

Researchers publish first comprehensive building stock characterization study for the US

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A new report and online dashboard by the U.S. Department of Energy's (DOE's) National Renewable Energy Laboratory (NREL) is the first comprehensive characterization and segmentation of the U.S. building stock, providing a national typology of buildings.

Titled "U.S. Building Stock Characterization Study: A National Typology for Decarbonizing U.S. Buildings, Part 1: Residential," the report provides key decisionmakers a foundational tool to identify technology requirements and engineering solutions for moving the existing U.S. [building](#) stock toward a net-zero-carbon future. This analysis supports a key initiative of DOE's Building Technologies Office—the Advanced Building Construction (ABC) Initiative.

The national building characterization study will serve as a foundational data source and tool for future analyses, such as assessments of the potential impacts of retrofit packages on building thermal energy use, including heating, cooling, ventilation, and water heating. Supporting the development of decarbonization strategies for the U.S. building stock, these retrofit packages will range from envelope to HVAC to water-heating solutions.

"We wanted to give our industry partners a baseline for the development of scalable efficiency and decarbonization strategies," said Janet Reyna, NREL senior research engineer and the report's lead author. "We're working to prioritize segments and integrate them with other goals of the ABC analysis work. Then we'll model a series of individual and packaged upgrades to identify wide-ranging solutions that can be implemented."

Leveraging the ResStock tool, NREL researchers were able to characterize and segment the residential building sector. A report focused on characterizing and segmenting the commercial building sector using the ComStock tool is planned for early 2022. To ensure ease of implementation, the team developed a [flexible approach](#) to ensure users could adapt the segmentation depending on their needs and application, and this can be explored in the accompanying online dashboard.

The model results benefit from the recent completion of the three-year DOE End-Use Load Profiles project to calibrate and validate the ResStock and ComStock models using data from 2.3 million utility meters.

DOE's Building Technologies Office funded the research, and it was completed with expert review and support from members of the ABC Collaborative, a network of building construction, real estate, and development stakeholders.

The ABC Initiative is focused on accelerating the decarbonization of the U.S. buildings sector through industrialized construction innovations that deliver efficient, affordable, and appealing new buildings and retrofits at scale. The new study provides an important framework for informing ABC research and development activities, including identifying which segments of the building stock should be prioritized for both deployment and technology research and development (R&D) activities. Ultimately, the study will be paired with other ABC analysis efforts to inform market aggregation and business model [development](#) for accelerating adoption of ABC approaches to building decarbonization.

More information: U.S. Building Stock Characterization Study: A National Typology for Decarbonizing U.S. Buildings, Part 1: Residential: www.nrel.gov/docs/fy22osti/81186.pdf

Provided by National Renewable Energy Laboratory

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