

July 11, 2018

Mr. Gregory Furnish
Commissioner and Chairman, Indiana Residential Code Committee
Indiana Government Center South
302 West Washington Street
Indianapolis, IN 46204

Re: Energy Conservation Requirements of the 2018 International Residential Code

Dear Chairman Furnish,

The undersigned organizations recommend that the Indiana Fire Prevention & Building Safety Commission adopt new building energy codes that will drive improvements in energy efficiency, conservation, public health and wellness, and that will create jobs and improve the statewide and local economies.

According to a 2016 report, the clean energy sector supports more than 47,720 jobs in Indiana. A large majority of those jobs - 81 percent - are in energy efficiency. All of these 38,453 energy efficiency jobs are interdependent with the building industry, whether it be HVAC, insulation, lighting or manufacturing. They are good, in-state jobs in a vital, growing sector of Indiana's economy.¹ We have an opportunity to build on this investment, improve the livability and resiliency of new homes, reduce energy waste, continue to spur local construction and manufacturing jobs, and become a leader in strong building energy codes throughout the region.

In order to achieve these wide-ranging benefits cost-effectively, our organizations specifically recommend that Indiana adopt the energy conservation requirements of Chapter 11 of the 2018 International Residential Code (IRC) in its entirety as the statewide minimum building energy code. We support the adoption of Chapter 11 of the 2018 IRC in Indiana because:

1. Efficiency and building improvements stemming from the 2018 IRC will save money and improve local economies as homeowners will have more disposable income.

According to a recent analysis, the average new homeowner in Indiana could expect to use 25 percent less energy and reduce energy costs by approximately \$500.00 annually; this energy code is also extremely cost-effective; a homeowner with a 30-year mortgage could realize a positive cash flow in less than 8 months and a life-cycle cost savings of over \$6,500.² It is important to note that these energy and cost savings will continue for the life of a building, which often extends 50 to 100 years or more.

By updating our codes to the 2018 IECC, the Midwest Energy Efficiency Alliance (MEEA) estimates that Indiana residents would collectively save about \$6.6 million and 607,000 MMBtus in the first year.³ However, first year savings only tell a fraction of the positive impact from an updated energy code, as energy and cost savings from efficiency measures are cumulative in nature. According to a recent US Department of Energy (DOE) study which analyzed cumulative savings over the years 2010 to 2030, Hoosiers will collectively save one billion dollars by regularly updating their residential energy code.⁴

¹ See Clean Energy Trust, Clean Jobs Indiana. <https://www.cleanjobsmidwest.com/state/indiana>

² See MEEA. Cost-effectiveness sheet, attached.

³ Ibid.

⁴ See DOE, *Impacts of Model Building Energy Codes*. (Table 7) https://www.energycodes.gov/sites/default/files/documents/Impacts_of_Model_Energy_Codes.pdf.

An investment in cost-effective updated building energy codes will put more money directly into Hoosiers' pockets, improving local economies for years to come.

2. Studies have shown that the adoption of the 2018 IRC will result in healthier, more comfortable, and more resilient homes.

A building enclosure that is tightly sealed, combined with a proper ventilation system, will have fewer indoor air pollutants. By controlling the movement of air into and out of the home, pollutants entering the home can be minimized, and those that still enter can be quickly exhausted to the outside.⁵ The requirement for buildings to have well sealed envelopes and duct systems, verified with diagnostic testing, will help ensure the realization of these air quality benefits. According to a recent study, by building more efficient homes, we can reduce the pollution associated with power generation, and reduce incidents of asthma, lung disease, heart attacks, strokes and other ailments.⁶

Additionally, improvements to the building envelope improve occupant comfort and maintain temperatures, especially during events with severe weather. A study conducted after Superstorm Sandy found that homes built to newer energy codes enabled residents to safely stay in their homes longer after a power outage compared to similar buildings constructed under an older code.⁷ The ability to shelter in place longer saves lives and provides critical flexibility for deploying first responder resources.

