

Saving Green

The Case for Sustainable Design



Oct 14th 2008

Jennifer Zirkle

jzirkle@facilityplanners.com

Kim Martin

kmartin@facilityplanners.com



BRAILSFORD & DUNLAVEY

NIRSA Facilities 2008

Presentation Agenda

Overview

Financial Planning

LEED On-Campus

Case Studies

Implementation



Overview

Learning Objectives

1. Obtain an understanding of green design and resources, including the LEED™ Accreditation System
2. Discuss and learn about creative sustainable practice opportunities
3. Learn ways to improve recreational sports facilities and operations on your campus



Overview

Who We Are

Experience – Over 250 University Projects Planned

Focus – “Quality of Life” Projects

Student Centers

Student Housing

Sports and Recreation Facilities – more than 150 assignments

Services – Concept Development => Implementation Support

Staff – Interdisciplinary/Broadly Experienced/Cross Trained

Leadership – Industry Standards / Disseminators of Ideas



Overview

Meet the Presenters

- **Jennifer Zirkle**

- Project Analyst with Brailsford & Dunlavey
- LEED Specialist
- Recreation Center Specialist

- **Kim Martin**

- Associate with Brailsford & Dunlavey
- University Recreation Background
- Feasibility & Marketing Specialist



Overview

What is Green Design?

Design and construction practices that significantly reduce or eliminate the negative impact of buildings on the environment and occupants in five broad areas:

- ✓ Sustainable Site Planning
- ✓ Safeguarding Water & Water Efficiency
- ✓ Energy Efficiency & Renewable Energy
- ✓ Conservation of Materials & Resources
- ✓ Indoor Environmental Quality



What is the LEED System?

LEADERSHIP in ENERGY and ENVIRONMENTAL DESIGN

A leading-edge system for certifying DESIGN, CONSTRUCTION, & OPERATIONS of the greenest buildings in the world

Scores are tallied for different aspects of efficiency and design in appropriate categories.

For instance, LEED assesses in detail:

1. Site Planning
2. Water Management
3. Energy Management
4. Material Use
5. Indoor Environmental Air Quality
6. Innovation & Design Process

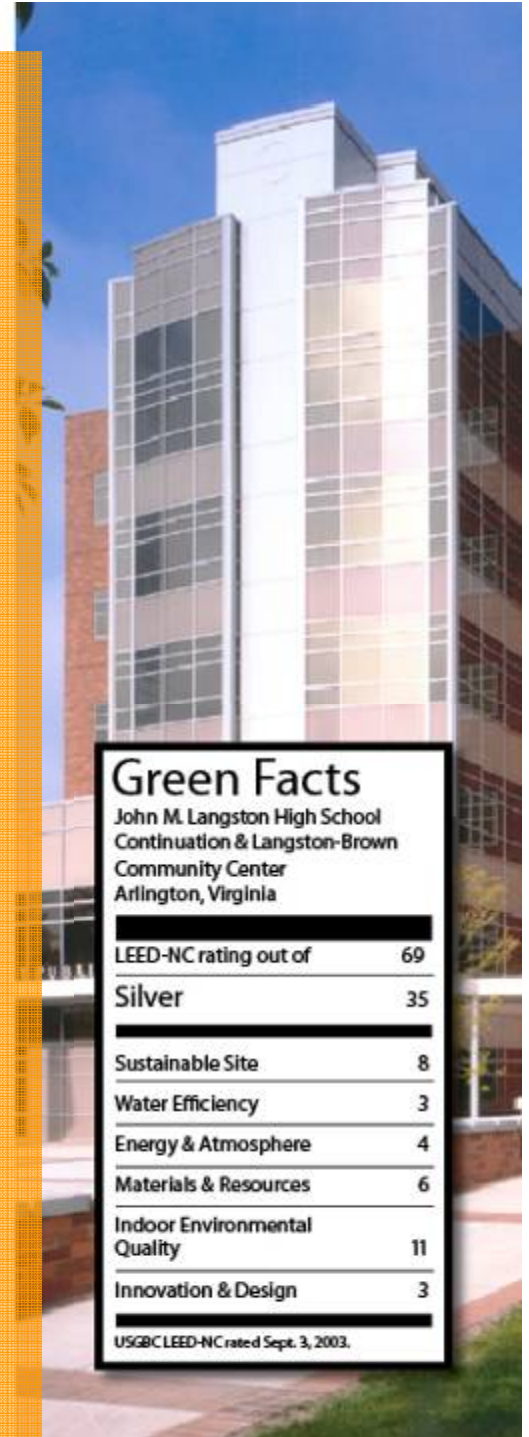


Green Facts

John M. Langston High School
Continuation & Langston-Brown
Community Center
Arlington, Virginia

