids 2030 District
Lansing 2030 District

Connie Lillie, Executive Director
Detroit 2030 District

** https://www.energy.gov/sites/default/files/2023-11/IRA-Codes-Program-ALRD_11-17-23_Mod0002.pdf

AIA Michigan

February 22, 2024

Mr. Andrew Brisbo
Director, Bureau of Construction Codes
Michigan Department of Licensing and Regulatory Affairs
611 W Ottawa St.
Lansing, MI 48933

Re: **2021 Michigan Uniform Energy Code; Administrative Rules Part 10a**

Dear Director Brisbo,

AIA Michigan supports adoption of the proposed Michigan Uniform Energy Code, Part 10a with the inclusion of IECC Appendix CC. Appendix CB is an important addition from the last draft, however, including appendix CC will improve building efficiency, resilience and is easier to implement due to recent legislation and utility renewable power programs.

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In addition, ASHRAE 90.1 2022, now published, includes an on-site solar prescriptive requirement:

AIA Michigan T (313) 965 4100
37637 Five Mile Rd #269
Livonia, Michigan 48154

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Thank you for your consideration of including Appendix CC in the current Commercial Energy Code update.

Sincerely,

Jeffrey S. Ferweda, AIA

Jan K. Culbertson, FAIA
AIA Michigan Government Affairs Committee Co-Chairs

** https://www.energy.gov/sites/default/files/2023-11/IRA-Codes-Program-ALRD_11-17-23_Mod0002.pdf

February 22, 2024

Department of Licensing and Regulatory Affairs
Bureau of Construction Codes
Administrative Services Division
P.O. Box 30254
Lansing, MI 48909

Dear Acting Director Brown, Deputy Director Pendleton, and Director Brisbo:

Thank you for the opportunity to submit comments about the proposed amendments to the Michigan Energy Code and Michigan Uniform Energy Code. Clean Fuels Michigan is a nonprofit trade organization for the clean transportation industries in Michigan. We advocate for policies and programs that support the transition to cleaner and zero-emission fuels. Our membership is strong and broad, spanning utility companies, auto manufacturers, fleet operators, charging station companies, advocacy groups, and more.

Clean Fuels Michigan recommends adding EV readiness requirements and definitions to the residential and commercial codes.

Codes should establish requirements for new construction projects to include electrical capacity, conduit, and wiring for the possible installation of EV charging stations in the future. Car manufacturers across the nation are making commitments to transition their vehicle offerings to electric. General Motors, Ford, Volvo, Jaguar, Honda, Mercedes-Benz, and others expect 100% of their sales to be electric by 2040, and some even earlier. The transition to electric vehicles will require charging stations in residences, workplaces, parking lots, and other commercial venues.

The next decade will be a critical time to build the required infrastructure to re-charge an increasing number of electric cars. The Michigan Energy Code is an opportunity to set Michigan drivers and building owners up for success; to future-proof our built environment and to lower the cost of electric vehicle charging equipment.

Studies show that EV infrastructure can cost up to 75% less[1] to install during new construction compared to retrofitting an existing parking lot or building. New residential and commercial buildings are designed to last for decades, so they should be ready to accommodate the upcoming demand for electric vehicle charging infrastructure.

Residences, including one- and two-family dwellings and townhouses with a dedicated attached or detached garage or on-site parking spaces, should have at minimum one *EV ready space* per dwelling unit.

[1] Plug-In Electric Vehicle Infrastructure Cost-Effectiveness Report

Commercial parking facilities shall also be provided with electric vehicle charging infrastructure based on a formulated percentage of the total number of parking spaces and rounded up to the nearest whole number. Where more than one parking facility is provided on a building site, the number of parking spaces required shall be calculated separately for each parking facility.

- EV READY SPACE for residential applications is defined as a designated parking space that is provided with an electrical circuit capable of supporting an installed 208/240-volt circuit level 2 electric vehicle supply equipment (EVSE) within three feet of the proposed location of the EV parking space.

- EV INSTALLED SPACE is a parking space that is provided with a dedicated EVSE. The EVSE serving EV Installed spaces shall be capable of supplying not less than 6.2 kW to an electric vehicle and shall be located within 3 feet (914 mm) of the parking space.

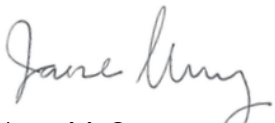
- EV READY SPACE is a parking space that is provided with an electrical circuit capable of supporting an installed EVSE. The branch circuit serving *EV Ready Spaces* shall have wiring capable of supporting a 40-amp 208/240-volt circuit and terminate at an outlet or junction box located within 3 feet (914 mm) of the parking space.

