Taming the Trend: How to Strategically Green Your Schools

Beth Penfield, LEED AP - Brailsford & Dunlavey
Willard Mangrum - Brailsford & Dunlavey
September 26, 2009

Taming the Trend: How to Strategically Green Your Schools

AGENDA:

- Green Schools Introduction
- LEED for Schools Review
- DCPS Case Study
- Green Charrette Activity
- Wrap Up

CEFPI & AIA

The Council of Educational Facility Planners International (CEFPI) is a Registered Provider with The American Institute of Architects Continuing Education Systems. Credit earned on completion of this program will be reported to CES Records for AIA members. Certificates of Completion for non-AIA members are available on request.

This program is registered with the AIA/CES for continuing professional education. As such, it does not include content that may be deemed or construed to be an approval or endorsement by the AIA of any material of construction or any method or manner of handling, using, distributing, or dealing in any material or product. Questions related to specific materials, methods, and services will be addressed at the conclusion of this presentation.

cefpi

Copyright Materials

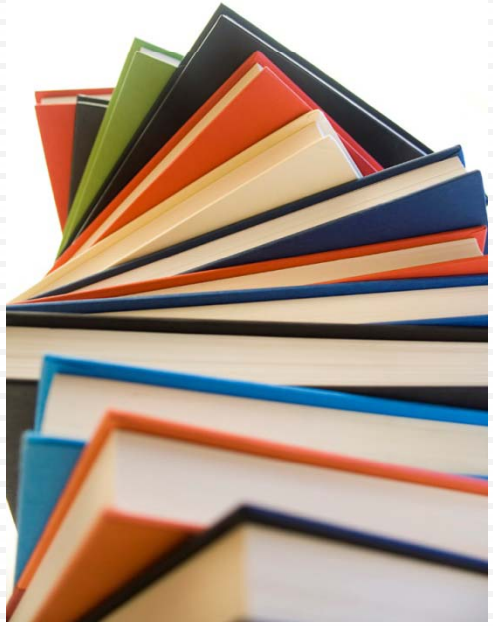
BRAILSFORD & DUNLAVEY

cefpi

Taming the Trend: How to Strategically Green Your Schools

Learning Objectives

- Better face the challenges of greening your schools through the lessons learned in the greening of the District of Columbia's Public Schools.
- Recognize the importance of systematic strategy development in implementing a green schools plan.
- Learn how to successfully engage stakeholders in sustainability prioritization.



cefpi

Green Schools

Green School – “a school building or facility that creates a healthy environment that is conducive to learning while saving energy, resources, and money.”
(USGBC 2008)

The two most important factors that make a school green: “the planning process by which the school is designed, and the standards used to construct and operate the building.”
(American Federation of Teachers 2008)

cefpi

Being strategic….

"Strategy is not a detailed plan or program of instructions; it is a unifying theme that gives coherence and direction to the actions and decisions of an individual or organization."

-Robert M. Grant *Contemporary Strategy Analysis (2005)*

It's about being proactive….

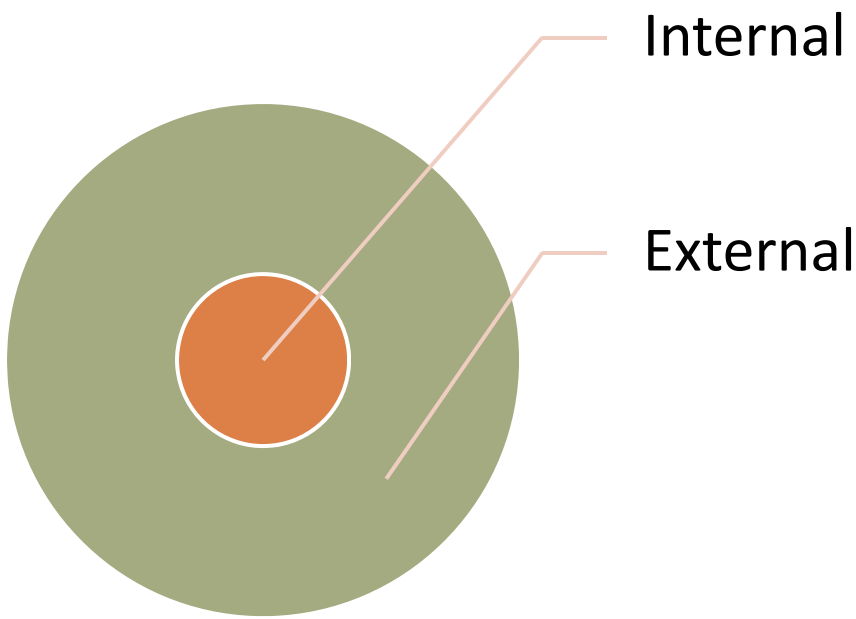
….and not reactive.

cefpi

Being successfully strategic….

