

Michigan Office of Administrative Hearings and Rules

Administrative Rules Division (ARD)

MOAHR-Rules@michigan.gov

**REGULATORY IMPACT STATEMENT
and COST-BENEFIT ANALYSIS (RIS)**

Agency Information:

Department name:

Licensing and Regulatory Affairs

Bureau name:

Bureau of Construction Codes

Name of person filling out RIS:

Tony Williamson

Phone number of person filling out RIS:

517-241-9303

E-mail of person filling out RIS:

WilliamsonT5@michigan.gov

Rule Set Information:

ARD assigned rule set number:

2021-48 LR

Title of proposed rule set:

Construction Code - Part 10. Michigan Uniform Energy Code

Comparison of Rule(s) to Federal/State/Association Standard

1. Compare the proposed rules to parallel federal rules or standards set by a state or national licensing agency or accreditation association, if any exist.

There are no federal rules or standards set by a state or national licensing agency or accreditation association.

A. Are these rules required by state law or federal mandate?

Yes, these rules are required by state law in MCL 125.1504(6) and federal mandate in 42 U.S.C. Sec. 6833(a).

B. If these rules exceed a federal standard, please identify the federal standard or citation, describe why it is necessary that the proposed rules exceed the federal standard or law, and specify the costs and benefits arising out of the deviation.

These rules, as required by MCL 125.1504(6), do not exceed the federal standards indicated in 42 U.S.C. Sec. 6833 (a).

2. Compare the proposed rules to standards in similarly situated states, based on geographic location, topography, natural resources, commonalities, or economic similarities.

The proposed rules incorporate by reference the 2021 edition of the IECC, published by the International Code Council (ICC), and ASHRAE standard 90.1-2019 with Michigan amendments, deletions, and additions. All surrounding Great Lakes states (Ohio, Illinois, and Wisconsin) follow the International Energy Conservation Code. Ohio and Illinois follow the 2018 IECC and Wisconsin follows the 2015 IECC. In addition, it is anticipated the surrounding states will adopt the latest version of the IECC, protecting the health, safety, and welfare of the public, while ensuring sustainable human welfare.

A. If the rules exceed standards in those states, please explain why and specify the costs and benefits arising out of the deviation.

The IECC is a nationally recognized model code used through the United States as a minimum standard. The Michigan rules do exceed the standards of other Great Lake States (Ohio, Illinois, and Wisconsin), because the surrounding Great Lakes states have not yet updated their codes. (Ohio and Illinois follow the 2018 IECC, and Wisconsin the 2015 IECC), but it is anticipated that the surrounding states will adopt the latest version of the IECC. There are costs of deviation from other Great Lakes States because the State of Michigan is using the newest Energy Code, which accounts for new technologies in energy use and conservation. Once the other Great Lakes States adopt the newest Energy Code, or newer than what they currently use, those States will fall into line with what Michigan is currently adopting. The State of Michigan will be at the forefront of the most up to date Energy Code. Regardless of which Energy Code other States use, structure owners within the State of Michigan only use the Energy Code when building a new structure or renovating an existing structure. The costs the structure owner will realize is predicated upon the size of the structure. Therefore, the smaller the size of the new build, or renovated structure, the less it will cost that owner.

3. Identify any laws, rules, and other legal requirements that may duplicate, overlap, or conflict with the proposed rules.

There are no federal, state, or local laws, rules or other legal requirements that may duplicate, overlap, or conflict with the proposed rules.

A. Explain how the rules have been coordinated, to the extent practicable, with other federal, state, and local laws applicable to the same activity or subject matter. This section should include a discussion of the efforts undertaken by the agency to avoid or minimize duplication.

There are no federal, state, or local laws, rules or other legal requirements that may duplicate with the proposed rules.

4. If MCL 24.232(8) applies and the proposed rules are more stringent than the applicable federally mandated standard, provide a statement of specific facts that establish the clear and convincing need to adopt the more stringent rules.

While 42 U.S.C. Sec. 6833(a) does not specifically mandate states to update standards, the code being adopted is a successor to the CABO Model Energy Code, 1992, or successor (i.e. 2021 IECC), and establishes the energy efficiency requirements for residential structures in the state. The proposed rules are not more stringent than the 2021 IECC.

5. If MCL 24.232(9) applies and the proposed rules are more stringent than the applicable federal standard, provide either the Michigan statute that specifically authorizes the more stringent rules OR a statement of the specific facts that establish the clear and convincing need to adopt the more stringent rules.

While 42 U.S.C. Sec. 6833(a) does not specifically mandate states to update standards, the code being adopted is a successor to the CABO Model Energy Code, 1992, or successor (i.e. 2021 IECC), and establishes the energy efficiency requirements for residential structures in the state. The proposed rules are not more stringent than the 2021 IECC.

Purpose and Objectives of the Rule(s)

6. Identify the behavior and frequency of behavior that the proposed rules are designed to alter.

The proposed rules adopt the 2021 IECC with technical provisions designed to alter the outdated residential energy efficiency standards and provide a more energy efficient built environment. The frequency of behavior change due to the proposed rules is only required when altering, renovating, or building a new residence. The requirements outlined in this rule set establish a more economical and environmentally friendly home energy use standard.

A. Estimate the change in the frequency of the targeted behavior expected from the proposed rules.

The proposed rules adopting the 2021 edition of the IECC will continue to establish a more progressive energy efficient Michigan Uniform Energy Code, allowing more flexibility while keeping current with technological innovations. However, there are no changes in the frequency from the current ruleset to the proposed rules, as the rules will continue to apply to alterations, renovations, or building of a new residence.

B. Describe the difference between current behavior/practice and desired behavior/practice.

To comply with the requirements of the Stille-DeRossett-Hale Single State Construction Code Act the proposed rules adopt the updated IECC. These adjustments will improve energy efficiency in residential construction when required to be applied to the alteration, renovation or building of a new residence.

C. What is the desired outcome?

The desired outcome is to bring the Michigan Energy Code rules in line with current IECC standards, to eliminate unnecessary requirements in the code, improve clarity, and align all codes with the Michigan rules. The rules are designed to provide consumer safety while allowing latitude for innovation and new technologies. Overall, this code is intended to protect the health, safety, and welfare of the public from potential dangers associated with the installation and operation of more energy efficient designs while ensuring sustainable human welfare.

