

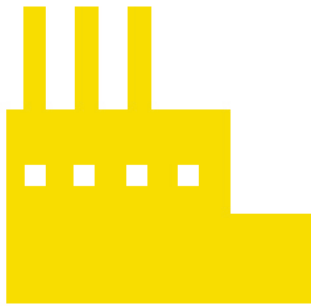
# **The Value Implications of Green**

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EPA Climate Leaders

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**INDUSTRY**  
**25%**



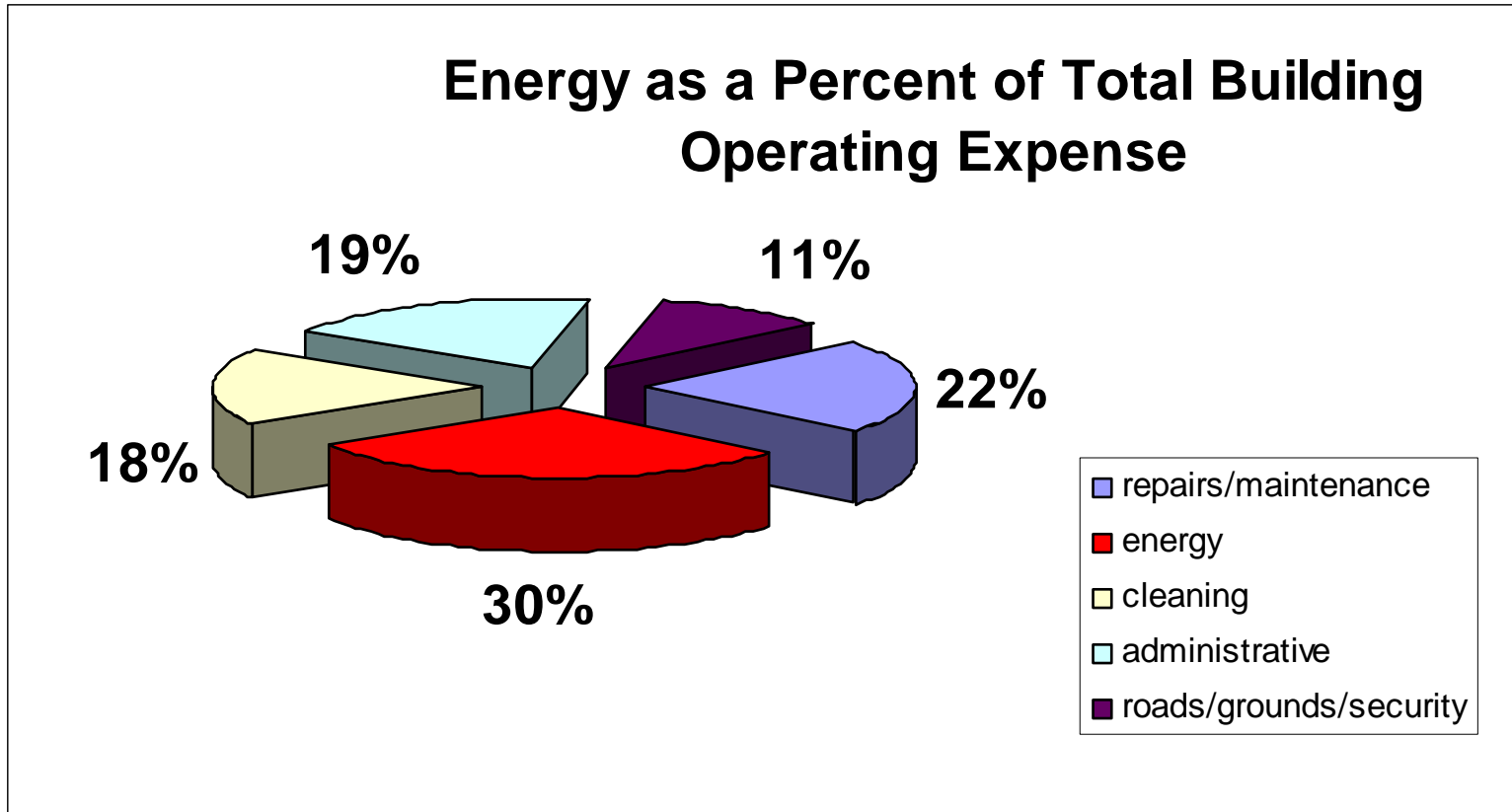
**TRANSPORTATION**  
**27%**



**BUILDINGS**  
**48%**

**U.S. ENERGY CONSUMPTION**

# Nationally, utilities are 30% of total office operating expenses

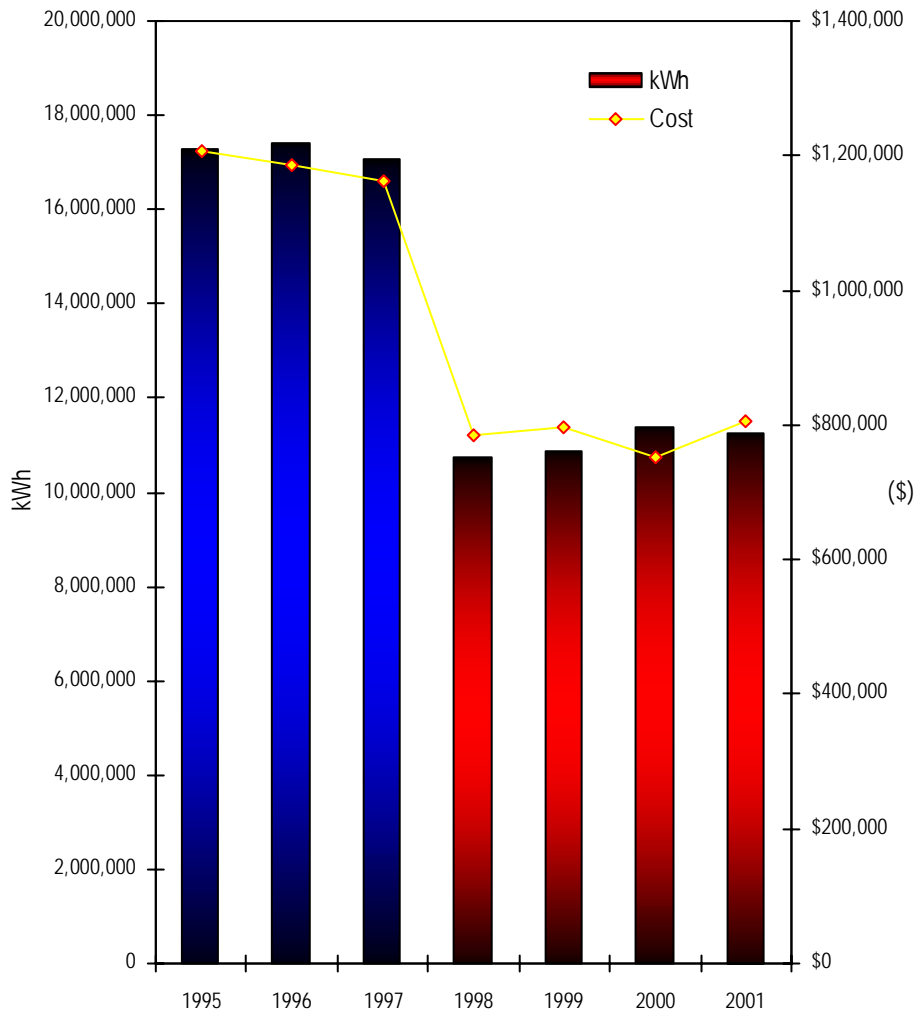


Data based on 2002 BOMA Experience Exchange Report  
(Average of Urban & Suburban Non-Government Buildings)

# Huge Savings Possible Even Without Capital Improvements

## Case Study: Class A Office Building

### Downtown Chicago, IL



- ➔ Under Previous Management (1995 – 1997) averaged 17,265,528 kWh at a cost of \$1,184,843
- ➔ Under Hines (1998 – 2001) averaged 11,074,991 kWh at a cost of \$785,255
- ➔ Average Annual Electrical Savings of \$0.48 PSF, a 34% reduction

# Even in existing buildings, typical ROIs from efficiency are anything but typical

On average each \$1 invested in energy performance retrofits increases asset value by \$2 to \$3

