



An Introduction to Sustainable Facilities & Infrastructure

Training Outcomes and Recommendations

Dr. Annie R. Pearce

Sustainable Facilities & Infrastructure Program

Georgia Tech Research Institute

Overview

- ◆ SFI training and its role in sustaining AFRC
- ◆ Training exercises and outcomes
- ◆ Barriers to implementing sustainability
- ◆ Recommended actions, goals, and objectives for AFRC (organization and projects)
- ◆ Discussion on next steps...

SFI Training and its Role in Sustaining AFRC

- ◆ Training:
 - 35 HQ AFRC participants
 - Two days of training and facilitated exercises
- ◆ Training Objective:
 - To provide an introduction to the concept of sustainability as it pertains to the built environment, along with an overview of basic tools and methods for sustainability implementation, assessment and evaluation, and economic analysis

SFI Training and its Role in Sustaining AFRC

- ◆ AFRC Motivation for Sustainability:
 - Policy Mandates
 - Mission, including health of the US and increased AFRC personnel productivity
 - Leadership
 - National strategic opportunity

SFI Training Topics



- ◆ The Context for Sustainable Capital Projects
- ◆ Sustainable Facility Strategies
- ◆ Integrated Strategy Design
- ◆ Barriers to Project Sustainability
- ◆ Decision Making and Selection Strategies
- ◆ The LEED Green Building Rating System
- ◆ Economics of SFI
- ◆ Implementation: Avenues for Change

Facets of Sustainable Facilities



- ◆ Site
- ◆ Energy
- ◆ Water
- ◆ Materials and Systems
- ◆ Indoor Environmental Quality
- ◆ Project Management

Facilitated Exercises

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- ◆ The meaning of built environment sustainability
- ◆ Reactions to, benefits of, and risks of implementing sustainability
- ◆ Ease of LEED point implementation in AFRC projects

Facilitated Exercises

- ◆ Barriers to, benefits of, and next steps for implementing top-ranking LEED points
- ◆ AFRC recommended action items, benefits, required resources, and target dates
- ◆ Personal commitment input sheets, including benefits, required resources, and target dates

The Meaning of BES



- ◆ Environmentally friendly (5)
- ◆ Use of recycled materials (5)
- ◆ Durable/long life cycle (5)
- ◆ Efficient use of resources (4)
- ◆ Cost-effective (3)
- ◆ Lowest net life cycle cost (2)
- ◆ Use of recyclable materials (2)
- ◆ Long-term minimal environmental impact (2)

Implementing Sustainability: Reactions, Benefits, and Risks

- ◆ Optimism: “worth extra effort”, “good way to save energy”, “[it’s the] right thing”, “noble concept”
- ◆ Pessimism: “too idealistic”
- ◆ Realism: “higher cost a challenge”, “doable, but a lot of change”, “will encounter resistance”, “change mindsets; challenge to think broadly”, “education is key”

Implementing Sustainability: *Reactions, Benefits, and Risks*

- ◆ Economic: “cost-effective”, “decrease cost to future generations”, “save money over facility life span”, “cheaper and quicker construction”
- ◆ Social/Mission: “good publicity”, “mission improvements”, “quality of life”, “improved working conditions; productivity”, “maintain competitiveness”, “public image”, “leadership”
- ◆ Environmental: “effective resource use”, “minimum environmental impact”, “reduce waste/pollution”

Implementing Sustainability: *Reactions, Benefits, and Risks*

- ◆ Uncertainty: “will we create the next asbestos?”, “unproven technology”, “will it work?”, “no guarantee”
- ◆ Organization: “team not properly built”, “leadership support for ‘funny green ideas’”, “inadequate education; learning curves”, “perceived risk to mission”, “long term leadership”, “performance issues; dissatisfied customers”
- ◆ Resources: “material availability”, “availability of craftsmen”, “management manpower drain”, “can contractors perform?”, “cost of implementation”