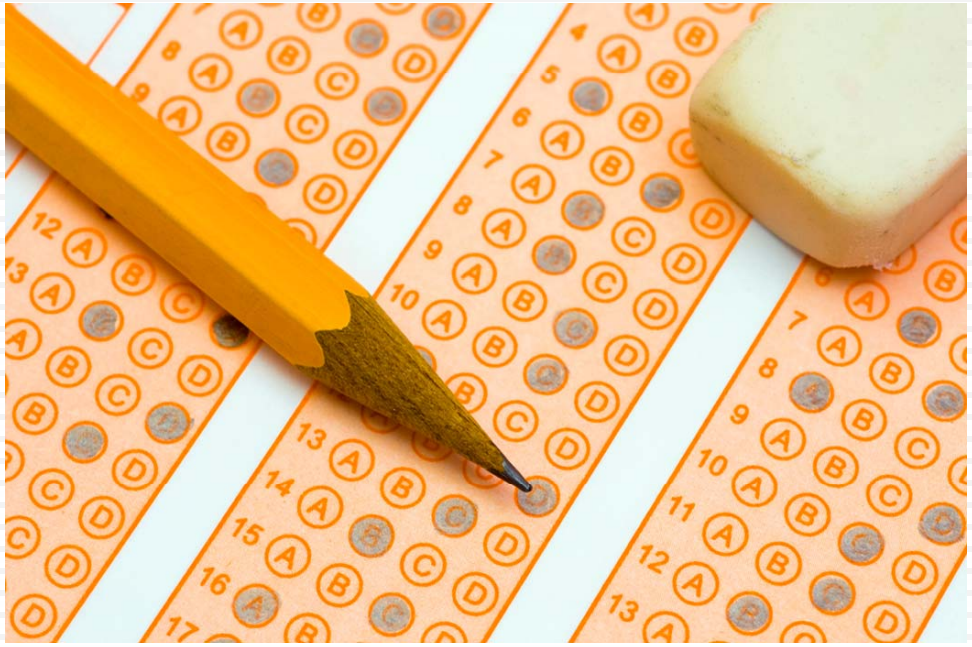
A strategy must be consistent with:

- The characteristics of the external environment
- The characteristics of the internal environment
  - Goals & values
  - Resources & capabilities
  - Structure & systems



cefpi

Green Schools Pop Quiz!



cefpi

Question:

- How many students are enrolled in K-12 in the US?
- How many teachers in the US?
- How many public schools? private schools?
- Average age of a US educational building?

cefpi

Answer:

- According US Census Bureau:
  - 56 million students enrolled this Fall
  - 7.2 million teachers in 2008
  - 98,793 public schools (06-07)
  - 28,219 private schools (07-08)

63.2 million occupants in 127,012 K-12 facilities daily

- According to a 1999 US Dept. of Ed study the average age of US school building was 40-years old and 1-in-4 schools reported at least one part of their facility to be “less than adequate”

cefpi

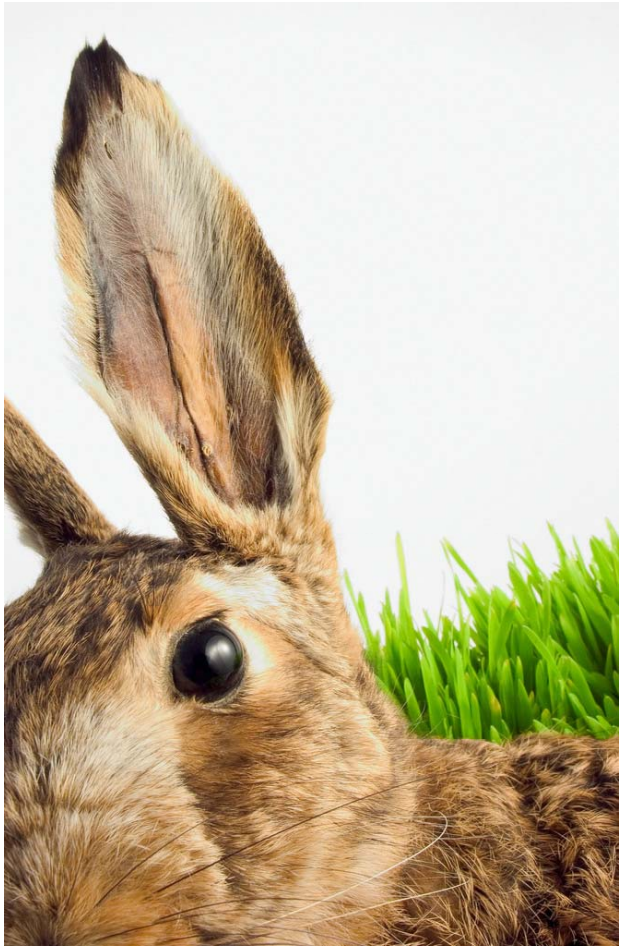
Question:

- What is the leading cause of absenteeism in the US? About how many days (total) a year?
- At what age does the developmental skill to focus on speech sounds mature?

cefpi

Answer:

- With an estimated 6 million children, Asthma accounts for mare than 14 million missed school days each year!
- The developmental skill to focus on speech sounds matures between 13 – 15 years; thus younger children require quieter and less reverberant conditions than do adults.



cefpi

Group Survey Question:

What do YOU believe are the top obstacles for building green educational facilities?

