



To: Douglas Baston
CC: Ashley Richards, Bruce Harrington
From: Mike DeWein, John Miller
Date: 5/3/2011
Re: Cost of Upgrading to 2009 IECC in Maine

Dear Doug,

This letter is in reference to your request for assistance on estimating the incremental construction cost of building a new home in Maine to the 2009 International Energy Conservation Code (IECC). In response to your question, BCAP estimates that the additional cost per new home to be \$2,974.

Methodology

To calculate incremental cost, we first established a baseline of current building practice, using builder input and the *Maine Residential New Construction Technical Baseline Study* completed by Vermont Energy Investment Corporation in 2008. Using this baseline, BCAP identified the building components that would have to be upgraded to meet the 2009 IECC. These changes included upgrades to attic ceiling insulation, wall insulation, window u factor, the addition of 50% compact florescent fixtures, and a programmable thermostat. As well, BCAP proposes insulating basement ceilings and basement hot water pipes to meet basement insulation requirements. Total incremental costs are estimated to be \$2,974. See appendix A for additional details on added cost.

Calculations were based on a 2,400 square foot, two-story colonial house – a house size BCAP used in its recent nationwide Incremental Cost Study, which was also the model used in US-DOE’s national study of residential energy savings impacts of the 2009 IECC. Construction costs for materials (both those currently used and required by the 2009 IECC) are sourced from the well-regarded RS Means Contractor’s Pricing Guide. Window cost estimates were provided by the Efficient Windows Collaborative. Costs were adjusted from RS Means’ nationwide averages by that publication’s location factor for Maine, reflecting the fact that building in Maine is less expensive than the national average by 12%. Overall, based on estimated construction costs of \$92 per square foot, the overall cost of 2400 square foot home would rise from \$194,304 to a maximum of \$197,278 with the addition of \$2,974—an increase of 1.53%, excluding land prices, which will further decrease the percentage increase.

Because new homebuyers will be able to roll these incremental costs into their mortgage and realize energy savings from day 1, the payback on their initial investment should occur within no more than three years. Assuming the national baseline price of \$266,678 for a 2,400 square foot home applies to Maine, a home with efficiency upgrades (\$2,974) would cost \$269,652. For a homebuyer, purchasing this home with 20% down at the current nationwide interest rate



of 5.05% would result in a down payment increase of \$595 and monthly mortgage payment increases of \$12.85. However, according to one Maine builder, the average home should conservatively save \$360 per year (\$30 per month) on heating costs alone. Taking these energy savings into consideration, a cost-benefit cash flow analysis indicates that the homebuyer would break even within 3 years (month 34) and thereafter save \$360 per year on energy costs for the life of the home. Homebuyers with a lower down payment—such as 5 or 10%—will realize payback much more quickly. For instance, a buyer with a 10% down payment will halve their added down payment increase and therefore achieve break-even within only 19 months of buying the home.

About BCAP

As an independent judge of the efficacy of energy codes, BCAP strives to use data to address energy code barriers, including the real or perceived construction costs incurred by code changes. To address concern in the building community that upgrading to the latest version of the residential energy code, the 2009 IECC, will result in cost prohibitive increases in construction cost for new single-family homes, BCAP has completed a nationwide incremental cost analysis as well as analysis for states on demand. Funding for this work is provided by the Environmental Protection Agency, the Department of Energy, and the National Association of State Energy Officials.

Please don't hesitate to contact us with additional questions or concerns.

Best Regards,

Mike DeWein, Technical Director, BCAP
John Miller, Senior Research Associate



Appendix A: Detailed Increment Cost Estimates

Maine 2009 IECC Incremental Cost Estimates
Option 1: R-30 Basement Ceilings + Insulated Pipes in Basement

Building Component	Proposed Baseline	Proposed Change	Baseline Cost	Proposed Cost	Change	Dimensions	Cost Increment	Location Factor*	Adjusted Cost Increment
Attic Ceiling	R-30	R-49	\$ 1.01	\$ 1.77	\$0.76	1200	\$ 912.00	88%	\$ 802.56
Wall Insulation	R-19	R-20	\$ 3.60	\$ 3.79	\$ 0.19	2380	\$ 452.20	88%	\$ 397.94
Window U Factor	0.37	0.35	-	50 cents/sf	\$ 0.50	357	\$ 178.50	88%	\$ 157.08
R-30 Basement Ceiling	None	R30 Ceiling	-	\$ 1.01	\$ 1.01	1200	\$ 1,212.00	88%	\$ 1,066.56
Insulated Basement Pipes	None	Pipe Insulation	-	\$ 5.00	\$ 5.00	100	\$ 500.00	88%	\$ 440.00
Thermostat	Manual	Programmable	\$ 82.00	\$ 157.00	\$ 75.00	N/A	\$ 75.00	88%	\$66
Lighting	No CFL	50% CFL	-	\$50	\$50	N/A	\$50	88%	\$44
Total									\$ 2,974.14