- EV CAPABLE SPACE is a parking space that is provided with some of the infrastructure necessary for the future installation of an EVSE – such as conduit, raceways, electrical capacity, or signage – or reserved physical space for such infrastructure. *EV Capable Spaces* shall be provided with electrical conduit that is continuous between a junction box or outlet located within 3 feet (914 mm) of the parking space and an electrical panel serving the area of the parking space.

Including EV readiness provisions in Michigan's Energy Code is a critical mechanism for meeting Michigan's goal of deploying 100,000 chargers to facilitate 2 million EVs on Michigan roads in accordance with the MI Healthy Climate Plan and the Michigan Council on Future Mobility and Electrification.

Thank you again for the opportunity to submit comments in the Michigan Energy Code and Michigan Uniform Energy Code processes. We look forward to working with you to prepare Michigan's buildings for electric vehicles. Please do not hesitate to reach out with any questions.

Sincerely,



Jane McCurry
Executive Director
jmccurry@cleanfuelsmi.org

PIMA
POLYISOCYANURATE INSULATION MANUFACTURERS ASSOCIATION

3033 Wilson Blvd., Suite 700
Arlington, VA 22201
703.258.0093
www.polyiso.org

Sent via Electronic Mail

February 12, 2024

Tony Williamson
Michigan Department of Licensing and Regulatory Affairs
Bureau of Construction Code
P.O. Box 30254
Lansing, Michigan 48909
LARA-BCC-Rules@michigan.gov

Re: Support for Adoption of the 2021 International Energy Conservation Code (IECC)
(Pending Rule Sets 2021-48LR and 2021-49LR)

Dear Mr. Williamson,

The Polyisocyanurate Insulation Manufacturers Association (PIMA) supports the proposed rules for adopting the 2021 IECC for residential and commercial buildings. Keeping the State's energy code updated to the current version of the IECC is an important and cost-effective policy for addressing the negative economic and environmental consequences of building energy waste – a sector that is responsible for 40 percent of total U.S. energy use. Importantly, adopting the 2021 IECC will result in the removal of several existing State-specific weakening amendments that would otherwise undermine the achievement of Michigan's climate goals. Also, adoption of the updated energy code will help Michigan achieve a range of benefits, including:

- Reduced air pollution;
- Consumer and business cost savings;
- Increased flexibility and reliability of the State's energy system and grid;
- Improved resiliency;
- Reduced peak energy demand; and
- Improved energy productivity and a stronger economy.

Staying current with the model energy code ensures that Michigan will benefit from the regular improvements in construction practices and building technology. This is especially true for commercial building alterations and ensures that the energy code will drive energy efficiency improvements in existing buildings when components are replaced, or when buildings are otherwise altered. These actions also support manufacturers and other businesses from the insulation and advanced building materials sectors, which represent more than 40,000 jobs in Michigan, according to the U.S. Department of Energy. Another 20,000 Michigan jobs are related to high efficiency lighting and HVAC equipment, which also directly benefit from improved building energy efficiency requirements.[1]

[1] U.S. Department of Energy, 2023 U.S. Energy & Employment Jobs Report (USEER), June 2023, available at: https://www.energy.gov/policy/us-energy-employment-jobs-report-useer

Moving from Michigan's current energy code, which is based on the 2015 IECC (and ASHRAE Standard 90.1-2013), to the 2021 IECC will save Michigan residents money and increase employment. This code update has been determined cost-effective by the U.S. Department of Energy. For commercial buildings, this change has a simple payback that is immediate, and for residential buildings purchased with a mortgage, there would be a positive net savings within 5 years. Over 30 years, the net present value of the energy savings from the 2021 IECC for residential buildings would be $4,500 and the impact on employment would be an increase of 15,000 jobs.[2]

The 2021 IECC also provides builders with significant flexibility in the design and construction of homes. Under the 2021 IECC, homebuilders can use numerous compliance pathways to construct a home that meets modern standards for energy efficiency – the prescriptive requirements for wall insulation, as an example, are just one option afforded to homebuilders under the code. While the 2021 IECC provides options, more and more builders are deciding to build homes with proven technology such as continuous insulation installed on the exterior of walls, which provide benefits beyond energy savings, including reduced air and moisture intrusion and improved comfort.

For most of the country, stronger building energy codes are viewed as an effective policy that benefits the environment and the economy. Your neighbors -- Illinois and Ohio – have already adopted the 2021 IECC with effective dates of January 1, 2024, and March 1, 2024, respectively.

Buildings are responsible for 74 percent of U.S. electricity consumption. Twenty-seven percent of Michigan's electricity is still generated by burning coal – a product that comes entirely from out-of-state.[3] As a result, outdated building energy codes result in more money leaving Michigan to purchase coal. Conversely, investments in energy efficiency led by the adoption of modern energy codes result in more money being invested in the local economies.