CEFPI Survey (2006)

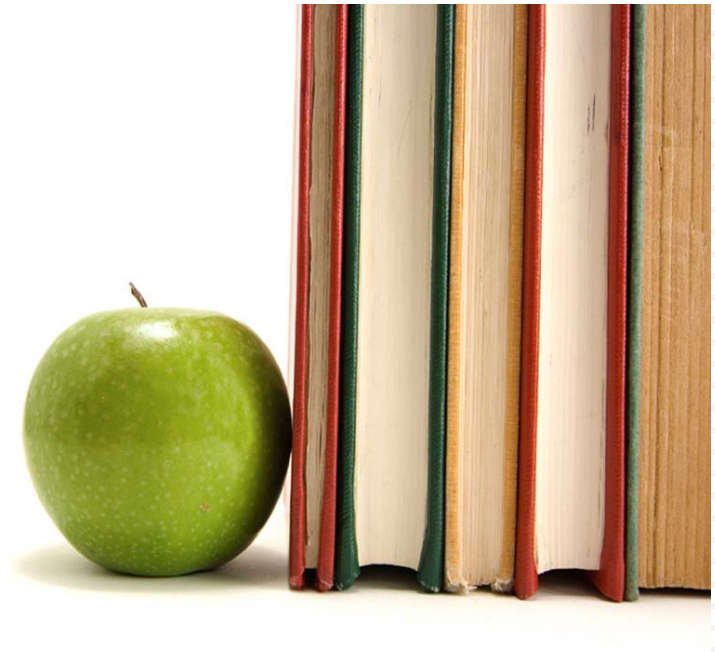
- First Costs Higher (87%)
- Cost & Time To Get Approved (60%)
- Different Budget Accounting – Capital vs Operating (45%)

Turner Construction Survey (2008)

- Cost & documentation for LEED Certification (54%)
- Higher Construction Costs (50%)
- Payback too long (50%)
- Lack of awareness of benefits (48%)
- Difficulty in quantifying benefits (43%)

cefpi

LEED® for Schools



cefpi

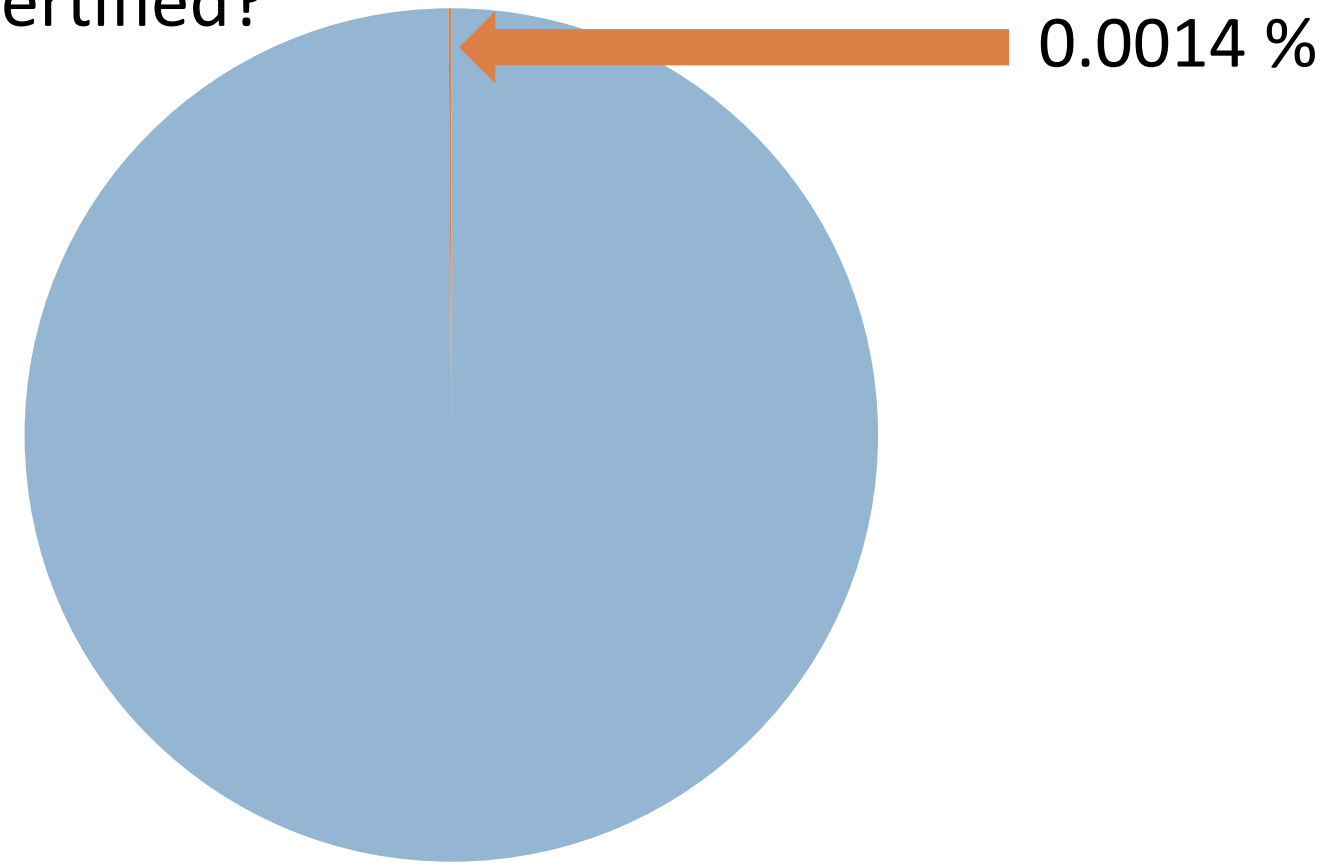
LEED® for Schools

- USGBC Green Building Rating System required for K-12 New Construction & Major Renovations
- Set of performance standards for certifying the design and construction phases of school buildings
- Intent: “to assist in the creation of high performance, healthful, durable, affordable, and environmentally sound school buildings.” (LEED-S 2007 p15)

cefpi

LEED® for Schools

- What percent of the US school building inventory is LEED certified?