LEED-NC rating out of	69
Silver	35
Sustainable Site	8
Water Efficiency	3
Energy & Atmosphere	4
Materials & Resources	6
Indoor Environmental Quality	11
Innovation & Design	3

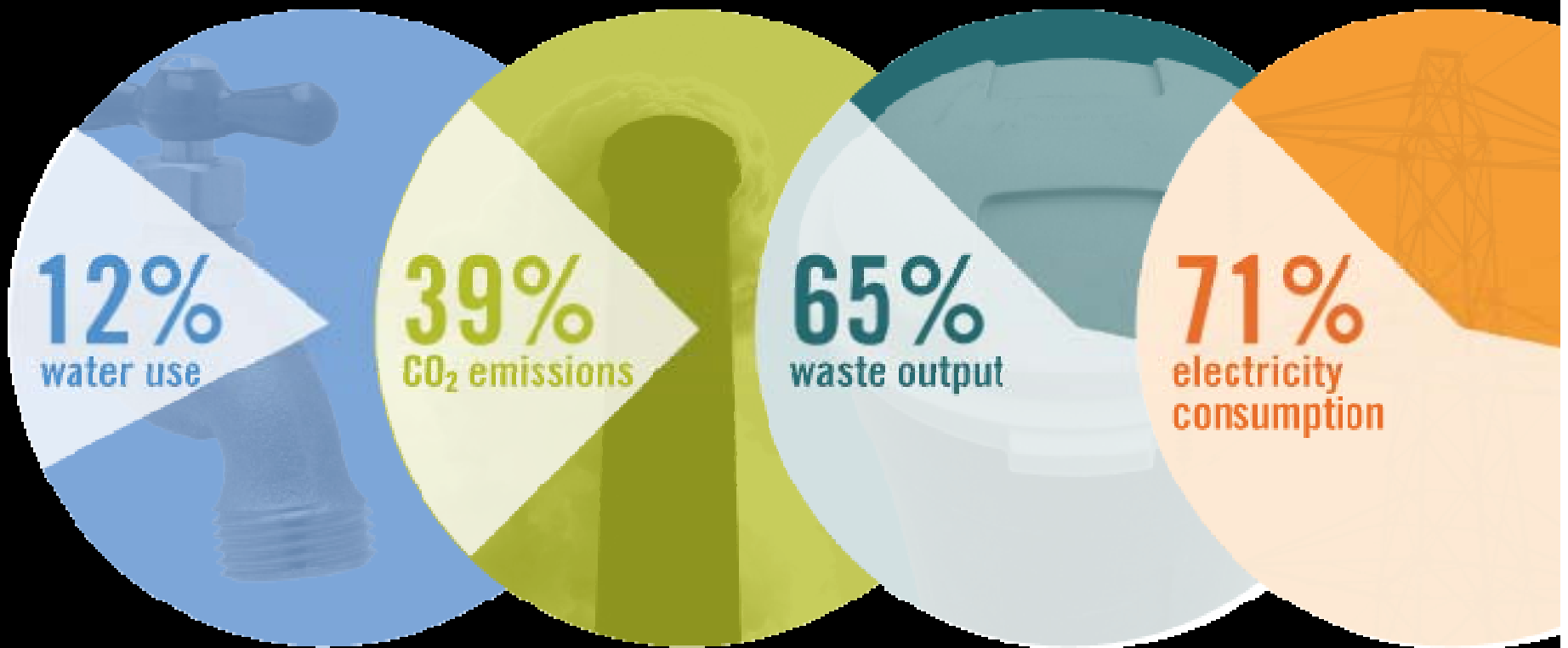
USGBC LEED-NC rated Sept. 3, 2003.



