



CONCLUSIONS

 Silver and Gold levels reduce greenhouse gas emissions for certified hotels

 Green Seal Standard for Hotel & Lodging Properties can potentially meet 6.4% of LA's climate goals

 User-friendly tool helps hotels understand financial and environmental savings from green hotel certification

 Silver and Gold levels increase consumer willingness to pay for nightly rates by 5.5%

RECOMMENDATIONS

We recommend Green Seal modify its green hotel certification in three main areas:

Quantitative Certification Requirements

Currently, Green Seal has mostly qualitative certification requirements. By updating its requirements to be more quantitative, it can better assess the impacts of its certification on greenhouse gas emissions.

Extensive Data Tracking

By maintaining detailed information about the efficiency upgrades that occur, Green Seal will be able to better attribute the direct causes of greenhouse gas emissions reductions of certified hotels.

Marketing with Numerical Values

Since consumers respond more to emissions reductions than a hotel's sustainable practices, green-certified hotels should market their actual emissions reductions that occurred from certification.

STAYING GREEN

Quantifying the Greenhouse Gas Impacts of a Green Hotel Certification on the City of Los Angeles

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LA'S CLIMATE GOALS

In 2015, the City of Los Angeles (LA) set goals to reduce its greenhouse gas (GHG) emissions 45% below its 1990 baseline by 2025. As part of these goals, LA uses a Green Lodging Program that encourages hotels in Los Angeles to become more sustainable in their operations. To help reduce the hospitality sector's impact on climate change, the Program requires hotels to become green-certified. Green Seal was elected the official green hotel certifier for the City of LA.



GREEN CERTIFICATION

The Green Seal Standard for Hotels & Lodging Properties requires hotels to reduce their carbon footprint by transforming their energy system and integrating environmentally sustainable practices into their day-to-day operations. The certification establishes environmental requirements in areas such as waste minimization, energy efficiency and conservation, and management of freshwater resources. The Standard consists of three levels:

BRONZE



Entry level for building a strong foundation in sustainable practices

SILVER



Mid-level for substantially reducing environmental impact

GOLD



Advanced level for practicing leadership at the top levels of sustainability

SIGNIFICANCE & OBJECTIVES

Despite having 49 certified hotels in the United States (with at least seven in the Los Angeles area), Green Seal currently does not have a method for quantifying the environmental savings directly associated with its hotel certification. This project addresses this knowledge gap by evaluating the greenhouse gas impacts of the green hotel certification on certified hotels as well as on the overall Los Angeles hospitality sector. Furthermore, this study presents a set of methodologies and tools that allow hotels interested in the Green Seal hotel certification to calculate the potential costs and benefits associated with the certification-required upgrades. The specific objectives are as follows:

 Quantify Green Seal hotel certification impact on greenhouse gas emissions for certified hotels in LA

 Develop a user-friendly Excel-based tool for hotel managers to assess potential savings for individual hotels

 Extrapolate emissions reductions to determine potential reduction scenario for LA's climate goals

 Analyze consumer willingness to pay for green hotel certification using varied marketing strategies

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References:

¹ U.S. Energy Information Administration. "Commercial Buildings Energy Consumption Survey: 2012 CBECS Survey Data." 2016. <https://www.eia.gov/consumption/commercial/data/2012/>.
Rogers, John. "Four Reasons America's Solar Revolution is Winning – and has only just begun." 2014. <http://www.occupy.com/article/four-reasons-america%E2%80%99s-solar-revolution-winning-%E2%80%93-and-has-only-just-begun#sthash.KTYeK6mD.dpbs>.
The Westin Bonaventure Hotel & Suites. "Los Angeles Attractions." 2017. <http://www.thebonaventure.com/los-angeles-attractions>.



GREENHOUSE GAS REDUCED BY CERTIFIED HOTELS

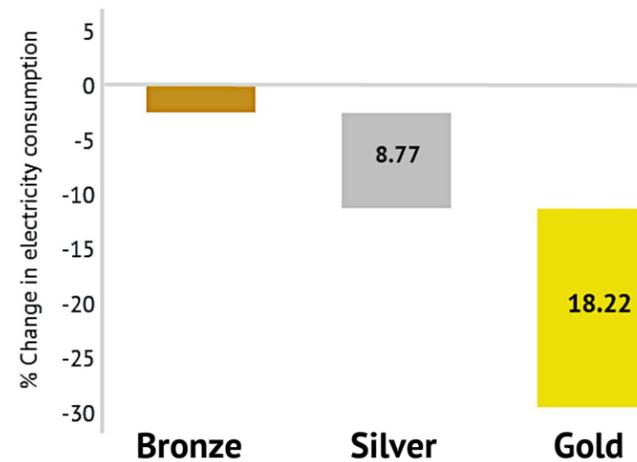


Using monthly energy consumption observations from six Green Seal-certified hotels in Los Angeles, this objective examined the actual emissions from these hotels before and after receiving certification. This analysis normalized different factors across the hotels, which enabled comparison of a hotel to itself before and after receiving Green Seal certification for each certification level.

