Business-as-usual projections of global carbon emission for new construction estimate that just about half (49%) of building-related emissions from now until 2050 will be from “upfront” embodied carbon, as compared to operational.¹

Recent data from a series of case studies conducted by Build Change demonstrates that upgrading vulnerable housing to improve disaster and climate resilience has significant benefits in reduction of embodied carbon compared to new construction.

With the overall goal of assessing the environmental impacts of structural retrofits, these case studies drew from Build Change’s work in Haiti, Colombia, Philippines, and Honduras, focusing primarily on carbon generated from product and construction processes.

**KEY FINDINGS**

- Improving existing buildings can **save 60%** embodied carbon compared to resilient new construction
- Retrofits resulted in **40% less embodied carbon**, even when they included vertical expansion (such as addition of a second story)
- On average more than **10 metric tons** of embodied CO2 per house can be saved for simple masonry houses when retrofitting
- **Savings are higher** when the work is done preventatively before a disaster causes damages, than after.

**Data for People-Driven Climate Action:** These case studies are a key step in catalyzing action by frontline communities towards net zero. Providing information about the carbon impact of retrofitting improves communication processes between homeowners, donors, and government and program partners when understanding environmental impacts, as well as financial cost, project timeline, and other key decision points in the home improvement process.

¹ Carbon Leadership Forum
HOUSING FOR A NET ZERO & RESILIENT FUTURE:

Retrofitting is a multi-faceted solution in hiding. In many locations around the world, there is an urgent need for more resilient housing to prevent unnecessary losses during disasters and to adapt to the changing climate. Improving existing houses instead of building new is not only a more cost effective and socially acceptable path to resilience, it also dramatically reduces the greenhouse gas emissions released into the atmosphere.

RETROFITTING:

- **Advances mitigation in one of the highest polluting sectors:** The building and construction sector is responsible for approximately 40% of carbon emissions, which gives it a vital role in eliminating carbon emissions.

![SHARE OF GLOBAL ENERGY-RELATED CO2 EMISSIONS BY SECTOR, 2015](image)


- **Safeguards people against the impacts of disaster and climate-related hazards:** Upgrading vulnerable housing also supports climate adaptation by strengthening climate adaptation measures. Retrofitting is cost-effective, delivers homeowners satisfaction, and avoids permanent relocation.

- **Supports safer densification:** Improving existing housing not only reduces the environmental impacts of construction. Through the engineered addition of second stories, retrofitting increases the supply of available safe housing and supports urban densification, which minimizes land consumption, increases the operational energy efficiency of housing units, and reduces emissions from transport.

- **Reduces waste:** Strengthening existing buildings reduces the amount of demolition and material waste generated after a disaster.

For more information, contact info@buildchange.org

Upgrading a house in Haiti for disaster resilience

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