*(Assumes a 10% cap rate)*



Source: ENERGY STAR research

# Investments in Energy Performance Retrofits Have High Returns\*

<b>Building 100,000 sf</b>	<b>Invest- ment/SF</b>	<b>Rate of Energy Savings</b>	<b>\$ Savings/ SF/Yr</b>	<b>Increase to NOI</b>	<b>Asset Value Increase</b>	<b>Simple Payback</b>
<b>Janitorial Services</b>	<b>\$0.01</b>	<b>5%</b>	<b>\$0.14</b>	<b>\$13,500</b>	<b>\$135,000</b>	<b>Immed- iate</b>
<b>O&amp;M</b>	<b>\$0.05</b>	<b>9%</b>	<b>\$0.20</b>	<b>\$19,800</b>	<b>\$198,000</b>	<b>4 months</b>
<b>Lighting</b>	<b>\$1.04</b>	<b>16%</b>	<b>\$0.36</b>	<b>\$36,000</b>	<b>\$360,000</b>	<b>3 years</b>
<b>HVAC</b>	<b>\$1.21</b>	<b>9%</b>	<b>\$0.21</b>	<b>\$20,700</b>	<b>\$207,000</b>	<b>6 years</b>
<b>All Measures</b>	<b>\$2.31</b>	<b>39%</b>	<b>\$0.90</b>	<b>\$90,000</b>	<b>\$900,000</b>	<b>2.5 years</b>

Source: ENERGY STAR research

\* Calculations based on national averages and \$0.09 per kWh.

# Energy costs

- are the single biggest operating cost
- vary dramatically among similar buildings
  - Efficient --> low costs
  - Inefficient --> high costs
- significantly impact NOI **and property value**

# Appraised value as a function of net operating income (NOI)

The *income capitalization approach* treats the property as a source of income.

$$\text{Asset value} = \frac{\text{NOI}}{\text{Capitalization rate}}$$

$$\$ 10 = \frac{\$ 1.00}{10 \%}$$



# Saving 30% of energy costs can increase net operating income (NOI) by up to 10%

Improving energy performance makes buildings:

## More Competitive

- Lower occupancy costs
- Enhanced comfort and productivity

## More Profitable

- Better tenant retention and attraction
- Lower vacancy rates result in higher rent revenue

## More Valuable

- Higher rent revenue increases cash flow
  - Lower operating costs increase cash flow

# Battery Park City in Lower Manhattan



# Benefits of Green Buildings

- Energy and Water savings
- Indoor Air Quality
- Health
- Productivity
- Comfort
- Visual and acoustic (less noise, glare, etc.)
- Durability: operations/maintenance costs
- Environmental responsibility

# Why Air Quality Matters

- Americans spend 90% of our time indoors
- Indoor air pollutants are up to 100x worse than outdoor air pollutants  
[US EPA]
- Percent of children getting asthma has doubled in two decades (1980-2001).  
[American Lung Association]
- ~50% of homes have family members with asthma, allergy or respiratory problems
- Health insurance cost related to asthma in the U.S. total \$13 billion annually.  
[Mayo Clinics study]

