



# INTEGRATING SAFETY & SUSTAINABILITY

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# Course Outline

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- Introduction to Sustainability, Green Building & Safety
- Introduction to Green Building Systems & Best Practices
- Safety through Design
- Green Building – Benefits to Safety
- Sustainable Practices – Roles & Responsibilities
- Prevention in the Field
- Company Wide Approach to Safety & Sustainability





# About the Project

## Safety and Health Investment Projects

### What's it all about?

In 2007, the Washington State Legislature established the Safety and Health Investment Projects (SHIP) Grant Program. The program is managed by the Division of Occupational Safety and Health (DOSH) in the Department of Labor & Industries (L&I).

The SHIP Grant Program awards occupational safety and health grants for projects that develop new and innovative practices to stimulate workplace safety.

Priority will be given to proposals that involve cooperation between employers and employees or their representatives.

### How Does It Work?

Eligible grants will aim to prevent injuries and illnesses, save lives, and educate workers and employers about workplace hazards and safe workplace practices.

Proposals submitted by applicants will be reviewed by SHIP Grant Program staff, and then by a SHIP Advisory Committee of business and labor representatives who will help L&I select projects for funding.

## Frequently Asked Questions (FAQs) about the SHIP Grant Program

### Q. Where do I get an application?

A. You'll find applications and helpful instructions on our Web site at [SafetyGrants.Lni.wa.gov](http://SafetyGrants.Lni.wa.gov).

### Q. Are there monetary limits on the amount I can request?

A. Some restrictions may apply; check our Web site for details.

### Q. What type of project will receive priority for a SHIP grant?

A. Employer/employee sponsored projects aimed at accident prevention will receive priority. L&I will also consider funding proposals for:

- The development of technical innovation and engineering controls
- Best practices
- Education and training
- Other priorities as identified by L&I

### Q. What types of activities can not receive SHIP funds?

A. You can not use SHIP funds for:

- Lobbying or political activities
- Supporting, opposing, or developing legislative or regulatory initiatives
- Any activity not designed to reduce workplace injuries, illnesses, or fatalities
- Reimbursing employers for the normal costs of complying with safety and health rules

### Q. Who decides if my project will be approved and funded?

A. SHIP Grant Program staff will review and score applications for eligibility, completeness, and project applicability. The SHIP Advisory Committee will then review the applications and forward recommendations to the Assistant Director of DOSH. The Assistant Director has final approval authority.

### Q. How will I know if my application is accepted or denied?

A. Applicants will receive written notification of the status of their application.

### Q. What if I disagree with the rejection or denial of my application?

A. You may appeal in writing explaining the reasons your application merits reconsideration.

### Q. If my application is rejected or denied, can I resubmit it?

A. Yes, but you must specifically address the reasons the application was originally rejected or denied.





# Project Development











# Project Development



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# Introductions

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- Name?
- Company/Organization?
- Experience with Safety?
- Experience with Green Building?



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**PRESENTS**

# **"GREEN BUILDING SAFETY"**



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# DEFINING SUSTAINABILITY

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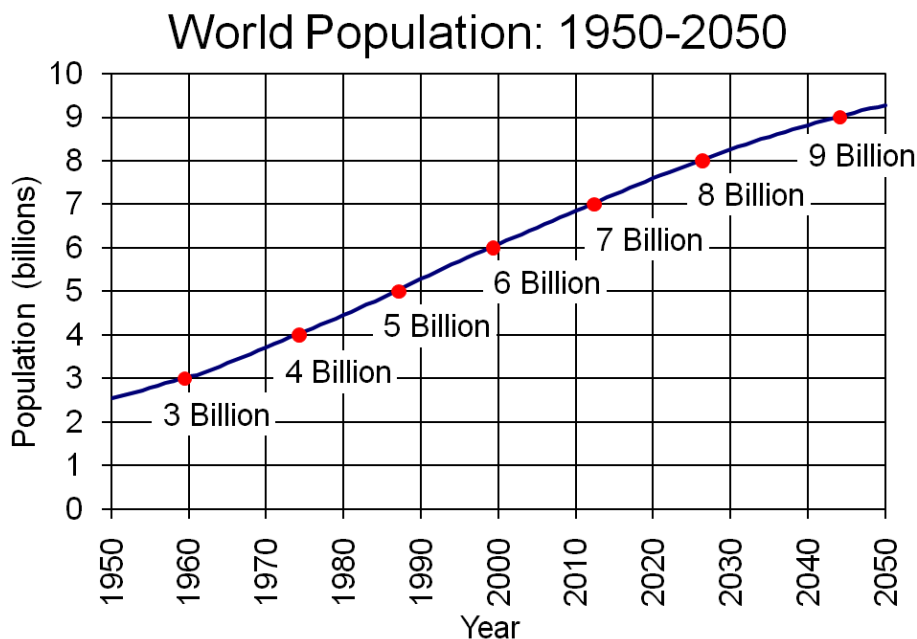
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# What is Sustainability?