cefpi

LEED® for Schools

- 11 school projects have been certified through the USGBC's LEED for Schools program.
  - (3) Certified
  - (2) Silver
  - (6) Gold
- 181 school projects have been certified through one of the USGBC's LEED programs (EB, CI, NC, S) *includes youth education/daycare
  - (63) Certified
  - (56) Silver
  - (58) Gold
  - (7) Platinum
- 841 school projects have been registered through the USGBC's LEED for Schools program.

cefpi Source: USGBC (August 1, 2009)

LEED® for Schools

Green Building Guidelines:

Prerequisites & Credits

- Sustainable Sites
- Water Efficiency
- Energy & Atmosphere
- Materials & Resources
- Indoor Environmental Quality
- Innovation in Design

cefpi

LEED® for Schools

- LEED for New Construction PLUS:
  - SS: Environmental Site Assessment, Site Master Plan, Joint Use of Facilities
  - WE: Process Water Use Reduction
  - IEQ: Minimum & Enhanced Acoustical Performance, Low-Emitting Materials: Furniture & Furnishings and Ceiling & Wall Systems, Mold Prevention

cefpi

LEED® for Schools

LEED for Schools 2007

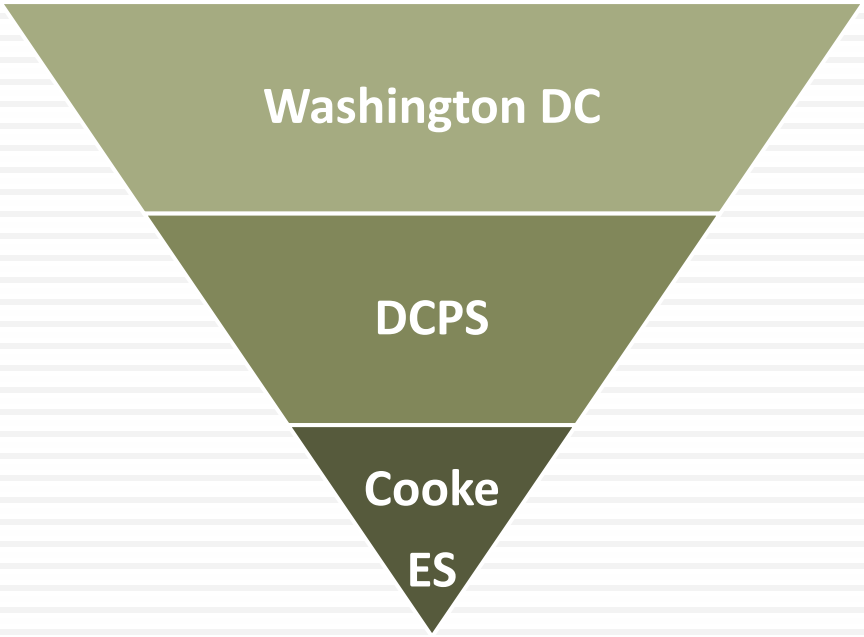
- 73 base points; 6 possible Innovation in Design points
- 9 prerequisites
  - Certified 29 – 36 points
  - Silver 37 – 43 points
  - Gold 44 – 57 points
  - Platinum 58 + points

LEED for Schools 2009

- 100 base points; 6 possible Innovation in Design & 4 Regional Priority points
- 10 prerequisites
  - Certified 40 – 49 points
  - Silver 50 – 59 points
  - Gold 60 – 79 points
  - Platinum 80+ points

cefpi

Case Study: Greening DCPS



cefpi

Greening of the District

- Legislation & Regulatory Action
  - Green Building Act of 2006 → LEED-S Silver
  - Clean & Affordable Energy Act of 2008
  - Greened Construction Code Roll Out
  - Lead Hazard Prevention and Elimination Act of 2008
  - Comprehensive Stormwater Management Enhancement Amendment Act of 2008

cefpi

Greening the District

Mayor's Green Agenda: The Mayor's government-wide agenda to create a model of urban sustainability

cefpi

Greening of the District

Green School Vision

- To provide green, healthy school buildings and schoolyards for every student in the district.
- Schools should be the focus of community-based sustainability education and awareness to prepare youth and adult learners to benefit from an increasingly green local economy.

cefpi

greendc agenda

DC Public Schools

- 50,000 + Students & Staff in DCPS facilities
- Current Inventory of 120 Facilities:
  - 62 Elementary Schools
  - 12 Middle Schools
  - 18 Senior High Schools
  - 22 PK-9 Schools
  - 6 Special Education Centers

More than 50 Million Hours Annually Spent Inside School Facilities by Students & Staff

More than 12.5 Million Square Feet to Green

cefpi

DC Public Schools

Pre - School Reform

- Turnover of Superintendents / Director of Facilities
- Lack of dedicated funding source for capital projects
- Historically plagued with mounting deferred maintenance challenges