3. Energy codes serve as a critical consumer protection, locking in energy and financial savings for decades to come.

Low-income households operate on fixed incomes and tight budgets.⁸ This population already spends an average of 7.2 percent of their income on energy bills compared to the national average at 3.5 percent.⁹ The adoption of the 2018 IRC would help ease the burden on this population. Considering that newly built homes will be around for 50 to 100 years, most homes built today could eventually be inhabited by low-income families. The 2018 IRC helps to ensure that all new homes are constructed with a quality building envelope, locking in key efficiency and health improvements for years to come. Otherwise, these building features are rarely updated.

The 2018 IRC is a cost-effective way to gradually increase the level of efficiency while remaining competitive with neighboring states throughout the region that have adopted the 2012 or 2015 IRC/IECC. Over the past four years, most of the surrounding states have updated their residential building energy code to the 2012 IECC or better, and currently Illinois, Minnesota and Ohio are considering the 2018 IECC for adoption.

We urge the Residential Code Committee to support the adoption of the full 2018 IRC Chapter 11 for residential buildings in Indiana to reduce energy use and cost for residents, create more comfortable and

⁵ See three studies on health and indoor air quality - <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3281289/>
<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4129915/> http://www.hvi.org/publications/pdfs/moldpaper_final1june09.pdf.

⁶ ACEE. *Saving Energy, Saving Lives: The Health Impacts of Avoiding Power Plant Pollution with Energy Efficiency*. <http://aceee.org/sites/default/files/publications/researchreports/h1801.pdf>.

⁷ ACEEE. *Leaks and Lives: How Better Building Envelopes Make Blackouts Less Dangerous* <http://aceee.org/files/proceedings/2014/data/papers/1-439.pdf>.

⁸ Now over 25 million American's 60+ live at or below 250% of the federal poverty level. <https://www.ncoa.org/news/resources-for-reporters/get-the-facts/economic-security-facts/>.

⁹ See ACEEE and EE for All. *Lifting the High Energy Burden in America's Largest Cities* http://energyefficiencyforall.org/sites/default/files/Lifting%20the%20High%20Energy%20Burden_0.pdf.

Re: Chapter 11 (2018 IECC) of the 2018 IRC, July 2018

Page 3 of 3

healthier indoor environments for Indiana families, and increase the resiliency of the building stock so new residential dwellings last for the next 50-100 years.

Thank you for considering our recommendation, and please contact us with any questions.

Sincerely,

Richard Hill, Chair, Sierra Club Hoosier Chapter

Eric Lacey, Chairman, Responsible Energy Codes Alliance

Robin Mohr, 350 Indiana-Indianapolis

Larry Zarker, CEO, Building Performance Institute

George Phelps, Manager, Product & Legislative Affairs, Knauf Insulation

Jesse Kharbanda, Executive Director, Hoosier Environmental Council

Mark Jansen, President, Energy Efficient Homes Midwest

Owens Corning

Curt Rich, President & CEO, North American Insulation Manufacturers Association

David Mann, Senior Director, Building & Construction, American Chemistry Council

Robert Koester, Director of the Center for Energy Research & Education & Service, Ball State University

Bill Fay, Energy Efficient Codes Coalition

Justin Koscher, President, Polyisocyanurate Insulation Manufacturers Association

J. Joseph Cullen, Director of Policy & State Outreach, The Home Performance Coalition

Douglas Fick, Region V Director, American Society of Heating, Refrigeration & Air Conditioning Engineers

Tom Carter, Executive Director, Efficiency First

Ian Blanding, Senior Building Policy Associate, Midwest Energy Efficiency Alliance

Kerwin Olson, Executive Director, Citizens Action Coalition

cc: Robin Nicoson, Chairman, Fire Prevention & Building Safety Commission

Eric Holcomb, Governor, State of Indiana



Residential Energy Use Comparison: IN (CZ 4 + 5) IN 2009 IECC, 2018 IECC

The adoption of the unamended 2018 International Energy Conservation Code (IECC) will greatly benefit Indiana residents by improving the comfort, air quality, efficiency and performance of newly constructed residential buildings. In addition to improving building performance, the 2018 IECC will ensure critical efficiency components are installed - for all income levels - when it's most cost-effective to do so, during the initial construction of the building. Below are findings which highlight the potential for energy and energy cost savings when building to the unamended 2018 IECC in climate zone 4 and 5.¹ On the back of this sheet MEEA provides a description of specific code improvements that largely influence building improvements.

