REINVENTING FIRE
BOLD BUSINESS SOLUTIONS FOR THE NEW ENERGY ERA

Rocky Mountain Institute®
US Buildings use more energy

U.S. building energy use relative to the TOTAL energy use of major energy consuming nations

- Australia
- Indonesia
- Saudi Arabia
- Ukraine
- Spain
- Mexico
- Iran
- Italy
- United Kingdom
- Korea South
- Brazil
- France
- Canada
- Germany
- India
- Japan
- Russia
- U.S. Building Stock
- China
- United States

2007 primary energy (quadrillion BTU)

A lot of cost effective energy efficiency is available

Costs $0.5 trillion
Saves $1.9 trillion
Net $1.4 trillion

U.S. buildings’ energy-saving potential, 2010–2050

RMI analysis
Don’t get left behind

Rental Rates
USD per SF

THE VALUE-ADD PROPOSITION OF SUSTAINABILITY

Efficiency
Efficient use of resources such as energy and water and reducing waste is a key component of sustainability. These efficiencies drive cost reductions that improve net operating income, thereby adding value to business and real estate alike. This is particularly true within some property types in the US (as demonstrated by the chart on this page). However, in many markets outside the US, market conditions may make it difficult to capitalize on efficiency (see case study, page 23).

Stability
By producing lower energy costs for tenants, solar leases provide incentives for tenants to remain in those buildings. In addition to reduced operating costs, many tenants are inclined to lease space within a green building. Green buildings tend to be more efficient, provide a higher level of indoor environmental quality and align with many tenants’ corporate missions. Repositioning a “standard” building to a “green” building can add value in the right situation (see case study, page 22).

Resiliency
We have identified markets in which we can lease unused space, such as empty rooftops, to developers who install solar photovoltaic panels. The panels produce electricity that can be sold to the electrical grid, the building’s tenants or to PREI for common area energy use. The leases create new incremental rent for the asset, a means to produce energy for the solar developer, discounted energy costs for some of our tenants, and a new renewable energy source for the community. (see case study, page 7).

The $50 Million Challenge
After giving careful thought to sustainability’s potential to add value to our portfolios, in the fall of 2010 we implemented the $50 Million Challenge. In 2011, we added value through all three strategies of efficiency, solar roof leases and tenant retention. The following chart provides a breakdown of our value-add proposition:

2011 $50 MILLION CHALLENGE RESULTS (IN MILLIONS)

<table>
<thead>
<tr>
<th>Region</th>
<th>Mixed Asset Efficiencies</th>
<th>Office Low Carbon Solutions</th>
<th>Retail Operational Efficiencies</th>
</tr>
</thead>
<tbody>
<tr>
<td>ASIA</td>
<td>$4.4</td>
<td>$4.9</td>
<td>$3.1</td>
</tr>
<tr>
<td>EUROPE</td>
<td>$9.6</td>
<td>$5.4</td>
<td>$3.4</td>
</tr>
<tr>
<td>LATIN AMERICA</td>
<td>$24.9</td>
<td></td>
<td>$24.9</td>
</tr>
<tr>
<td>TOTAL:</td>
<td>$56.4</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*The value add calculation is based on incremental revenue and/or actual or estimated savings with an assumed cap rate of 7.5%. Some savings and value add may be shared with tenants. Non-US cap rate assumed to be 8.5%.
One third of all commercial buildings need major capital work for reliability/security.

**US Commercial Building Stock Vintage and Renovation History**

*Billion Square Feet*

- Office
- Education
- Warehs/Storage
- Retail Mall
- Retail not Mall
- Lodging
- Service
- Assembly
- Worship
- Hospital
- Food Service
- Healthcare Outpnt
- Food Sales
- Public Safety

Legend:
- Pre-1990 with No Renovations
- Pre-1990 with Renovations; All 1990–1999
- 50% of Post-2000

Source: DOE Commercial Buildings Energy Consumption 2003 Survey, Pike Research, RMI Analysis
Energy-planning mantra: “Go cheap or go deep”

Decision Tree for Deep Energy Retrofits (www.retrofitdepot.org)
Deep energy savings can save a lot, but require significant capital expenditure

For a standard U.S. office building:

<table>
<thead>
<tr>
<th>Energy Use</th>
<th>Energy Reduction (kBtu/SF/yr)</th>
<th>Capital Cost ($/SF)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Plug Load</td>
<td>6–15</td>
<td>0</td>
</tr>
<tr>
<td>Lighting</td>
<td>6–8</td>
<td>3–5</td>
</tr>
<tr>
<td>Ventilation</td>
<td>4–5</td>
<td>2–5</td>
</tr>
<tr>
<td>Cooling</td>
<td>10–25</td>
<td>10–75</td>
</tr>
<tr>
<td>Heating</td>
<td>3–10</td>
<td>10–75</td>
</tr>
<tr>
<td>Total</td>
<td>30–50</td>
<td>25–150+</td>
</tr>
</tbody>
</table>

Deep energy retrofits enhance the building performance to create value

- Improved reputation and leadership
- Cost reduction
- Revenue growth
- Compliance
- Reduced risk to future earnings
- Lower maintenance and utilities cost
- Higher resale value
- Employee satisfaction
- Higher Rents
- Meet sustainability reporting needs
- Visual acuity & comfort
- Indoor air quality
- Occupant environmental control
- Green/energy rating or score
- HVAC
- Lighting
- Envelope
- Miscellaneous

Getting started on deep energy savings

Build the Case:

Better Bricks: High Performance Portfolio Framework
Rocky Mountain Institute: Retrofit Depot
DOE: Advanced Energy Retrofit Guides
Getting started on deep energy savings

Consider emerging tools for energy analysis — “no-touch energy audits”

Large range of quality—few inputs to many inputs—and cost (as little as hundreds of dollars per building); includes both energy cost savings and capital cost

Highly detailed analysis that takes many days and costs thousands of dollars per building (slightly less than the cost of a Level 2 energy audit); does not estimate capital cost

Free high level analysis that indicates energy efficiency opportunity; does not estimate capital cost