About PIMA

PIMA is the trade association for North American manufacturers of rigid polyiso foam insulation – a product that is used in most low-slope commercial roofs as well as in commercial and residential walls. Polyiso insulation products and the raw materials used to manufacture polyiso are produced in over 50 manufacturing facilities across North America, including BASF headquartered in Wyandotte, Michigan.

Thank you for the opportunity to submit these comments. Please contact me should additional information be necessary (jkoscher@pima.org; (703) 224-2289).

Sincerely,

Justin Koscher, President

[2] U.S. Department of Energy, see "State Energy Code Fact Sheet-Michigan" available at: https://www.energycodes.gov/sites/default/files/2021-07/EED_1365_BROCH_StateEnergyCodes_states_MICHIGAN.pdf

[3] U.S. Energy Information Administration available at: https://www.eia.gov/beta/states/states/mi/analysis.

February 16, 2024

Mr. Andrew Brisbo
Director, Bureau of Construction Codes
Michigan Department of Licensing and Regulatory Affairs
611 W Ottawa St.
Lansing, MI 48933

Mr. Brisbo,
I am submitting comments to the Michigan LARA Bureau of Construction Codes on behalf of the GreenHome Institute (GHI), a nonprofit organization that empowers professionals and homeowners to make healthier and more sustainable choices in the places we live. GHI recognizes the phenomenal work conducted by you and your staff in advancing sustainability in our built environment and support your work in achieving our mission. We would like to take the opportunity to submit public comments pertaining to the 2021 IECC and Michigan's adoption of updated energy codes.

GHI would like to reaffirm our support of the inclusion of 2021 IECC and readiness provisions in the update of Michigan's energy conservation code, in line with the Administration's goals. Additionally, we support an optional net-zero compliance pathway. These provisions will provide additional benefit to Michigan's residents related to utility costs, and improve resilience and comfort in extreme weather. In addition, the provisions will also improve indoor air quality and protect public health, create new jobs in the state, and significantly reduce climate impacts from the building sector.

The 2021 IECC is necessary for Michigan to have modern, affordable new construction. It also helps Michigan residents save money. In addition to the adoption of the 2021 IECC, we encourage LARA to consider the following amendments:

- Require EV-, solar-, storage-, and electric-ready amendments in the base residential and commercial codes.
- Adopt the current net zero and renewables appendices as a statewide optional compliance pathway.

The transition to electric appliances will likely grow due to rising, volatile gas prices and federal incentives that make the technologies that readiness amendments support more affordable. Improvements to the energy code will help ensure Michigan residents participate in and benefit from the energy transition. Not only will readiness provisions allow building owners to save money on installation costs, but they will also allow them to take advantage of federal incentives. Residential single-family homes can expect over $10,000 in tax credits to adopt a heat pump, EV, and solar PV. This number could increase when the rebates are available. Funding includes:

- Residential Energy Efficiency Tax Credit (25C) that provides up to $2,000 for heat pump appliances. (Currently Active)

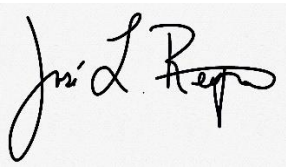
- Residential Clean Energy Tax Credit (25D) that provides up to 30% off solar PV, battery storage, and geothermal heat pump projects. (Currently Active)
- New Clean Vehicle Tax Credit (30D) that provides up to $7,500 for new EVs. (Currently Active)
- Investment Tax Credit (48) that provides up to 70% off commercial or utility-scale renewable energy systems. (Currently Active)
- Home Electrification Rebate that provides up to $14,000 for electric appliances in new construction and retrofits. (Expected 2024)

By adopting 2021 IECC, EV-, solar-, storage-, and electric-ready amendments, and optional net zero and renewables appendices, Michigan can join other states in modernizing and decarbonizing the new construction sector. The codes proposed within align the state with the Governor's goals and improve resiliency and customer choice while keeping new construction affordable.

Additionally, the review and adoption of the IECC has typically occurred every 3 to 6 years. It is understood that there is consideration to adopting a policy that mandates that this review and update be conducted every 3 years. GHI overwhelmingly supports this policy change as we anticipate it will provide agility to review and update the IECC to keep pace with technology changes and resource availability.

As we come closer to the adoption of the 2021 IECC, we would like to take this opportunity to encourage LARA to begin the process of adopting the IECC 2024 provisions as soon as they are available. The new 2024 codes will offer additional vital energy savings to households in Michigan and should be reviewed as quickly as possible upon completion to reap the most benefits for Michigan's residents.