Comparison of Current Indiana Code against the 2018 IECC as Written

- If the unamended 2018 IECC were adopted, **a future homeowner could expect to reduce energy use by 25% and save ~\$500** per year on energy bills.
- If the 2018 IECC were passed as written, the **local economy could expect to gain \$6.6 million in the first year.**

	Reduced Energy Use Per Home	Annual Energy Cost Savings Per Unit	Simple Payback Period ²	Net Positive Cash Flow ²	Life-cycle Cost Savings ²
Climate Zone 4	24%	\$427	5.2 years	10 months	\$5,670
Climate Zone 5	25%	\$491	4.4 years	8 months	\$6,825
Annual Statewide Economic Gain:³ \$ 6,600,000/yr Annual Statewide Energy Savings: 607,000 MMBTU					

Importance for Low-Income Households

Low-income households - which include an increasingly larger share of elderly adults - operate on fixed incomes and tight budgets.⁴ Both the energy savings and building health benefits associated with adopting the 2018 IECC are especially critical to improving the lives of this at-risk community for the following reasons:

- This population **spends double the amount of their income on energy bills** compared to the national average.⁵
- **These residents do not have the opportunity to retrofit after the home is built;** improving comfort, efficiency, and occupant health needs to be done during construction.
- Considering buildings are around for 50 -100 years, **all newly built homes could eventually be occupied by low-income residents.**

* Sources listed on the back of this page



Significant Improvements from Adopting the 2018 IECC:

Building Thermal Envelope

- **Air Infiltration:** Tighter building envelopes and envelope testing
 - A tighter building envelope and a reduced air leakage rate will improve air quality, comfort and building efficiency.
 - This is verified by diagnostic blower door test; it is difficult to meet the requirement and realize energy benefits without testing.
- **Insulation:** Increased wall, ceiling and basement insulation (Climate zone dependent)
 - Increasing insulation is most cost-effective during initial construction and is not often addressed after the home is constructed.
- **Windows:** More efficient windows
 - More efficient windows and increased insulation improve the building thermal envelope resulting in improved efficiency and comfort.
- **Mechanical Ventilation:** Whole house mechanical ventilation that meets the 2015 IRC/IMC is required
 - Controlled ventilation guarantees the exchange of fresh and filtered air in the home, resulting in better indoor air quality.

HVAC System

- **Duct Tightness:** More effective duct systems through reduced leakage
 - A tighter duct system and a reduced leakage rate improve air quality and duct system efficiency.
 - This requirement is verified with a diagnostic duct leakage test when the ducts are not entirely within conditioned space.

Lighting

- **Lighting:** 40% increase in efficient lighting
 - This change will result in cost-effective electricity savings for the homeowner.

Sources:

1. Based on MEEA REM/Design analysis using DOE model home specifications - IN 2009 IECC to 2018 IECC home. Determined energy savings and multiplied that by EIA Indiana 2016 residential energy costs.
2. Based on the US DOE methodology for residential cost-effectiveness in energy codes.
<https://www.energycodes.gov/development/residential/methodology>
Incremental Costs of \$2,260 (cz4) and \$2,197 (cz 5) were derived from the following sources: PNNL, RS Means, Home Depot, and local energy raters.
3. Based on 14,640 new construction building permits in 2016. Source: U.S. Census data, 2016 1+2 Unit residential homes in Indiana: <https://www.census.gov/construction/bps/txt/tb2u2016.txt>
4. Now over 25 million American's 60+ live at or below 250% of the federal poverty level.
<https://www.ncoa.org/news/resources-for-reporters/get-the-facts/economic-security-facts/>
5. See ACEEE and EE for All. Lifting the High Energy Burden in America's Largest Cities
http://energyefficiencyforall.org/sites/default/files/Lifting%20the%20High%20Energy%20Burden_0.pdf