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# Intro to Green Building, USGBC & the LEED™ Rating System

with the USGBC-CF's

**Kyle Abney – Hoar Construction, LLC**





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## Agenda

Defining a **Green** Building

Benefits of **Green** Building

Costs of **Green** Building

The USGBC

LEED™



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***Kyle Abney***

**HOAR**  
CONSTRUCTION

### ***Education***

- Bachelor of Design, University of Florida
- Master of Building Construction, Concentration in Sustainable Construction, University of Florida

### ***Affiliations***

- U.S. Green Building Council – National: Chapter Regionalization Task Force
- U.S. Green Building Council – Central Florida: Board Member & Current Treasurer
- U.S. Green Building – University of Florida Student Chapter: Founding President



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# Environmental Impact of Buildings\*

- 65.2% of total U.S. electricity consumption
- > 36% of total U.S. primary energy use
- 30% of total U.S. greenhouse gas emissions
- 136 million tons of construction and demolition waste in the U.S. (approx. 2.8 lbs/person/day)
- 12% of potable water in the U.S.
- 40% (3 billion tons annually) of raw materials use globally

\* Commercial and residential



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# A *Green* Building is a:

High Performance Building

- Energy & Water Efficient
- Longer Life Cycle

Healthy Building

- Lower VOCs; Cleaner Air

Responsible Building

- Environmentally & Socially





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Which one is the **Green** building?

A



B



C



D



**ALL OF  
THEM  
ARE  
GREEN!**



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# Benefits of *Green* Building

## *Economic Benefits*

- Energy savings
- Water savings
- Daylighting – increase sales 40%
- Improve productivity, reduce absenteeism and turnover (savings here have been shown to exceed the entire energy bill)

## *Community Benefits*

- Reduce strain on infrastructure (if we can be more water efficient – can we avoid millions of dollars for a new treatment plant?)





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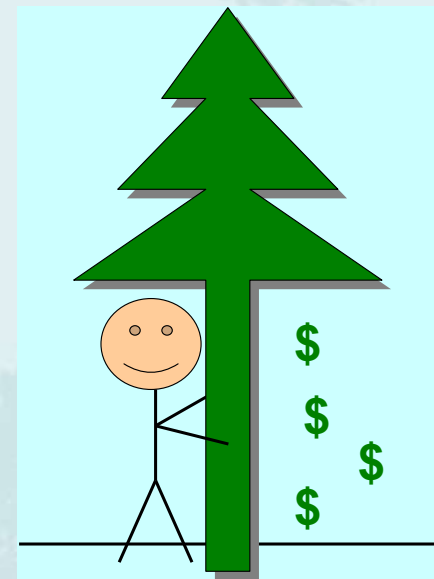
## Benefits of **Green** Building

### ***Environmental Benefits - Reduce the Impacts of Natural Resource Consumption***

- Fossil Fuels
- Aquifers
- Landfills

### ***Health and Safety Benefits - Indoor Environmental Quality***

- Daylighting – increase test scores
- Occupant Comfort
- Ventilation Effectiveness
- Non-toxic building materials







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# Costs of **Green** Building

## ***"Costing Green: A Comprehensive Cost Database and Budgeting Methodology"***

- Less than 2% additional costs for LEED™ silver in a similar climate (Houston)

## ***Eugene M. & Christine Lynn Business Center at Stetson University***

- Florida's first LEED™ certified building
- \$9 million construction cost with \$110,000 due to LEED™, results in a 1.2% cost increase
- **Energy savings resulted in a 5 to 8 year payback!**





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# Costs of **Green** Building

***"The Costs and Financial Benefits of Green Buildings – A Report to California's Sustainable Building Task Force"***

- Studied 33 green buildings in California
- On average, less than 2% additional costs for all levels of LEED™ buildings
- Less than 1% additional costs for LEED™ certified

Category	20-year NPV
Energy Savings	\$5.80/SF
Emissions Savings	\$1.20/SF
Water Savings	\$0.50/SF
Operation & Maintenance Savings	\$8.47/SF
Productivity & Health Benefits	\$36.90-\$55.30/SF
Average Premium for <b>Green</b> Buildings	(\$4.00)/SF
Total 20-year Net Present Benefit	<b>\$50-\$65/SF</b>