Sincerely,



José L Reyna, Executive Director
GreenHome Institute
1415 Lake Drive SE
PO Box 6484
Grand Rapids, MI 49516
(616) 901-4753

Attn: Tony Williamson
Bureau of Construction Codes
P.O. Box 30254
Lansing, MI 48909
Lara-bcc-rules@michigan.gov

Re: Michigan's 2021 Energy Conservation Code Adoption Ruleset

RMI writes to support the inclusion of effective energy efficiency provisions in the update of Michigan's energy conservation code, in line with the Administration's goals. These provisions will lower utility costs, improve resiliency and comfort in the face of extreme weather, and ensure Michiganders have more options in the future that take advantage of technological advancements. This can be done while improving indoor air quality and protecting public health, creating new jobs in the state, and significantly reducing climate impacts from the building sector.

Michigan will benefit from adopting the 2021 IECC base code that aligns with the Administration's Healthy Climate Plan.

We applaud LARA for including 2021 IECC in the draft for Michigan's updated energy codes. 2021 IECC is necessary for Michigan to have modern, affordable new construction.

Reducing total cost of ownership: A Michigan household's purchase of a new home affects their lives for decades to come. The cost to build that home, plus builders' profit margin, is amortized across a mortgage of 30 years. As PNNL analysis shows, adopting the 2021 IECC is cost-effective over a much shorter time horizon. Over the whole life of a home, there is no question that the 2021 IECC delivers benefits far exceeding its costs. The unamended 2021 IECC for homes will provide statewide energy savings of 10.7% across all climate zones compared to the current Michigan state energy code.[1] These energy savings translate to $327 of annual utility bill savings for the average Michigan household. The savings come in significant part from improved envelope insulation and air sealing, which makes buildings more resilient to extreme weather or utility infrastructure failures.

Safe and resilient: The resilience benefits of modern energy codes are critical today, as Michigan is facing hotter summers and more extreme weather, meaning utility infrastructure failures can be even more dangerous for residents when they occur. The unamended 2021 IECC's improved efficiency can increase the duration of safe temperatures, making homes and buildings safer to occupy for longer during extreme events.[2]

Setting up the state for success: The federal Inflation Reduction Act allocates $330M in grants for technical assistance to adopt and implement energy codes at least as efficient as 2021 IECC. Michigan may be able to apply for the formula portion of this funding if it adopts the 2021 IECC without weakening amendments. This could provide deeply needed resources to support code compliance, including training and workforce development for code officials, builders, and contractors. Weakening the code not only reduces its intended impact but would also reduce its actual impact as Michigan loses out on these federal resources.

[1] https://www.energycodes.gov/sites/default/files/2021-07/MichiganResidentialCostEffectiveness_2021.pdf
[2] https://rmi.org/insight/hours-of-safety-in-cold-weather/

Again, we applaud LARA for proposing this 2021 IECC which will modernize Michigan's new construction.

Michigan should swiftly shift its attention to the next code update process.

We appreciate LARA's thorough effort to propose 2021 IECC for Michigan's building code update. We support Michigan adopting the proposed code and urgently implore them to do so without further delay. Furthermore, we recommend that Michigan act swiftly following this update to assess and open the next code update. Although it is 2024, this active code process was slated for 2021. To ensure Michigan does not fall further behind, it is vital the state quickly opens the next building code update. This will provide the state opportunity to continue meeting Governor Whitmer's Healthy Climate Plan Goals: "Adopt the 2021 Model Energy Code with provisions to support electric vehicle charging and consider incorporation of additional climate mitigating solutions such as energy storage, renewable energy, and building decarbonization."[3]

To meet Michigan's goals outlined in the Healthy Climate Plan, LARA must look to enact electrification measures, EV readiness, solar PV readiness, and battery storage readiness provisions in the 2024 code cycle. Not only would these meet the goals outlined in the Governor's Healthy Climate Plan, but they will also bring cost, health, and emission benefits to the state. Between winter 2022 and 2023, natural gas prices rose 24%, whereas electricity prices only rose 4%.[4,5] Requiring these amendments will allow building owners to adapt to rising prices more easily. Furthermore, these amendments enable building owners to install efficient electric appliances and EV charging without paying high post-construction retrofit costs. **If installed during construction, EV-, solar PV-, electric-, and battery storage-readiness amendments cost around $1,500, which is about $10,000 less than it would be to install them after construction.[6] If all-electric code amendments to 2021 IECC were passed, a single-family detached residential home is estimated to be cost-neutral over 7 years compared to Michigan's current code in Climate Zones 5 and 6.[7]** For the next code update, Michigan should adopt these amendments which improve resiliency and customer choice while keeping new construction affordable.