*Human survival depends on healthy natural ecosystems*



Source: U.S. Census Bureau, International Data Base, June 2010 Update.



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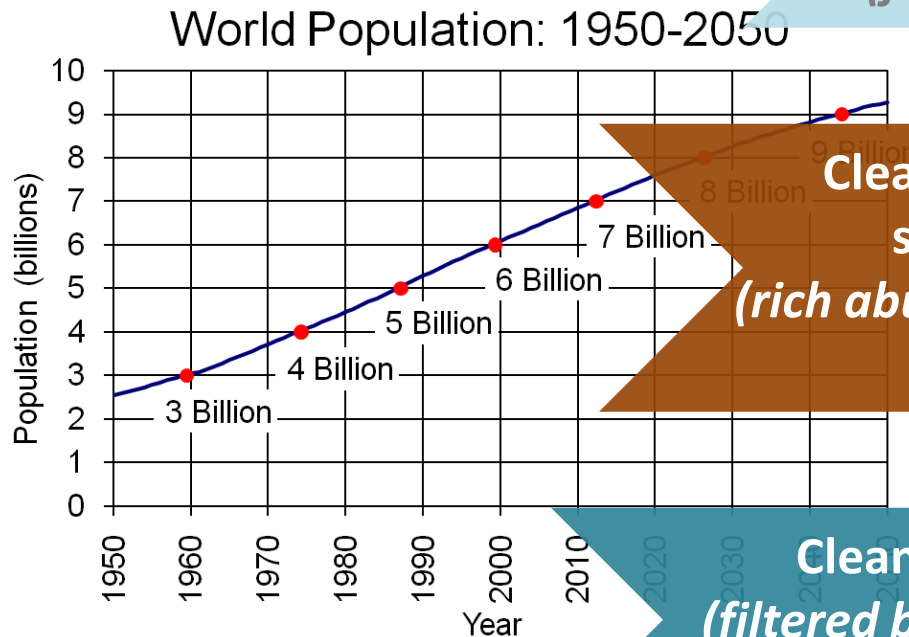
# What is Sustainability?

*Human survival depends on healthy natural ecosystems*

Clean air  
(filtered)

Clean food  
sources  
(rich abundant  
soil)

Clean water  
(filtered by flora  
& fauna)



Source: U.S. Census Bureau, International Data Base, June 2010 Update.



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# Is this Sustainable?



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# Would you rather be Here?



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# CLIMATE CHANGE





# Seeing Beyond the Trees



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# Climate Change

## Transportation

- 1 gal gasoline = 19.4 lbs of Co<sub>2</sub>
- 1 gal diesel = 22.2 lbs of Co<sub>2</sub>