# Key Findings from Tenant Surveys

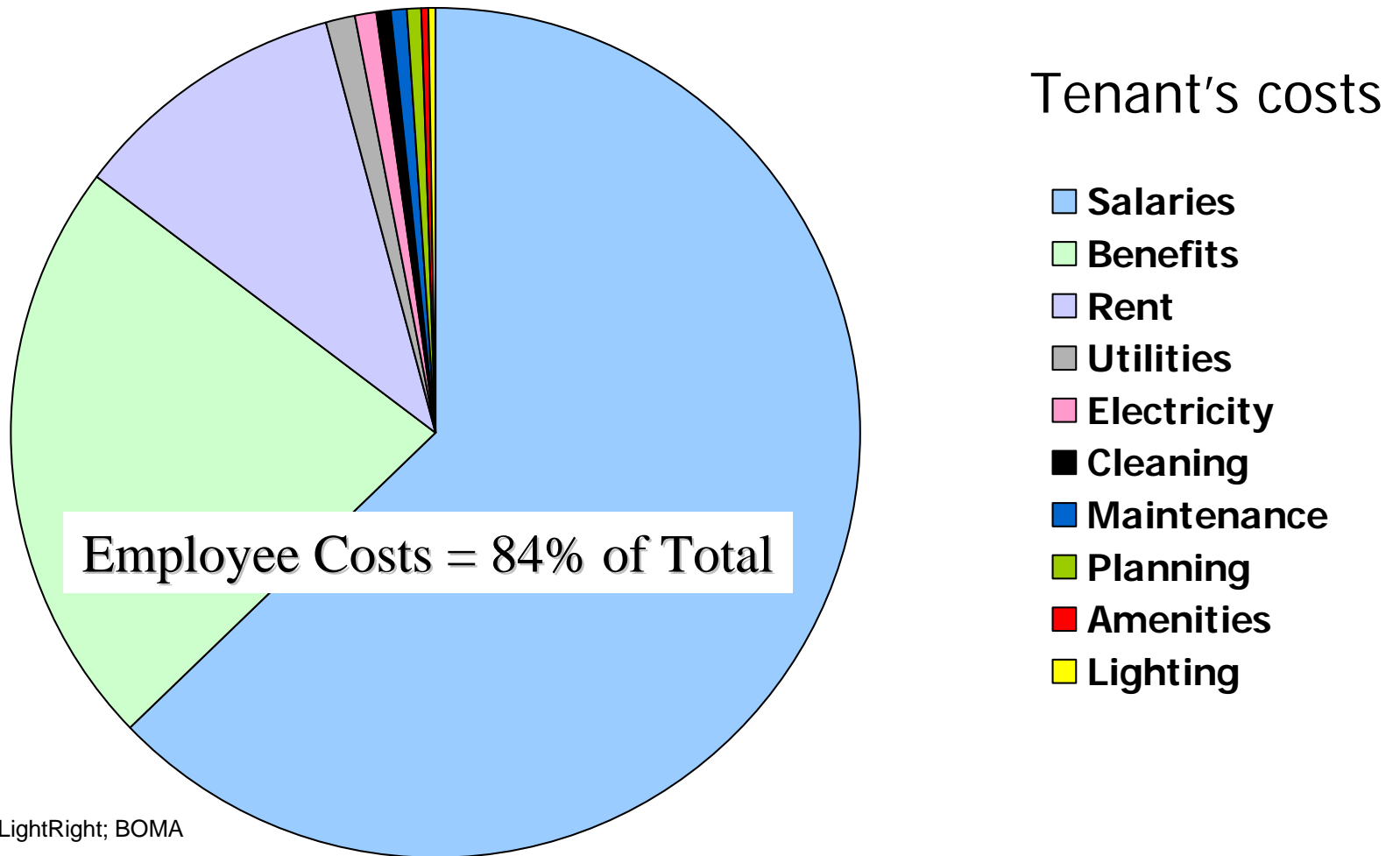
**“Energy efficiency generates the greatest demand among tenants, followed by access to natural light and wanting more open offices.”**

Workplace Satisfaction Survey, BOMA, 2002

**“Tenants’ ability to control the temperature in their suite is the only feature to show up on both the list of most Important features and the list where tenants are least satisfied.”**

