



**SUSTAINABLE PROPERTY REWARDS INITIATIVE:
A CORPORATE STRATEGY FOR GREENING COMMERCIAL PROPERTY MANAGEMENT**

ON THE WEB AT [HTTP://WWW.BREN.UCSB.EDU/~YARDI](http://www.bren.ucsb.edu/~yardi)

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Introduction

Despite the economic and technical feasibility of green building improvements, many existing commercial buildings do not utilize best management practices. The Sustainable Property Rewards Initiative (SPRI) seeks to leverage the market share of Yardi Systems, a leading property management software firm, to improve the performance of the domestic commercial building stock. In order to provide our property management audience with the information and tools necessary for the implementation of green building improvements and sustainable management practices, SPRI has developed the Interactive Resource Manual (IRM). This web-based resource integrates the knowledge and experience gained from extensive background research, a series of local building audits and a nationwide survey of Yardi Systems' commercial clients. Our corporate strategy maximizes the effectiveness of the IRM through the design of three deployment programs, which include audit support, software integration and co-marketing. Together, these components of SPRI can achieve measured reduction of the environmental impacts associated with the U.S. commercial building sector.

Background

Commercial and residential buildings account for a substantial share of energy and water consumption, carbon emissions, waste and environmental toxicity throughout the United States. This project seeks to achieve maximum return in both environmental and financial terms by focusing exclusively on improvements related to energy, water, and materials procurement practices within the U.S. commercial building stock.

Taken as a whole, the building sector represents a significant consumer of energy. In 2007, buildings accounted for 37 percent of all end-use energy consumption, with 48 percent of that measure attributed to the commercial sector aloneⁱ. Consequently, commercial building efficiency standards are expected to become more rigorous under future revisions applicable to both new buildings as well as facilities renovationsⁱⁱ. The commercial building sector also uses a substantial

and increasing share of water resources. In 1995, this sector used an average of 9.6 billion gallons of water per day, an increase of almost 15 percent from 1990 levelsⁱⁱⁱ. This translates to approximately 12 percent of the total end water use by sector (Figure 1: Energy and Water Use by Sector). The procurement of ongoing consumables and cleaning materials is another area within commercial building operations that results in considerable human and environmental health impacts.

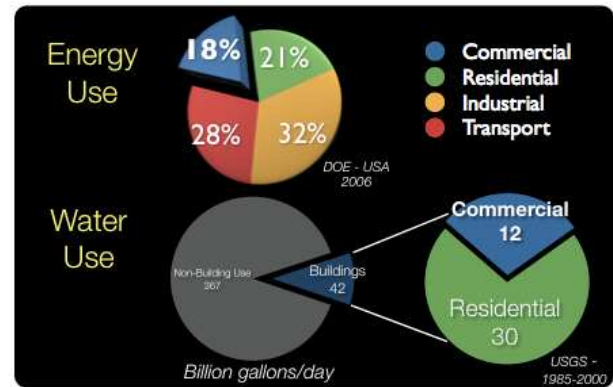


Figure 1: Energy and Water Use by Sector

SPRI targets the building sector in the United States as it is in an opportune position to implement upgrades due to lower marginal costs associated with carbon abatement relative to other sectors. Investment in the reduction of carbon emissions throughout the U.S. will be highly concentrated in the power and transportation sectors, requiring significant capital investment. The commercial building sector's projected demand for energy in 2020 can be cut by 20 percent if available energy efficiency opportunities are captured. Commercial buildings do not face the same degree of difficulty with modifying economies of scale. Opportunities for reduced environmental impact include negative cost options, and are often associated with lower societal costs than improvement in the aforementioned sectors^{iv}. Negative cost options such as lighting and appliance upgrades as well as automation of electrical and HVAC systems have been proven economical and have the potential to make large impacts in terms of greenhouse gas emissions reduction.



