

Study Says ICF Homes Reduce Heating Costs 44%

U.S. and Canada homeowners could save at least 44% per year on heating costs and (where applicable) approximately 32% for cooling energy by buying a house constructed with the exterior walls made of insulated concrete forms instead of conventional wood frame walls, according to a new study recently completed by a Boston University School of Management professor.

Dr. Pieter VanderWerf, assistant professor of business management at Boston and co-author of *Insulating Concrete Forms Construction Manual*, says energy savings will be even higher for homes built in extreme climates where total bills are higher.

VanderWerf says most new home owners have positive feelings toward their homes regardless of the composition of their exterior walls. However, the reasons ICF home owners gave sharply contrasted the reasons given by frame home owners. ICF owners most often cited functional advantages provided by the icf walls: even temperature, low air filtration, sound reduction, energy efficiency. Conversely, frame owners most often cited advantages that come with most new homes, regardless of their construction: floor plan, location, features.

"These differences suggest that frame owners saw little advantage to their new house beyond the features one might expect in any new house," concludes VanderWerf. "Mention of benefits attributable to superior construction of their new houses was conspicuously infrequent."

VanderWerf's statistics come from an analysis of 58 homes, 29 ICF and 29 frame. So as to get an "apples-to-apples" correlation VanderWerf paired each ICF house with a frame house that was nearby, of similar square footage, less than six years old. He then adjusted and compared energy consumption of each house to control for differences in size, design, foundation, number of occupants, thermostat settings and HVAC equipment. At the conclusion of the study ICF homeowners spent \$221 less for heating energy and \$89 less for cooling energy per year than owners of the frame houses.

Interestingly, these energy savings rates showed no appreciable connection to the local climate. That is, it was impossible for the research team to tell whether energy savings for either heating or cooling raised or lowered appreciably in warmer or cooler climates. VanderWerf concluded that ICF homeowners would receive similar rates of energy savings no matter what climate they lived in.

Additionally, the study suggests that houses with ICF exterior walls consume less space conditioning energy than the wood frame houses. VanderWerf estimates the Btu savings for the average U.S. or Canadian ICF house are 40% for heating, 30% for cooling, and 40 % for both.

In addition to the energy questions, the researchers asked each homeowner why they liked or disliked living in their homes. Responses were varied, but 82.5% of the responses by the ICF homeowners dealt with comfort related issues, such as the quiet nature of the house (65%), its energy

efficiency (38%), evenness of temperature (25%) , lack of drafts (23%), overall "solidness" (20%) and resistance to wind (12%). Conversely, the frame home owners focused their likes and dislikes on location and design, rather than the method of construction.

VanderWerf determined that frame owners focus on location and design attributes of new construction because their new houses offer little functional advantage over their old homes. Location and design were the distinctive attributes. On the other hand ICF homeowners emphasized functional benefits because the location and design attitudes are dull in comparison with the remarkable differences in comfort, quiet, and energy efficiency they were gaining over their former frame home. Location and design were already a "given".

Another implication why ICF buyers seemed so enamored with their homes is because their perceived advantages closely match purported advantages promoted by ICF manufacturers. Comfort, quiet, energy efficiency, strength and durability are benefits found throughout ICF advertising literature and long desired by ICF buyers. Additionally, ICF homebuyers perceive new ICF construction having more advantages over new frame construction than new frame construction has over old frame construction. In other words, says VanderWerf, buyers don't perceive new frame walls as having much functional advantage, while ICF walls do.

Finally, several ICF homeowners indicated they would not have the need to upgrade their heating system if they ever decide to finish their basements. They assured the researchers their unfinished basements already maintained a sufficiently warm ambient temperature without any heat source. They insisted that should they finish off the basement without increasing condition energy consumption, the home's living space would increase substantially without a comparable increase in energy consumption. "Thus their normalized energy consumption would drop sharply and probably widen the gap between ICF and frame construction," says VanderWerf.

In other words, the heating savings in an ICF home with a finished basement would probably be greater than a frame house with a finished basement, even higher than estimated in this study, both in percentage increase and in BTUs or dollars.■

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