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Submitted to: Montana Building Codes Advisory Council

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NCAT recommends that the State of Montana adopt the 2012 version of the ICC codes including the 2012 IECC. This recommendation is based on the discussion points provided below and with the understanding that some implementation accommodations may be warranted.

- 1. General Statement in Favor of adopting the 2012 IECC.** Montana would be well served to keep pace with the National Codes, including the IECC. The non-residential elements of the energy code are generally not controversial and should be adopted intact. Some residential provisions of the 2012 IECC are more controversial and may need to be phased in over the next two years. One key benefit of the residential provisions of the energy code is minimizing the costs of owning and operating a home for the homeowner. Other benefits include national energy security and the environmental benefits of reducing energy waste.
- 2. Adoption Timeline.** Some residential provisions of the 2012 IECC could be an undue burden if implemented without a reasonable transition period. For example the mandatory blower door testing requirements of the 2012 IECC could be phased in over a two year period. This is especially important in the rural areas of the state.

Instead of 90 days for implementation, the state should consider allowing until October 1, 2014 for local jurisdiction adoption. This will allow builders an entire building season to adjust to the provisions of the code update.

**3. 2012 IECC Reference: Table R402.1.1
Recommendation Regarding Wall Insulation Sheathing**

One of the key changes to the residential provisions of the 2012 IECC prescriptive path is the addition of wall insulation sheathing. This construction technique has been used for many years and

was used successfully in the construction of my own home 25 years ago. The USEPA ENERGY STAR New Homes program and the USDOE Building America Program have demonstrated and endorsed this construction technique based on over fifteen years of experience. But to afford builders in Montana time to become more familiar with this construction technique delaying implementation of this particular provision until October 1, 2015 is reasonable.

It should be noted that if a builder does not wish to install wall insulation sheathing they may take advantage of the flexibility built into the IECC with its envelope component tradeoff and performance approaches. For example installing better windows or more insulation in the ceiling will allow for a reduction in the R-value of the walls. Such trade-offs are easily documented using free public domain software titled RESCheck.

**4. 2012 IECC Reference: Table R402.1.3
Recommendation Regarding Frame Wall Assembly U-Factor**

**TABLE R402.1.3
EQUIVALENT U-FACTORS**

CLIMATE ZONE	FENESTRATION U-FACTOR	SKYLIGHT U-FACTOR	CEILING U-FACTOR	FRAME WALL U-FACTOR	MASS WALL U-FACTOR	FLOOR U-FACTOR	BASEMENT WALL U-FACTOR	CRAWL SPACE WALL U-FACTOR
1	0.50	0.75	0.035	0.082	0.197	0.064	0.360	0.477
2	0.40	0.65	0.030	0.082	0.165	0.064	0.360	0.477
3	0.35	0.55	0.030	0.057	0.098	0.047	0.091	0.136
4 except Marine	0.35	0.55	0.026	0.057	0.098	0.047	0.059	0.065
5 and Marine 4	0.32	0.55	0.026	0.057	0.082	0.033	0.050	0.055
6	0.32	0.55	0.026	0.048 0.054	0.060	0.033	0.050	0.055
7 and 8	0.32	0.55	0.026	0.048	0.057	0.028	0.050	0.055

Note: All footnotes remain unchanged.

NCAT recommends that the 2012 IECC frame wall assembly U-factor value of 0.048 be amended to 0.054 to correspond with the frame wall R-value in Table R402.1.1 as amended. The current Montana energy code and 2009 IECC frame wall assembly U-factor value is 0.057. When the 2009 IECC frame wall R-value was amended by Montana from R-20 to R-21 in Table R402.1.1 the U-factor of Table R402.1.3 should have been adjusted accordingly. By not adjusting the U-factor a loop-hole was created to allow builders to skirt the intent of the more efficient frame wall R-value. The U-factor of 0.054 represents the same proportionate efficiency improvement of R-21.

This value should revert back to the 2012 IECC value on October 1, 2015. The delay in implementation of this provision will allow builders to become familiar with construction techniques required to build a more efficient wall.