Project Significance

Yardi Systems has become a leading provider of investment, asset, and property management software enabling property managers worldwide to efficiently manage their real estate portfolios. Yardi Systems' software serves over 20,000 businesses, corporations and government agencies which represent more than 7 billion square feet of domestic commercial space.

SPRI can take advantage of this substantial market share to reach a large proportion of commercial property management firms and provide feasible options to assist in the reduction of the environmental impact of the U.S. commercial building stock. Although there are various online sources for green building improvements, SPRI takes a targeted approach with the Interactive Resource Manual designed specifically for property managers to utilize in the implementation of green building upgrades and sustainable management practices to improve existing buildings in the commercial sector.

Approach

As financial, managerial, regulatory, and informational barriers can make investment decisions regarding green upgrades difficult to justify, SPRI has developed the Interactive Resource Manual (IRM) to educate property managers on existing improvement options and overcome these barriers to implementation. The IRM is a comprehensive and consolidated web-based resource, built upon the knowledge gained from both our Santa Barbara area audit process, and the analysis of a nationwide survey of Yardi Systems' commercial clients.

Audit Process

The goals of a building audit are to assess the efficiency of technical and operational components of a property and establish a performance baseline. The audit assessment data allows the auditor to analyze and address critical inefficiencies existing at the site, as well as compare building performance to similar type buildings. The establishment of building performance baselines is a key first step in reducing inefficiencies within operations.

Given the need for more examples of sustainable building success^v, the SPRI team conducted commercial audits on four properties in the Santa Barbara area (Figure 2: SPRI Commercial Building Audits by Type). The Towbes Group, a local property management firm and client of Yardi Systems, manages three of the audited properties


and the fourth is Yardi Systems' corporate headquarters.

Commercial Property Type	Build Date	Area (Sq. Ft.)
Multi-tenant Office Building	1981	48,880
Multi-tenant Retail Shopping Center	1976-1982	125,041
Multi-tenant Office Park	1912-1935	92,566
Single-tenant Office Building	2004	61,000

Figure 2: SPRI Commercial Building Audits by Type

These audits have been developed into case studies, which serve as a key resource for property managers to model in the assessment and improvement of their own commercial properties. Property inefficiencies are identified, updated technologies are detailed and recommended, and amounts of environmental and financial savings potential are measured for each property (Figure 3: Sample Case Study). These case studies guide property managers through the audit process, recommend specific upgrades and strategies, and have been made available online in the IRM.

**Case Study:
Multi-tenant Office Building**



Diversion of CO ₂ (Metric Tons)	147
Annual Energy Savings (kWh)	25,911
Annual Water Savings (Gallons)	66,000
Investment Cost	\$2,298
Annual Cost Savings	\$3,354
Payback (Years)	0.69
Annual Return on Investment	146%
Increased Net Operating Income	\$3,354
Capitalization Rate	7%
Increased Building Asset Value	\$47,914.29

Figure 3: Sample Case Study



National Survey

As the Santa Barbara area is not representative of the nation as a whole, a survey was distributed nationwide to over 3,600 of Yardi Systems' commercial clients in order to gain a more thorough understanding of the drivers for green building upgrades. The survey identifies barriers and incentives faced by property managers (Figure 4: Sample Survey Response), and determines the current level of green building upgrades.

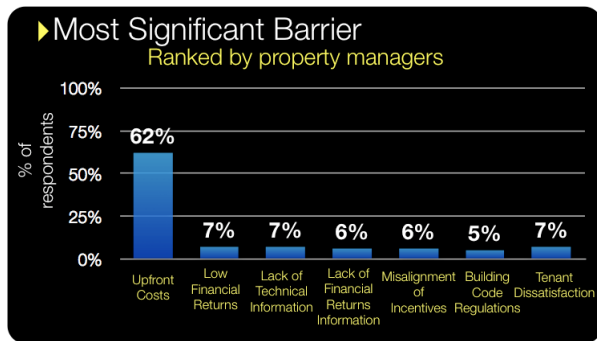


Figure 4: Sample Survey Response

Major findings included:

1. Survey respondents are representative of Yardi Systems' commercial client base;
2. The amount of property managed (square footage and number of units) does not significantly affect decision making drivers of property managers;
3. The most important incentive driving building improvements varies according to past level of upgrades; and
4. Barriers, incentives, and information valued by property managers focused consistently on financial obstacles and rewards.