7. Identify the harm resulting from the behavior that the proposed rules are designed to alter and the likelihood that the harm will occur in the absence of the rule.

Without implementation of the proposed rules, the businesses would not be able to take advantage of new methods, materials, or technologies leading to improved energy efficiency. The rules are designed to provide consumer safety while allowing latitude for innovation and new technologies. Overall, this code is intended to protect the health, safety, and welfare of the public from potential dangers associated with the installation and operation of more energy efficient designs while ensuring sustainable human welfare.

A. What is the rationale for changing the rules instead of leaving them as currently written?

MCL 125.1504(6): The director shall add, amend, and rescind rules to simultaneously update all chapters of the Michigan residential code not less frequently than once every 6 years or more frequently than once every 3 years as the director determines is appropriate.

42 U.S.C. Sec. 6833(a): The state, not later than 2 years after the date of the publication of a determination by the Secretary of Energy that revision of residential energy efficiency code standards would improve energy efficiency (CABO Model Energy Code, 1992, or any successor), to certify that it has reviewed the provisions of its residential building code regarding energy efficiency and made a determination as to whether it is appropriate for the state to revise the residential building code provisions to meet or exceed the revised code for which the Secretary made such determination.

8. Describe how the proposed rules protect the health, safety, and welfare of Michigan citizens while promoting a regulatory environment in Michigan that is the least burdensome alternative for those required to comply.

Aligning the Michigan Energy Code with the 2021 IECC will protect the health, safety, and welfare of Michigan citizens while promoting a regulatory environment that is the least burdensome alternative for those required to comply. These rules ensure the ongoing assessment of safety in various energy efficient measures and training of staff to keep current with the most updated information. The rules are designed to provide consumer safety while allowing latitude for innovation and new technologies. Overall, this code is intended to protect the health, safety, and welfare of the public from potential dangers associated with the installation and operation of more energy efficient designs while ensuring sustainable human welfare.

9. Describe any rules in the affected rule set that are obsolete or unnecessary and can be rescinded.

The following rules are unnecessary because they are outdated and will be rescinded: R 408.31060c, R 408.31060e, R 408.31061, R 408.31062, R 408.31063, R 408.31063a, R 408.301064, R 408.31065, R 408.31069, R 408.31070, R408.31071, and R 408.31071a.

Fiscal Impact on the Agency

Fiscal impact is an increase or decrease in expenditures from the current level of expenditures, i.e. hiring additional staff, higher contract costs, programming costs, changes in reimbursements rates, etc. over and above what is currently expended for that function. It does not include more intangible costs for benefits, such as opportunity costs, the value of time saved or lost, etc., unless those issues result in a measurable impact on expenditures.

10. Please provide the fiscal impact on the agency (an estimate of the cost of rule imposition or potential savings for the agency promulgating the rule).

The proposed rules have no fiscal impact to the agency beyond the current operational costs.

11. Describe whether or not an agency appropriation has been made or a funding source provided for any expenditures associated with the proposed rules.

The proposed rules will not result in additional fiscal impact on the agency. Thus, there is no need for an additional appropriation or funding source as a result of the changes in the rules.

12. Describe how the proposed rules are necessary and suitable to accomplish their purpose, in relationship to the burden(s) the rules place on individuals. Burdens may include fiscal or administrative burdens, or duplicative acts.

The application of the rules and adopted IECC is required to set the minimum standards for uniform energy code compliance, fostering better solutions for the safety and care placed upon individuals and communities in compliance with the Stille- DeRossett-Hale Single State Construction Code Act. Although there is no administrative burden on the individual, each person must review expenses for the project and decide if costs match budget. There will be an increase in upfront costs for materials for alterations, renovations, or building of a new residence.

A. Despite the identified burden(s), identify how the requirements in the rules are still needed and reasonable compared to the burdens.

The amendments will clarify code requirements which will make compliance less burdensome. The individual will realize a net savings in energy costs pursuant to these requirements in accordance with MCL 125.1504(3)(f) and (g), the cost-effective analysis provides details of cost reduction for homeowners meeting the required cost-effective energy efficiency standards. To evaluate the cost-effectiveness of the changes introduced by the 2021 IECC over the Michigan-amended 2015 IECC, Pacific Northwest National Laboratory (PNNL) estimated the incremental construction cost associated with these changes. For this analysis, cost data sources consulted by PNNL include:

Building Component Cost Community (BC3) data repository

2020 RSmeans Residential Cost Data

2018 ENERGY STAR Cost & Savings Estimates²³

Price data from nationally recognized home supply stores.

The incremental costs are calculated separately for each code change (Michigan amended 2015 IECC to the 2021 IECC) and then added together to obtain a total incremental cost by climate zone, building type, and foundation type.

Tables 5 and 6 show the climate zone-specific incremental construction costs when updating to the 2021 IECC based on the single-family and multifamily prototypes used in this analysis. These costs have been adjusted using a construction cost multiplier of 0.989 to reflect local Michigan construction costs based on location factors provided by 2020 RS Means and converted to 2023 dollars. Incremental construction costs for individual measures included in this analysis were compared to the incremental costs in the 2021 CONSOL Report – Impact of 2021 IECC on 2015 Michigan Residential Code. Measure level cost estimates between the two reports were found to be similar, with PNNL costs being slightly higher on average.

Table 5. Total Single-Family Construction Cost Increase for the 2021 IECC Compared to the Michigan Amended 2015 IECC

Single-family Prototype House

Climate Zone	Crawlspace	Heated Basement	Slab
5A	\$4,238	\$4,442	\$4,915
6A	\$3,738	\$3,480	\$4,415
7	\$4,972	\$4,714	\$4,972
Average	\$4,189	\$4,339	\$4,861

Table 6. Multifamily Construction Cost Increase for the 2021 IECC Compared to the Michigan Amended 2015 IECC

Multifamily Prototype Apartment/Condo

Climate Zone	Crawlspace	Heated Basement	Slab
5A	\$1,933	\$1,743	\$2,033
6A	\$1,428	\$1,170	\$1,528
7	\$2,249	\$1,990	\$2,249
Average	\$1,880	\$1,682	\$1,979

Impact on Other State or Local Governmental Units

13. Estimate any increase or decrease in revenues to other state or local governmental units (i.e. cities, counties, school districts) as a result of the rule. Estimate the cost increases or reductions for other state or local governmental units (i.e. cities, counties, school districts) as a result of the rule. Include the cost of equipment, supplies, labor, and increased administrative costs in both the initial imposition of the rule and any ongoing monitoring.

