2008 Federal Environmental Symposium East

Selling Sustainability at Sandia Labs

June 4, 2008

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Sandia is a multiprogram laboratory operated by Sandia Corporation, a Lockheed Martin Company, for the United States Department of Energy's National Nuclear Security Administration under Contract DE-AC04-94AL85000.

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Sustainable Design at Sandia to Date

- Almost 10% of SNL/NM S.F. is already or will soon be LEED certified
- More certified buildings than any other NM entity
  - 6 LEED NC certified buildings
    - WETL, JCEL, CINT, MESA Fab,
    - MESA MicroLab & WIF
  - 2 LEED NC registered buildings (in design)
    - ESC and IBL
  - 1 LEED EB registered building

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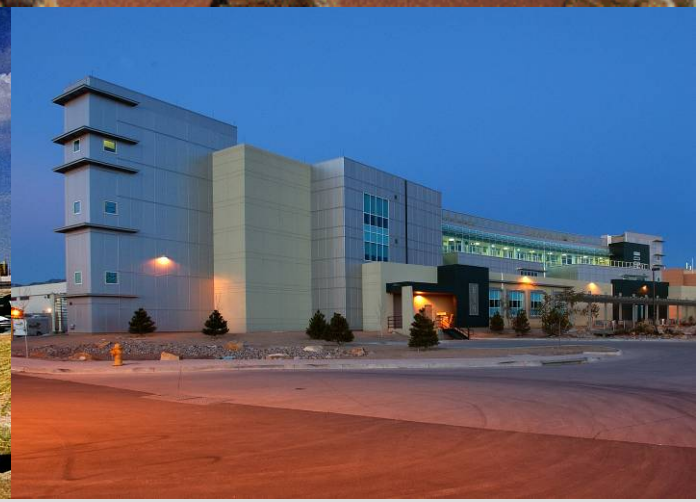
Sustainable Design Leads to Good Design



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How did it happen at Sandia?

- *Nature of the mission*
- *Points of Awareness*
- *A Collection of Advocates*
- *Seek Success and Build Upon it*
- *Team Effort*
- *Serendipity – Luck Counts*