USGBC has four levels of LEED:



U.S. Building Impacts:



**ENERGY
USE**

30-50%

**CARBON
EMISSIONS**

35%

**WATER
USE**

40%

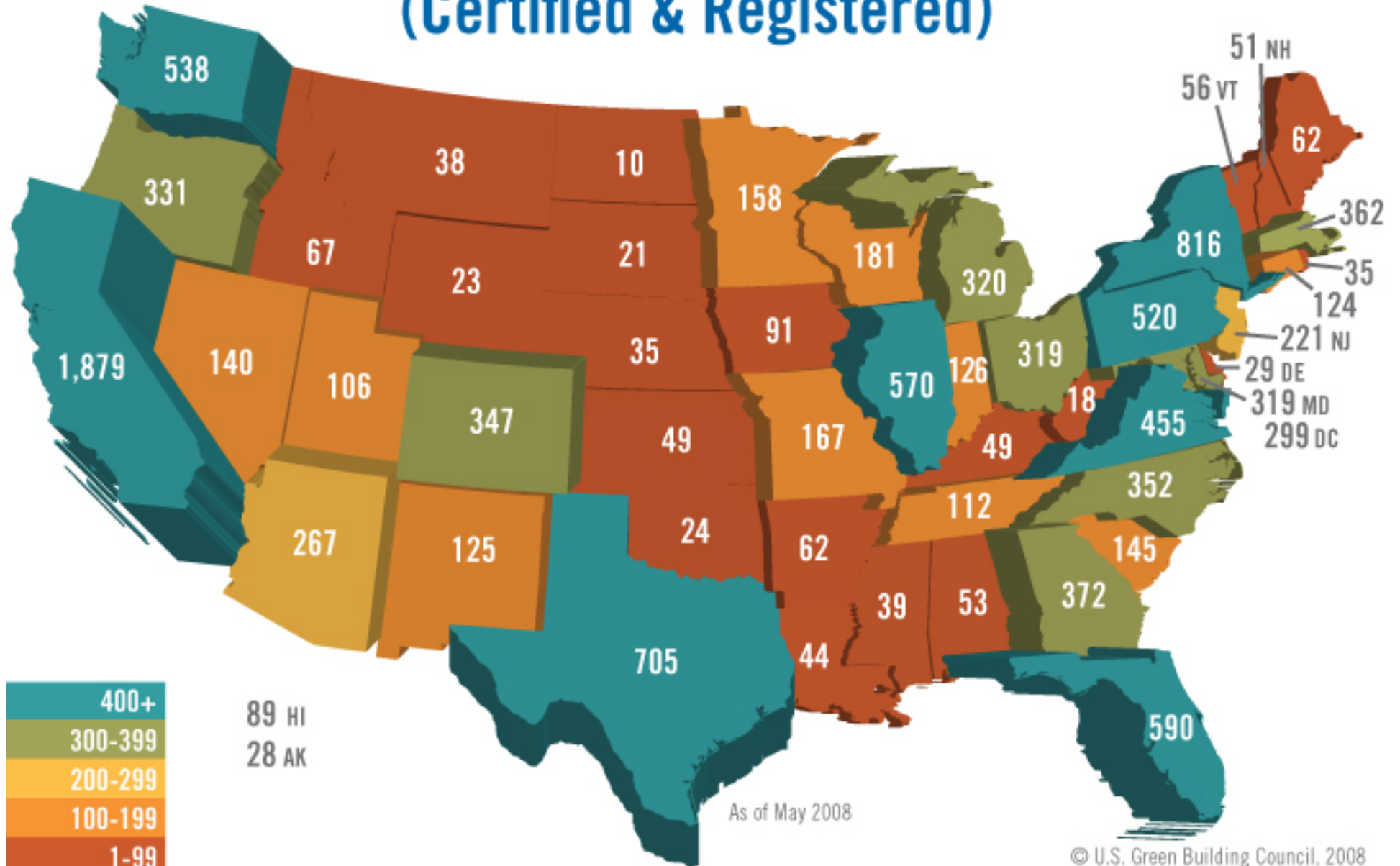
**SOLID
WASTE**

70%

Average Savings of Green Buildings



Commercial LEED Projects by State (Certified & Registered)