118 out of 142 schools rated in "poor" condition or worse in 2005

cefpi

DC Public Schools

School Reform

- Summer 2007 D.C. Mayor Adrian Fenty used authority of the Public Education Reform Act of 2007
- Public Schools (DCPS) shifted away from an autonomous school board to the city government
  - → Created Office of the Chancellor & hired Michelle Rhee
  - → Created Office of Public Education Facilities Modernization (OPEFM) & hired Allen Lew

cefpi

Office of Public Education Facilities Modernization

Charged with the modernization of a system comprised of 142 school buildings

cefpi

OPEFM's Charge

- Assume management of budget exceeding $2.4 billion funding:
  - Former 10- to 15 year Capital Improvement Program,
  - An initial stabilization program to correct major life safety, environmental, and security issues
- Immediate assumption of management over capital improvement projects already initiated, exceeding $650 million in project costs

cefpi

OPEFM's Charge

- Analyze and Refine 2006 Master Facilities Plan and Capital Improvement Plan for Approval by DC Council
- Achievement of Leadership in Energy and Environmental Design (LEED) Silver certification for all Modernization projects
- Local Business Contracting Goal for CBE of 50%

cefpi

OPEFM & Greening DCPS

Hurdles & Challenges to Greening

- Lack of inclusions for LEED for Schools
- General unfamiliarity with LEED
- Large un-modernized building stock
- Unclear utility tracking

cefpi

OPEFM & Greening DCPS

- Modernizations in process without specific inclusions for LEED :
  - → Inclusion of green design elements within in progress schools
  - → Initiate changes to ensure Silver and higher certification in 6 projects

- Outdated Design Guidelines
  - → “Green” 2006 Design Guidelines – “Slam Dunk Score Card”
  - → Evaluation of alternative finishes and materials

cefpi

OPEFM & Greening DCPS

- MFP & CIP with Outdated Budgets
  - → Inclusion of Green Goals within MFP
  - → Budget re-evaluation for high performance schools
- General unfamiliarity with LEED & implications for following the guidelines
  - → Hiring and Training of PM Team & Consultants
  - → Partnership with the Office of the Chancellor, DDOE, USGBC, & Clinton Climate Initiative
  - → Implementation of pilot programs

cefpi

OPEFM & Greening DCPS

- Large un-modernized building stock
  - → Adaptive Reuse Philosophy
  - → Closing and Consolidations Then: 142 Now: 120
  - → Phased Approach
- Utility tracking
  - → Collaboration with District Agencies
  - → Consideration of

    LEED - Existing Buildings

cefpi

OPEFM & Greening DCPS

- Overall Sustainable Approach
  - High performance and safe learning environments
  - Schools as teaching tools for students, staff, & community
  - Continued review of methodologies & guidelines

cefpi

5- Minute Break

cefpi

The Greening of HD Cooke Elementary School

The Greening of HD Cooke ES

- Scope of Work: Full modernization of existing building (1909 and 1960's wing) and construction of a new addition (gymnasium, cafeteria, and food service area)
- Project Data
  - Existing Building: 64,000 SF
  - New Building: 22,000 SF
  - Total: 86,000 SF
  - Previous Enrollment: 284 PreS – 6th
  - Modernized Enrollment: 442 PreS – 5th