Local jurisdictions with administrative enforcement of the code may incur some cost in training of inspection staff and would not realize any cost reduction. However, when construction is up in general, there will be increased revenue from permits, (re)inspections, and plan reviews. The construction market is subject to numerous outside influences such as: material costs, labor costs, and interest rates.

Local jurisdictions will be required to comply with the rules when engaging in construction projects on structures owned by the jurisdiction. The agency has no way of knowing what the additional specific expenses will be, as each individual structure will be unique to the needs of the governmental unit. Overall, a person must review expenses for the project and decide if costs match budget. There will be an increase in upfront costs for materials for alterations, renovations, or building of a new structure.

14. Discuss any program, service, duty, or responsibility imposed upon any city, county, town, village, or school district by the rules.

It is anticipated that a local government unit would incur added responsibility due to the proposed rules if a local unit of government has decided to administer and enforce the code under the Stille-DeRossett-Hale Single State Construction Code Act. They would be responsible for learning, understanding, and applying the new code accurately. However, no additional program, service, duty, or responsibility will be imposed on any city, county, town, village, or school district by the rule changes.

A. Describe any actions that governmental units must take to be in compliance with the rules. This section should include items such as record keeping and reporting requirements or changing operational practices.

The proposed rules would require additional or new responsibilities on behalf of governmental units to be in continued compliance with the rules. They would be responsible for learning, understanding, and applying the new code accurately, which would require training of all applicable staff.

15. Describe whether or not an appropriation to state or local governmental units has been made or a funding source provided for any additional expenditures associated with the proposed rules.

No additional appropriations for additional expenditures associated with the proposed rules have been made to state or local governmental units. However, \$1.2T in federal grant programs through the Bipartisan Infrastructure Law and/or the Inflation Reduction Act are available to states, local governments, and other organizations contingent upon the adoption of the 2021 IECC.

Rural Impact

16. In general, what impact will the rules have on rural areas?

The proposed rules affect the state of Michigan as a whole. There is no specific rural impact, rules are applicable to both urban and rural new build structures alike. Where allowed under the Stille- DeRossett-Hale Single State Construction Code Act, there continue to be limited agricultural exemptions under the applicable construction codes. Therefore, there is no specific rule impact as these rules are applicable to urban and rural new building structures alike.

A. Describe the types of public or private interests in rural areas that will be affected by the rules.

Pursuant to the Stille- DeRossett-Hale Single State Construction Code Act, there is an agricultural exemption to the applicability of the construction codes from permits and inspections for those reasons; however, any structures not falling under the agricultural exemption, would still need to follow the code. It is unlikely that the proposed rules will have any impact on public or private interests in rural areas.

Environmental Impact

17. Do the proposed rules have any impact on the environment? If yes, please explain.

As cited in PNNL Cost-Effectiveness Analysis of the 2021 IECC for the State of Michigan, it is expected with the adoption of the 2021 IECC during the first year alone, collectively, Michigan residents could expect to save over \$7,229,392 in energy costs and 44,850 metric tons in avoided CO2 emissions.

Small Business Impact Statement

18. Describe whether and how the agency considered exempting small businesses from the proposed rules.

Because the Stille-DeRossett-Hale Single State Construction Code Act does not allow for exemption of small businesses from the Michigan Energy Code, the agency has no authority to exempt small businesses from the proposed rules.

19. If small businesses are not exempt, describe (a) the manner in which the agency reduced the economic impact of the proposed rules on small businesses, including a detailed recitation of the efforts of the agency to comply with the mandate to reduce the disproportionate impact of the rules upon small businesses as described below (in accordance with MCL 24.240(1)(a-d)), or (b) the reasons such a reduction was not lawful or feasible.

The agency was obligated to follow the Stille-DeRossett-Hale Single State Construction Code Act, which is applicable to scenario “(b) the reason such a reduction was not lawful or feasible” as the act did not provide for such an exemption within the act.

A. Identify and estimate the number of small businesses affected by the proposed rules and the probable effect on small businesses.

According to the most current federal data available, Michigan has 765,487 small businesses. Business involved in residential construction will see an increase in costs related to the standards in the rule set. It is likely these costs will be passed along to the person contracting for the residential construction project. The analysis conducted by PNNL demonstrates that although there will be an increase in upfront costs, the energy efficiency improvements result in a positive net cash flow within 3 years.

B. Describe how the agency established differing compliance or reporting requirements or timetables for small businesses under the rules after projecting the required reporting, record-keeping, and other administrative costs.

The agency did not establish differing compliance or reporting requirements or timetables for small businesses as the agency was obligated to follow the Stille-DeRossett-Hale Single State Construction Code Act which applies to all structures, regardless of the size of the business owning the structure or contracting for improvements of the structure.

C. Describe how the agency consolidated or simplified the compliance and reporting requirements for small businesses and identify the skills necessary to comply with the reporting requirements.

The agency did not establish consolidated or simplified the compliance and reporting requirements for small businesses as the agency was obligated to follow the Stille-DeRossett-Hale Single State Construction Code Act which applies to all structures, regardless of the size of the business owning the structure or contracting for improvements of the structure.

D. Describe how the agency established performance standards to replace design or operation standards required by the proposed rules.

R 408.31059 adopts by reference the 2021 IECC which is a nationally recognized model code. For that reason, the agency need not establish performance standards as the design and operation standards are established through the 2021 IECC.

20. Identify any disproportionate impact the proposed rules may have on small businesses because of their size or geographic location.