The proposed codes will benefit Michiganders while meeting many of the state goals.

Passing the 2021 IECC is a huge win for Michigan. Residents will have more affordable utility bills and more resilient buildings to work and live in. However, the state is not done. LARA must act swiftly to open the 2024 codes update process and adopt codes that align with state goals and serve the needs of residents. Thank you again for the work your office has put into this code update.

---

[3] https://www.michigan.gov/egle/about/organization/climate-and-energy/mi-healthy-climate-plan

[4]https://www.eia.gov/electricity/data/browser/#/topic/0?agg=2,0,1&fuel=vtvv&geo=g&sec=g&linechart=&columnchart=ELEC.GEN.ALL-US-99.M~ELEC.GEN.COW-US-99.M~ELEC.GEN.NG-US-99.M~ELEC.GEN.NUC-US-99.M~ELEC.GEN.HYC-US-99.M~ELEC.GEN.WND-US-99.M&map=ELEC.GEN.ALL-US-99.M&freq=M&start=200101&end=202303&ctype=linechart&ltype=pin&rtype=s&maptype=0&rse=0&pin=

[5] https://www.eia.gov/dnav/ng/ng_pri_sum_a_EPG0_PRS_DMcf_m.htm

[6] https://newbuildings.org/resource/cost-study-of-the-building-decarbonization-code/

[7] https://www.michigan.gov/lara/-/media/Project/Websites/lara/bcc-media/Rules-Info/Part-10-Michigan-Energy-Code/Compiled-2021-Energy-Codes-Advisory-Meeting-Comments-322.pdf?rev=9fe80d902fc547ac864918012652d6a2&hash=061E4101D96506D30961ABDF9D2A84F9

Lauren Reeg
Senior Associate, RMI
lreeg@rmi.org, 972-832-9698

ELEVATE
Equity through climate action

February 20, 2024

Elevate's comments on updating Michigan's Energy Code

Dear Director Brisbo and to whom else it may concern,

Thank you for taking the time to consider our brief written comments.

On behalf of Elevate, **I'm writing to voice our support for the Department of Licensing and Regulatory Affairs updating the state's residential and commercial energy code**. Adopting the proposed code would cut greenhouse gas emissions, reduce utility bills, and open up new federal funding streams for the state, municipalities, businesses, and NGOs. This is a crucial step to achieving the goals laid out in Governor Whitmer's MI Healthy Climate Plan. **However, we wish this went further and 1) provided options for municipal governments wanting to go above and beyond the code as well as 2) included readiness provisions for solar, storage, EVs, and building electrification.**

Elevate is a non-profit organization that designs and implements programs to ensure that everyone has clean and affordable heat, power, and water in their homes and communities – no matter who they are or where they live. We administer a variety of energy efficiency, solar, battery storage, workforce development, and clean water programs, focusing on affordable multi-family housing, nonprofit, and institutional buildings in underserved communities across the Midwest and Pacific Northwest. We've built resilience centers, run clean energy job training accelerators, and helped decarbonize and deliver clean water for hundreds of thousands of housing units including many in Detroit, Flint, Ann Arbor, Grand Rapids, Muskegon, and more. **Updating and improving Michigan's building codes would be helpful for many of the local governments and community partners we work with, especially toward ensuring newly constructed affordable housing in underserved communities is healthier, safer, more comfortable, resilient, and efficient.**

Sincerely,

Mike Berkowitz (he/him)
Associate Director, Policy (MI) at Elevate

Email Mike.Berkowitz@elevatenp.org
Website ElevateNP.org

February 5, 2023

Mr. Tony Williamson
Bureau of Construction Codes
Michigan Department of Licensing and Regulatory Affairs
Administrative Services Division
P.O. Box 30254
Lansing, MI 48909

Sent via Electronic Mail: Lara-bcc-rules@michigan.gov

Re: Support for Adoption of the 2021 International Energy Conservation Code (Proposed Rules 2021-48LR and 2021-49LR)

Dear Mr. Williamson,

The American Chemistry Council (ACC) thanks you for the opportunity to submit comments and recommend the adoption of the 2021 International Energy Conservation Code (IECC) with reference to ASHRAE 90.1-2019.