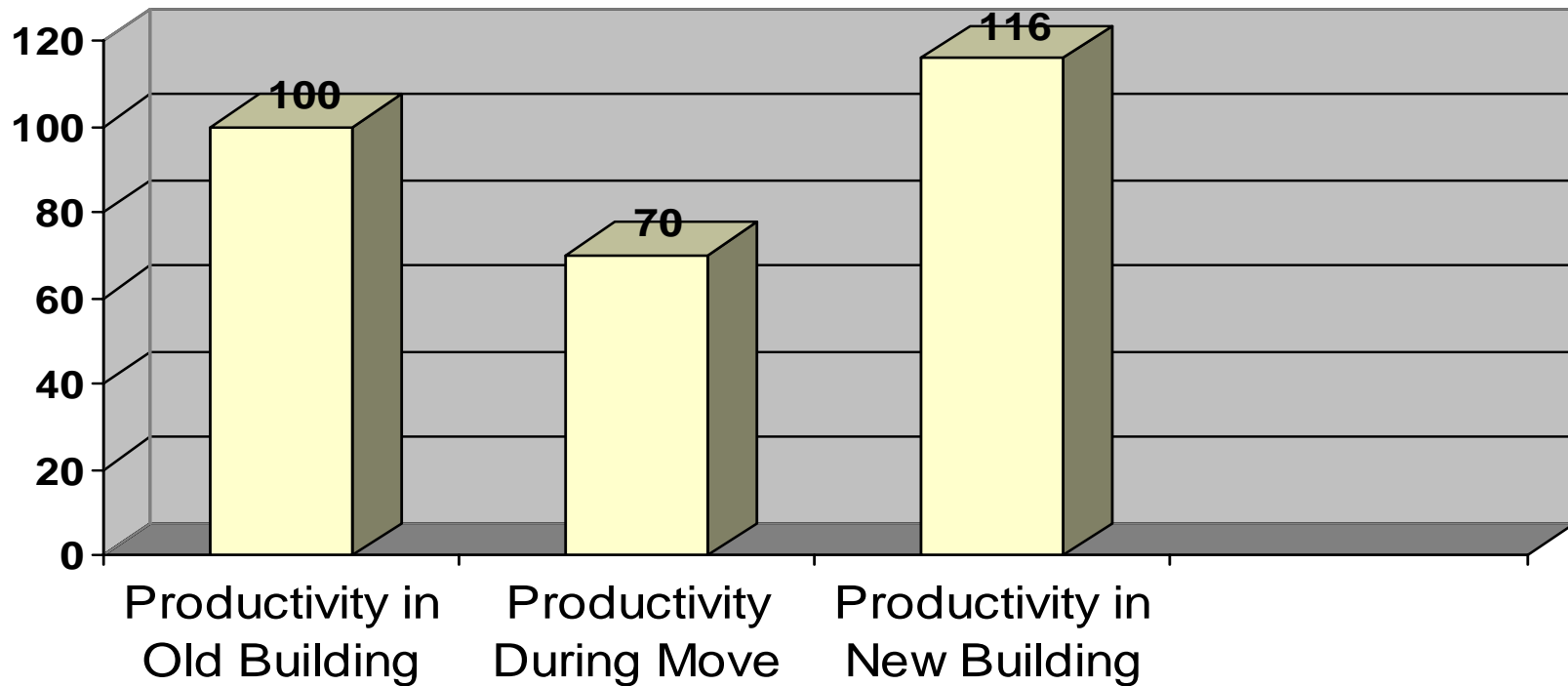
What Office Tenants Want, BOMA 1999

# The Office Tenant's Perspective



# West Bend Mutual Insurance Company

(West Bend, WI)



# Daylighting benefits

- **Retail**

- Study of 108 stores found an average 6-40% increase in sales per square foot
- Exemplars include: Wal-Mart, Target, Staples

- **Schools**

- student test scores improved by over 20% in classrooms that were daylit.

- **Commercial and Industrial**

- Productivity increases resulting from better lighting
- Greater job satisfaction and fewer illnesses (15% drop at Lockheed Martin paid for new building in one year)





Jewelry



Diamond Edition

KEEPSAKE  
Fine Jewelry



fall savings



Self Checkout  
Auto-Checkout



BATTERY CENTER



# **Report on Costs and Financial Benefits of Green Buildings**

A report to California's Sustainable Building Task Force, a group of over 40 state agencies, with funding from seven.

Drawing on cost data from 33 green building projects and benefits data from over 100 buildings nationwide. Developed in partnership with USGBC.