The impact of these proposed rules will be directly correlated to the size of the new build structure, or renovation, a small business chooses to design. The larger the square footage of the new building structure or renovation, the higher the material costs and other associated expenses will incur. The proposed changes to the rules have a disproportionate impact on small businesses engaged in residential construction in the three different climate zones defined in the IECC, with each climate zone having its own unique building requirements (installation) effect cost because of their size or geographical location. Small businesses located in climate zone 5 (southern lower peninsula) will have lower compliance costs than small businesses located in climate zone 7 (upper peninsula) due to the environmental differences in the climate zones.

21. Identify the nature of any report and the estimated cost of its preparation by small businesses required to comply with the proposed rules.

There are no increased costs of preparing reports to small businesses, or requirements mandating completion of reports with the proposed rules.

22. Analyze the costs of compliance for all small businesses affected by the proposed rules, including costs of equipment, supplies, labor, and increased administrative costs.

The agency was able to determine variables to estimate compliance costs utilizing the PNNL Cost-Effectiveness Analysis of the 2021 IECC for the State of Michigan. In particular, the size of the new build structure, or its renovation, will dictate the ultimate expenses to the business. Additionally, inflationary costs and specific material selections, will factor into the expenses for the businesses. The impact of these proposed rules will be directly correlated to the size of the new build structure, or renovation, a small business chooses to design. The larger the square footage of the new building structure or renovation, the higher the material costs and other associate expenses will incur. It is likely that any increase in cost will be passed along from the small business engaged in the residential construction project to the homeowner contracting for the project. Homeowners will incur upfront, higher costs, but these expenses will be offset by the long-term financial savings because of this rule set. Overall, the agency has no way of knowing what the additional specific expenses will be, as each individual structure will be unique to the needs. The following are impacts due to the proposed rules, but are not limited to the list below:

The resulting analysis shows that a home designed to comply with the residential provisions of the 2021 IECC would yield short-term and long-term consumer benefits compared to a home built to the Michigan-amended 2015 IECC.

When building to the 2021 IECC, Michigan households can expect to save 10.7% in energy costs, equating to \$396 of annual utility bill savings.

When amortizing costs and benefits over a typical 30-year mortgage, homeowners will see a positive cash flow in the first two to six years, depending on building type and climate zone.

Over the course of 30 years, a first-time homebuyer will net approximately \$7,300, and an average-income homebuyer around \$9,250 in life-cycle cost savings.

During the first year alone, collectively, Michigan residents could expect to save over \$7,229,392 in energy costs and 44,850 metric tons in avoided CO₂ emissions.

Adopting the 2021 IECC in Michigan is expected to result in homes that are energy efficient, more affordable to own and operate, and which are designed and constructed to modern standards for health, comfort, and resilience.

A first-time homebuyer will be cashflow positive in year three of owning the home.

Moving to the 2021 IECC is cost-effective for first-time homebuyers living in single-family and low-rise multifamily units in Michigan.

Michigan is currently ranked third in mortgage foreclosures nationally. By updating to the 2021 IECC, Michigan homeowners will see more stable energy bills month over month, reducing the financial strain that can lead to foreclosure.

States adopting the latest model energy codes are provided favorable insurance underwriting as they rank higher on the ISO's Building Code Effectiveness Grading Schedule (BCEGS®).

Energy-efficient homes built to the latest energy-efficient codes are more durable, resilient, and help lower mortgage default rates, nationally, on average, by 32 percent.

Regulated small businesses may incur training costs for energy code continuing education courses with fees ranging from free to \$400.00 from ASHRAE. If the regulated small businesses desire use of the code book, a fee of \$52.00 will be required for the energy code. The agency leaves it to the discretion of the regulated small businesses to choose how they obtain their training.

23. Identify the nature and estimated cost of any legal, consulting, or accounting services that small businesses would incur in complying with the proposed rules.

There is no anticipated change to the nature and estimated cost of any legal, consulting, or accounting services that small businesses would incur in complying with the proposed changes to the rules.

24. Estimate the ability of small businesses to absorb the costs without suffering economic harm and without adversely affecting competition in the marketplace.

It is likely that any increase in cost will be passed along from the small business engaged in the residential construction project to the homeowner contracting for the project. Homeowners will incur upfront, higher costs, but these expenses will be offset by the long-term financial savings because of this rule set. It is assumed that all builders who are small businesses will pass the costs along to the homeowner, therefore, competition would not be impacted.

25. Estimate the cost, if any, to the agency of administering or enforcing a rule that exempts or sets lesser standards for compliance by small businesses.

There are no rules that exempt or set lesser standards for compliance by small businesses. If the agency were to administer or enforce a rule that exempted or set lesser standards for compliance by small businesses the agency would incur some cost in training of inspection staff. Based on the current numbering of staff who would need to be trained, the estimated cost would be approximately \$2,195.00 (average of \$43.90 per hour times for 50 people).

26. Identify the impact on the public interest of exempting or setting lesser standards of compliance for small businesses.

There is no public interest at play as it relates to exempting standards of compliance for small businesses. To maintain the integrity, security, and fairness of business conducted in Michigan, all businesses must be held to the same compliance and exempting small businesses or setting lesser standards of compliance is not an option for fair and equal businesses practices. The code is applied uniformly across the state to ensure all jurisdictions are providing for the health, safety, and welfare of the public. Setting lesser standards of compliance for small businesses would negatively impact the safety of structures built by the small businesses and therefore the occupants of those homes and other structures.

27. Describe whether and how the agency has involved small businesses in the development of the proposed rules.

The agency involved small businesses through the Code/ Rule Change Proposal Form as well as at the in person Public Advisory Meeting, the in person Public Hearing, along with having the ability to submit written comments to the agency.

A. If small businesses were involved in the development of the rules, please identify the business(es).

The agency received proposed rules from the plumbing trade, electrical trade, mechanical contractors, building inspectors, residential builders, energy rating companies, and small home and residential builders in addition to the following small business, associations of small businesses, stakeholder organizations, and governmental entities involved within the development rules:

The Home Builders Association of Michigan

Consumer's Energy & DTE, municipalities (specifically the City of Grand Rapids)

Building officials (inspectors)

The American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE)

Pacific Northwest National Laboratory, architects and engineers, Masonry Institute and energy home raters.