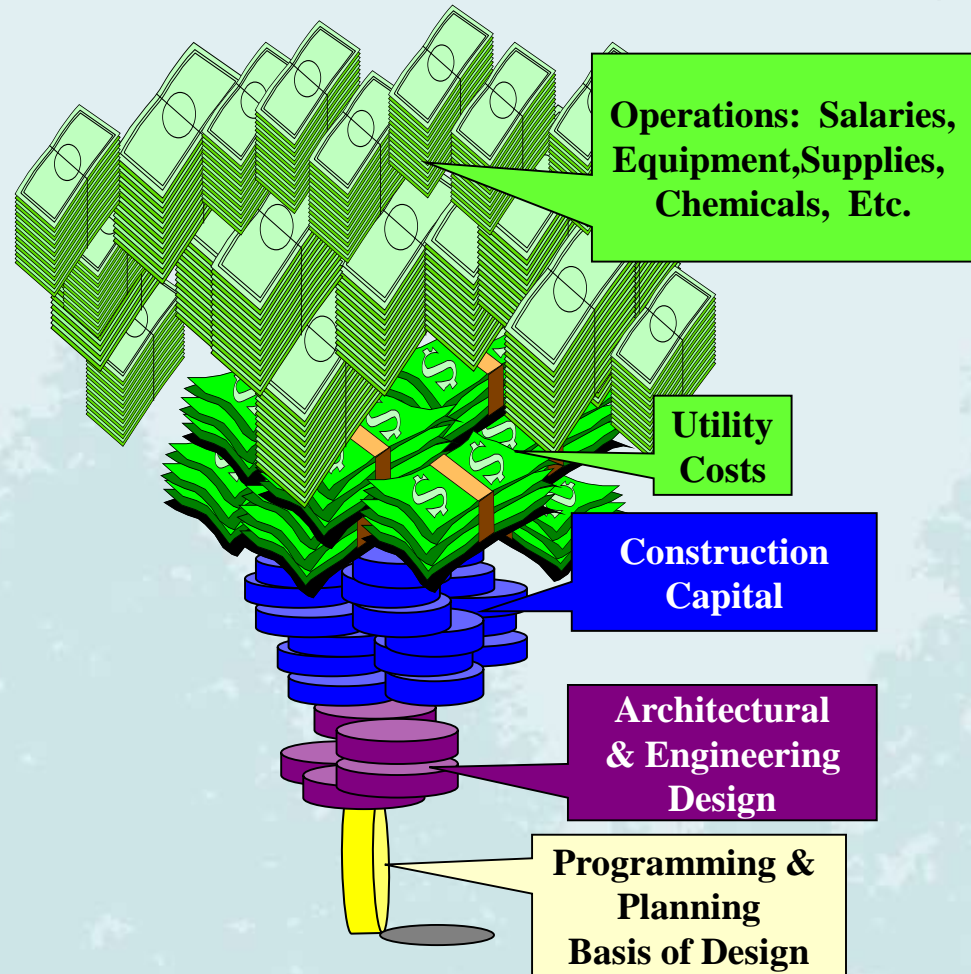


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## Costs vs. Benefits





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## Costs vs. Benefits

Average Annual Commercial Expenditure  
2000 (Dollars/SF)





