

Establishing and Testing a Building Codes and Resilience Field Study Methodology

Project Team Lead: National Association of State Energy Officials

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Project Team Member Organizations:

National Renewable Energy Laboratory

Florida Solar Energy Center

International Code Council

Florida Building Commission

Arizona Governor's Office of Resiliency

Project Locations: Arlington, VA; Cocoa, FL; Golden, CO; Arizona (statewide); Florida (statewide)

Areas of interest targeted:

High Impact States and Local Jurisdictions

Implementation and Compliance

Innovative approaches

Partnerships

Key outcomes targeted:

Advancing new and innovative codes approaches and tools

Improving energy code compliance

Developing the next-generation workforce

The National Association of State Energy Officials (NASEO), with the support of the Arizona Governor’s Office of Resiliency (State Energy Office), as well as project partners the National Renewable Energy Laboratory (NREL), the Florida Building Commission, the Florida Solar Energy Center (FSEC), and the International Code Council (ICC) proposes to establish a methodology to measure the resilience of new buildings constructed to current building energy codes in the face of natural hazards such as extreme temperatures, high winds, and wildfires. The goal of developing this methodology is to: 1) make clear the benefits of updated building energy codes for resilience, 2) identify measures in other code chapters that contribute to structural resilience and increased energy efficiency, and 3) identify areas for focused building code training to improve both energy performance and resilience. This methodology will be established by identifying and weighting key building energy code measures that impact the ability of a building to continue to provide safety and services to its occupants during extreme weather and electric grid outage events. The approach will implement the methodology established in *Enhancing Resilience in Buildings Through Energy Efficiency* to identify relevant building characteristics and metrics that can be inspected during site visits, and to model the resilience of buildings to certain hazards.¹ The new field study methodology will incorporate field study data gathering instruments (e.g. spreadsheets or checklists) to be used by field inspectors.

The expected outcome of this project is a nationally replicable methodology for the measurement of building code effectiveness and the ability of buildings to provide safety and shelter for occupants in instances of extreme weather and other natural hazards. This methodology will be utilized in tandem with the existing energy code compliance study methodology². Using the methodology developed through this project, states will be able to better understand the impact of building codes and building practices on the resilience of individual buildings and the structure’s ability to continue to provide safe shelter and internal temperatures for occupants in the event of an electric system outage based on data driven analysis. Further, this methodology will enable states to assess the effectiveness of adopted building codes to protect residents, assist with emergency planning, and inform programs that support building code implementation. States that use the methodology will gather data on building practices to inform training for construction stakeholders on specific targeted areas to improve energy efficiency and the resistance of structures to natural hazards.

¹ Franconi, E, E Hotchkiss, T Hong, M Reiner et al. 2023. *Enhancing Resilience in Buildings through Energy Efficiency*. Richland, WA: Pacific Northwest National Laboratory. PNNL-32737, Rev 1.

² Residential Building Energy Code Field Study – Data Collection and Analysis Methodology. <https://www.energycodes.gov/sites/default/files/2022-09/bto-Res-Field-Study-Methodology--updated.pdf>. September 2022.