American Chemistry Council

New Buildings Institute

Natural Resources Defense

The American Institute of Architects

Dream Development & Energy Technology, LCC

Grand Rapids 2030 District

VonMelle Construction

Metro Detroit Construction Consultants, LLC

Calabria Homes, INC

Michigan Environmental Council

Michigan Energy Innovation Business Council

Ecology Center

Midwest Energy Efficiency Alliance (MEEA)

The Michigan Conservative Energy Forum (MICEF)

Residential Energy Services Network (RESNET)

Cost-Benefit Analysis of Rules (independent of statutory impact)

28. Estimate the actual statewide compliance costs of the rule amendments on businesses or groups.

The agency was able to determine variables to estimate compliance costs utilizing the PNNL Cost-Effectiveness Analysis of the 2021 IECC for the State of Michigan. In particular, the size of the new build structure, or its renovation, will dictate the ultimate expenses to the business or group. Additionally, inflationary costs and specific

material selections, will factor into the expenses for the businesses or groups. The impact of these proposed rules will be directly correlated to the size of the new build structure, or renovation, a business or group chooses to design. The larger the square footage of the new building structure or renovation, the higher the material costs and other associate expenses will incur. It is likely that any increase in cost will be passed along from the business or group engaged in the residential construction project to the homeowner contracting for the project. Homeowners will incur upfront, higher costs, but these expenses will be offset by the long-term financial savings because of this rule set. Overall, the agency has no way of knowing what the additional specific expenses will be, as each individual structure will be unique to the needs. The following are impacts due to the proposed rules, but are not limited to the list below:

The resulting analysis shows that a home designed to comply with the residential provisions of the 2021 IECC would yield short-term and long-term consumer benefits compared to a home built to the Michigan-amended 2015 IECC.

When building to the 2021 IECC, Michigan households can expect to save 10.7% in energy costs, equating to \$396 of annual utility bill savings.

When amortizing costs and benefits over a typical 30-year mortgage, homeowners will see a positive cash flow in the first two to six years, depending on building type and climate zone.

Over the course of 30 years, a first-time homebuyer will net approximately \$7,300, and an average-income homebuyer around \$9,250 in life-cycle cost savings.

During the first year alone, collectively, Michigan residents could expect to save over \$7,229,392 in energy costs and 44,850 metric tons in avoided CO2 emissions.

Adopting the 2021 IECC in Michigan is expected to result in homes that are energy efficient, more affordable to own and operate, and which are designed and constructed to modern standards for health, comfort, and resilience.

A first-time homebuyer will be cashflow positive in year three of owning the home.

Moving to the 2021 IECC is cost-effective for first-time homebuyers living in single-family and low-rise multifamily units in Michigan.

Michigan is currently ranked third in mortgage foreclosures nationally. By updating to the 2021 IECC, Michigan homeowners will see more stable energy bills month over month, reducing the financial strain that can lead to foreclosure.

States adopting the latest model energy codes are provided favorable insurance underwriting as they rank higher on the ISO's Building Code Effectiveness Grading Schedule (BCEGS®).

Energy-efficient homes built to the latest energy-efficient codes are more durable, resilient, and help lower mortgage default rates, nationally, on average, by 32 percent.

For homeowners, the size of the new build structure, or its renovation, will dictate the ultimate expenses to the individual. The PNNL Cost-Effectiveness Analysis of the 2021 IECC for the State of Michigan indicates cost of the material is based on the project size and scope. Additionally, inflationary costs and specific material selections, will factor into the expenses for the individual. The analysis indicates the increased upfront costs to be approximately \$3,500 to \$5,000 per single-family home. According to data from the Home Builders Association of Michigan was on pace to issue 15,546 new home permits in 2023, resulting in a statewide compliance cost of approximately \$54,411,000 to \$77,730,000. According to the PNNL analysis, these upfront costs would be offset through life-cycle cost savings as indicated in the chart below.

Table 7. First Time Homebuyer Life-Cycle Cost Savings of the 2021 IECC Compared to the Michigan Amended 2015 IECC

Climate Zone	First-Time Homebuyer 7 yr. LCC (\$)	First Time Homebuyer 30 yr. LCC (\$)	Average Income Homebuyer 7 yr. LCC (\$)	Average Income Homebuyer 30 yr. LCC (\$)
5A	\$614	\$7,288	\$662	\$9,259
6A	\$962	\$7,785	\$1,018	\$9,675
7	\$46	\$4,463	\$74	\$6,000
Average	\$648	\$7,322	\$696	\$9,281

A. Identify the businesses or groups who will be directly affected by, bear the cost of, or directly benefit from the proposed rules.

The businesses and groups who will be directly affected by the proposed rules are those entities who either build a new structure or renovate an existing structure to work in or renovate an existing structure. Also, contractors will be affected by these proposed rules because they will be hired to construct to the new energy requirements. The businesses or groups who will directly benefit from the proposed rules will be the individuals producing the energy products and commercial and residential contractors because they will be able to profit through the hired work to be performed based upon the new energy code requirements. Additionally, structure owners will realize an energy costs savings, long-term, as these standards are implemented through new build or renovations. The individuals who will build a new structure or renovate an existing structure will bear the cost of the new standards.

B. What additional costs will be imposed on businesses and other groups as a result of these proposed rules (i.e. new equipment, supplies, labor, accounting, or recordkeeping)? Please identify the types and number of businesses and groups. Be sure to quantify how each entity will be affected.

Residential builders and skilled trades licensees may incur training costs for energy code continuing education courses, which typically cost \$400.00 from qualified training organizations. If the residential builder or skilled trade licensee desired the use of the code book, a fee of \$52.00 will be required for the energy code. The agency leaves it to the discretion of the residential builders and skilled trades licensees to choose how they obtain their training. There are over 54,000 licensed residential builders and over 61,000 skilled trades licensees in this state who will be impacted.

29. Estimate the actual statewide compliance costs of the proposed rules on individuals (regulated individuals or the public). Include the costs of education, training, application fees, examination fees, license fees, new equipment, supplies, labor, accounting, or recordkeeping.