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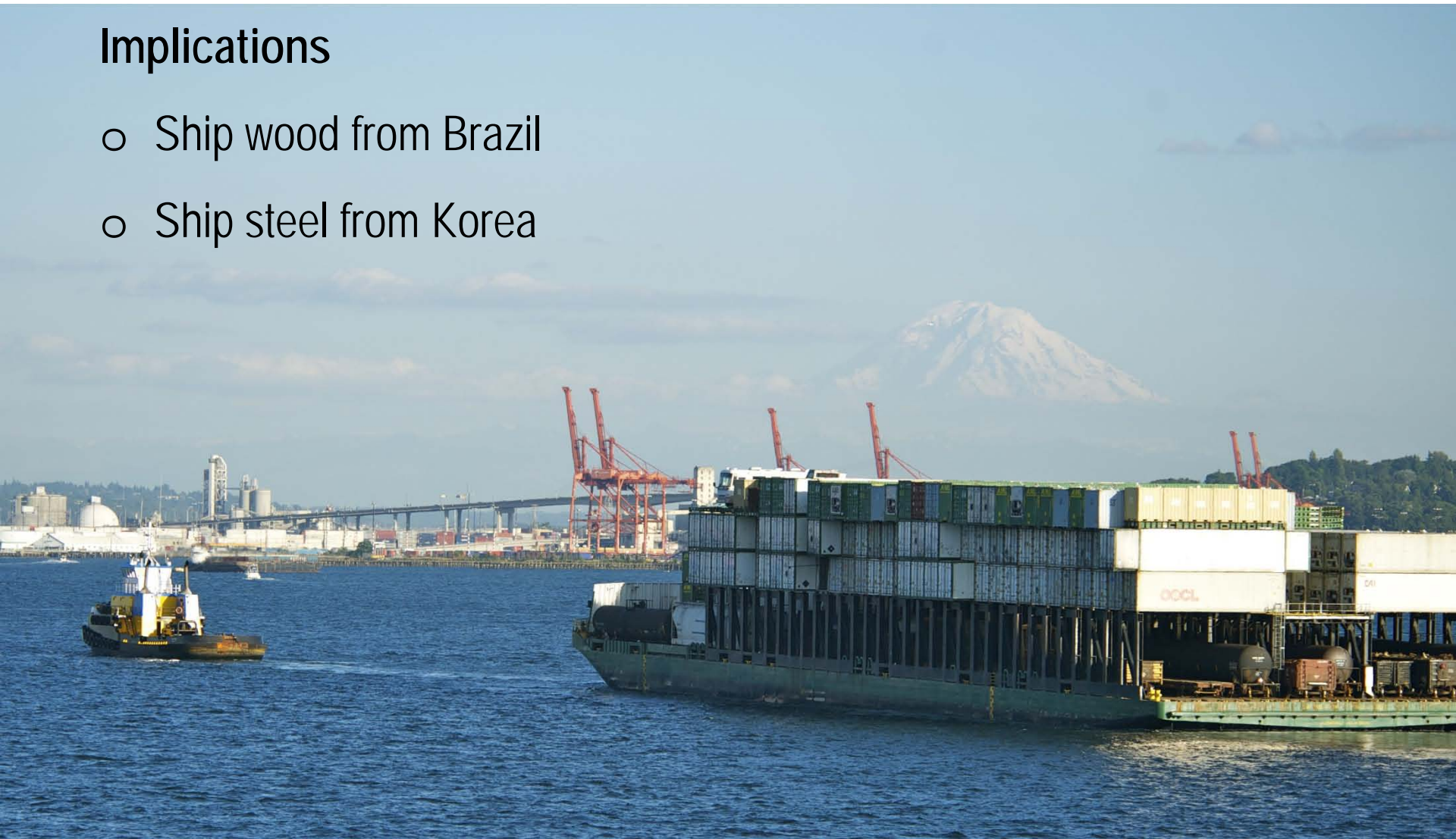
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# Climate Change

## Implications

- Ship wood from Brazil
- Ship steel from Korea



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# **BUILDING INDUSTRY**

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# BMPs 50 Years Ago



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# ARE WE CHANGING FAST ENOUGH?

Che futuro  
vogliamo?  
Due possibili  
scenari per  
il 2020.  
A sinistra, le  
conseguenze  
dello sviluppo  
attuale: smog,  
sporcizia,  
ingorghi.  
A destra, un  
modello di città



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# WHAT'S STOPPING US?



