



Planning for Sustainable Design

May 2005

Outcomes for Planning Session

- Project Requirements and Goals
- Sustainable Principles and Objectives
- Potential Benefits and Risks
- Sustainable design integration process
- Rating System Overview
- Cost Factors and Funding



Goals, Principles & Objectives

- Establish goals and objectives
- Reduce impact on environment
- Enhance health and well-being of occupants
- Eliminate known health and environmental risks
- Reduce energy and material consumption
- Improve operational efficiencies and control
- Ensure flexibility and re-configurability
- Apply sustainable technologies responsibly
- Use 'Best Practices' during design and construction
- Create economic benefit for stakeholders
- Understand costs vs. benefits
- Measure against objective standards



Facts and Figures



Buildings in this country:

- Consume 35% of all energy
- Consume 65% of all electricity
- Contribute 35% of CO₂ emissions
- Americans use 55 gallons of water per day

High performance buildings can:

- Reduce energy consumption 20%-50%
- Generate energy on-site
- Reduce water consumption 30%
- Increase productivity – 1% increase (7 minutes/day) is equivalent to a benefit of roughly \$1000 per year

Benefits of Sustainability

- Occupants and users
 - Air quality
 - Light quality
 - Improved health and morale
 - 'Pride of ownership' of space
- Administration and Facilities
 - Improved staff productivity
 - Improved community stewardship
 - Improved morale – customer service
 - Reduced complaints and maintenance calls
 - Reduced operating cost

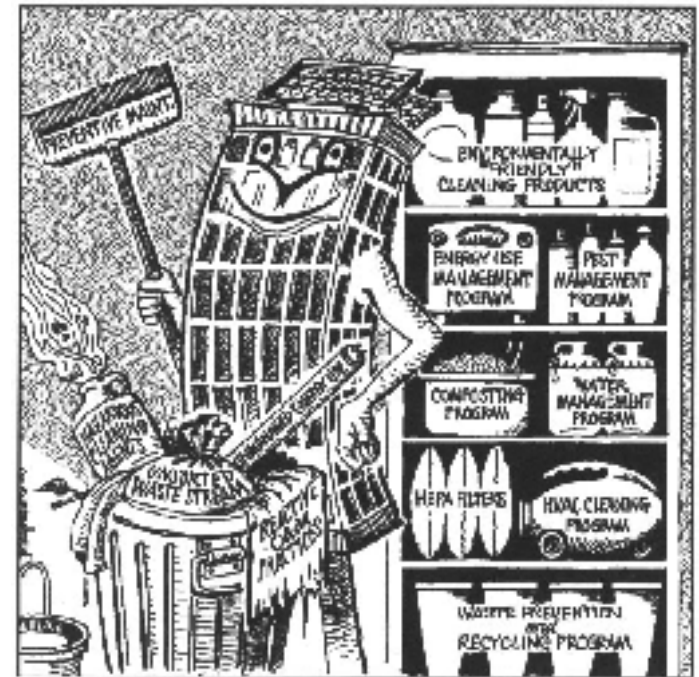


Illustration: Bruce Hender

Benefits of Sustainability

- Community and Environment
 - Less impact on adjacent properties
 - Reduced pollution
 - Improved green spaces
 - Reduced demand on infrastructure
- Owner
 - Better value for dollars spent
 - Reduced operating costs
 - Lifecycle benefit
 - Improved community stewardship

