

Cost-Effectiveness of the 2015 IECC for New Hampshire Based on Custom Inputs

Summary of Inputs

Table 1. Economic Parameters Used in the Analysis

Parameter	User Input	Default Value	Units
Mortgage interest rate (fixed rate)	5%	5%	Annual Rate, %
Loan fees	0.6%	0.6%	Initial, % of the mortgage amount
Loan term	30	30	years
Down payment	10%	10%	% of the home value
Nominal discount rate	5%	5%	Annual Rate, %
Inflation rate	1.6%	1.6%	Annual Rate, %
Marginal federal income tax	15%	15%	Annual Rate, %
Marginal state income tax	0.0%	5.0%	Annual Rate, %
Property tax	2.0%	1.1%	Annual Rate, %

Summary of Results

Table 2 shows the statewide economic impact of the 2015 IECC in terms of life-cycle cost savings, energy cost savings, years to simple payback, and various first-year cash flows. The results shown are weighted averages of single- and multifamily buildings in the state.

Table 2. Highlights—Economic Impact of the 2015 IECC

Metric	Compared to the 2010 New Hampshire State Code
Life-cycle cost savings of the 2015 IECC	\$9233.19
Simple payback period of the 2015 IECC	3.1 years
Net annual consumer cash flow in year 1 of the 2015 IECC	\$476.30
First year energy cost savings of the 2015 IECC (\$)	\$601.23
Annual energy cost savings of the 2015 IECC (%)	20.8%

Total Construction Cost Increase

Tables 3 and 4 show the incremental construction cost (materials plus labor) of the 2015 IECC for a typical single-family home and a typical multifamily dwelling unit in the state. Incremental costs are shown for each climate zone in the state and for four common foundation types.

Table 3. Incremental Construction Costs of the 2015 IECC for a Single-Family House

Single-family Prototype House				
Climate Zone	Crawlspace	Heated Basement	Slab	Unheated Basement
5A	\$1,548.38	\$1,802.63	\$1,593.84	\$1,548.38
6A	\$2,775.78	\$2,775.78	\$2,821.25	\$2,775.78

Table 4. Incremental Construction Costs of the 2015 IECC for a Multifamily Dwelling Unit

Multifamily Prototype Apartment/Condo				
Climate Zone	Crawlspace	Heated Basement	Slab	Unheated Basement
5A	\$884.15	\$921.05	\$884.15	\$884.15
6A	\$1,332.84	\$1,332.84	\$1,332.84	\$1,332.84

Simple Payback and Life-Cycle Cost Savings

Tables 5 and 6 show two metrics indicative of the economic impact of the 2015 IECC in the state. Table 5 shows the simple payback period, which is the number of years required for the energy cost savings to exceed the incremental first costs of the new code. The simple payback does not account for the time value of money, the energy cost savings that will accrue after payback is achieved, or expected fuel price escalations.

Table 5. Simple Payback from the 2015 IECC

Climate Zone	Payback Period (Years)
5A	2.7
6A	3.6
State Average	3.1

Table 6 shows the total life-cycle cost (LCC) savings of the 2015 IECC. The LCC accounts for all costs and benefits experienced by a typical home owner as a consequence of the new code, including incremental first costs, annual energy cost savings, costs and benefits (tax deductions)

associated with a home mortgage, and the cost of replacing energy efficiency measures with lifetimes shorter than the analysis period.

Table 6. LCC Savings of the 2015 IECC

Climate Zone	Life-Cycle Cost Savings (\$)
5A	\$8,575.10
6A	\$10,258.81
State Average	\$9,233.19

Consumer's Cash Flow

Table 7 shows the net cash flows experienced by a typical homebuyer as a result of implementing the 2015 IECC. Included are the down payment and other up-front costs associated with buying a home and securing a mortgage, annual energy cost savings (first-year, before any fuel price escalations), the increase in annual mortgage payments, and three quantities showing the early and yearly impacts on homebuyers. The latter quantities include the net annual cost associated with mortgage tax deductions, private mortgage insurance, and property taxes; the net annual cash flow to the consumer after accounting for increased annual mortgage costs and energy cost savings (first year, before any fuel price escalations); and the number of years required for the net annual cash flow benefits to pay for the increased up-front costs.

Table 7. Consumer Cash Flow from the 2015 IECC

	Cost/Benefit	5A	6A	State Average
A	Down payment and other up-front costs	\$148.14	\$253.33	\$189.25
B	Annual energy savings (year one)	\$542.34	\$693.01	\$601.23
C	Annual mortgage increase	\$81.48	\$139.35	\$104.10
D	Net annual cost of mortgage interest deductions, mortgage insurance, and property taxes (year one)	\$16.31	\$27.89	\$20.83
E = [B-(C+D)]	Net annual cash flow savings (year one)	\$444.55	\$525.77	\$476.30
F = [A/E]	Years to positive savings, including up-front cost impacts	0.33	0.48	0.40
Note: Item D includes mortgage interest deductions, mortgage insurance, and property taxes for the first year. Deductions can partially or completely offset insurance and tax costs. As such, the "net" result appears relatively small or is sometimes even negative.				