Nature of the Mission

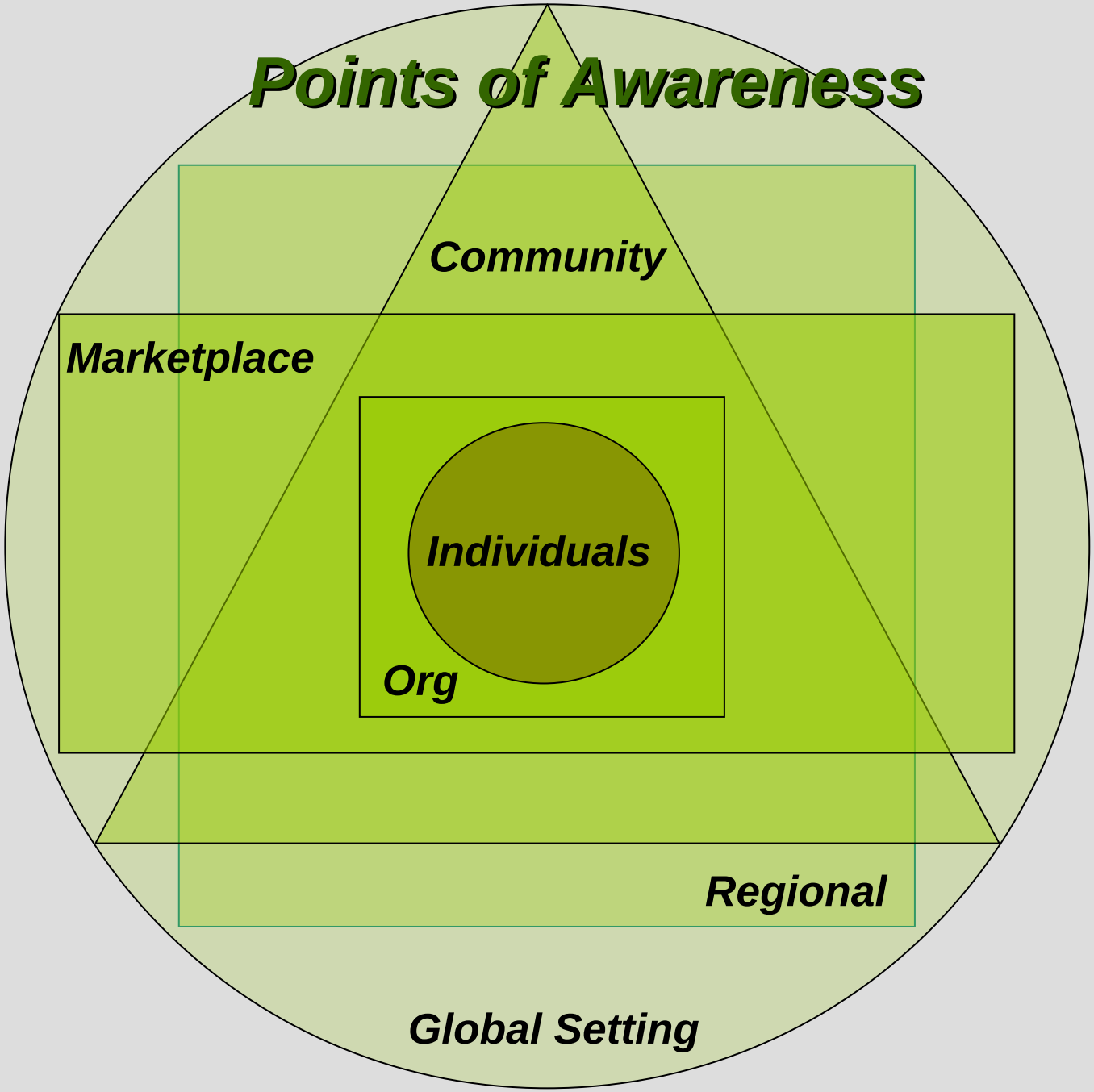
The mindset creates the opening

- The strength of Sandia's mission work is the application of engineering and science to solve complex problems in the delivery of service

- This strength lends itself to implementing sustainability because the scientists and engineers are receptive to innovation in performance

- On the flip side….Engineers are conservative by nature and sometimes need convincing

Points of Awareness



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A Collection of Advocates

- Energy Management
  - From the 70's energy crisis it became an ingrained value
- Water Conservation
  - In the West water has always been precious
- Customers
  - Performance, Awareness
- Project Management
  - DOE Orders, Exec Orders, Best Practice
- Integrated Design
  - Architects, Engineering disciplines, Consultants, and AEs
- Environmental/Pollution Prevention
  - Leaders, Guides and a bit of prodding
- Custodial services
  - Workers, Users, Facility Managers

Seek Success – Build Upon it

Getting on the Guest List

- Show and publicize success
  - One successful project leads to another
  - Awards and recognition
  - Increase advocate pool
- Define and demystify (note Workshops)
- Revise and refine project documentation
  - Becomes the template for the next project
- Revise corporate documents
  - “Green” construction specifications
  - “Green” Design Manual
  - Campus Design Guidelines