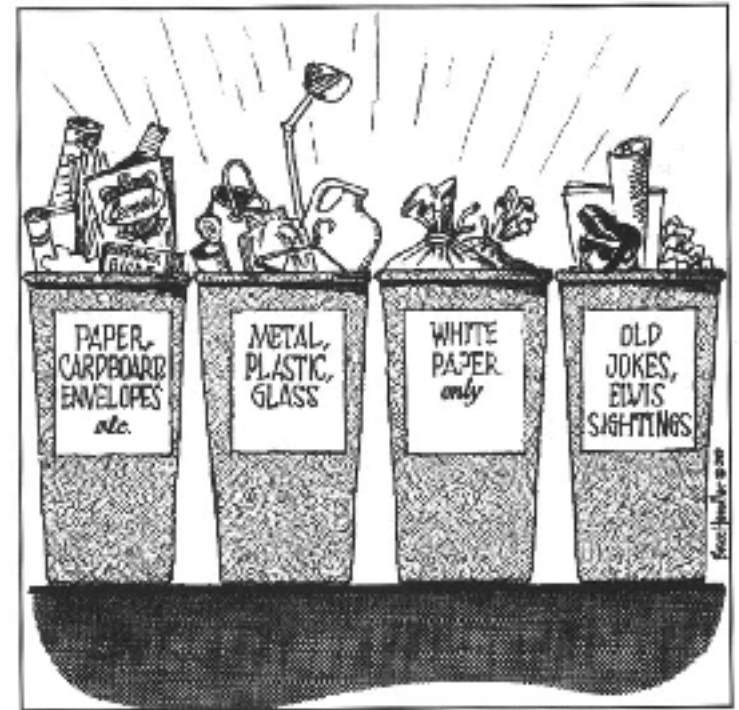


Illustration: Bruce Hendler

Integrating Sustainability into the Project - Timeframe

Study

- High benefit
- Low cost
- Comprehensive integration
- Exploration of alternatives
- Set goals and requirements

Design

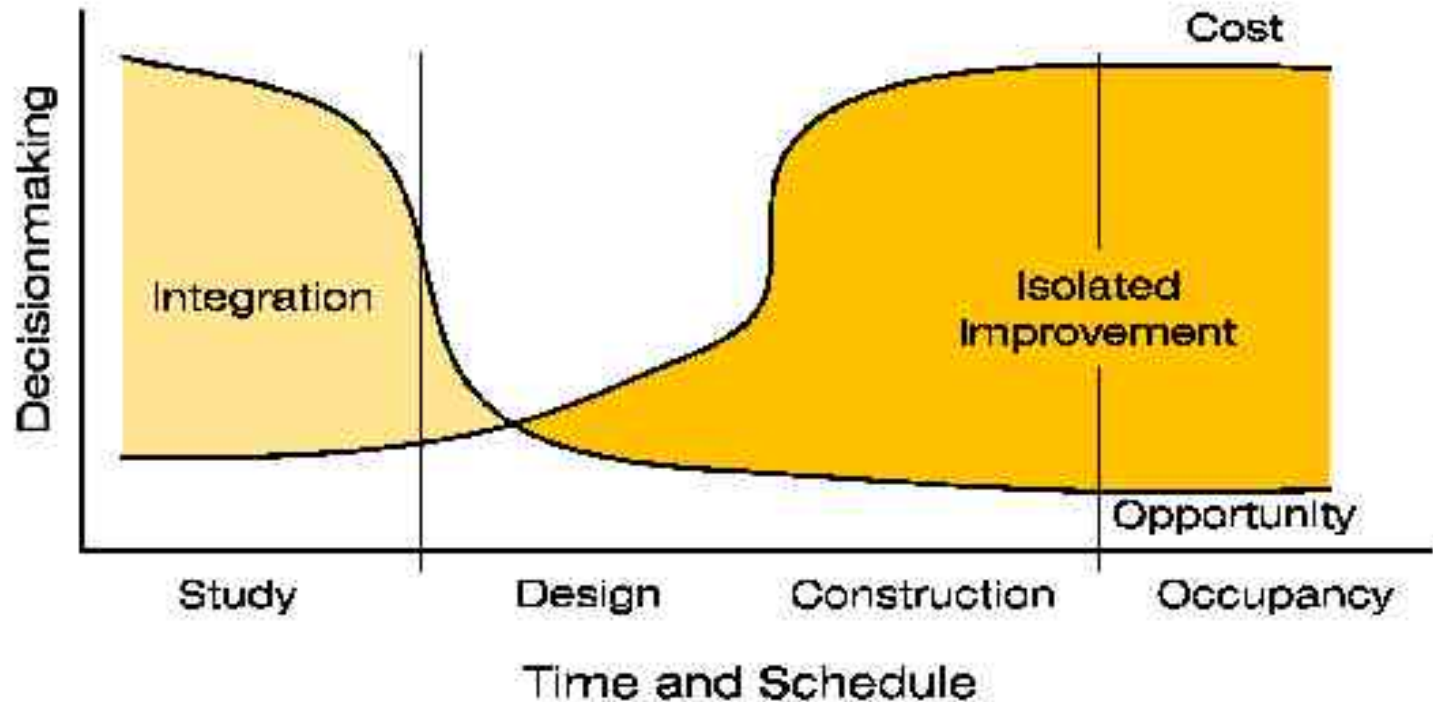
- Decreasing benefit
- Increasing cost
- Segregated integration
- Schedule constraints
- Budget constraints

Construction

- Marginal benefit
- High marginal costs
- Limited integration
- Fixed schedule
- Fixed budget

Decision making Timeline

- As the planning, design, and construction phases move forward, the ability to make effective changes decreases while marginal costs increase.