Presentation Agenda

Overview

Financial Planning

LEED On-Campus

Case Studies

Implementation



Financial Planning

By the Numbers – Capital Cost Premiums by Level

	USGBC	B&D
Certified	0.66%	2%
Silver	2.11%	4%
Gold	1.82%	6%
Platinum	6.50%	10%

* Sources: USGBC



Financial Planning

By the Numbers – Operational Cost Savings

	Energy	Water	B&D
Certified	31%	22%	25%
Silver	36%	27%	30%
Gold	37%	42%	35%
Platinum	NP	NP	40%

* Sources: Green Building Smart Market Report & Greening America's Schools



Financial Planning

By the Numbers – Student Fee Premiums by Level

<u>Estimated Target</u>		<u>Cost per SF Increase</u>	<u>Utility Savings</u>	<u>Student Fee</u>
Silver				\$160
Certified	26 to 32 points	2.00%	25%	\$160
Silver	33 to 38 points	4.00%	30%	\$162
Gold	39 to 51 points	6.00%	35%	\$165
Platinum	52 to 69 points	10.00%	40%	\$170

Impact Summary

123,850	Gross Square Feet of Project
Yes	Seeking LEED Certification?
\$6,200	Registration and Review Fees
1.0%	Materials / Systems Testing and Verification (% of construction cost)
\$314,000	Registration, Testing, and Verification Allowance
Construction Cost	
4.00%	Construction Cost - Estimated Increase per Square Foot
Utilities	
30.00%	Electricity, Water, Gas, etc. - Estimated Savings per Square Foot

* Sources: USGBC & Greening America's Schools



Presentation Agenda

2003	2004
4,276,384	4,447,439
1,428,000	1,485,120
122,182	127,070
40,800	42,432
42,835	44,458
1,428,000	1,485,120



Overview

Financial Planning

LEED On-Campus

Case Studies

Implementation



LEED On-Campus

On the Way to Green...

At least 35 colleges and universities have adopted LEED initiatives, including:

- Arizona State University
- Ball State University
- Clemson University
- Duke University
- University of Vermont

Ball State, Duke & UVM require all new construction & renovation to attain certified status.

ASU & Clemson have set goals for Silver certification for all new construction.



LEED On-Campus

On the Way to Green...

New Positions are Springing up...

- ✓ Kennesaw State appointed a new Director for Sustainability in September 2008
- ✓ Iowa State is currently searching for the new position of Director of Sustainability Programs
- ✓ Portland State is searching for a Director for their Center for Sustainable Processes and Practices



LEED On-Campus

Campus Sustainability Leaders

Arizona State University
Bates College
Bowdoin College
Carnegie Mellon University
Dickinson College
Duke University
Harvard University
Middlebury College
MIT
Northeastern University
Oberlin College
Oregon State University

Pennsylvania State University
Santa Clara University
University of California
University of Colorado
University of Florida
University of Michigan
University of New Hampshire
University of North Carolina
University of Oregon
University of Vermont
University of Washington
Yale University

* Source: College Sustainability Report Card 2008 by the Sustainable Endowments Institute



LEED On-Campus

LEED Point System – High Points

- Site Selection
- Alternative Transportation – Public Transportation Access
- Alternative Transportation – Bike Storage & Changing Rooms
- LEED Accredited Professional
- Low Emitting Materials (Adhesives & Sealants)
- Local / Regional Materials (20% Manufactured)
- Water Efficient Management (Reduce by 50%)
- Construction Waste Management (Divert 50%)
- Recycled Content (10%)
- Low Emitting Materials (Carpet)
- Indoor Chemical & Pollutant Source Control



Presentation Agenda

2003	2004
4,276,384	4,447,439
1,428,000	1,485,120
122,182	127,070
40,800	42,432
42,835	44,458
1,428,000	1,485,120



Overview

Financial Planning

LEED On-Campus

Case Studies

Implementation



Case Studies – University of Maine

Level:	Silver
Opened:	2007
Architect:	Cannon
Total Sf:	87,000
Enrollment:	11,912
Sf per Student:	7 sf
Total Cost:	\$25 mil.
Cost per Sf:	\$287
Student Fee:	\$90 / Semester

Key Features:

- Recycled & Local Materials
- 90% of Spaces have Views to Outdoors
- Low VOC-emitting Paints
- Low-flow plumbing fixtures

- ❖ 2008 NIRSA Outstanding Sports Facility Award
- ❖ 2008 Athletic Business Magazine Architectural Showcase Recipient