Principal Author: Greg Kats, [Capital E](#)

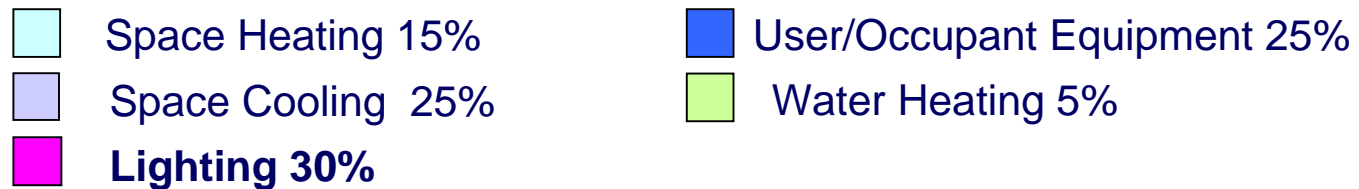
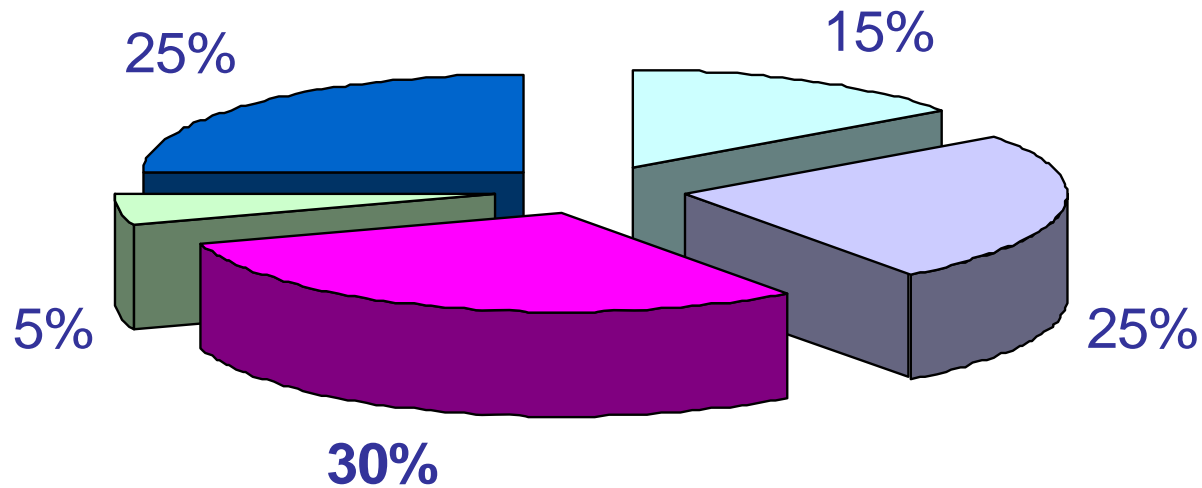
# Financial Benefits of Green Buildings

## Summary of Findings (per ft<sup>2</sup>)

Category	20-year Net Present Value
Energy Savings	\$5.80
Emissions Savings	\$1.20
Water Savings	\$0.50
Operations and Maintenance Savings	\$8.50
Productivity and Health Value	\$36.90 to \$55.30
<b>Subtotal</b>	<b>\$52.90 to \$71.30</b>
Average Extra Cost of Building Green	(-3.00 to -\$5.00)
<b>Total 20-year Net Benefit</b>	<b>\$50 to \$65</b>