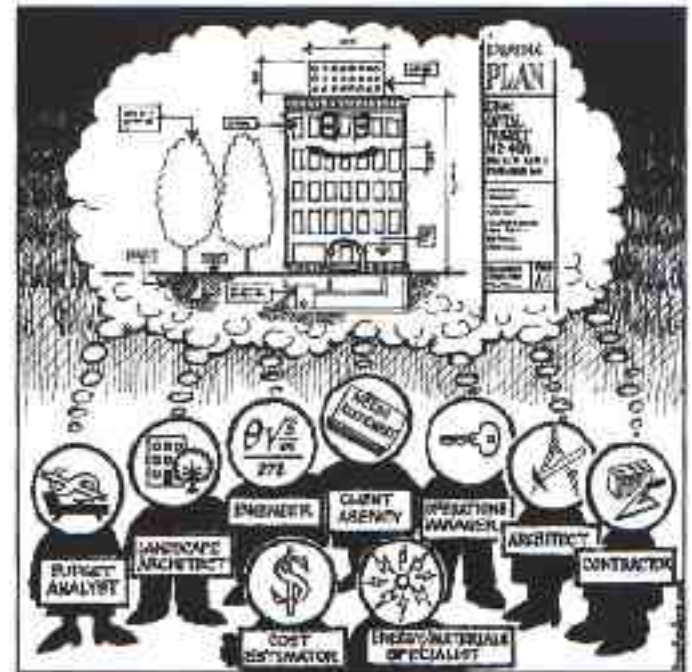
Project Goals

- Owner
- Administration
- Users
- Facilities
- Designer

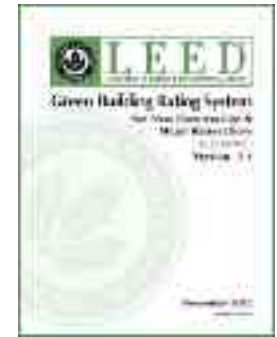


Integrating Sustainability into the Project

- Assemble stakeholders and contributors
- Understand process and principles
- Recognize potential benefits
- Establish goals and objectives
- Clarify requirements and constraints early
- Collaborate throughout project study and design
- Periodically review progress and objectives
- Search for opportunities to maximize intangible and associated benefits



LEED Rating System



- Third party objective rating standard
- Categories based on project type (NC, EB, CI, etc)
- Evaluates projects against five categories and 69 credits
- Four achievement certification levels



Certified



Silver



Gold



Platinum

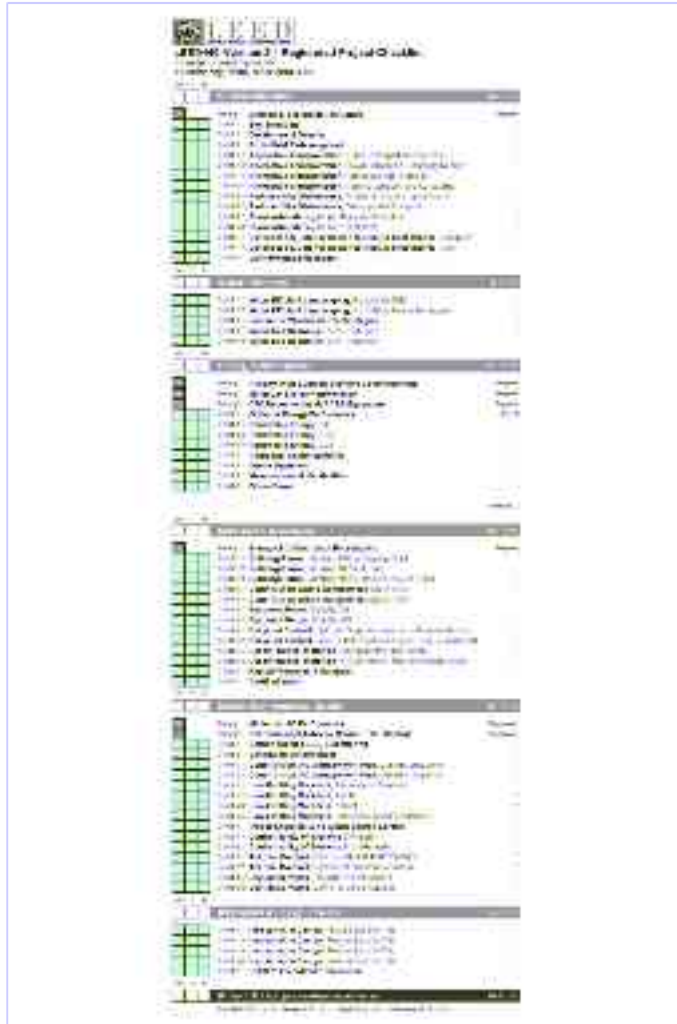
Categories:

- Sustainable Sites
- Water Efficiency
- Energy and Atmosphere
- Materials and Resources
- Indoor Environment Quality

Other references:

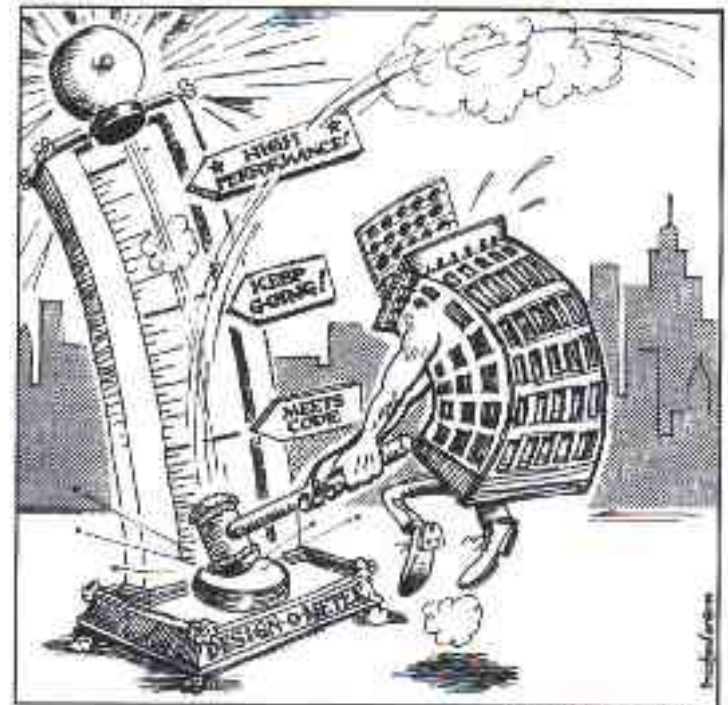
- CHPS
- NYC High Performance Building Guidelines
- ASHRAE
- GSA

LEED checklist handout



Cost Factors

- Cost variability based on:
 - Region
 - Project type and complexity
 - Green design threshold
 - Green design integration
 - Incentives, grants, rebates
 - Project team experience
 - Construction team experience
- The reality:
 - Green design is not yet industry standard practice
 - Additional costs may be better value in the end
 - Avoid point-chasing



Cost guidelines during design

- High performance design is becoming more common but it is not yet standard practice. There remains a higher incremental cost for individual measures.
- GSA study indicates 2%-4% cost premiums for LEED certification, based on large commercial projects.
- Design-phase engineering and design efforts are higher than standard practice. Additional building modeling.
- Additional consultants (renewable energy technologies, commissioning, grant writing)
- LEED documentation and certification paperwork & fees.

Cost factors through project

Study

- Planning meetings and charrette
- Additional existing conditions investigation

Design

- LEED application and documentation
- Commissioning review
- Energy and daylight modeling
- Value-added design features

Construction

- Higher first-cost components
- Commissioning
- LEED documentation and certification
- Controls and monitoring
- Familiarity with green buildings

Conclusions

- Set Goals and tasks for project
- Understand requirements
- Assess benefits and risks
- Understand costs

- Resources and handouts