Hotel GHG Impacts

8.8%

18.2%



A statistical analysis used electricity consumption to calculate Scope 2 emissions reductions, demonstrating that the average emissions reduction for a Bronze-certified hotel in LA was **2.8%**, but this was not statistically significant. Silver-certified hotels saw emissions reductions of **8.8%** and Gold-certified hotels saw emissions reductions of **18.2%**, both of which were statistically significant.

USER-FRIENDLY TOOL FOR HOTEL MANAGERS

This project developed tools and methodologies for Green Seal to improve their marketing strategy and reach more hotels in Los Angeles. The first step in this process was to create a user-friendly Excel-based tool to analyze the financial and environmental impacts associated with the Green Seal certification.

Tool Inputs	Level
Lighting, Exit Signs, HVAC, Office & Room Equipment, Kitchen Equipment, Laundry Equipment	BRONZE
Sensors, Windows	SILVER
Renewable Energy Credits, Carbon Offsets	GOLD

Tool Outputs

Environmental Impact Reductions

Energy Savings
Emissions Savings

Financial Savings

Avoided Utility Costs
Net Present Value
Internal Rate of Return
Simple Payback



StayGreen Tool

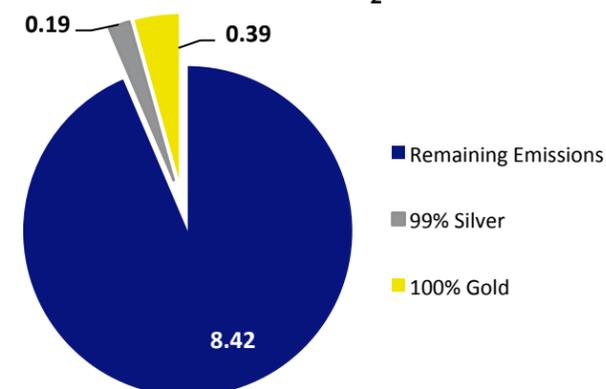
This tool can be used by hotel managers to make the business case for sustainability by exploring the benefits of the Green Seal hotel certification. The simple format is laid out so that hotels can easily understand the requirements of certification, the costs of the upgrades the hotel chooses to pursue, and the emissions reductions associated with their Green Seal certification compliance strategies.

GREENHOUSE GAS SAVINGS FOR THE CITY OF LOS ANGELES



To meet the City of Los Angeles' climate goals, LA must decrease its greenhouse gas emissions by 9 million metric tons of carbon dioxide (MMT CO₂). Green Seal could potentially help reduce the City's greenhouse gas emissions if it scaled up its certification program to all hotels in LA. This analysis found the average annual electricity consumption of hotels in the Pacific Region to be 4,246,281 kWh,¹ which was assumed to represent the annual energy usage of LA hotels. The percentages for electricity reduction (determined by the statistical analysis) were then applied to this number to find the average annual energy usage for hotels that achieve Green Seal certification.

Million Metric Tons of CO₂ Emissions



Potential Citywide GHG Impacts

2.1%

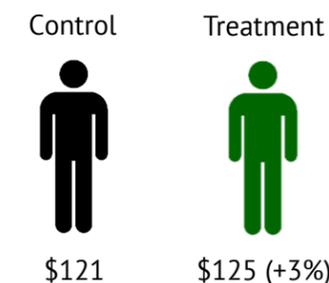
6.4%

If 99% of all 997 hotels in Los Angeles achieved Green Seal Silver certification, the City could reduce its emissions by **0.19 MMT CO₂**. This would account for **2.1%** of LA's required emissions reductions.

If all 997 hotels in Los Angeles achieved Green Seal Gold certification, the City could reduce its emissions by an additional **0.39 MMT CO₂**, which would account for a total of **6.4%** of LA's required emissions reductions.

CONSUMER SURVEY ON GREEN HOTEL PREFERENCES

This project tried to better understand how consumers react to a green hotel certification program. A survey with over 1,000 respondents was fielded to ask how much they would be willing to pay for different hotel descriptions. The control version had no description of a green certification. The Bronze version, on the other hand, had vague descriptions of the green hotel certification program. Finally, the Silver and Gold versions had numerical descriptions of the green hotel certification (derived from the emissions reductions seen in LA hotels). The Platinum version was an additional description from a hypothetical scenario with even further emissions reductions than the Gold level.



Survey 1: A survey of 500 respondents found that consumers are **not willing to pay more** for a hotel with a generic description of sustainable practices (Treatment) than one without any environmental practices or green certification (Control) ($p = 0.14$).

Survey 2: A second survey of over 1,000 respondents found that consumers are willing to pay over **5.5% more** for a green-certified hotel with quantitative descriptions of the environmental impacts of the green certification program (Silver, Gold, and Platinum treatments) compared to hotels that offer only vague descriptions of the certification (Bronze) ($p=0.01$).