*Source: Capital E Analysis*

# Typical Energy Uses in DC Office Buildings



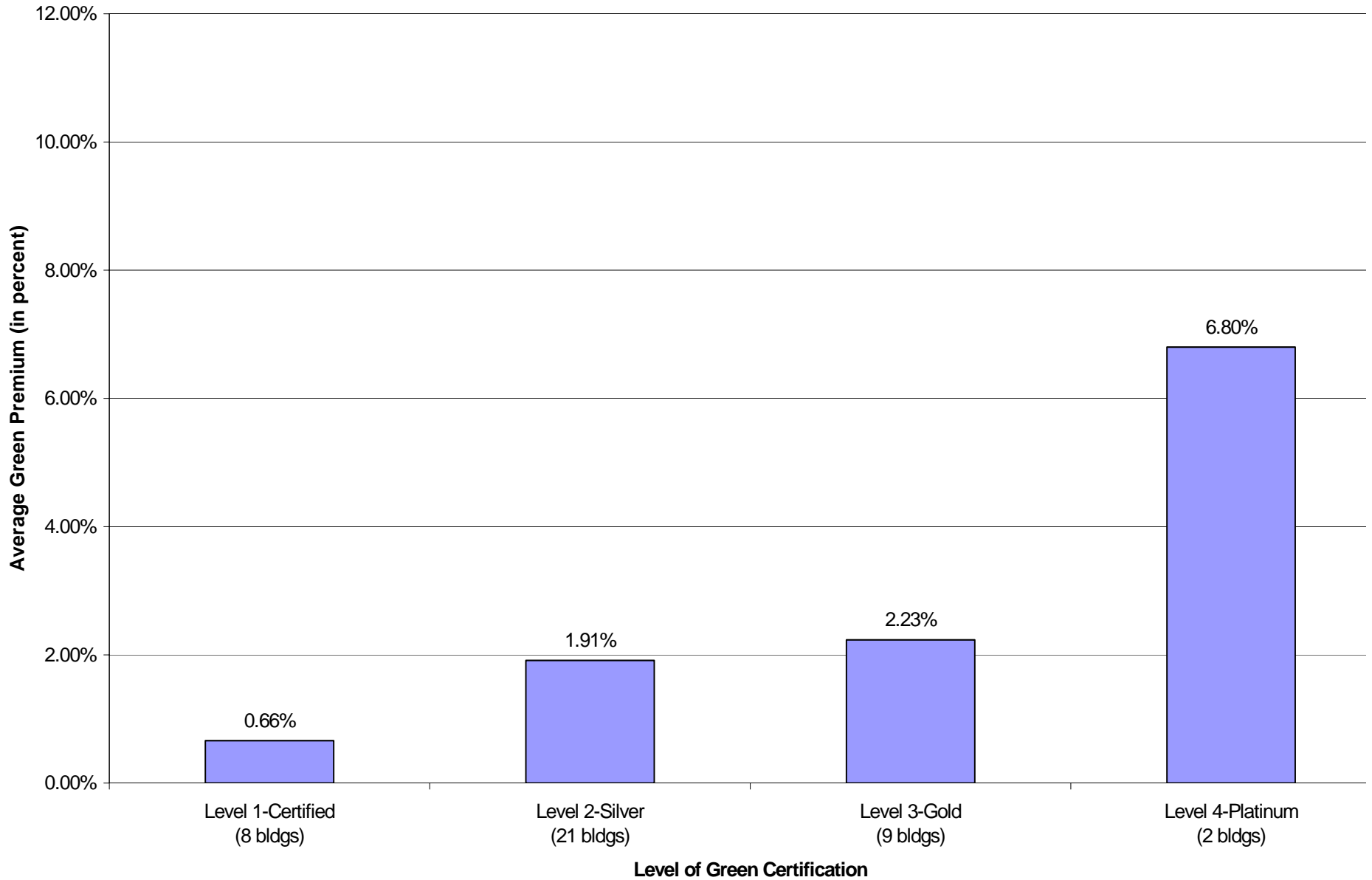
Source: Transwestern Commercial Services

# Smart building design can often slash operating costs at little or no up-front cost

*Strategies include:*

- *Integrated design*
- *Airtight construction*
- *Right-sizing ducts and equipment*
- *Building siting, orientation and shading to maximize southern exposure, daylighting and passive solar while minimizing unwanted solar heat gain*

## Average Green Premium vs. Level of Green Certification (for Offices and Schools)





## **Case Study:** Telergy Building, Syracuse, NY

- Class A suburban office building
- 116,000 net rentable area
- 9.7-acre parcel with 430 parking spaces
- Built in 1981 and significantly expanded in 1999
- An energy hog in a depressed market

Full case study: [www.imt.org/Papers/Telergy.pdf](http://www.imt.org/Papers/Telergy.pdf)

# Telergy Appraisal

- Telergy defaulted on mortgage to HSBC in August 2001 and soon after filed for bankruptcy
- HSBC commissioned appraisal
- Draft appraisal based on historic utility bills of \$4.46 psf valued property at \$4,300,000
- HSBC-commissioned energy analysis revealed tenant-specific electric loads (telecom and data centers)
- Normalization of energy bills led to \$1.2 million increase in appraised value to \$5.5 million – a 28% increase





# Institute for Market Transformation

[www.imt.org](http://www.imt.org)

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