

# Sustainable Design at Pacific Northwest National Laboratory



Stan Jones    Jeff Pittman  
PNNL Facilities & Operations

# Project Goals

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- Expedite the implementation of sustainable design working standards for the design and construction of projects supporting the Laboratory
- Obtain input from other DOE sites
- Post recommendations on the PNNL External Website: [www.pnl.gov/conserves-energy/index.htm](http://www.pnl.gov/conserves-energy/index.htm)
- Present the program and results at a conference

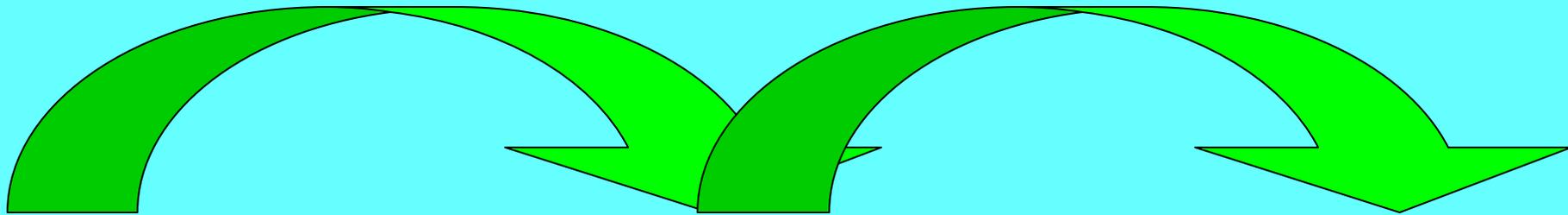
# Paradigm Shift

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"The Old Way"

"The Present Way"

"The Sustainable Way"



Basic

State  
of the Art

Sustainable

Meets Current Needs,  
Minimum First Costs

Strategic Mission Asset  
Anticipates Future Needs  
Minimum Life-Cycle Cost

Strategic Organizational  
Asset, Merges People, Planet,  
and Profit, Maximum Return  
on INVESTMENT

# Keys to Implementation

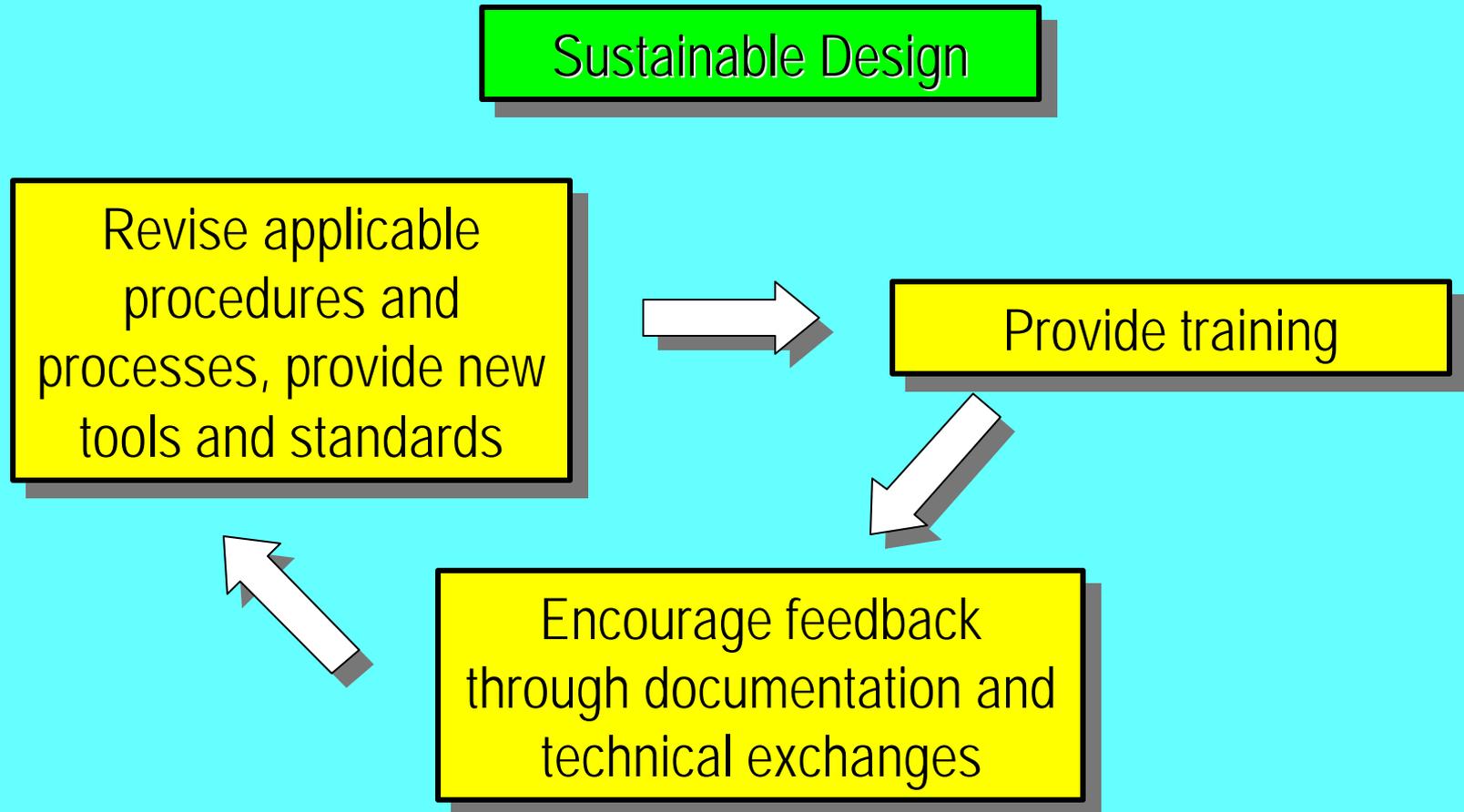
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- Management Support
- Staff Involvement
- Vision
- Planning
- Recognize previous accomplishments
- Communications and Training
- Reward and Advertise Successes