Case Studies – Haverford College

Level:	Gold
Opened:	2005
Architect:	Bohlin Cywinski Jackson
Total Sf:	92,000
Enrollment:	1,168
Sf per Student:	79 sf *
Total Cost:	\$26 mil.
Cost per Sf:	\$282
Student Fee:	\$175 / Semester



Key Features:

- 40% Optimal Energy Performance
- 90% Daylight & Views
- 75% of Construction Waste Diverted
- 30% Reduction in Water Use

- ❖ 2006 Mid-Atlantic Construction Magazine Award of Merit
- ❖ 2006 Athletic Business Magazine Architectural Showcase

* Facility shared with Athletics and Bryn Mawr Students (1,500 students)



Case Studies – Western Washington University

Level:	Silver
Opened:	2003
Architect:	Opsis
Total Sf:	100,000 sf
Enrollment:	12,979
Sf per Student:	8 sf
Total Cost:	\$26 mil
Cost per Sf:	\$260
Student Fee:	\$80 / Quarter

Key Features:

- Green Housekeeping Techniques
- Multi-modal Public Transportation Access
- Use of Facility for Community Education on Sustainable Design

❖ 2004 NIRSA Outstanding Sports Facility Award



Case Studies – University of Cincinnati

Level:	Certified
Opened:	2006
Architect:	Morphosis
Total Sf:	350,000sf
Enrollment:	37,000
Sf per Student:	9 sf
Total Cost:	\$113 mil
Cost per Sf:	\$323
Student Fee:	\$147 / Semester

Key Features:

- 35 Skylights
- 30% Recycled Materials
- Rainwater Collection System
- Reflective Roofing to Decrease Heat Island Effect

- ❖ 2007 Recreation Management Magazine Innovative Architecture & Design Award
- ❖ 2007 American School & University Magazine Outstanding Design Award



Case Studies – College of William & Mary

Level:	Certified
Opened:	2006
Architect:	Hastings & Chivetta and Moseley
Total Sf:	94,450sf
Enrollment:	7,625
Sf per Student:	12 sf
Total Cost:	\$10 mil
Cost per Sf:	\$ 106 *
Student Fee:	\$105 / Semester



Key Features:

- Water Efficient Plumbing Fixtures
- Access to Alternative Transportation
- Composite Wood Materials
- 24% Local & Regional Materials

❖ 2008 NIRSA Outstanding Sports Facility Award

* 55,000 sf renovated with a 39,450 sf addition



Case Studies – Cleveland State University

Level:	Certified
Opened:	2006
Architect:	Sasaki
Total Sf:	130,000 sf
Enrollment:	16,000
Sf per Student:	8 sf
Total Cost:	\$30 mil.
Cost per Sf:	\$280
Student Fee:	\$ 84 / Semester

Key Features:

- Recycled and Local Materials
- Rooftop Garden / Green Roof
- Captured Rainwater Used for Irrigation

❖ 2007 & 2008 Athletic Business Magazine Architectural Showcase



Case Studies – Longwood University

Level: Gold
Opened: 2006
Architect: Hastings & Chivetta and Moseley
Total Sf: 75,000 sf
Enrollment: 4,700
Sf per Student: 16 sf
Total Cost: \$ 13.5 mil
Cost per Sf: \$ 180
Student Fee: \$ 90 / Semester

Key Features:

- Energy Cost Savings of \$60k / year
- Waterless Urinals & Low-flow Showers
- 98% Waste Diverted
- Recycled Building Materials



Case Studies – Cal Poly - Pomona

Exterior Sustainable Design Features

- Integrated translucent PV (Photovoltaic) panels diffuse light
- High Albedo roof
- Extensive glazing w/ shading devices & overhangs oriented south & east
- Natural ventilation/ Automated operable windows
- North facing skylight minimizes daytime lighting required
- Reuse of existing Building
- Sediment retention garden
- Green roof to reduce storm water run-off & heat gain
- Earth-berm to reduce HVAC loads
- Permeable paving
- Solar orientation

Sustainable Features

Solar orientation

- Bike racks for alternate means of transportation
- Sediment retention swale gardens
- Green roof areas to reduce runoff and heat gain
- Light pollution reduction
- Permeable paving areas
- Reduced heat island effect

Water Efficiency

- Drought tolerant landscaping
- Low flow plumbing fixtures
- Waterless urinals
- Sensor faucets
- Gray water for irrigation