Regulated individuals may incur training costs for energy code continuing education courses with fees ranging from free to \$400.00 from qualified training organizations. The 2021 IECC essentials course offered by ICC online costs \$198.00 for non-members. If the regulated individual desires use of the code book, a fee of \$52.00 will be required for the energy code. The agency leaves it to the discretion of the regulated individual to choose how they obtain their training. Estimated statewide compliance costs, assuming all regulated individuals take a course and purchase a code book is \$28,750,000. The qualitative effect will be to improve licensee knowledge of the code, as well as new technologies and techniques derived when completing training.

For homeowners, the size of the new build structure, or its renovation, will dictate the ultimate expenses to the individual. The PNNL Cost-Effectiveness Analysis of the 2021 IECC for the State of Michigan indicates cost of the material is based on the project size and scope, only if the cause for alterations, renovations or building of a new residence is required. Additionally, inflationary costs and specific material selections, will factor into the expenses for the individual. The analysis indicates the increased upfront costs to be approximately \$3,500 to \$5,000 per single-family home. According to data from the Home Builders Association of Michigan was on pace to issue 15,546 new home permits in 2023, resulting in a statewide compliance cost of approximately \$54,411,000 to \$77,730,000. According to the PNNL analysis, these upfront costs would be offset through life-cycle cost savings as indicated in the chart below.

Table 7. First Time Homebuyer Life-Cycle Cost Savings of the 2021 IECC Compared to the Michigan Amended 2015 IECC

Climate Zone	First-Time Homebuyer 7 yr. LCC (\$)	First Time Homebuyer 30 yr. LCC (\$)	Average Income Homebuyer 7 yr. LCC (\$)	Average Income Homebuyer 30 yr. LCC (\$)
5A	\$614	\$7,288	\$662	\$9,259
6A	\$962	\$7,785	\$1,018	\$9,675
7	\$46	\$4,463	\$74	\$6,000
Average	\$648	\$7,322	\$696	\$9,281

According to PNNL, energy-efficient building codes impact job creation through two primary value streams:

1. Dollars returned to the economy through reduction in utility bills and resulting increase in disposable income, and;

An increase in construction-related activities associated with the incremental cost of construction that is required to produce a more energy efficient building.

A. How many and what category of individuals will be affected by the rules?

It is anticipated that approximately 54,000 licensed residential builders and 61,000 skilled trades licensees and other regulated individuals (including architects and engineers) will be affected by these proposed rules, but only when new build structures or renovations are contracted for. An estimated 15,546 homeowners engaged in new home construction or home renovation projects will be impacted through the requirement for the projects to be completed in compliance with the rules and the adopted code.

B. What qualitative and quantitative impact do the proposed changes in rules have on these individuals?

In particular, the size of the new build structure, or its renovation, will dictate the ultimate expenses to the individual. Additionally, inflationary costs and specific material selections, will factor into the expenses for the individual. The qualitative impact to the individual will result in a Life-Cycle Cost (LCC) savings in the long-term. As cited in PNNL Cost-Effectiveness Analysis of the 2021 IECC for the State of Michigan. The following are impacts due to the proposed rules, but are not limited to the list below:

The resulting analysis shows that a home designed to comply with the residential provisions of the 2021 IECC would yield short-term and long-term consumer benefits compared to a home built to the Michigan-amended 2015 IECC.

When building to the 2021 IECC, Michigan households can expect to save 10.7% in energy costs, equating to \$396 of annual utility bill savings.

When amortizing costs and benefits over a typical 30-year mortgage, homeowners will see a positive cash flow in the first two to six years, depending on building type and climate zone.

Over the course of 30 years, a first-time homebuyer will net approximately \$7,300, and an average-income homebuyer around \$9,250 in life-cycle cost savings.

During the first year alone, collectively, Michigan residents could expect to save over \$7,229,392 in energy costs and 44,850 metric tons in avoided CO2 emissions.

Adopting the 2021 IECC in Michigan is expected to result in homes that are energy efficient, more affordable to own and operate, and which are designed and constructed to modern standards for health, comfort, and resilience.

A first-time homebuyer will be cashflow positive in year three of owning the home.

Moving to the 2021 IECC is cost-effective for first-time homebuyers living in single-family and low-rise multifamily units in Michigan.

Michigan is currently ranked third in mortgage foreclosures nationally. By updating to the 2021 IECC, Michigan homeowners will see more stable energy bills month over month, reducing the financial strain that can lead to foreclosure.

States adopting the latest model energy codes are provided favorable insurance underwriting as they rank higher on the ISO's Building Code Effectiveness Grading Schedule (BCEGS®).

Energy-efficient homes built to the latest energy-efficient codes are more durable, resilient, and help lower mortgage default rates, nationally, on average, by 32 percent.

30. Quantify any cost reductions to businesses, individuals, groups of individuals, or governmental units as a result of the proposed rules.

If the aforementioned groups stay within their existing building, and never make changes, they will neither incur costs nor realize savings based on this new set of rules. The cost reductions will depend upon if the individual, business, group of individuals, or governmental units build a new structure or renovate an existing structure where they are located. The following are results of cost reductions due the proposed rules, but are not limited to following listed below:

The resulting analysis shows that a home designed to comply with the residential provisions of the 2021 IECC would yield short-term and long-term consumer benefits compared to a home built to the Michigan-amended 2015 IECC.

When building to the 2021 IECC, Michigan households can expect to save 10.7% in energy costs, equating to \$396 of annual utility bill savings.

When amortizing costs and benefits over a typical 30-year mortgage, homeowners will see a positive cash flow in the first two to six years, depending on building type and climate zone.

Over the course of 30 years, a first-time homebuyer will net approximately \$7,300, and an average-income homebuyer around \$9,250 in life-cycle cost savings.

During the first year alone, collectively, Michigan residents could expect to save over \$7,229,392 in energy costs.

A first-time homebuyer will be cashflow positive in year three of owning the home.

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Energy-efficient homes built to the latest energy-efficient codes are more durable, resilient, and help lower mortgage default rates, nationally, on average, by 32 percent.