cefpi

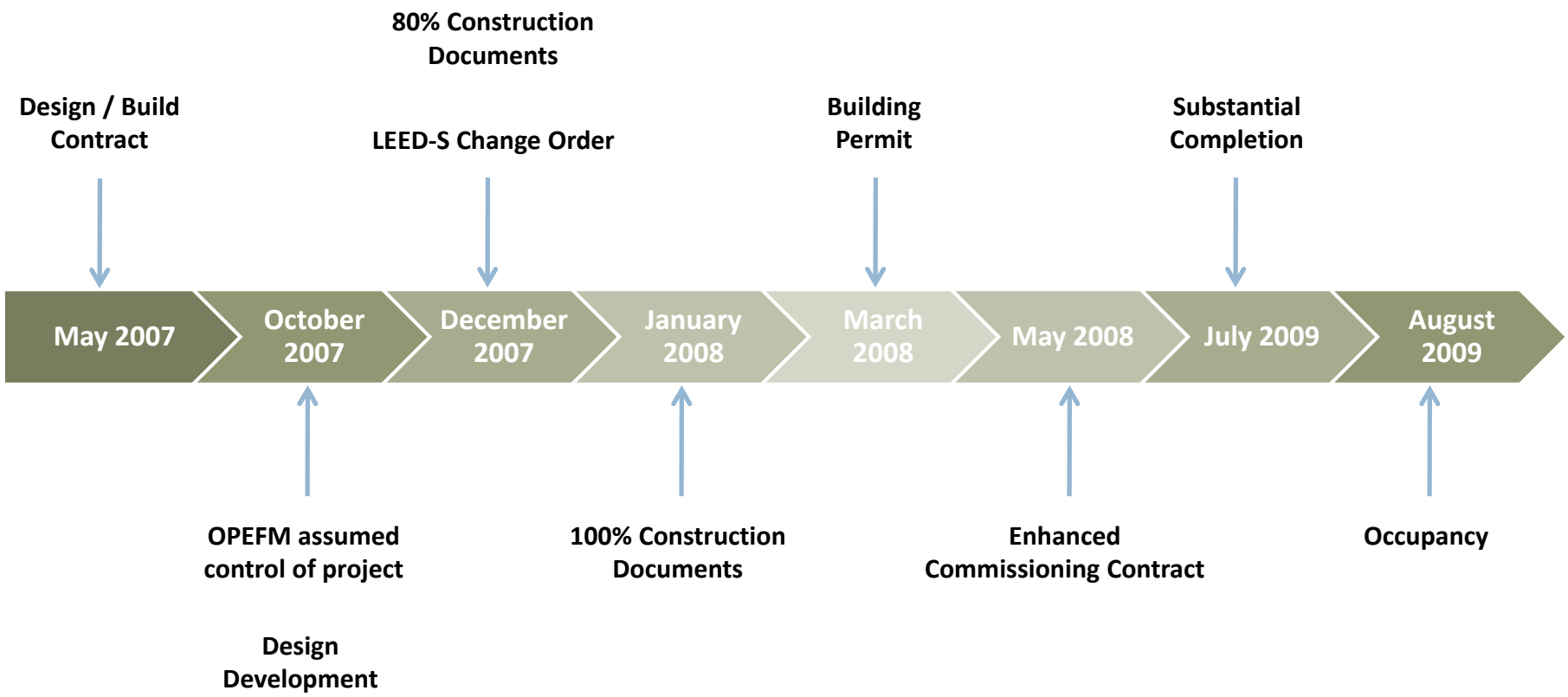
HD Cooke ES – May 2008

HD Cooke ES – August 2009

HD Cooke ES – September 2009

New Construction: Gymnasium

HD Cooke Timeline



HD Cooke Budget

- Total Budget: $35 million
  - Hard Costs: $25 million - $290 / SF
  - Soft Costs: $10 million
- LEED Change Order's: $620,500
  - 2.5% of Hard Costs:
    - LEED Third Party Consultant & Enhanced Commissioning
    - Lighting Controls, Acoustic Panels, Walk Off Mats, Bike Racks, Recycling Area Canopies, and Certified Wood
- Other Scope Change Order's: $2,000,000
  - 8% of Hard Costs:
    - Terrazzo Tile, Upgraded Rubber Flooring, New Windows

cefpi

HD Cooke & Turning LEED Mid-Design

Factors for Success

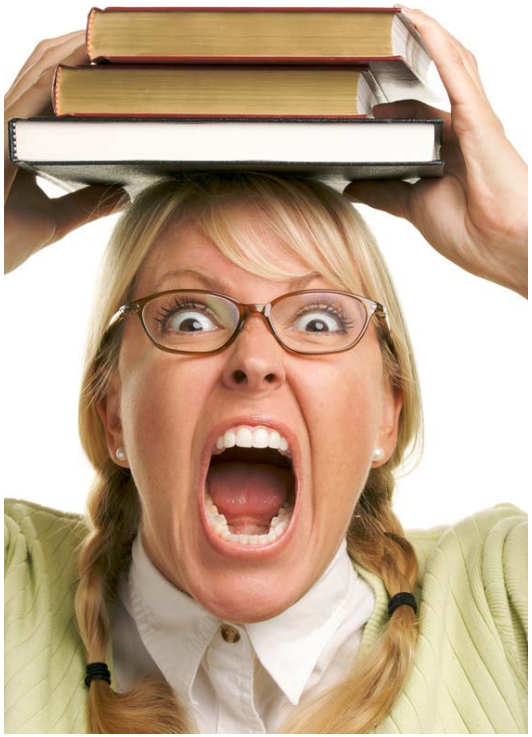
- **Responsible Design / Build Team**
  - Water Efficient Fixtures and Landscaping
  - Recycled Content and Regional Materials
  - Reuse of 95% of Existing Structure
  - Diversion of construction waste from Landfills
- **Stake Holders**
  - Community Investment & Interest
  - “Carrot” of Being One of the First LEED-S Project
  - Collegial Project Team
- **Budget Support**

cefpi

HD Cooke & Turning LEED Mid-Design

Factors Against Success

- **Administration Change Over**
  - Project as OPEFM "Guinea Pig"
  - New Principal & Restructuring School
  - No Manual or Lessons Learned to Use
- **Change Order Process**
  - Liability for Design and USGBC Review
  - Timing and Council Approval
- **Limited LEED Experience / APs**



cefpi

HD Cooke & Green Design

- **Sustainable Sites: 11 Points**
  - Site Selection, Development Density, Brownfield Redevelopment, Alternative Transportation, Stormwater Design, Joint Use of Facilities
- **Water Efficiency: 5 Points**
  - Water Efficient Landscaping, 40% Water Use Reduction
- **Energy & Atmosphere: 9 - 10 Points**
  - Fundamental & Enhanced Commissioning, 28% / 21% Energy Efficiency, Enhanced Refrigerant Management, Green Power

cefpi

HD Cooke & Green Design

- **Materials & Resources: 8 Points**
  - Recycling, 95% Building Reuse of Existing Walls, Floors & Roof, Construction Waste Management w/ >75% Diversion, >10% Recycled Content, >20% Regional Materials, Certified Wood
- **Indoor Environmental Quality: 15 – 16 Points**
  - IAQ Performance, Enhanced Acoustical Performance, Outdoor Air Delivery Monitoring, Construction IAQ Mgt Plan, Low Emitting Materials, Indoor Chemical & Pollutant Source Control, Controllability of Systems, Thermal Comfort, Daylight & Views, Mold Prevention

cefpi

HD Cooke & Green Design

- **Innovation & Design Process: 4 – 6 Points**
  - LEED Accredited Professional
  - School as a Teaching Tool
  - Innovation:
    - Exemplary Performance – Alternative Transportation
    - Exemplary Performance - 70 % Green Power
    - Exemplary Performance – 40% Regional Materials
    - Green Cleaning