Energy & Atmosphere

- Minimize greenhouse gas emissions
- High albedo (diffused reflectivity) roof to reduce building heat gain
- Earth berms to reduce HVAC load
- High performance mechanical systems
- Enhanced refrigerant management
- Energy efficient lighting
- Motion sensors and photo sensors
- Green power such as solar collectors
- Building commissioning

Materials & Resources

- Reuse of existing building – Darlene May Gym
- Construction waste recycling
- Recycling containers and program
- Recycled content materials such as carpet, track surface, furniture, concrete, rebar, etc.
- Recyclable materials
- Regional materials

Indoor Environmental Quality

- Natural ventilation in some areas
- Low VOC (Volatile Organic Compound) content materials
- Extensive use of daylighting
- Sunshades and overhangs
- Views to exterior
- Energy system controls

REC CENTER 2012 **Your Window to A Better future**



Case Studies – Cal Poly - Pomona



Case Studies – Cal Poly - Pomona



Presentation Agenda

Overview

Financial Planning

LEED On-Campus

Case Studies

Implementation

2003	2004
4,276,384	4,447,439
1,428,000	1,485,120
122,182	127,070
40,800	42,432
42,835	44,458
1,428,000	1,485,120



Implementation

Things To Do Today

Indoor Facilities

- ✓ Install dimmer controls to existing lighting
- ✓ Replace incandescent light fixtures and bulbs with compact florescent
- ✓ Use ECO-friendly cleaning supplies
- ✓ Provide recycling bins for plastic bottles, newspapers etc.
- ✓ Print double-sided copies to save paper
- ✓ Develop policies to decrease printing by working electronically-only
- ✓ Purchase office supplies comprised of recycled materials
- ✓ Do full loads of laundry & use cold water
- ✓ For staff, switch to fair trade coffee and re-usable mugs, rather than paper cups
- ✓ Encourage users to switch from plastic bottles to re-usable bottles



Implementation

Things To Do Today

Outdoor Facilities

- ✓ Install dimmer controls to existing lighting
- ✓ Replace incandescent light fixtures and bulbs with compact florescent
- ✓ Provide recycling bins for plastic bottles, newspapers etc.
- ✓ Develop policies to encourage staff to carpool, bike or walk to work
- ✓ Use systems to gather rainwater to use for landscaping, fields, etc.



Implementation

Things To Do in the Future

Upgrades, Renovations or New Facilities

- ✓Purchase furniture that is formaldehyde free
- ✓Install ceiling fans to minimize AC use
- ✓Replace showerheads, faucets and toilets with low-flow fixtures
- ✓Purchase local & regionally made materials
- ✓Use recycled materials wherever possible
- ✓Use low-emitting materials for carpet, paints, composite wood & adhesives
- ✓Landscape with native plants
- ✓When purchasing any vehicles, consider a hybrid



Implementation

Campus Sustainability Day

Created by Society for College & University Planning

- Over 300 Colleges & Universities Participate
- Sample Events:
 - ✓ Exhibit Hall with Info, Giveaways and Games
 - ✓ Lectures, Webcasts & Presentations from Experts
 - ✓ Local Farmer's Market on Campus
 - ✓ Gardening & Landscaping Activities



For more info on: <http://www.scup.org/csd>



Do It Today

Resources

Association for the Advancement of Sustainability in Higher Education (AASHE) www.aashe.org

Coalition of High Performance Schools (CHPS) www.CHPS.NET

GREENGUARD environmental institute www.greenguard.org

US Green Building Council <http://www.usgbc.org>

GREENBUILD <http://www.greenbuildexpo.org>



Do It Today

Resources

The College Sustainability Report Card

www.greenreportcard.org

Smart & Sustainable Campus Conference (SCUP)

www.scup.org/profdev/sustainability/2007/epa_ssc.html

The Sustainable Campus

www.sustainablecampus.org

Higher Education Associations Sustainability Consortium (HEASC)

<http://www.aashe.org/heasc/index.php>



Saving Green

The Case for Sustainable Design



Oct 14th 2008

Jennifer Zirkle

jzirkle@facilityplanners.com

Kim Martin

kmartin@facilityplanners.com



BRAILSFORD & DUNLAVEY

NIRSA Facilities 2008