Michigan can ensure more energy efficient and resilient homes by adopting the latest building energy codes, which lower utility bills, improve construction quality, create local jobs and support workforce training for Michiganders.

31. Estimate the primary and direct benefits and any secondary or indirect benefits of the proposed rules. Please provide both quantitative and qualitative information, as well as your assumptions.

The agency was able to determine variables to estimate compliance costs utilizing the PNNL Cost-Effectiveness Analysis of the 2021 IECC for the State of Michigan. In particular, the size of the new build structure, or its renovation, will dictate the ultimate expenses to the business or group. Additionally, inflationary costs and specific material selections, will factor into the expenses for the businesses or groups. The impact of these proposed rules will be directly correlated to the size of the new build structure, or renovation, a business or group chooses to design. The larger the square footage of the new building structure or renovation, the higher the material costs and other associate expenses. It is likely that any increase in cost will be passed along from the business or group engaged in the residential construction project to the homeowner contracting for the project. Homeowners will incur higher upfront costs, but these expenses will be offset by the long-term financial savings because of this rule set. While each individual structure will be unique to the needs of the occupant, the following are impacts due to the proposed rules, but are not limited to the list below:

The resulting analysis shows that a home designed to comply with the residential provisions of the 2021 IECC would yield short-term and long-term consumer benefits compared to a home built to the Michigan-amended 2015 IECC.

When building to the 2021 IECC, Michigan households can expect to save 10.7% in energy costs, equating to \$396 of annual utility bill savings.

When amortizing costs and benefits over a typical 30-year mortgage, homeowners will see a positive cash flow in the first two to six years, depending on building type and climate zone.

Over the course of 30 years, a first-time homebuyer will net approximately \$7,300, and an average-income homebuyer around \$9,250 in life-cycle cost savings.

During the first year alone, collectively, Michigan residents could expect to save over \$7,229,392 in energy costs and 44,850 metric tons in avoided CO2 emissions.

Adopting the 2021 IECC in Michigan is expected to result in homes that are energy efficient, more affordable to own and operate, and which are designed and constructed to modern standards for health, comfort, and resilience.

A first-time homebuyer will be cashflow positive in year three of owning the home.

Moving to the 2021 IECC is cost-effective for first-time homebuyers living in single-family and low-rise multifamily units in Michigan.

Michigan is currently ranked third in mortgage foreclosures nationally. By updating to the 2021 IECC, Michigan homeowners will see more stable energy bills month over month, reducing the financial strain that can lead to foreclosure.

States adopting the latest model energy codes are provided favorable insurance underwriting as they rank higher on the ISO's Building Code Effectiveness Grading Schedule (BCEGS®).

Energy-efficient homes built to the latest energy-efficient codes are more durable, resilient, and help lower mortgage default rates, nationally, on average, by 32 percent.

Regulated individuals may incur training costs for energy code continuing education courses with fees ranging from free to \$400.00 from qualified training organizations. The 2021 IECC essentials course offered by ICC online costs \$198.00 for non-members. If the regulated individual desires use of the code book, a fee of \$52.00 will be required for the energy code. The agency leaves it to the discretion of the regulated individual to choose how they obtain their training. Estimated statewide compliance costs, assuming all regulated individuals take a course and purchase a code book is \$28,750,000. The qualitative effect will be to improve licensee knowledge of the code, as well as new technologies and techniques derived when completing training.

The businesses and groups who will be directly affected by the proposed rules are those entities who either build a new structure or renovate an existing structure. Also, contractors will be affected by these proposed rules because they will be hired to construct to the new energy requirements. The businesses or groups who will directly benefit from the proposed rules will be the individuals producing the energy products and commercial and residential contractors because they will be able to profit through the hired work to be performed based upon the new energy code requirements. Additionally, structure owners will realize an energy costs savings, long-term, as these standards are implemented through new build or renovations. The individuals who will build a new structure or renovate an existing structure will bear the cost of the new standards

It is anticipated that approximately 54,000 licensed residential builders and 61,000 skilled trades licensees and other regulated individuals (including architects and engineers) will be affected by these proposed rules, but only when new build structures or renovations are contracted for. An estimated 15,546 homeowners engaged in new home construction or home renovation projects will be impacted through the requirement for the projects to be completed

in compliance with the rules and the adopted code.

For homeowners, the size of the new build structure, or its renovation, will dictate the ultimate expenses to the individual. The PNNL Cost-Effectiveness Analysis of the 2021 IECC for the State of Michigan indicates cost of the material is based on the project size and scope. Additionally, inflationary costs and specific material selections, will factor into the expenses for the individual. The analysis indicates the increased upfront costs to be approximately \$3,500 to \$5,000 per single-family home. According to data from the Home Builders Association of Michigan was on pace to issue 15,546 new home permits in 2023, resulting in a statewide compliance cost of approximately \$54,411,000 to \$77,730,000. According to the PNNL analysis, these upfront costs would be offset through life-cycle cost savings as indicated in the chart below.

Table 7. First Time Homebuyer Life-Cycle Cost Savings of the 2021 IECC Compared to the Michigan Amended 2015 IECC

Climate Zone	First-Time	First Time	Average	Average
	Homebuyer	Homebuyer	Income	Income
	7 yr. LCC (\$)	30 yr. LCC (\$)	Homebuyer	Homebuyer
			7 yr. LCC (\$)	30 yr. LCC (\$)
5A	\$614	\$7,288	\$662	\$9,259
6A	\$962	\$7,785	\$1,018	\$9,675
7	\$46	\$4,463	\$74	\$6,000
Average	\$648	\$7,322	\$696	\$9,281

Jobs Creation through Energy Efficiency

According to PNNL, energy-efficient building codes impact job creation through two primary value streams:

1. Dollars returned to the economy through reduction in utility bills and resulting increase in disposable income, and;
2. An increase in construction-related activities associated with the incremental cost of construction that is required to produce a more energy efficient building.

The agency relied on the following information as cited in the PNNL Cost-Effectiveness Analysis of the 2021 IECC for the State of Michigan when determining the existence and extent of the impact of the proposed rules:

The primary and direct benefits of our proposed rules include things such as long-term costs savings, a reduction in the carbon footprint and other energy savings to the owners of new build structures and renovations.