Interactive Resource Manual (IRM)

The data collected from our commercial audit process and national survey allowed SPRI to tailor the Interactive Resource Manual to best meet the needs of property managers when making green building improvements. The IRM has been built into a web platform that is available online to all property managers at:

www.sustainablepropertyrewards.info and www.greenerbuildings.info

Core components of the IRM include:

- Self-Auditing Toolkit
- Financial Calculators
- Informational Resources
- Environmental Benefits

- Best Practices for Energy, Water, and Materials Procurement
- SPRI Commercial Property Case Studies
- Information on Green Leases
- National Survey and Results

The IRM is designed as an easily navigable, intuitive web-based resource, targeting Yardi Systems' U.S. commercial clients, but available to anyone with internet access. Currently there is no comparable resource available that specifically aids property managers in the greening of their buildings. The IRM addresses this need and creates the potential for SPRI to improve the sustainability of the entire commercial building sector.

Market Projections

The potential for SPRI to affect significant environmental improvement in the commercial building sector depends greatly on appropriate deployment of the IRM. Our corporate strategy maximizes the effectiveness of the IRM through the design of three programs, which include audit support, software integration and co-marketing. Audit support can provide assistance to property managers throughout their own audit process. The software integration program recommends incorporation of utility tracking software into the Yardi Systems product suite. Lastly, the co-marketing campaign can highlight Yardi Systems' best performing clients on their website and newsletters.

Yardi Systems' clients manage over 7 billion square feet of commercial space translating to nearly one tenth of the nation's total. Assuming even the most conservative rates of implementation, SPRI can be the catalyst for the achievement of significant energy and water use reductions, as well as for the adoption of environmentally preferable procurement practices on a vast scale.

SPRI's market projections model implementation of modest improvements in the energy and water categories. Our market impact projections are based on the assumption that a small percentage of Yardi Systems' client base will utilize the tools provided in the IRM to facilitate some degree of environmental upgrades in their facilities. Based on our survey findings, we modeled differing degrees of adoption across unimproved square footage.

Lighting Efficiency Projections

The survey found that 50 percent of square footage managed by Yardi Systems' clients had undergone no lighting efficiency upgrades whatsoever. This

equates to over 360 million square feet of space with a high potential for improved efficiency in lighting alone. SPRI assumes a conservative 10 percent increase in the efficiency of lighting energy intensity and models this across the unimproved square footage. A sensitivity analysis yields the resulting environmental benefits for different implementation rates, from 5 percent of total square footage to 50 percent, with the upper bound representing a 100 percent implementation rate across previously unimproved square footage.

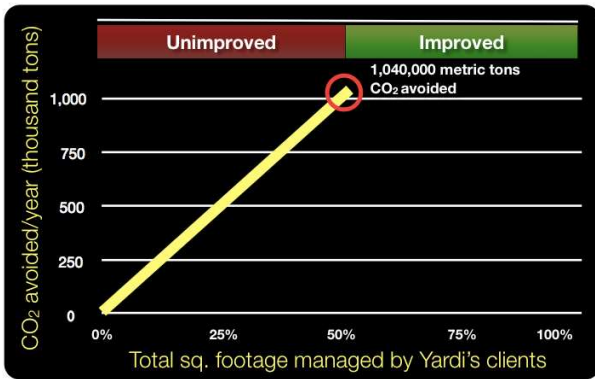


Figure 5: Increased Lighting Efficiency Projections

This analysis concludes that if all unimproved square footage managed using Yardi Systems' software were to undergo a modest 10 percent lighting efficiency upgrade, over 1 million metric tons of CO₂ emissions would be avoided annually, the equivalent of removing over 91,000 large sport utility vehicles from the road (Figure 5: Increased Lighting Efficiency Projections).

