

Energy and Mortgage Default: A Primer for Lenders

Do a commercial building's energy expenses affect its risk of mortgage default? Substantially, according to a study conducted by Lawrence Berkeley National Laboratory (LBNL) and the University of California's Haas School of Business that was sponsored by the U.S. Department of Energy (DOE). When the research team merged [TREPP](#)'s large mortgage performance data sets for commercial office and multifamily properties with energy consumption data from the same buildings (available due to many major cities' energy consumption disclosure laws), the correlation between energy usage and mortgage defaults was clearly evident – higher energy use was associated with higher default rates. Similar correlations were found with electricity prices – higher prices were associated with higher default rates. An example of how energy cost risk can impact cash flow is illustrated in Figure 1.

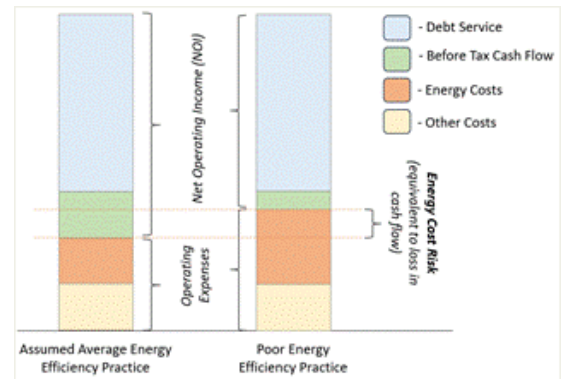


Figure 1. Illustration of Energy Cost Risk and its potential impact on pre-tax cash flow in average and poor energy management scenarios.

Building off these findings, the team collaborated with lender partners to look at specific loan data on several office buildings. Each showed that energy management practices and pricing were shown to have considerable implications on the likelihood for default. Figure 2 shows the potential range in energy consumption depending on the quality of energy management practices at the subject building. Figure 3 below shows how a Denver office building in one lender's portfolio demonstrated roughly one-third greater default risk (268 basis points) than the industry average of roughly 8% when it was modeled with poor energy management practices (basically, poorly controlled lighting and HVAC) rather than typical ones. The same building had about 30% (248 basis points) less default likelihood than the 8% average assuming good energy management practices. The findings also held true for a Denver hotel and San Francisco multi-family building (not shown in charts).

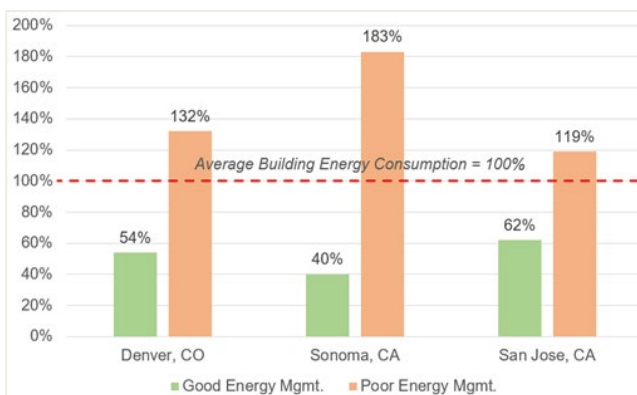


Figure 2. Impact of good vs. poor energy management practices on energy consumption in 3 case study office buildings

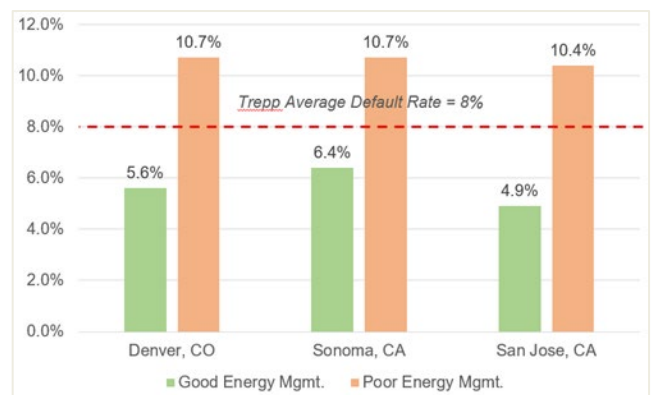


Figure 3. Impact of good vs. poor energy management practices on default rate in 3 case study office buildings.

It's important in that standard industry lending practices largely overlook energy expenses. Ostensibly, they are part of net operating income (NOI), but standard practice often uses industry averages rather than actuals in making NOI estimates. Moreover, these practices rarely ever consider the potential volatility of either energy consumption or prices in developing their loan offers, and the research results show that this volatility can be considerable – and have substantial impacts over the course of a mortgage term.

Impacts on Mortgage Pricing

A follow-on study analyzed the impact of energy risk on mortgage pricing. Based on the empirical results of default rates described above, the research team conducted large scale parametric simulations of loan-level market prices and derived the impact of energy use on mortgage interest rates and points. A 10% change in energy use translates to 77 and 40 basis points sensitivity in mortgage interest rates for office and multi-family loans respectively.

Piloting an Energy Risk Metric

Currently, the team is working to develop a simple way to demonstrate a building's energy risk, perhaps akin to the seismic risk rating that is widely recognized in the mortgage industry. This energy risk metric would account for both the absolute level of energy usage and prices, as well as the volatility risk over the life of the mortgage e.g., debt service coverage ratio reduction (Δ DSCR) due to energy risk, as shown in Figure 4. The goal is to make it both simple and easily computable using data that are largely already being collected during a loan application. The group is also investigating the difference in energy effects between buildings with gross and net leases.

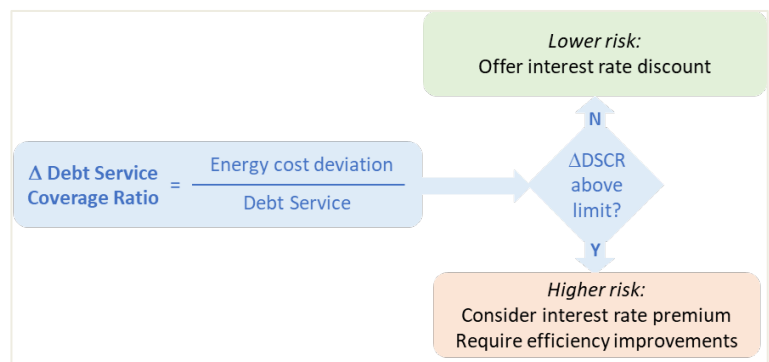


Figure 4. Debt service coverage ratio reduction (DDSCR) metric and its application and implications on the mortgage underwriting process.

Call to Action

Interested in learning more or participating in a pilot test of the energy risk score? Contact the project's principal investigators, Paul Mathew (PAMathew@lbl.gov) or Nancy Wallace (newallace@berkeley.edu). The team is particularly interested in working with lenders and investors who would like to understand the implications of the results for their own investments.

- ▶ Study: [Buildings with Poor Energy Efficiency Default at Higher Rate, Urban Land Institute](#)
- ▶ [Poor Energy Efficiency May Predict CMBS Default Risk, TREPP](#)
- ▶ [Technical reports and more information](#)

Participants to date:

