



Hawai'i Natural Energy Institute Research Highlights

Energy Efficiency & Transportation; Energy Policy & Analysis

Healthy and Resilient Buildings Initiative

OBJECTIVE AND SIGNIFICANCE: The Healthy and Resilient Buildings Initiative (“Initiative”) was developed by HNEI and introduced by the City and County of Honolulu, Hawai‘i in the 4th Quarter of 2020 to offer free energy assessments vis-à-vis virtual energy audits to commercial building owners with revenue-grade smart meters. The objective was to provide an immediate pathway for relief to businesses from the coronavirus pandemic by using virtual energy audits to quickly identify operational energy savings from potential energy efficiency measures (EEMs) and indoor air quality improvements through potential increased air flow. The outcomes of each virtual energy audit were summarized in a report to participating building owners and outlined potential energy efficiency and resiliency measures to be further investigated for deployment.

BACKGROUND: The opportunity for energy efficiency savings in existing buildings is extremely large, considering that nearly two-thirds of the building area existing today will still exist in 2050 on a global level. At the federal level in the U.S., building retrofits are among the solutions chosen by the Biden Administration to pursue green jobs and climate change mitigation. These objectives are addressed under the proposed American Jobs Plan that includes building, preserving, and retrofitting more than two million homes and commercial buildings in the U.S. It is not clear, however, whether the retrofit of as many as a quarter of the commercial buildings in the U.S. can be achieved at the scale contemplated by the Biden policies without less expensive and quicker means to assess potential EEMs or indoor air quality improvements. The

urgency for climate change mitigation may compel priority actions, such as strengthening the market pull for energy-efficiency innovations and demand-side policies.

PROJECT STATUS/RESULTS: The primary outcome of the Initiative was to establish the understanding that virtual energy audits are a step beyond benchmarking and could be used as an educational tool to motivate business owners to act on reducing energy use. Based on the virtual energy audit estimates of potential energy savings, business owners may wish to consider early replacement of less efficient equipment. For example, the four HVAC/cooling measures in the Honolulu case study account for 48-97% of the estimated energy savings of the ten audited buildings. While replacing HVAC equipment with more efficient models is an expensive retrofit, implementing the reschedule and set point changes on existing equipment accounts for 28-69% of the total estimated savings.

This project has produced the following publication:

- 2021, M.B. Glick, et al., [Analysis of Methodology for Scaling up Building Retrofits: Is There a Role for Virtual Energy Audits?—A First Step in Hawai‘i, USA](#), *Energies*, Vol. 14, Issue 18, Paper 5914. (Open Access: [PDF](#))

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