LEED: Ease of Implementation

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◆ Sustainable Sites:

- Site selection (14)
- Reduce site disturbance (7)
- Reduce stormwater runoff (6)

◆ Water Efficiency:

- Water use reduction (15)
- High efficiency irrigation (14)

LEED: Ease of Implementation

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◆ Energy and Atmosphere:

- Best practice commissioning (13)
- Optimize energy performance (12)
- Measurement and verification of energy performance (12)
- Eliminate HCFCs and halons (11)

LEED: Ease of Implementation

◆ Materials and Resources:

- Building reuse (9)
- Construction waste management/recycling (8)
- Use of recycled content materials (8)
- Use of local/regional materials (8)
- Use of certified sustainably harvested lumber (8)

LEED: Ease of Implementation

A dark blue world map is visible in the background of the slide, showing the continents in a slightly lighter shade of blue.

- ◆ Indoor Environmental Quality:
 - Carbon dioxide monitoring (14)
 - Use of low-emitting materials - paints and coatings (9)
 - Controllability of systems - windows and lighting (7)

Implementing LEED:

Barriers, Benefits, and Next Steps

- ◆ Difficulty in obtaining necessary funding (13)
- ◆ Difficulty in identifying appropriate alternative materials (6)
- ◆ Potential lack of qualified AFRC personnel and/or contractors (6)
- ◆ Obtaining management buy-in for sustainable alternatives (3)
- ◆ Lack of guidance, policies, or specifications for implementing sustainable alternatives (3)

Implementing LEED: *Barriers, Benefits, and Next Steps*

- ◆ Lower costs (12)
- ◆ Reduced environmental impact (10)
- ◆ Reduced energy and water consumption (6)
- ◆ Preservation of non-renewable resources (4)
- ◆ Better quality of life (3)

Implementing LEED:

Barriers, Benefits, and Next Steps

- ◆ Additional education/training (8)
- ◆ More data, information, and research/development (5)
- ◆ Top-down management support (5)
- ◆ Changes to specifications (5)
- ◆ Additional funding (4)
- ◆ Early coordination and planning (3)
- ◆ Policy guidance/changes to current policy (3)
- ◆ Development of appropriate SOW (3)
- ◆ Matching needs with availability (3)

Barriers to Implementing Sustainability for AFRC

- ◆ Perceived economic impacts
- ◆ Regulatory and code restrictions
- ◆ Resistance to change
- ◆ Lack of necessary knowledge
- ◆ Lack of management buy-in
- ◆ Risk of failure
- ◆ Lack of appropriate measures of project success
- ◆ Project procurement processes
- ◆ Potential conflict with mission requirements

AFRC Goals and Objectives

- ◆ Establish a common vision and mission for sustainability for AFRC capital projects:
 - Draft a vision/mission statement, circulate for review, and revise as necessary
 - Revision vision/mission annually and revise to reflect new knowledge or project experience

AFRC Goals and Objectives

- ◆ Establish knowledge base:
 - Sustainable facility reference materials
 - LEED training for selected AFRC personnel
 - In-depth training on specific topics
 - Periodic refresher training for all personnel
 - Working group to champion sustainability, with the authority to audit processes/projects and make recommendations for change

AFRC Goals and Objectives

- ◆ Establish awareness of and alignment with sustainability vision/mission among *all* team members:
 - Web site/other materials to describe/explain sustainability vision and mission
 - Lunch n' learn sessions for project team and other AFRC personnel
 - Use of sustainability criteria for A/E/C selection

AFRC Goals and Objectives

- ◆ Increase the sustainability of future projects:
 - Require minimum LEED rating
 - One project/year as showcase sustainable facility with interpretive displays/other publicity
 - Shift resources/responsibilities to allow for material and technology research
 - Sustainability design review criteria + responsibility for checking compliance + contractual penalties and rewards



Discussion of Next Steps...