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A Decade Analysis of Residential LEED Buildings Market Share in the United States: Trends for Transitioning Sustainable Societies

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Highlights

- Decade-worth US Residential LEED market adoption data statistically and visually analyzed.
- LEED AP and GDP per capita and policies were significant and consistent predictors of market share.
- Being a republican or democratic presidential voting state has a weaker influence on market share.

Abstract

Third-party verification and certification processes for low energy built environments have played a critical role in influencing transitioning sustainable societies to reduce their emissions footprint in both residential and commercial buildings. One prominent example is the Leadership in Energy and Environmental Design (LEED) certification program, which was conceived by the United States Green Building Council (USGBC). Its residential platform, LEED for Homes, started as a pilot in 2004 and was fully implemented in 2008. This paper attempts to answer the question: what are the characteristics of growing sustainable LEED residential societies in the United States? The paper examines residential LEED market adoption trends in the United States by analyzing a decade-worth of data from 2005 to 2014 (71,438 certified units). The study implemented data visualization techniques and statistical analyses to explore predictors of residential LEED community adoption trends. The findings suggest that market share of LEED licensed residences in a state and the number of policies and incentives in that state are generally related. Overall market share for LEED Residential had a smaller effect ($\beta = -0.03$ with outliers, 0.11 without outliers) than for LEED for Homes overall ($\beta = 0.06$ with outliers, 0.12 without outliers). A significant positive relationship between LEED residential market share and number of LEED AP per capita was also found. The strongest relationship in this subset of variables was with LEED for Homes single-family homes, where one standard deviation increase in LEED AP per capita in year $t$ was associated with a 0.15 standard deviation increase in market share in year $t+1$. LEED
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