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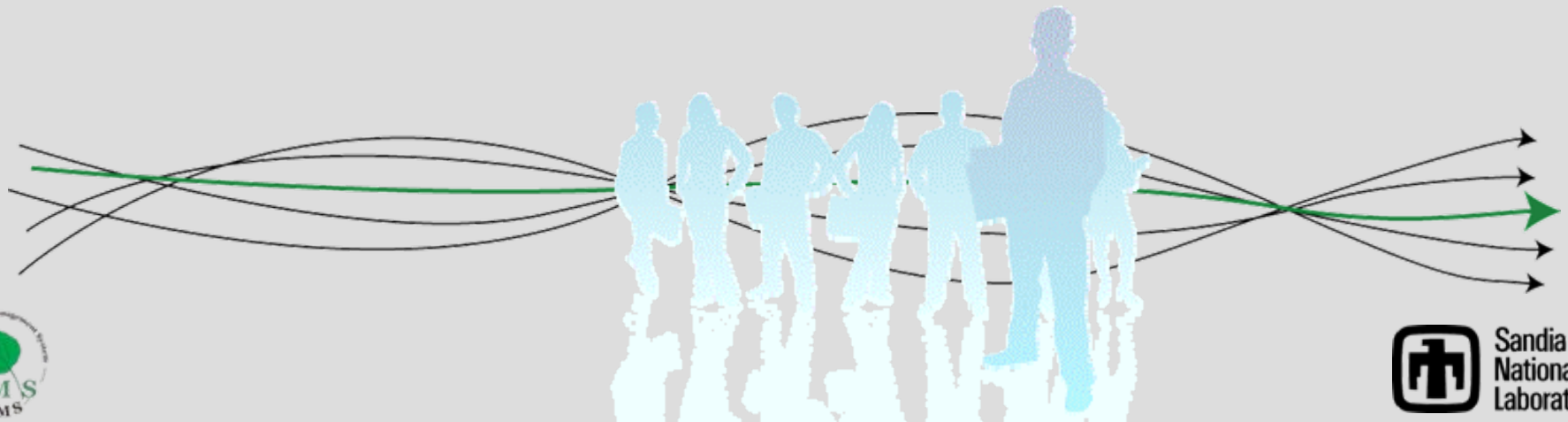
Team Effort

- Collaboration with EMS, Energy Management Team, Facilities architects and engineers and project managers, Site Planning Department, Line customers, Pollution Prevention, Custodial Services, Procurement, Consultants, AEs, and Facilities operations and maintenance



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PROJECT INVOLVEMENT

The Front Door

Most projects welcome the opportunity to incorporate sustainable design from project inception through design and execution.

It is important to have Clearly defined direction and support from DOE, SNL site management and the customer.

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PROJECT INVOLVEMENT

The Back Door

Most projects will require a less formal approach to incorporating Sustainable design goals.

- Use the drivers available
- Emphasis productivity and work force benefits
- Use the advocates
- Replicate success!
- Learn for Failures!

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Building 836 Conference Room - 1996

"You can't build with SD because it costs too much."
– We think Otherwise, and we showed them.

Wall covering

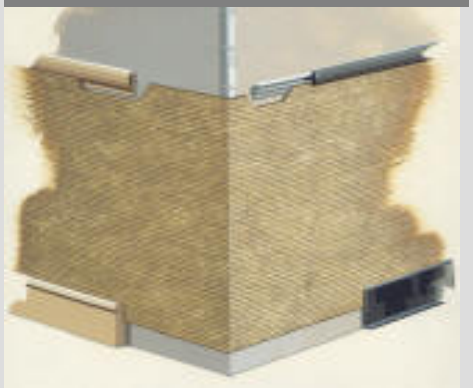
•100% natural (organic, farmed, by-products composted)

Features

Non-flammable; durable; noise reduction; diffuses reverberation; 100% recyclable

Cost

~50% savings



Ceiling Tiles

•70% recycled material; high % of water recycling

•100% recyclable; reuses 90% of scrap.

Features

high acoustical performance; ~ 90% light reflectance; superior resistance to sagging

Cost

Same

Carpet

•25% of post-consumer reclaimed fiber; backing is 100% recycled

• 75% of production waste is recycled

Features

High wear resistance; zero VOC adhesives during installation

Cost

30-40% savings

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Process Environmental Technology Laboratory

- Site Selection — Completed 2000 (Pre-LEED)
- Building Orientation
- Energy Efficient Exhaust to offset Once-Thru Air
- High Performance Building Envelope
- Daylighting
- Chilled Water Loop

Sustainable Design Leads to Good Design

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Model Validation Testing Center

- 20,000 ft.^{2} rehabilitated building that upgrades ability to monitor, analyze and view remote testing
- Performance-based, design-build contract
- Program of Requirements included an Sustainable Design section as part of the contractor selection

White House Closing the Circle Award

- Integrated SD Charrette established roadmap for SD in the project
- Whole building approach used during Schematic Design
- SD Report submittals and final SD report based on LEED template
- Established templates for many LEED credits

Did not include night sky radiation option – Be careful what you ask for
Non-LEED because of commissioning – Be careful of the details

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What Is Sustainable Design at Sandia?