Chemistry is essential to the U.S. economy and plays a vital role in driving innovations that make our world safer, more sustainable, and more productive. Chemistry supports over 25% of the U.S. GDP and 9% of U.S. goods exports – a $486 billion enterprise. 529,000 skilled American jobs are provided by the business of chemistry. The U.S. is the 2nd largest global producer, providing 13% of the world's chemicals. Chemistry in Michigan pays $1.84 billion in wages and generates $142 million in state and local taxes.[1]

There are many reasons we support the Michigan adoption of these modern energy codes. Primarily, the energy savings that are realized by the people who live and own businesses in the state. The Department of Energy (DOE) determined the 2021 energy codes provide **cost-effective levels of energy efficiency** and performance for residential and commercial buildings in Michigan. Based on housing starts in Michigan the adoption of the 2021 Residential IECC would save $3,873,000 in the first year alone.[2] Likewise, based on new commercial construction numbers in Michigan the adoption of the 2021 IECC with reference to ASHRAE 90.1-2019 for commercial buildings would save $1,587,000 in the first year alone.[3]

[1] Michigan.pdf (americanchemistry.com)
[2] See Cost-Effectiveness of the 2021 IECC for Residential Buildings in Michigan (energycodes.gov)
[3] See Cost-Effectiveness of ANSI/ASHRAE/IES Standard 90.1-2019 for Michigan (energycodes.gov)

This is especially important in order to address the **environmental justice issue of the affordable housing** needs of lower income households. According to the U.S. Energy Information Administration:

> Across the United States, high utility bills are costing homeowners a significant portion of their monthly incomes. According to the most recent EIA Residential Energy Consumption Survey,[4] about one in five households reported reducing or forgoing basic necessities like food and medicine to pay an energy bill. Stronger energy codes and more widespread code compliance can help change the tide on this type of energy poverty. Improving compliance with residential energy codes opens up an array of economic and health benefits for homeowners, residents, local governments, and building officials, including:
>
> - Reduced energy costs that yield monthly savings for owners and occupants, helping to boost the local economy and improving housing affordability by reducing utility costs.
> - More comfortable and durable homes that better shield people from outdoor temperature extremes.
> - Better protected occupant health from improved efficiency and indoor air quality.
> - Greater market certainty for the building design and construction industry due to consistent implementation across jurisdictions.
> - A level playing field for manufacturers, builders, and other building related industries.

Beyond the obvious energy savings benefits there are many other important reasons for Michigan to update their building energy codes:

- **Job creation,** based on U.S. Census data on residential housing permits, it is estimated that over 80,000 residential one- and two-family homes have been permitted in Michigan since the last energy code update in late 2017.[5]
- **GHG emission reductions,** DOE estimates that the 30-year cumulative reduction of CO_2 emissions that Michigan would realize with the adoption of the 2021 residential provisions is equivalent to 11,460,000 metric tons.[6]
- **Resilience,** in a 2021 report the National Institute of Building Sciences found that adopting the latest building code requirements is affordable and saves $11 per $1 invested. Building codes have greatly improved society's disaster resilience, while adding only about 1% to construction costs relative to 1990 standards. The greatest benefits accrue to communities using the most recent code editions.[7]
- **Energy Security,** the International Energy Agency recognizes that energy efficiency can bolster regional or national energy security. By reducing overall energy demand, efficiency can reduce reliance on imports of oil, gas and coal. Energy efficiency can therefore play a crucial role in ensuring both long- and short-term energy security in a cost-effective manner.[8]

[4] See Residential Energy Consumption Survey (RECS) - Energy Information Administration (eia.gov)

[5] See U.S. Census Bureau, Building Permits Survey, available at https://www.census.gov/construction/bps/

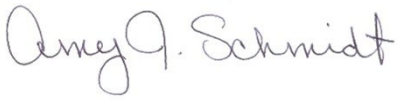
[6] See Cost-Effectiveness of the 2021 IECC for Residential Buildings in Michigan (energycodes.gov)

[7] See Mitigation Saves: Mitigation Saves up to $13 per $1 Invested (nibs.org)

[8] See Energy security – Multiple Benefits of Energy Efficiency – Analysis - IEA

ACC is grateful for the opportunity to encourage and support the adoption of the 2021 International Energy Conservation Code (IECC) for all the great benefits these new codes would bring to the people in the State of Michigan.

Sincerely,



Director, Building & Construction
American Chemistry Council, Plastics Division

tim mrozowski, a.i.a.
mro + zow + ski
Architecture + Design + Planning

February 22, 2024

Michigan Bureau of Construction Codes

RE: Proposed amendment to Section R 408.31098 Part 10a of the Michigan Commercial Energy Code

I am writing to propose a possible amendment for consideration to the proposed MI BCC adoption of IECC (2021) and ASHRAE 90.1 (2019) as our Michigan statewide energy code for commercial buildings.

Proposed Amendment

Retain exception 7 of the Envelope Alterations language in Part 10a Section R 408.31098 and add language "This exception is subject to submission of sufficient documentation and approval of the Authority Having Jurisdiction."