Certified	29 – 36 Points
Silver	37 – 43 Points
Gold	**44 – 57 Points**
Platinum	58 – 79 Points

Cooke 52 – 56 Points
$620,500 in
Change Orders
2.5% of original GMP

cefpi

Lessons Learned:

OPEFM & HD Cooke

cefpi

Lessons Learned

1 - School as a Teaching Tool

- Issue: OPEFM cannot promise this point on behalf of DCPS
  - Do not assume everyone is open to accepting green initiatives because its “good” – competing interests exist
  - Design / LEED Consulting Team - difficulty in understanding this relationship
  - Start discussions for green curriculum early to succeed and be persistent when pursuing change

RECOMMENDATION

Creation of cross agency committee to discuss issues and keep communications open; Identify leader & decision makers; Recognize that the process is slow and buy in is important to properly manage expectations.

cefpi

Lessons Learned

2 - Contractual Relationships and Strategic Implementation

- Issue: LEED Certification implemented as change order to existing contract, thus every LEED related item is an add ($$$$)
  - Used green language in RFP process
  - Need to fully integrate into design and construction contracts
  - Set clear green goals and objectives with entire project team
  - Owner / Owner Representative knowledgeable of LEED process and building guidelines

RECOMMENDATION

Revised Contracts; LEED AP training for all Project Managers / Owner's Representatives; "Greening" of Design Guidelines for future green projects

cefpi

Lessons Learned

3 - Managing External Factors

- Issue: Absence of clear sustainability plan and dedicated leader
  - Thinking through LEED and implications for operations (i.e. new flooring materials, maintenance, etc.)
  - Donations – “Free” is not necessarily “Free”
  - Explaining a green design with the absence of “flashy” green elements

RECOMMENDATION

Design Charrettes; Clear School Improvement Team Rules; Designation of Leader / Green Clearing House for Schools; Create Sustainability Strategic Plan beyond MFP; Create Green Scopes of Work

cefpi


Questions?
A+

15- Minute Break

cefpi

Activity

I. Break into “Green Teams”
II. “Green to Greenest” Group Icebreaker
III. Green School Charrette
IV. Discussion

cefpi

“Green to Greenest” Icebreaker

- Each Green Team is given the same 8 “green” items
- Review the items together and work together to order them from “green” to “greenest” – there is no right answer!
- Report back rankings to larger group

cefpi

“Green to Greenest” Icebreaker

- Put the following items in order from (1) “green” to (8) “greenest”:

_____ Brownfield Site Redevelopment

_____ Low-Flow Fixtures

_____ Fundamental Commissioning

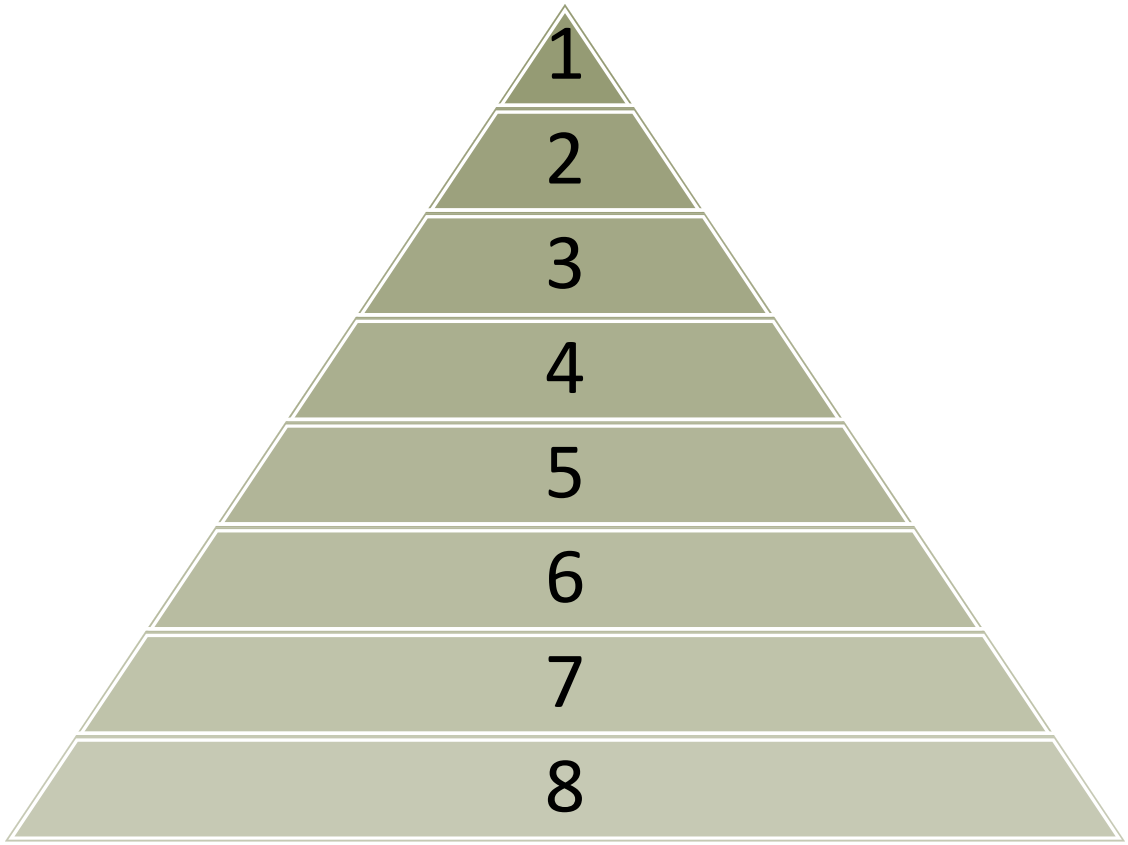
_____ Green Cleaning Program

_____ Vegetated Roof

_____ Pervious Concrete

_____ Low VOC Paint

_____ Rain Garden



cefpi

Time Remaining:

Start: 10-Minutes

cefpi

Time Remaining:

Midpoint: 5-Minutes

cefpi

Time Remaining:

Nearly Done!
2-Minutes

cefpi

Time Remaining:

Done!!
Time to Report

cefpi

Green Schools Charrette

- Remember the AFT quote - The two most important factors that make a school green: “the planning process by which the school is designed, and the standards used to construct and operate the building.”
- Same groups: Green Team
  - Now each person will have an assigned role
  - Each group works under a scenario
- Expanded list of “green” items with $$ values

cefpi

Green Schools Charrette

- Task 1: From within roles – chose a leader who the group deems the most appropriate
- Task 2: Develop a strategy / unifying theme
- Task 3: Working as a group, develop a green building program from the list of green items:
  - Requirement 1: Stay within given budget
  - Requirement 2: Act within your roles and work for your priorities
  - There is no requirement to meet a “certification” standard or particular items / categories – the group is to develop the decision making rule for item selection.
- Task 4: Report back to the larger group

cefpi

Green Team Charrette

- Scenario: Modernization of a High School in an Urban School District
- Roles:
  - **Architect:** Your firm is a leader in sustainable design and you were previously involved in a LEED-S Project that was certified at the Gold level.
  - **Principal:** You were hired two years ago and recruited specifically to help raise test scores. Your staff has a high turnover rate and the school is under enrolled.
  - **Parent:** You head up a local grass roots effort for healthy schools with a heavy focus on low impact development and healthy diets. Your children are currently enrolled in elementary and middle school.
  - **Director of Facilities:** You have been in your position for ten years and oversee 100 buildings. The average tenure of your building support and engineer staff is 30-years. Your budget is very tight and to-date, no new construction or major renovations have been certified under the LEED program.
  - **School Superintendant:** You are the figure head of the public schools and report to the city's school governing body. You have been in your position for four years. You are charged with making the schools into a safer, healthier environment while improving overall academic performance.
  - **If a 7th group member is present….**
  - **Project Manager:** You will be responsible for managing the architect and builder's contract through out the project. You must keep the project on time and on budget. You have no experience with green or LEED projects.

cefpi

Green Team Charrette

- Scenario: New construction of an Elementary School in a Suburban School District
- Roles:
  - **Architect:** Your firm is a leader in sustainable design and you were previously involved in a LEED-S Project that was certified at the Gold level.
  - **Principal:** You were hired two years ago and recruited specifically to help raise test scores. Your staff has a high turnover rate and the school is under enrolled.
  - **Parent:** You head up a local grass roots effort for healthy schools with a heavy focus on low impact development and healthy diets. Your children are currently enrolled in elementary and middle school.
  - **Director of Facilities:** You have been in your position for ten years and oversee 10 buildings. The average tenure of your building support and engineer staff is 30-years. Your budget is very tight and to-date, no new construction or major renovations have been certified under the LEED program.
  - **School Superintendant:** You are the figure head of the public schools and report to the city's school governing body. You have been in your position for four years. You are charged with making the schools into a safer, healthier environment while improving overall academic performance.
  - **If a 7th group member is present….**
  - **Project Manager:** You will be responsible for managing the architect and builder's contract through out the project. You must keep the project on time and on budget. You have no experience with green or LEED projects.

cefpi

Green Team Charrette

- Overall Strategy / Unifying Theme:
  - Goals & Values:
  - Resources & Capabilities:
  - Structure & Systems:

cefpi

Green Team Charrette

- Green Team Notes:

Time Remaining:

Start: 20-Minutes

cefpi

Time Remaining:

15-Minutes

cefpi

Time Remaining:

10-Minutes

cefpi

Time Remaining:

8-Minutes

cefpi

Time Remaining:

5-Minutes

cefpi

Time Remaining:

4-Minutes

cefpi

Time Remaining:

3-Minutes

cefpi

Time Remaining:

2-Minutes

cefpi

Time Remaining:

1-Minutes

cefpi

Time Remaining:

Done!!

cefpi

Green Team Reports:

- Scenario 1 vs. Scenario 2: Urban School District
- Scenario 3 vs. Scenario 4: Suburban School District
  - Each read your mission statements
  - Were your selected leaders different?
  - What items were selected? How many were the same?
  - Does your end result match your mission statement?
  - Having completed the exercise – would you change your mission statement?
  - Other interesting points from the group interaction?

cefpi


Questions?
A+


Thank you
for attending
A+