5. 2012 IECC Reference: 402.1.4 Total UA Alternative

Recommendation Regarding Use of Total UA Alternative in REScheck Compliance Software

REScheck software was developed and is maintained by USDOE to provide a simple and accessible way for builders to use the Total UA Alternative approach to meeting the envelope requirements of the energy code. But unless the version of REScheck used by the builders includes the Montana amendments to the IECC use of REScheck becomes a path for circumventing the intent of the Montana energy code.

NCAT recommends that REScheck be allowed as an energy code compliance alternative in Montana only if it incorporates all current Montana amendments. USDOE has made similar adjustments to REScheck software for other states.

6. 2012 IECC Reference: Table R402.4.1.2

Recommendation Regarding Building Tightness Testing

One of the most significant changes in the 2012 IECC is the requirement for building tightness testing. It is important that code officials be able to establish minimum qualifications for individuals who will be performing the testing. The provision that code officials be able to require third party testing is also very important.

NCAT suggests the department provide guidance to local jurisdictions regarding how to set minimum certification standards for building tightness and duct tightness testers. The currently available certifications that could be adopted as minimum tester qualifications include Performance Testing Comfort Systems (PTCS) New Homes Duct Testing certification, Home Energy Rater certification, and Building Performance Institute Building Analyst certification. Of the three the PTCS training is most accessible. It is a one-day training that is the accepted standard in the four Pacific Northwest States. It is recognized by the Northwest Energy Efficiency Alliance and the Bonneville Power Administration.

7. 2012 IECC Reference: R405.5.2(1)

Recommendation Regarding Equipment for Envelop Efficiency Trade-offs.

There is an effort by the National Association of Home Builders (NAHB) to reintroduce the space conditioning equipment for envelope efficiency trade-off that was allowed in the 2006 IECC. Montana should **not** amend the energy code by re-introducing a space conditioning equipment for envelope efficiency trade-off. Doing so would be a major step backwards in terms of new home building envelope energy efficiency.

The building envelop will last the life of the house while the space conditioning equipment may be replaced several times. While it may be possible to replace the space conditioning equipment with more efficient units, the cost of making improvements to the building envelope components will be prohibitive. By deemphasizing the efficiency of the building envelope in favor of equipment efficiency the opportunity for a more efficient envelope will be effectively lost.

Since many new homes are now equipped with high efficiency equipment, an equipment for envelope efficiency tradeoff is an invitation for builders to reduce the envelope efficiency. The penetration rate of 90% plus AFUE furnaces is already high. In June of 2012 the Montana Department of Environmental Quality (MTDEQ) conducted a survey of heating, ventilation and air conditioning (HVAC) contractors, listed in the NorthWestern Energy Preferred Equipment Contractor list. That survey found 93% of all furnaces sold by those contractors are 90% AFUE and above. Unfortunately the MTDEQ survey did not differentiate between new and existing homes but the implication is clear. The clear majority of new furnaces are well above the federal minimum efficiency of 83% AFUE.

According to the 2008 Natural Gas Resource Assessment conducted by a third party for NorthWestern Energy specifically for Montana customers the incremental cost of a 90% AFUE residential sized furnace compared to an 80% AFUE furnace was \$142.98. The incremental cost of a 90% AFUE residential sized boiler compared to an 82% AFUE boiler is \$213.00. While this data is somewhat dated it makes the point that the cost of installing a high efficiency unit compared to a federal minimum efficiency unit is not great.

An equipment tradeoff is not in the best interests of Montana homeowners and in fact runs counter to energy code improvements of the last two code cycles.

8. IRC Section 1507 Mechanical Ventilation

Recommendation regarding IRC Section 1507.

Historically Montana has not adopted Chapter 15 of the IRC regarding mechanical ventilation. Mechanical ventilation is now mandatory in both the IMC and IRC Chapter 15 Section 1507. While the requirements for continuous and spot ventilation are the same in both IRC Section M1507 and IMC Section 403 their presentation differs. In Chapter 15 of the IRC a table is provided for continuous ventilation which is not included in the IMC. This table makes the continuous ventilation requirement easier to understand. In addition IRC Section 1507 includes a table of factors to apply to intermittent ventilation systems that is not included in the IMC. It makes sense to allow builders to comply with either IRC Section M1507 or IMC Section 403.