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Environmentally Sustainable Non-Residential Buildings: Sustainability Obstacles

Part II, Proceedings of National Sustainable Buildings Workshop 1999

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ENVIRONMENTALLY SUSTAINABLE NON-RESIDENTIAL BUILDINGS: SUSTAINABILITY OBSTACLES.

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Sustainability obstacles

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ENVIRONMENTAL PERFORMANCE ASSESSMENT

Overview of Tools

1. Assessment Tools
 - e.g., LEED, GBC, BREEM
2. Resource Tools
 - e.g., AIA Environmental Resource Guide, Sustainable Building Technical Manual, Green Building Advisor
3. Simulation Tools
 - e.g., DOE 2, Energy10
4. Whole Building LCA Tools
 - e.g., ATHENA Model
5. Product Assessment Models
 - e.g., BEES (Building Research Establishment Environment Assessment Method)
6. Integration Tools/Product Assessment Tools
 - e.g., BDA (Building Design Advisor)
7. Information Sources
 - e.g., Harris Directory, Environmental Building News Product Catalog

Obstacles related to particular tools

1. Assessment Tools

General

- Lack of normalization
- Users may have different priorities than those highlighted



Sustainability obstacles

GBC:

- Too complex and expensive
- Much data is required
- Not well-publicized (lack of awareness that it exists)
- Scoring method subject to criticism
- Lack of or inconsistent benchmarks

BREEAM:

- In reducing complexity, it reduces utility
- Validity of scanning methods questioned

LEED:

- Lack of quantitative metrics
- Based on subjective decision making

2. Resource Tools

- Data availability
- Objectivity
- Not specific in applications
- Cost-prohibitive: AIA-ERG (GBA more affordable)

3. Simulation Tools

- Too complex/tend to “micro-analyze”
- Not user-friendly
- Some programs and systems require specialists to use
- Large number of input parameters (DOE2, need to set requirements, Energy10 will default)
- Inability to adequately model human behavior
- Need to input material twice, in CAD and specific programs

4. Whole Building LCA Tools

- Data: regional vs. global
- Need to re-input design info
- Unclear about future demolition
- Need to link use-phase with operating energy
- Uncertainty
- Temporal and spatial elements need to be better addressed

5. Product Assessment Models

- Data/regional
- Weighting/scoring limitations
- Limited number of products
- Functional equivalence problem
- Funding for software but not data collection and operation
- Math issues: weighting and scoring limitations, but only a problem when combined measure



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6. Integration Tools/Product Assessment Tools

- Complexity in making linkages
- Funding continuity
- Level of simplification in design
- Time constraints

7. Information Sources



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ECONOMICS

- There is no agreed upon universal definition for the words 'Green', or 'green buildings'
- Lack of scientific data on the economic benefits of sustainability
- Insufficient education of lending institutions, the government, insurance companies on the issues of green and the benefits
- Lack of a concerted effort by the advocates of sustainability to share information with financial institutions



Sustainability obstacles

CODE ISSUES

1. Technical code barriers
 - Prescriptive or proscriptive wording, rather than performance codes
 - No attention to scale – a small house and a large building are treated the same
 - No attention to regionalism and each bio-region's particular health and safety needs like cold, heat, sun, etc.
 - Lack of testing data for unusual materials, e.g. wood and straw
 - Level of testing materials is so high that current materials, like wood, would not be able to pass given current standards.
 - Codes do not include integrated design or include whole systems. Each part is compartmentalized. Systems cannot be substituted.

2. Structural/mindset barriers of code officials
 - Attitude
 - Narrow interpretation of code – no common sense
 - “Policing” attitude/relationship
 - Assumptions about technology
 - Any new/unusual product must be tested, which is only possible for big, high-budget projects.
 - Risk aversion
 - Liability for institution/individual
 - Building occupant safety
 - Understaffed, under-qualified, no political support for money to improve

3. Limits on official's time, resources, level of expertise

4. Lack of acceptance of sustainable building practices
 - Public/ Politics
 - Labor/Unions
 - Industry/Institutions

5. Resistance to change / inertia



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ORGANIZATIONAL CONDITIONS

- Lack of:
 - Tools to measure success
 - Regional planning guides
 - Awareness of environmental problems and institutional responsibilities
 - Time
 - Local examples
 - City government initiatives
 - Integrated design software
 - Training and education of installers/contractors
 - Appropriate controls for the pricing process
- Lack of transparent process
- Dump/tipping fees
- Emphasis is on initial cost instead of life cycle



Sustainability obstacles

STAKEHOLDER AND PUBLIC EDUCATION

1. General obstacles

- Information glut – available information is disorganized
- Information is highly complex
- Lack of awareness for sustainability
- Lack of concern for sustainability
- People have difficulty seeing the link between their environment and sustainability; issue of values
- Lack of interoperability / interaction between people and environment
- Resistance to professional development, changing practices
- Initial cost of implementing a sustainable design is viewed as prohibitive
- Fee structure of projects is obstructive
- Language barrier – Each participant has a different understanding and approach to a project / different goals
- Lack of altruism
- Impact of actions - issue of not seeing the impact of individual actions on the bigger picture
- Cultural inertia is a barrier – cultural resistance to change
- Inability to connect one on one in a project between those involved. There is poor communication and understanding between the different players of a project
- Inability to market “sustainability” – lack of speakers to reach the general public

2. Obstacles for designers

- The claims of the environmental performance of products are difficult to validate
- The industry is constantly changing. Information is outdated
- Architects must ask vendors for accurate information on products
- Lack of time – Sustainability takes too much time to learn and design
- There is an ignorance of actual analytic models (LCA)
- Testing protocol limitations – i.e. Architect wants to prove / utilize a product but no testing is available for it – no proof of performance
- Perceived conflicts between aesthetics and sustainable design
- There is a commodification of architectural services
- Time constraints – Sustainable designs require more time to complete
- Sustainable design may require another area of sub specialization for architects
- Project delivery is already very complex. Sustainability adds to the complexity
- Sustainable design involves new products and processes. There is a lack of time to learn new things
- Architects / designers have a lack of exposure to existing resources and knowledge
- The architecture curriculum in schools is not sufficiently preparing future architects
- The AIA and other professional organizations have conflicting interests in the area of sustainability
- There is an uncertainty about the independence of sources regarding sustainable products. (What are the interests behind the product selections of SWEETS and MasterSpec?)



Sustainability obstacles

3. Obstacles for manufacturers

- There is too much misguided information and poor communication within the industry
- Lack of time – Sustainability takes too much time to learn and design
- There is an ignorance of actual analytic models (LCA)
- Possible negative performance perceptions / negotiating connotation of environmental label
- Green manufactures need an education in common business language and methods. Green manufacturers lack business wit and/or language.

4. Obstacles for building users/occupants

- Information on sustainable use doesn't filter down to the tenant
- There is a lack of communication between tenant and owner
- When owners are not users, there is a lack of accountability for the use of the facility – user feels no responsibility
- Users are disconnected from any feeling of ownership / accountability – again lack of responsibility
- Buildings have passive not active users. There is a lack of user participation – buildings do not engage the users