Water Efficiency Projections

Water efficiency upgrades were completed less frequently among Yardi Systems' clients than lighting upgrades, with survey results indicating that 64 percent of square footage managed using Yardi Systems' software had undergone no water fixture efficiency upgrades to date. The Energy Policy Act (EPA) of 1992 mandates efficiency levels for lavatory flow and flush fixtures, and these rates were assigned to the baseline case of square footage having undergone no improvements. By installing more efficient toilets, waterless urinals and lavatory sink faucets, the average amount of water consumption per occupant can be reduced from 1,521 gallons to 617 gallons annually. These upgrades are modeled assuming varying levels of implementation across unimproved square footage to yield total water saved annually. If all unimproved square footage managed using Yardi Systems' software were to undergo retrofits of existing

lavatory water fixtures, over 8 billion gallons of water could be saved annually, or the equivalent of annual irrigation water demand for over 11,000 acres of United States cropland (Figure 6: Increased Water Efficiency Projections).

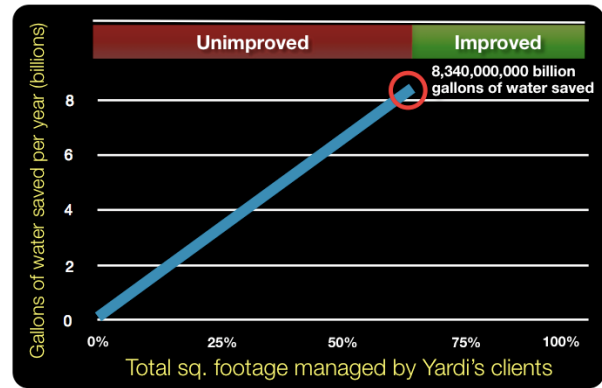


Figure 6: Increased Water Efficiency Projections

It is important to note that these projections model only improvements and upgrades performed on the unimproved square footage of Yardi Systems' client base. As our case studies demonstrate, even properties that have already incorporated green upgrades hold the potential for further improvement. These market projections are meant to be conservative, and only model a small portion of the environmental change SPRI is capable of achieving.

Conclusion

SPRI currently exists as an independent initiative to Yardi Systems' existing product offerings. In future development cycles, Yardi Systems will consider a variety of features to be included in new software versions. In each of these cycles, components of SPRI can be incorporated into their software package; such as utility tracking, carbon accounting, and Energy Star integration. It is clear that Yardi Systems can leverage their market share to affect environmental change. As the Interactive Resource Manual is also available industry-wide, SPRI not only has the potential to improve sustainability of Yardi Systems' client base, but the entire commercial building sector as well.

ⁱ "Energy Efficiency Standards for Residential and Nonresidential Buildings." California Energy Commission. 8 Apr. 2008. <<http://www.energy.ca.gov/title24/>>
ⁱⁱ "Best Practice Guide: Commercial Office Buildings." *Flex Your Power*. 2008. Efficiency Partnership. <<http://www.fyopower.org/bpg/index.html?b=offices>>.
ⁱⁱⁱ US Geological Survey, Department of Interior. Commercial Water Use. 1995. <<http://www.usgs.gov/science/science.php?term=186&type=theme>>.
^{iv} "Curbing Energy Demand Growth, The Energy Productivity Opportunity" *McKinsey & Company*. May 2007. <www.mckinsey.com/mgi/publications/Curbing_Global_Energy/index.asp>.
^v Castillano, Marya, Peter Hurlley, and Peter Dobrovolny. *High Performance Building Delivers Results*. Sustainable Demand Project. Seattle, WA: Seattle City Light, 2000. 5-6. 20 May 2008 <<http://www.cityofseattle.net/light/conservesustainability/SDPFRa.pdf>>.