Model Energy Codes: Counting the Costs

by Bruce Sullivan

The 1992 Energy Policy Act requires states to consider adopting the 1992 Model Energy Code, published by the Council of American Building Officials. In the 19 states where energy codes already meet or exceed the MEC, builders will be unaffected. If any of the other 31 states adopt the MEC or something like it, builders may be required to use more efficient windows and doors, and to install more insulation in walls and ceilings. The code will also influence the selection of hvac, water-heating, and lighting equipment.

Many builders worry that the extra construction costs — and resulting higher mortgage payments — imposed by mandated energy codes like the MEC will drive buyers out of the market. Supporters of the code counter that the increased mortgage payments will be more than offset by lowered monthly energy costs. What's the truth? The Oregon State University Extension Energy Program recently looked at the impact of the Oregon State Energy Code, which is stricter than the MEC. The OSU researchers concluded that even ambitious conservation efforts can be cost-effective for the homeowner.

The study was done in 1993, when the code had been in place for more than a year. Using data collected from 146 material suppliers, the OSU researchers estimated the cost of code compliance for sample house designs (see chart, next page). Cost comparisons showed that the energy savings to owners of electrically heated homes would always exceed the extra monthly cost to finance the energy-saving measures. In gas-heated homes, the monthly cost of the energy improvements might be a few dollars more than the energy savings, but given the current rate of rise in energy prices, the improvements would offset the cost in just seven years.

Component Costs

Nearly every part of the building shell (floors, walls, ceilings, and windows) costs more under the new code. But the cost-effectiveness of the energy improvements is helped by the fact that over the long term, energy prices inch up while the cost of new technology comes down. This lets you build more efficient homes without adding to the homeowner's overall housing costs.

Take floor framing, for example. The higher price of the floor system comes from both the extra insulation and the deeper framing cavities needed to hold it. But builders can contain costs by using non-traditional framing methods. The OSU study detailed ten different floor framing options, with insulation values that ranged from R-19 to R-38. The lowest cost was for an R-19 floor ($1.72 per sq. ft.), the highest for an R-38 floor ($2.61 per sq. ft.). However, an R-38 option that used wood I-beams and 10-inch-thick, high-density R-38 batts cost only $2.17 per square foot.

The news about wall framing is even better. Meeting the new code meant beefing up the wall studs from 2x4 to 2x6. This would have raised material costs by an average of 31¢ per square foot of floor area. However, using 2x6s lets builders use "advanced" framing techniques, where studs are spaced 24 inches on-center and unnecessary trimmers and corner studs are eliminated. This lowered the increase to only 15¢ per square foot. Since these costs were collected in early 1993, when lumber prices were at an all-time high, they may be somewhat elevated. However, the ratio of the price comparison should stay the same — that is, the price increase for an advance-framed 2x6 wall should remain half that of a standard 2x6 wall.

The study didn't estimate labor costs for wall construction, but other research has shown that labor costs are lower for advanced-framed walls. In fact, most of the builders I know who build to these standards find that the installed cost of a 2x6 wall with advanced framing is no higher than for a standard 2x4 wall.

The windows required for the new code added only slightly to costs. The impact could have been greater, because when the code was being written, the low-e glazing needed to meet it was expensive. By the time the code became law, however, low-e argon-filled windows had become an industry standard, and market forces had lowered their price considerably. Insulated entry doors also tend to cost significantly less than wood doors. In this study, a metal-skin insulated panel door cost 47% less than a wood panel door.

A final factor that held down cost increases was that code generally follows practice. In the Northwest at least, utility-sponsored conservation programs have been in place for several years. These programs have helped to educate builders about new technologies and building techniques. The new code merely recognized what was happening anyway, so the pain of adjusting to it was minimal. Meeting the less-stringent requirements of the MEC shouldn't be too much of a stretch for any good builder. ■

Bruce Sullivan, a writer in Eugene, Ore., specializing in energy topics for builders, is a principal of Iris Communications and the editor of Energy Source Builder.

Paying for Energy Code Compliance

Cost	1,344 Sq. Ft. House
Extra construction cost	$1,009.00
Monthly increase to mortgage payment (30 yrs. @ 8.5%)	$7.76
Monthly energy savings	$17.08
Net effect on homeowner's monthly cash flow	+$9.32

Researchers at Oregon State University estimated that, in electrically-heated homes, the increased cost of meeting Oregon's energy code is offset by energy savings. Savings are less for homes heated with gas, so construction costs take longer to recoup.