Sustainable Design Defined:

Integrating building principles that use ecologically sensitive site development, environmentally preferable resources, energy efficient building systems, water conservation measures, and indoor environmental quality for the entire life-cycle of facilities and infrastructure.

DOE - HIGH PERFORMANCE AND SUSTAINABLE BUILDINGS

LEED

- ***Sites***
- ***Water Efficiency***
- ***Energy and Atmosphere***
- ***Materials and Resources***
- ***Indoor Environmental Quality***

Integrated Educational Series Approach

- Follow the LEED Green Building Rating System
- Cover each subject in 2 hour sessions, with Lunch
- Utilize and develop in-house expertise
- Each session listed targeted audience subgroups
- Three IES workshops
  - 2003 - Basic SD and LEED
  - 2004 - (More) Advance SD and LEED
  - 2006 - Lessons Learned

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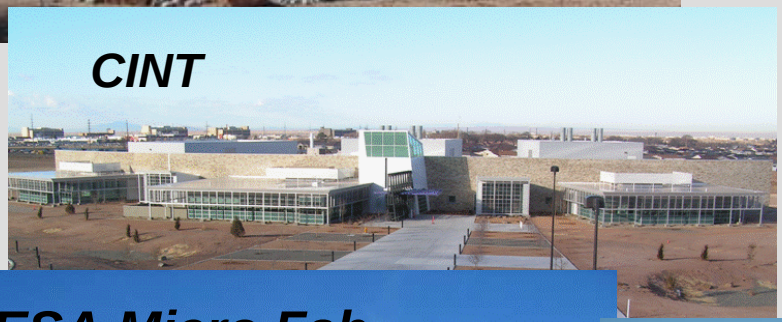
The Process for Line Item projects

- Add appropriate language in project documents (CDR, DC, RFP)
- Conduct Sustainable Design Charrette, using LEED as an ideas and evaluation tool
- Have sustainable design advocate on the review team
- Sustainable Design Report is a project deliverable
- Track progress during construction
- Submit for LEED Certification

LEED Buildings



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Sandia Small Projects

BUILDING 971
B&D/DPS

BUILDING 729
SUMMIT/SMPC

BUILDING 751
SUMMIT/SMPC

BUILDING 1090
HB/FBT

BUILDING 770
MVI/FBT

BUILDING 969
B&D/DPS

BUILDING 752
SUMMIT/SMPC

BUILDING 755
FBT/MVI

BUILDING 750
SUMMIT/SMPC

CAFETERIA
FBT/SUMMIT

BUILDING 758
B&D/DPS

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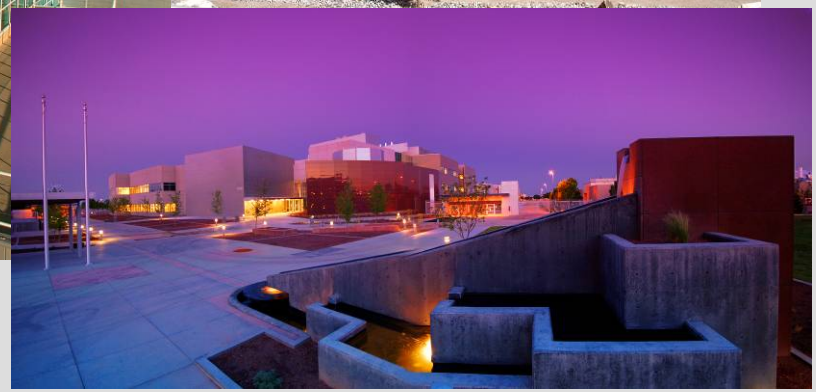
SD Approach for Small Projects

- Applies to New buildings, additions and major renovations greater than 10,000 SF. Revised Construction Specification 01000S
- Minimum requirements as stated Section 1.2 “Provide documentation of Sustainable Design for the Facility, organized according to the LEED rating categories.”
- Simplified guidance for SD reports
- Submit SD report at end of 60% design, 100% design and construction complete
- With improved knowledge and implementation, goal is to submit GPP projects for certification

Discussion



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