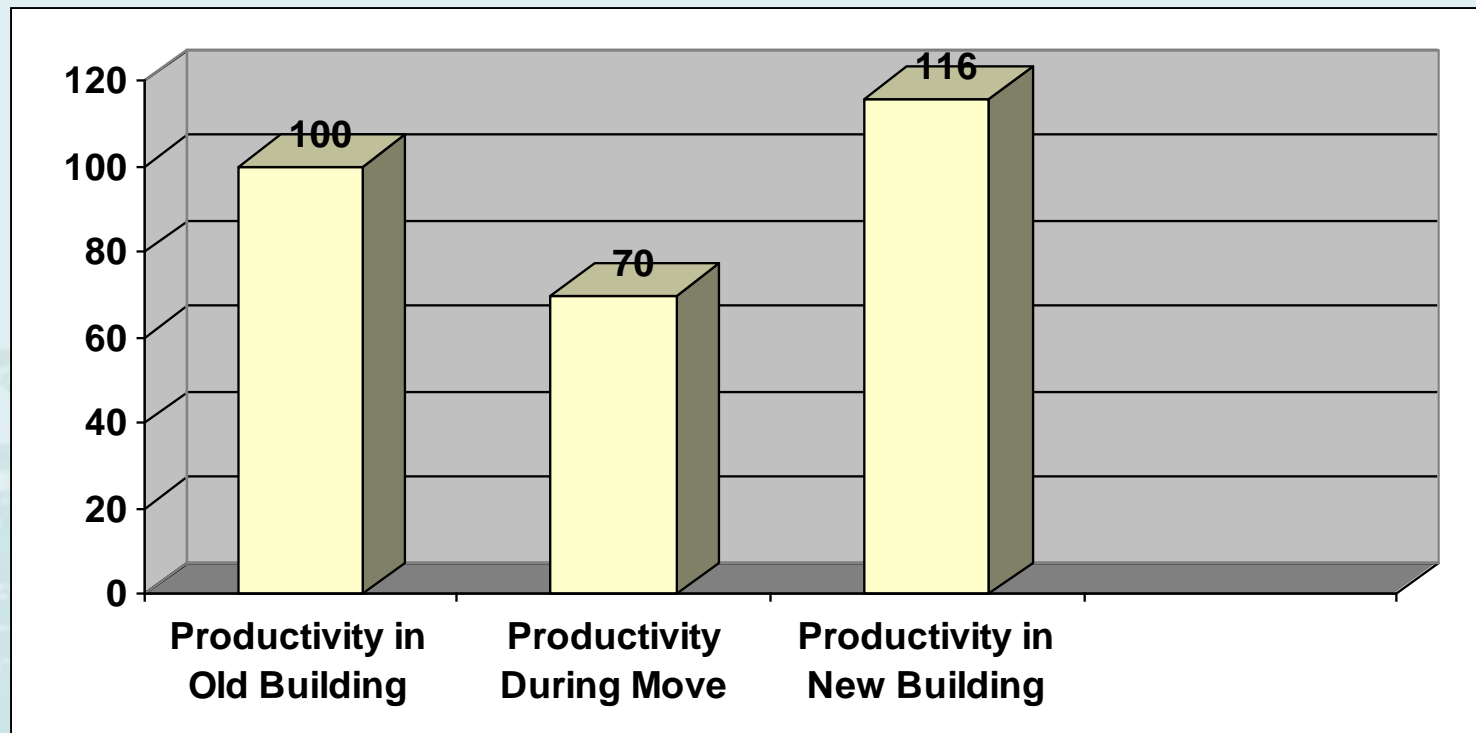


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## Costs vs. Benefits





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## What is the **US Green Building Council?**

USGBC is...

- A national nonprofit organization
- A diverse membership of organizations
- Consensus-driven
- Committee-based product development
- Developer and administrator of the LEED® Green Building Rating System



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# What is the **US Green Building Council?**

USGBC's MISSION:

*to promote the design and construction of buildings that are environmentally responsible, profitable, and healthy places to live and work.*

The organization's activities...

- *Integrate* building industry sectors
- *Lead* market transformation
- *Educate* owners and practitioners



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# Who are **US Green Building Council** Members?

- Architecture Firms
- Engineering Firms
- Contractors
- Manufacturers
- Government Entities
  - Federal, State, and Local
- Real Estate Developers & Owners
- Financial Institutions
- Universities/Colleges
- Retail Companies
- Nonprofit Associations
- Utility Providers
- Others





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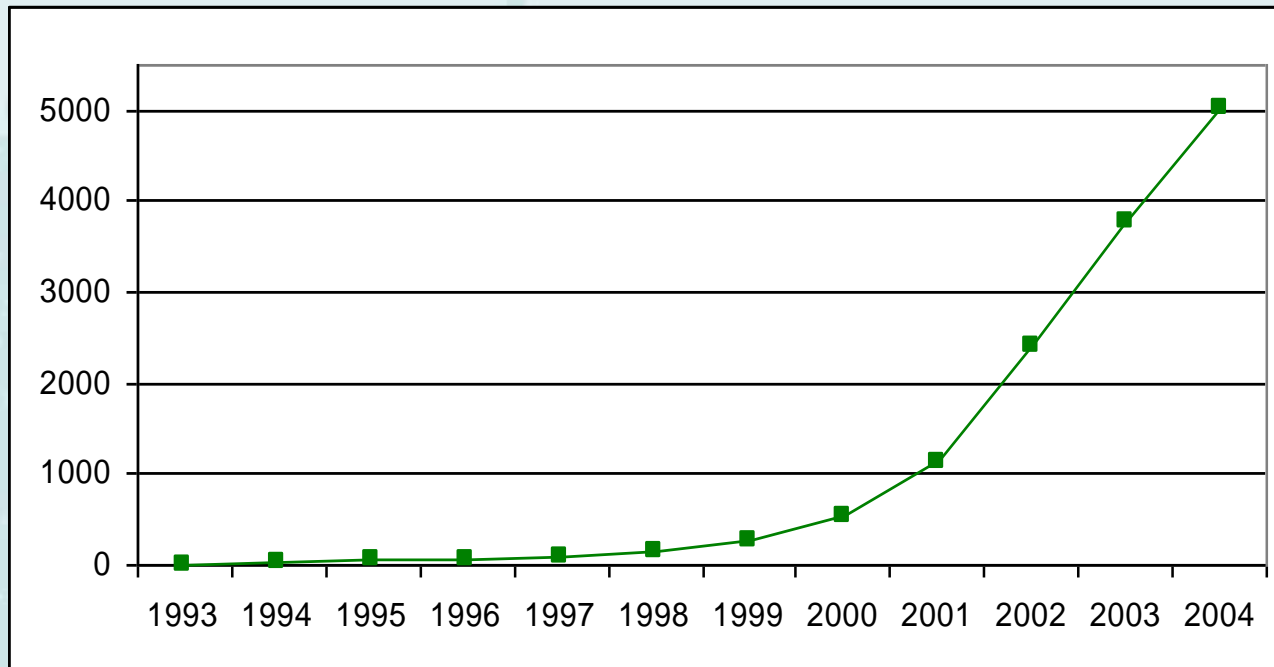
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# USGBC's Membership\*

