SEEA SNAPSHOT

North Carolina Energy Code Field Study:
Energy Savings Opportunities

OVERVIEW

The Southeast Energy Efficiency Alliance (SEEA) conducted a study of 249 new single-family homes under construction in North Carolina to determine the level of compliance with the building energy code using an accepted methodology.

The study was conducted in three phases: Phase I collected baseline data beginning in January 2015; Phase II included 15 months of targeted training based on the findings from Phase I; and Phase III collected data after the training, concluding in December 2017. During this time, the residential code in North Carolina adhered to the 2012 International Energy Conservation Code (IECC) with additional state-specific amendments. This snapshot presents results from Phase III.

Significant savings opportunities for improving compliance in **six high-impact areas** were identified. Each year, this has the potential to cut household energy costs by **$2,368,044**. The full report can be found here.

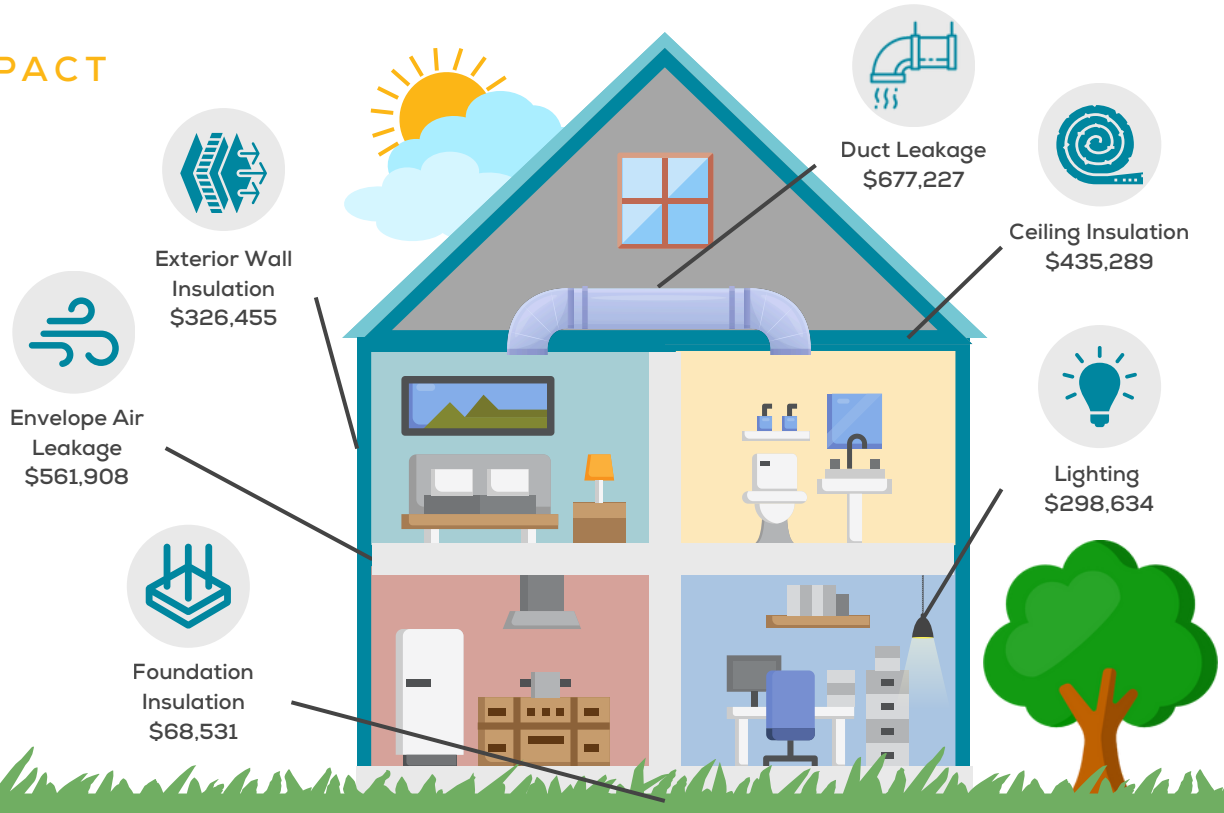
AT A GLANCE

Goal
Assess energy efficiency and energy savings potential

Annual Savings Potential
$2,368,044

Largest Savings Impact
Duct Leakage

HIGH-IMPACT AREAS



CEILING INSULATION

- Nearly all observations in Phases I and III met the R-value requirement exactly. In Phase III, this included 30 observations in Climate Zone 3 and 38 in each of Climate Zones 4 and 5.
- Grade I installation quality increased in Phase III; however, many observations were still rated as Grade II or III.
- While R-value compliance was high, overall assembly performance remains a savings opportunity; U-Factor compliance was 71%.

DUCT LEAKAGE

- Only 52% of observations met the duct leakage requirement; this represents a continued opportunity for energy savings.

ENVELOPE AIR LEAKAGE

- Envelope air leakage rate compliance decreased from 88% in Phase I to 76% in Phase III.
- Despite a Phase II focus on education and training, opportunities for further savings remain.

LIGHTING

- In Phase I, 57% of observations met the requirement; this was lower than expected based on the current code.
- Lighting was a focus of Phase II education and training; compliance improved to 70% in Phase III but remains a continued savings opportunity.

WALL INSULATION

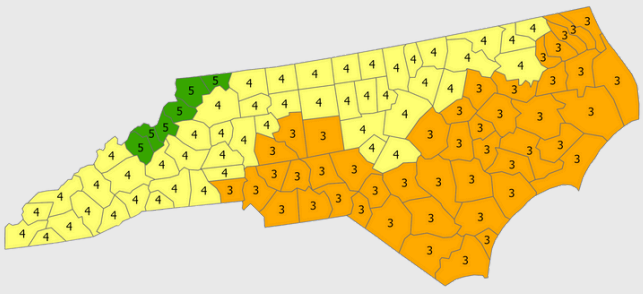
- The cavity R-value was achieved at a high rate; all observations in Climate Zone 3, all but one in Climate Zone 4, and all in Climate Zone 5 met or exceeded the prescriptive code requirement based on labeled R-value.
- In Phase I, 55% of observations were rated as Grade II or III for installation quality; Grade I observations increased in Phase III, but many Grade II and III observations remain.
- U-Factor compliance increased from 12% in Phase I to 65% in Phase III.
- Overall assembly performance remains a savings opportunity.

FOUNDATION & FOUNDATION INSULATION

- **Slabs:**
  - Slab edge insulation compliance in Climate Zone 4 improved from 73% in Phase I to 86% in Phase III.
  - Slab insulation quality was not specifically recorded in the field study input form; however, field observations and photos from Phase I showed that installation quality could be improved.
  - Phase II education and training highlighted key steps for improving slab insulation quality.
- **Floors:**
  - The cavity insulation requirement was achieved at a high rate in both phases, based on labeled R-value.
  - From an assembly perspective, U-Factor performance shows room for improvement; nearly half of Phase I observations had Grade II or III installation quality.
  - Installation quality improved in Phase III, with only 35% rated as Grade II or III; however, continued savings opportunities remain.

WINDOWS

- SHGC compliance was 99%; most observations fell between 0.20 and 0.30, slightly below the maximum requirement of 0.30.
- Window U-Factor compliance was high; all but one observed fenestration product met or exceeded the requirement, representing one of the study's most significant findings.



For additional information, please contact fieldstudy@seealliance.org

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