The secondary or indirect benefits of the proposed rules are the skilled trade professions who will benefit from the contracted work that will result from an updated energy code as property owners pursue energy efficiencies and skilled contractors will be needed for the projects.

32. Explain how the proposed rules will impact business growth and job creation (or elimination) in Michigan.

The proposed rules will benefit the skilled trades profession as well as the energy related industry due to the new requirements which are established in this rule set. Michigan can ensure more energy efficient and resilient homes and businesses by adopting the latest building energy codes, which lower utility bills, improve construction quality, create local jobs and support workforce training for Michiganders.

33. Identify any individuals or businesses who will be disproportionately affected by the rules as a result of their industrial sector, segment of the public, business size, or geographic location.

Overall, the proposed changes to the rules have a disproportionate impact on small businesses in the three different climate zones, with each climate zone having its own unique building requirements effect cost because of their size or geographical location. The code is applied uniformly across the state to ensure all jurisdictions are providing for the health, safety, and welfare of the public.

34. Identify the sources the agency relied upon in compiling the regulatory impact statement, including the methodology utilized in determining the existence and extent of the impact of the proposed rules and a cost-benefit analysis of the proposed rules.

Data for this Regulatory Impact Statement came from the PNNL Cost-Effectiveness Analysis of the 2021 IECC for the State of Michigan, information and data provided from public advisory meeting, stakeholders, the Construction Code Commission, the State Plumbing Board, the Electrical Administrative Board, the Board of Mechanical Rules, the Residential Builders Maintenance and Alteration Contractors Board, reviewed comments from the code/rule proposal forms, and research on other Great Lake States (Ohio, Illinois, and Wisconsin).

Through the means identified above, the following stakeholders contributed to this regulatory impact statement:

The Home Builders Association of Michigan

Consumer's Energy & DTE, municipalities (specifically the City of Grand Rapids)

Building officials (inspectors)

The American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE)

Pacific Northwest National Laboratory, architects and engineers, Masonry Institute and energy home raters.

A. How were estimates made, and what were your assumptions? Include internal and external sources, published reports, information provided by associations or organizations, etc., that demonstrate a need for the proposed rules.

As cited in PNNL Cost-Effectiveness Analysis of the 2021 IECC for the State of Michigan, it is expected with the adoption of the 2021 IECC during the first year alone, collectively, Michigan residents could expect to save over

\$7,229,392 in energy costs and 44,850 metric tons in avoided CO2 emissions.

Results due to the proposed rules include, but are not limited to, the following:

The resulting analysis shows that a home designed to comply with the residential provisions of the 2021 IECC would yield short-term and long-term consumer benefits compared to a home built to the Michigan-amended 2015 IECC.

When building to the 2021 IECC, Michigan households can expect to save 10.7% in energy costs, equating to \$396 of annual utility bill savings.

When amortizing costs and benefits over a typical 30-year mortgage, homeowners will see a positive cash flow in the first two to six years, depending on building type and climate zone.

Over the course of 30 years, a first-time homebuyer will net approximately \$7,300, and an average-income homebuyer around \$9,250 in life-cycle cost savings.

During the first year alone, collectively, Michigan residents could expect to save over \$7,229,392 in energy costs.

A first-time homebuyer will be cashflow positive in year three of owning the home.

Moving to the 2021 IECC is cost-effective for first-time homebuyers living in single-family and low-rise multifamily units in Michigan.

States adopting the latest model energy codes are provided favorable insurance underwriting as they rank higher on the ISO's Building Code Effectiveness Grading Schedule (BCEGS).

Energy-efficient homes built to the latest energy-efficient codes are more durable, resilient, and help lower mortgage default rates, nationally, on average, by 32 percent.

Michigan can ensure more energy efficient and resilient homes, and businesses by adopting the latest building energy codes, which lower utility bills, improve construction quality, create local jobs and support workforce training for Michiganders.

The agency relied on the following information as cited in the PNNL Cost-Effectiveness Analysis of the 2021 IECC for the State of Michigan When determining the existence and extent of the impact of the proposed rules:

Commission and Stakeholders

Pacific Northwest National Laboratory, Cost-Effectiveness Analysis of the 2021 IECC for the State of Michigan (PNNL-SA-188473)

Life-Cycle Cost (LCC) cash flow analysis.

The U.S. Department of Energy (DOE) cost-effectiveness methodology

The U.S. Energy Information Administration (EIA).

National Association of Realtors (NAR) report.

National Association of Home Builders report “What Buyers Really Want.”

Building Component Cost Community (BC3) data repository

2020 RSMMeans Residential Cost Data

2018 ENERGY STAR Cost & Savings Estimates

Price data from nationally recognized home supply stores

Alternative to Regulation

35. Identify any reasonable alternatives to the proposed rules that would achieve the same or similar goals.

No reasonable alternatives would achieve the same goals. The agency is required by statute to adopt the updated IECC.

A. Please include any statutory amendments that may be necessary to achieve such alternatives.

Although the agency does not believe any statutory amendments are necessary to the Stille-DeRossett-Hale Single State Construction Code Act, individuals who believe the energy code updates cause additional expenses to be incurred, may wish to lobby the legislature to extend the energy code adoption to greater than every three to six years.

36. Discuss the feasibility of establishing a regulatory program similar to that proposed in the rules that would operate through private market-based mechanisms. Please include a discussion of private market-based systems utilized by other states.

The agency is unaware of similar programs or private market-based systems in other states.

37. Discuss all significant alternatives the agency considered during rule development and why they were not incorporated into the rules. This section should include ideas considered both during internal discussions and discussions with stakeholders, affected parties, or advisory groups.

The most significant alternative, which was presented to the agency and not adopted, was the proposition to require all new structures or renovations be exclusively electric in nature. This would mean no use of propane or natural gas. This would result in extraordinarily expensive construction beyond the current normal practice. It also eliminates possible cheaper modes to energy.

Additional Information

38. As required by MCL 24.245b(1)(c), please describe any instructions regarding the method of complying with the rules, if applicable.

Upon promulgation of the Michigan rule's, the agency will publish instructions on obtaining the updated code books.