\*as of 11/2004

***On Average, 150 Companies Join a Month!***





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**2003:** Over 5000  
Registered Attendees

**2003:** Over 300 Exhibitors



**2004:** Over 8000  
Registered Attendees

**2004:** Over 480 Exhibitors



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# USGBC - Central Florida

## Mission Statement

**Have a positive impact on Central Florida's environment, economy and social well being by:**

- Promoting green and sustainable design, construction and operation of buildings.
- Developing green and sustainable building standards, design practices and technologies.
- Outreach and education to our members and communities.



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# **USGBC-Central Florida**

## **Founding Members**

<b>Burns Brothers, Inc.</b>	<b>Johns Manville</b>
<b>Civil &amp; Marine</b>	<b>Johnson Controls</b>
<b>Florida Business Interiors</b>	<b>Morris Architects</b>
<b>GDC Properties</b>	<b>PRB Design</b>
<b>GRG Consulting Engineers, Inc.</b>	<b>Shaw Tek</b>
<b>Haworth, Inc.</b>	<b>SchenkelShultz</b>
<b>HermanMiller</b>	<b>Skanska USA Building, Inc.</b>
<b>Hoar Construction, LLC</b>	<b>TLC Engineering for</b>
<b>HuntonBrady Architects</b>	<b>Architecture</b>
<b>Interface Flooring Systems</b>	<b>The Trane Company</b>





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# Emerging Green Builders

### ***Who we are:***

The USGBC's Emerging Green Builders represents a coalition of students and young professionals intent on promoting the integration of future leaders into the green building movement.

### ***Vision:***

To integrate students and professionals into the green building movement.

### ***Mission:***

To create a network of emerging green building leaders and develop opportunities for involvement through the USGBC to further generate momentum for the green building industry.



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# LEED (Leadership in Energy & Environmental Design) Green Building Rating System

**A leading-edge system for designing, constructing, operating and certifying green buildings.**



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# LEED Applications

**LEED-NC (New Construction) – Version 2.2**

**LEED-EB (Existing Buildings) – Version 1.1**

**LEED-CI (Commercial Interiors) – Version 1.1**

**LEED-CS (Core & Shell) – Pilot**

**LEED-H (Home) – Pilot**

**LEED-NB (Neighborhood Developments) – D&D**

**LEED-R (Retail) – D&D**

**LEED-MB (Multiple Buildings) – D&D**

**LEED-HC (Healthcare) – D&D**



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# LEED-NC Breakdown

<b>Category</b>	<b>Possible Points</b>
<b>Sustainable Sites</b>	<b>14</b>
<b>Water Efficiency</b>	<b>5</b>
<b>Energy &amp; Atmosphere</b>	<b>17</b>
<b>Materials &amp; Resources</b>	<b>13</b>
<b>Indoor Environmental Air Quality</b>	<b>15</b>
<b>Innovation &amp; Design</b>	<b>5</b>
<b>Total</b>	<b>69</b>





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# LEED-NC Ratings

Certified:	26-32 Points
Silver:	33-38 Points
Gold:	39-51 Points
Platinum:	52-69 Points



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# LEED-NC in the Last Four Years

	2000	2002	2003	2004
Register Projects	45	602	1077	1542
Cumulative SF	8.4M	>80M	>141M	>188M



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# LEED & Stormwater Management Sustainable Sites

Prerequisite – Erosion and Sedimentation Control

Credit 6.1 – Stormwater Management

Credit 7.1 - Landscape & Exterior Design to  
Reduce Heat Islands



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# Sustainable Sites

Prerequisite – Erosion and Sedimentation Control

Intent: Control erosion to reduce negative impacts on water and air quality.