"7. Removal and replacement of a roof membrane where the insulation is installed entirely above the roof deck, a minimum of R-20 insulation shall be permitted where the placement of additional insulation greater than R-20 insulation would require either of the following:

a. Raising the height of parapets, weep systems, or through wall flashings where roof abuts adjoining walls or parapets.

b. Raising the height of mechanical or electrical equipment, mechanical curbs, roof hatches, skylight curbs, service equipment, piping, conduit, duct work, roof platforms, ladders, stairs, guard rails, expansion joints, roof davits, or door thresholds." (Retained language)

"This exception is subject to submission of sufficient documentation and approval of the Authority Having Jurisdiction." (Added Language)

Background and Justification

The current Michigan Energy Code for Commercial Buildings Section R 408.31098 has exception 7, which was put in place during the last Michigan energy code revision cycle to specifically provide the Authority Having Jurisdiction (AHJ) to have limited authority to allow for an existing roof R value to remain provided there is at least R20 roof insulation, without having to upgrade

tim mrozowski a.i.a. + 613 grove street + east lansing + michigan + 48823 + 517-648-1470
tim.mrozowski@gmail.com

to R30. This exception was put in place to cover the relatively rare situation where increasing the roof insulation thickness to achieve R30 during a roof replacement project, would necessitate expensive non-energy related modifications such as raising parapets, reworking flashings, raising mechanical and skylight cubs or penthouse door thresholds etc.

The exception applies only to roofs where the roof insulation is entirely above the roof deck and is intended to provide some relief for building owners of existing buildings, such as school districts, who may need to replace a roof for general leaking or maintenance reasons, but incorporating increased insulation thickness triggers a range of expensive non-energy related work to accommodate the increased thickness.

The following photo below shows an existing roof where a simple roof replacement would trigger a substantial amount of additional work to accommodate an increased insulation thickness.

Tim Mrozowski, AIA LEED AP is a practicing licensed architect and Professor Emeritus of Construction Management, in the School of Planning Design and Construction at Michigan State University. Professor Mrozowski developed the Michigan Uniform Energy Code Training and Implementation Project (MECTIP) at MSU and served as its director from 2003-2018. This project has been active in energy codes since 2003 under ten energy code training and development grants. Eighteen curricula were developed and approved by the Bureau of Construction Codes for Public Act continuing education for building officials. Over 150 training programs with over 7000 attendees have been conducted. It is estimated that over one half of all building officials in Michigan have attended one or more energy code trainings conducted by MECTIP. MECTIP was funded by grants from: DTE Energy, Consumers Energy, US DOE, Pacific Northwest

tim mrozowski a.i.a. + 613 grove street + east lansing + michigan + 48823 + 517-648-1470
tim.mrozowski@gmail.com

National Laboratory NREL, Midwest Energy Efficiency Alliance, Michigan Public Service Commission, Michigan State Housing Development Authority, Michigan Bureau of Energy Systems, the Michigan Economic Development Corporation, Dow and Guardian Industries.

Over several past energy code revision cycles Mr. Mrozowski was appointed by MI Bureau of Construction Codes to serve on the Michigan Energy Code adoption and revision committee. He also was recently part of a team led by Building Vitals Inc. that did a comparison study of the current Michigan Commercial Energy code to ASHRAE 90.1 (2019) and IECC (2023) under a contract with the Michigan Energy Office/EGLE.

In addition to his architectural practice he currently serves as an assessment leader with the Industrial Assessment Center, funded by US Department of Energy at Michigan State University, whose mission is to conduct energy assessments and make recommendations to large industrial building owners about their facilities. He also is a member of the Detroit AIA Building Codes and Regulations Committee, chairs the East Lansing Building Board of Appeals and is a grant proposal reviewer for the US Department of Energy, Building Technologies Office which awards energy code adoption and implementation grants to states and regional associations across the US targeted toward improving adoption of and compliance with energy codes.

tim mrozowski a.i.a. + 613 grove street + east lansing + michigan + 48823 + 517-648-1470
tim.mrozowski@gmail.com

tim mrozowski, a.i.a.
mro + zow + ski
Architecture + Design + Planning

February 22, 2024

Michigan Bureau of Construction Codes

RE: Proposed amendment to R 408.31098a (C506.2) Vestibules. Rule 1098a. Section 5.4.3.4 Part 10a of the Michigan Commercial Energy Code

I am writing to propose two possible amendments for consideration to the proposed MI BCC vestibule exception language as follows:

To maintain our current vestibule exception language in Part 10a and replace the ASHRAE 90.1 (2019) and (IECC 2021) with vestibule exception language included in the current R 408.31098a (C506.2) Vestibules. Rule 1098a. Section 5.4.3.4 which reads as follows:

"Exceptions:
1. Doors not intended to be used by the public, such as doors to storage, mechanical, electrical, or equipment rooms.
2. Doors opening directly from a sleeping unit or dwelling unit.
3. Doors that open directly from a space less than 3,000 feet2 (298 m2) in area.
4. Revolving doors.
5. Doors used primarily to facilitate shipping, receiving, or material handling.
6. Doors with no exterior entrance hardware.
7. Doors leading solely to outdoor eating areas.
8. Overhead doors." (Retained Language"

Additionally both IECC (2021) and ASHRAE 90.1 (2019) both allow for an exception when air curtains are used. Therefore if the existing exceptions are maintained, the air curtain exemption should also be added. Add exception 9

"9. When an air curtain is used that meets the requirements of the standard"

Background and Justification

MI EGLE and the MI Energy Office recently funded a contract with Building Vitals Inc. to do a comparison analysis of our current commercial energy code with ASHRAE 90.1 (2019) and IECC (2021). Those comparisons showed significant differences between when vestibules would be required under ASHRAE 90.1 (2019) and IECC (2021). For example, IECC (2021) exempts any space less than 3000 SF from having to have a vestibule, while ASHRAE 90.1 (2019) only exempts

tim mrozowski a.i.a. + 613 grove street + east lansing + michigan + 48823 + 517-648-1470
tim.mrozowski@gmail.com

these spaces when it is separate from the building entrance. This is a vastly different requirement.

In the last MI Commercial Energy Code revision cycle the committee appointed by MI Bureau of Construction codes carefully modified ASHRAE 90.1 (2013) to make it clear that employee doors would not be exempt from vestibule requirements by deleting the phrase "used by the public". Large buildings such as data centers, warehousing, manufacturing facilities, distribution centers and processing centers often have large numbers of employees that enter through an employee entrance. Under IECC (2021) language since these doors are not used by the public they would be exempted.

Additionally, the current Michigan exceptions make it clear that doors leading to outdoor eating areas are exempt. Today it is common to see restaurants provide access to an outdoor eating area through either a roll-up door or patio door. These doors do not appear to be exempt under ASHRAE 90.1 (2019) or IECC (2021).

Lastly, air curtains have been allowed as an exemption to the requirement for vestibules dating back at least to 2015 in the IECC, while they were not allowed in our Michigan Commercial Energy Code. They are now allowed as exceptions in both IECC (2021) and ASHRAE 90.1 (2019) and if Michigan uses its current exceptions it make sense they would now be allowed.

Im Mrozowski, AIA LEED AP is a practicing licensed architect and Professor Emeritus of Construction Management, in the School of Planning Design and Construction at Michigan State University. Professor Mrozowski developed the Michigan Uniform Energy Code Training and Implementation Project (MECTIP) at MSU and served as its director from 2003-2018. This project has been active in energy codes since 2003 under ten energy code training and development grants. Eighteen curricula were developed and approved by the Bureau of Construction Codes for Public Act continuing education for building officials. Over 150 training programs with over 7000 attendees have been conducted. It is estimated that over one half of all building officials in Michigan have attended one or more energy code trainings conducted by MECTIP. MECTIP was funded by grants from: DTE Energy, Consumers Energy, US DOE, Pacific Northwest National Laboratory NREL, Midwest Energy Efficiency Alliance, Michigan Public Service Commission, Michigan State Housing Development Authority, Michigan Bureau of Energy Systems, the Michigan Economic Development Corporation, Dow and Guardian Industries.

Over several past energy code revision cycles Mr. Mrozowski was appointed by MI Bureau of Construction Codes to serve on the Michigan Energy Code adoption and revision committee. He also was recently part of a team led by Building Vitals Inc. that did a comparison study of the current Michigan Commercial Energy code to ASHRAE 90.1 (2019) and IECC (2023) under a contract with the Michigan Energy Office/EGLE.

In addition to his architectural practice he currently serves as an assessment leader with the Industrial Assessment Center, funded by US Department of Energy at Michigan State University, whose mission is to conduct energy assessments and make recommendations to large industrial building owners about their facilities. He also is a member of the Detroit AIA Building Codes and Regulations Committee, chairs the East Lansing Building Board of Appeals and is a grant proposal reviewer for the US Department of Energy, Building Technologies Office which awards energy code adoption and implementation grants to states and regional associations across the US targeted toward improving adoption of and compliance with energy codes.

tim mrozowski a.i.a. + 613 grove street + east lansing + michigan + 48823 + 517-648-1470
tim.mrozowski@gmail.com