



## Residential Energy Use Comparison: MN (CZ 6 + 7) MN 2012 IECC, 2018 IECC

The adoption of the unamended 2018 International Energy Conservation Code (IECC) will greatly benefit Minnesota residents by improving the comfort, air quality, efficiency and performance of newly constructed residential buildings. The 2018 IECC will also ensure critical efficiency components are installed - for all income levels - when its most cost-effective to do so, during the initial construction of the building. Additionally, the adoption of the 2018 IECC will keep Minnesota current with technology and building standards in the marketplace. Below are findings which highlight the potential for energy and energy cost savings when building to the unamended 2018 IECC in climate zone 6 and 7.<sup>1</sup> On the back of this sheet MEEA provides a description of specific code improvements that largely influence building improvements.

### Comparison of Current Minnesota Code against the unamended 2018 IECC

If the 2018 IECC were adopted as written:

- **a future homeowner could** reduce energy use by 6%, save ~\$140 annually, and achieve a positive cashflow in 3.5 - 4 years;
- **the statewide energy demand would** be reduced by 160,000 MMBTUs; and,
- **the state economy could** expect to gain \$2 million in the first year.

	Reduced Energy Use Per Home	Annual Energy Cost Savings Per Unit	Simple Payback Period <sup>2</sup>	Net Positive Cash Flow <sup>2</sup>	Life-Cycle Cost Savings <sup>2</sup>
Climate Zone 6	6%	\$135	15 years	4.2 years	\$812
Climate Zone 7	6%	\$146	14 years	3.4 years	\$1,005
Annual Statewide Economic Gain: <sup>3</sup> \$ 2.0 million Annual Statewide Energy Savings: 160,000 MMBTU					

### Incremental Cost and Payback (DOE definitions):

- Simple payback
  - The number of years required for energy cost savings to exceed the incremental first costs of a new code *without consideration of amortized costs*.
- Net Positive Cash Flow
  - *When amortizing incremental costs over a 30-year mortgage, this represents the amount of time it will take for the monthly energy savings to surpass monthly costs, resulting in a positive cashflow for the life of the building.*
- Life-Cycle Cost Savings
  - *Life-Cycle Cost (LCC) Savings is the total economic benefit to the homeowner after a 30-year period. The analysis considers the initial investment, incremental costs, life of measures, and the energy savings resulting from implementing the efficiency improvements of a new energy code.*
    - Incremental costs are amortized over a 30- year mortgage and future cash flows are discounted to present values.

\* Sources listed on the back of this page

## Significant Improvements from Adopting the 2018 IECC:

### Building Thermal Envelope

- **Insulation:** Increased wall and basement insulation
  - 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.

### Lighting

- **Lighting:** 15% increase in efficient lighting
  - This change will result in cost-effective electricity savings for the homeowner.

### Builder Flexibility

- **ERI:** Compliance pathway that uses an energy model which accounts for all efficiency aspects in a home
  - This allows for full credit to be given for more efficient HVAC equipment, water heaters, and appliances, enabling builders to find the least cost path to code compliance

## Importance for Low-Income Households:

Low-income households - which include an increasingly larger share of elderly adults - operate on fixed incomes and tight budgets.<sup>4</sup> 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.<sup>5</sup>
- **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:

1. Based on MEEA REM/Design analysis using DOE model home specifications - MN 2012 IECC to 2018 IECC home. Determined energy savings and multiplied that by 2017 statewide residential energy costs for MN (EIA). Used DOE methodology for cost-effectiveness and assumed a 5% discount rate.
2. Incremental Costs of \$2,036 (total) or \$7 (monthly when amortized over a 30-yr. mortgage) derived from local department stores and RS Means MN database. Costs include material, labor and profit.
3. Based on 14,704 new construction building permits in 2016. Source: U.S. Census data, 2016 1+2 Unit residential homes in Minnesota: <http://censtats.census.gov/cgi-bin/bldgprmt/bldgdisp.pl>
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](http://energyefficiencyforall.org/sites/default/files/Lifting%20the%20High%20Energy%20Burden_0.pdf)