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# Sustainable Sites

## Prerequisite – Erosion and Sedimentation Control

Requirement: Design a sediment and erosion control plan specific to the site that conforms to U.S. EPA September 1992 Storm Water Management for Construction Activities, (Document No. EPA-832-R-92-005, Chapter 3) or local sedimentation and erosion standards, whichever is more stringent. The plan shall meet the following objectives:

- Prevent loss of soil during construction by storm water runoff and/or wind erosion, including protecting topsoil by stockpile for reuse.
- Prevent sedimentation of storm sewer or receiving streams and/or air pollution with dust and particulate matter.



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# Sustainable Sites

## Credit 6.1 – Stormwater Management: 2 Points

(Rate & Quantity)

Intent: Limit disruption of natural water flows by minimizing stormwater runoff, increasing on-site infiltration and reducing contaminations.



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# Sustainable Sites

## Credit 6.1 – Stormwater Management

Rate: 1 Point

Requirement: No net increase in the rate and quantity of stormwater runoff from existing to developed conditions; OR, if existing imperviousness is greater than 50% implement a stormwater management plan that results in a 25% decrease.



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# Sustainable Sites

## Credit 6.1 – Stormwater Management

Quantity: 1 Point

Requirement: Treatment systems designed to remove **80%** total suspended solids (TSS), and **40%** of the average post development total phosphorus (TP), by implementing Best Management Practices (BMPs) outlined in Chapter 4, Part 2 (Urban Runoff), of the United States Environmental Protection Agency's (EPA's) *Guidance Specifying Management Measures for Source of Nonpoint Pollution in Coastal Waters*, January 1993 (Document No. EPA-840-B-92-002) or the local government's BMP documents (whichever is more stringent).





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# Sustainable Sites

## Credit 7.1 – Landscape & Exterior Design to Reduce Heat Islands: 1 Point

(Roof)

Intent: Reduce heat islands (thermal gradient differences between developed and undeveloped areas) to minimize impact in microclimates, human and wildlife habitat.



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# Sustainable Sites

## Credit 7.1 – Stormwater Management

### Roof – 1 Point

Requirement: Use ENERGY STAR compliant (highly reflective) AND high emissivity roofing (emissivity of at least 0.9 when tested in accordance with ASTM 408) for a minimum of 75% of the roof surface; OR, **install a green (vegetated) roof for at least 50% of the roof area.** Combinations of high albedo and vegetated roof can be used providing they collectively cover 75% of the roof area.



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# LEED™ in Florida



### **50,000 sq. ft. Dunedin Community Center:**

Reduced electricity costs by  
\$24,500 per year



### **27,000 sq. ft. Girl Scouts Facility in Sarasota:**

Will use Low-emitting carpet,  
paint and adhesives to achieve  
higher Indoor Air Quality



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## LEED™ in Florida



### **20,000 sq. ft. Office Building in Lake Worth:**

Will harvest rainwater and filter through a Living Machine to save thousands of gallons of water per year...



### **University of Florida:**

It would take the rest of the day to go through all of their LEED™ Projects!





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## LEED™ in Florida

### University of Florida Rinker Hall:

First LEED™ Gold  
Building in Florida utilizes  
daylighting to save  
energy and improve  
Indoor Environmental  
Quality





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# *Green Building* is Not a Fad

There is an estimated \$15 billion worth of green buildings currently in design or under construction in the US, representing 12-15% of total public construction and 2% of private sector construction. Although the \$15 billion is less than 5% of the total \$315 billion US annual construction for commercial, industrial and institutional buildings, this category is growing at a rate of about 75% annually.

Hybrid Vehicles

Organic Groceries



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# **David A. Gottfried Honorary Scholarship**

**Founder of the USGBC**

**\$1500 – Deadline is Nov. 15th**

**All majors related to the  
protection of the environment.**

**Applications available at the end of presentation.**



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On behalf of the Central Florida  
Chapter of the USGBC,

# Thank You.