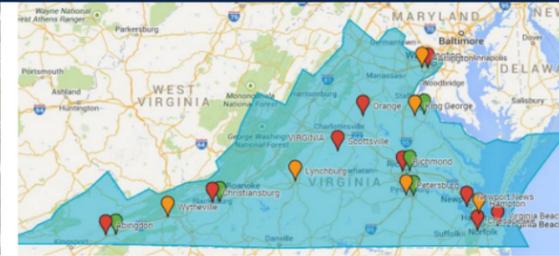


The Impact of Energy Efficient Design and Construction on LIHTC Housing in Virginia

OVERVIEW

The Impact of Energy Efficient Design and Construction on LIHTC Housing in Virginia

RESULTS



In 2014, Viridiant partnered with Housing Virginia and the Virginia Tech Center for Housing Research on a first-of-its-kind study to demonstrate the impact of energy efficient incentives in the construction of affordable rental housing. The study, conducted over the course of year and published in 2015, analyzed actual utility usage data from 15 Low-Income Housing Tax Credit (LIHTC) properties across the state of Virginia of varying types - new construction, rehabilitation, adaptive reuse, senior and family. All 15 projects were built and certified to EarthCraft Multifamily standards, a nationally recognized green building program that uses high performance building practices to achieve energy and sustainability improvements. This study evaluated the value of EarthCraft Multifamily certification by analyzing actual utility consumption data within the EarthCraft certified, LIHTC units and correlating behavior surveys.

KEY RESEARCH QUESTIONS

- What are the **estimated household utility costs** (energy modeled savings) of energy efficient design for new construction and renovation LIHTC projects?
- What are the **actual household utility costs** for energy efficient design among new construction and renovation as well as senior and non-senior LIHTC projects?
- What is **net change in household utility costs**, pre-and-post-energy efficiency, new construction and renovation for senior-and-non-senior-based occupancy?
- What are **other net effects** of utility costs on the household's other consumption?

TEAM



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BUILD BETTER BUILDINGS WITH VIRIDIANT

Viridiant's EarthCraft Multifamily program is the country's first multifamily-specific green building program. It accommodates both newly constructed multifamily projects and renovations and addresses a wide range of sustainability issues, including environmental performance, indoor air quality, building durability, comfort, and affordability.

Viridiant works hand-in-hand with the project team throughout the construction process to ensure the project is meeting all program criteria. The EarthCraft Multifamily program utilizes a HERS rating, program guidelines, points-based worksheet, site visits, and diagnostic testing to verify that each project complies with program standards and current green building best practices.

By the Numbers

- 250 projects totaling 17,000 units
- Average HERS, New Construction: 71
- Percentage Improvement, Reno: 48%

Certification Process

1. Pre-Review (spec/plan submittal, preliminary modelling)
2. Pre-Construction (registration, workbook/plans, design review)
3. Construction (construction kick-off meeting, site-visits, preliminary testing)
4. Project Closeout (final inspection/testing, workbook)
5. Certification (compliance verification, plaque, certificate, labels and HERC)

Certification Costs

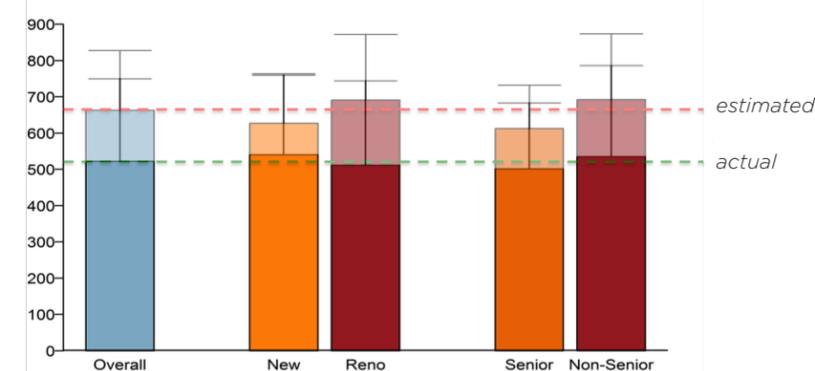
- \$500 pre-review fee*
- approximately \$300 - 700 per unit

*Fees may be higher for renovation



EXECUTIVE TAKEAWAYS

- Apartments certified to EarthCraft Multifamily high energy efficiency standards, with third-party testing and inspection, outperform modeled estimates by **16.6%** and new standard construction housing by approximately **30%** with respect to energy consumption.
- On average, residents participating in the study saved **464 kWh a month**, which translates to \$54 based on current energy prices. This means that over the course of a year, **residents save an average of \$648** on their electricity bill.
- Apartments are generally more affordable, comfortable and residents are more satisfied and have lower utility bills (compared to previous housing).
- In the design process, green certification agents like Viridiant with the EarthCraft Multifamily program, add value as independent, third parties that implement green buildings.
- While managers are educating residents, high performance knowledge is not transferring to residents.



Energy usage is 16.6% less than estimated and approximately 30% less than standard new construction.

IMPACT

This study demonstrates the value of green building implementation through public-private partnerships to achieve monthly utility savings for residents, maximize financial investments, and support sustainable communities. The results of this study are exciting for many - the tenants who save money every month and the builders and developers who now have assurance that energy efficiency programs with third party oversight result in significant savings.

Between 2007 and today, Viridiant has certified almost 17,000 EarthCraft Multifamily LIHTC units in Virginia. If each of these households saves the average amount on energy consumption and bills, the total savings per year amount to:

- over \$11 million
- over 94 GWh of energy

For more information, visit: viridiant.org/VThousingstudy

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THE IMPACT OF GREEN AFFORDABLE HOUSING

After the exciting results of the LIHTC Impact study in Virginia, our partners, Southface Energy Institute worked with VCHR at Virginia Tech to analyze data on the cost and efficiency impact of green building programs on affordable housing development. The report, *The Impact of Green Affordable Housing* (published in January 2016), looks at 18 affordable, LIHTC housing developments in AL, GA, NC and SC - 11 of which are green building program certified, 7 of which are conventional or "non-green."



When compared to non-green developments, **green developments:**

- Are nearly 5% less expensive on total construction costs/sq foot and more than 13% less expensive on soft construction costs
- Save nearly \$5,000/year on owner-paid utility costs
- Experience operations and maintenance costs that are 15% less expensive
- Provide benefits in quality of end product and achieving the developer's objectives and mission

For more information, visit: viridiant.org/southfacestudy

A similar study on the Virginia LIHTC market is being led by VCHR at Virginia Tech with findings anticipated in 2017.