# Management Commitment

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# Project Implementation

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- Incorporate into appropriate manuals
- Include in project budget planning
- Include staff w/ knowledge of sustainable design on project team
- Provide training
- Document sustainable design process/results
- Include sustainable design expectation in contracts
- Communicate lessons learned
- Provide rewards & recognition

# Existing Processes & Procedures

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- Design & Drafting Procedure Manual
- Facility Design Manual
- Project Management Manual
- Additional administrative procedures including the Configuration Management Program

# Revised Processes & Procedures

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- Design & Drafting Procedures: Facility Design Notes
  - Template for the engineer and designer to use in creating facility design drawing notes and specifications
  - Revamped to standard CSI division format
  - Sustainable design principles inserted throughout
  - Delivered electronically to the desktop
  - Real-time updates as new information, practices, and materials become available

# Revised Processes & Procedures

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## ■ Facility Design Manual

- Establishes the requirements for engineering designs supporting the research, operations, and facilities of the Laboratory
- Sustainable design integrated into the responsibilities of the architectural/engineering design team starting with planning and continuing on through commissioning
- Section in manual devoted to Sustainable Design, link to Sustainable Design Considerations for all phases of design

# Project Implementation

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- Expedited implementation of Sustainable Design concepts at PNNL
- Computational & Analytical Sciences Building
- Project D-494, Laboratory System Upgrades



# Computational & Analytical Sciences Building

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- ~100,000 ft<sup>2</sup> laboratory/office building
- Planned occupancy in CY2004
- Performance Specifications
  - Building to be LEED™ certifiable
  - Certain LEED™ credits mandated
  - Life Cycle Cost Analysis (LCCA) and energy modeling required
  - Initial commissioning and on-going commissioning required



# Project D-494, Laboratory System Upgrades

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- Multiple facility systems including lighting, HVAC, fume hoods, etc.
- Cost Savings (Lifecycle) – against design selected base case
  - Light Sensors – (\$506)/\$605
  - Lights - \$2,703/\$12,309
  - Motors – No difference between base case and selected options

# Training and Certifications

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- LEED™ certified professionals
  - Currently two Engineering & Design Services staff are LEED™ certified
- On-going training in LEED™ and sustainable design concepts
  - Engineering & Design Services
  - Project Managers
  - Construction Managers

# Tools

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- Website
- Checklist
- LEED™
- P2-EDGE
- BEES
- BLCC
- Federal Acquisition Regulations (FARs)

# Path Forward

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- Additional training
- Lessons learned
- Maintain currency with industry standards