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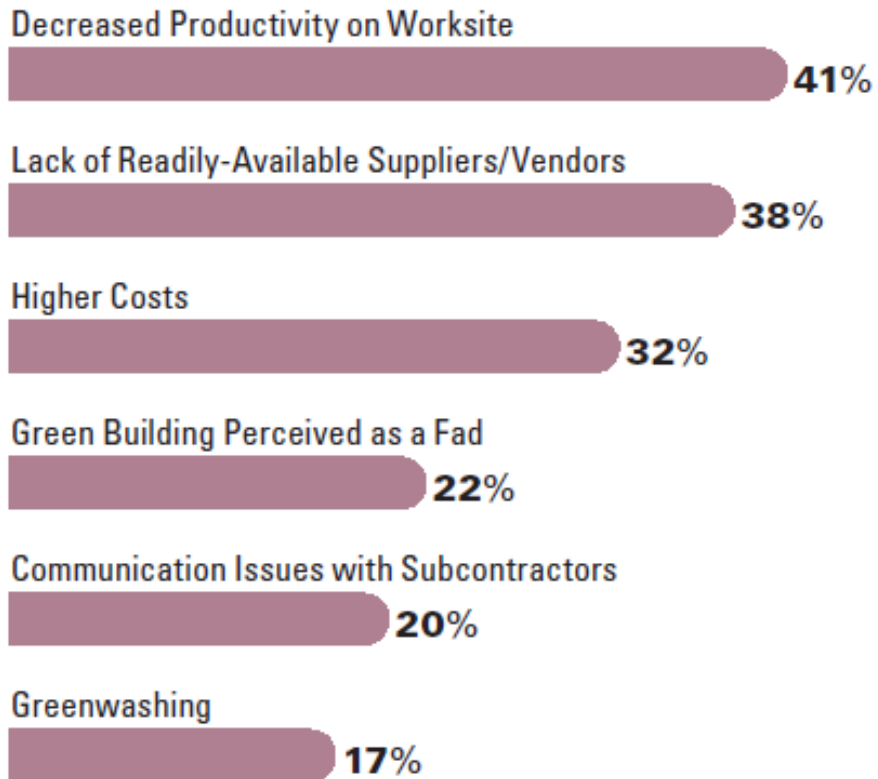


# Barriers to Change

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## Challenges Impacting the Use of Sustainable Waste Practices

Source: McGraw-Hill Construction, 2009.





# What's Driving Change?

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- Build sustainably for less cost
- Reduce operational costs
- Position for market differentiation
- Satisfy their client demand
- Respond to employees
- Demonstrate environmental responsibility



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# What's Driving Change?

- Formaldehyde Standards for Composite Wood Act - July 7, 2010
- WA State 2009 State Energy Code Draft
- WA State Legislature Chapter 39.35D RCW - High-performance public buildings
- City of Seattle Green Factor
- GHG shall be regulated by the Clean Air Act
- International Green building Code





# Changing a Culture



<http://www.youtube.com/watch?v=NxTNZUhesZk>

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# Parallel to Safety Culture

# AGC



*Skill · Integrity · Responsibility*

[ABOUT US](#) [MEMBERSHIP INFO](#) [FIND A CONTRACTOR](#) [JOBSITE](#) [MEMBER LOG IN](#) [SEARCH](#)

## Member Benefits

### Government Affairs

### Safety Services

### Services, Products, Training

### AGC Safety Team

### Safety Forums

### Rules and Regulations

### Member Safety Contacts

### Links

## Labor Relations

### Group Retro

### AGC Future Leaders

## Education and Training

### Contract Documents

### Member Discounts

### Construction News

### Where's the Work?

### Membership Directory

### Contact Us

## 20 Year Safety Team Members

**Congratulations to these AGC Safety Team members for being a part of the Safety Team for 20 years!**

- Abbott Construction
- Absher Construction Company
- Active Construction, Inc.
- Bayley Construction, GP
- Ceco Concrete Construction
- Cope Construction Company
- Deeny Construction Company, Inc.
- Emerald Paving, Inc.
- Ferguson Construction, Inc.
- Fisher & Sons, Inc.
- Foushee & Associates, Inc.
- GLY Construction
- Haskell Corporation
- Jones & Roberts Company
- Joseph S. Simmons Construction, Inc.
- Korsmo Construction, Inc.
- Lakeside Industries
- Lease Crutcher Lewis WA, LLC
- Leonard and Company
- Max J. Kuney Company
- Mowat Construction Company
- Northwest Cascade, Inc.
- Pease & Sons, Inc.
- Pease Construction, Inc.
- Penny Lee Trucking, Inc.
- Poe Construction, Inc.
- Quigg Bros., Inc.
- R V Associates, Inc.
- Sellen Construction Co., Inc.
- Sunset Pacific General Contractors, Inc.
- Wade Perrow Construction, LLC (WPC)

AGC of America  
THE ASSOCIATED GENERAL CONTRACTORS OF AMERICA  
Quality People. Quality Projects.



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 Sellen  
SUSTAINABILITY



# DEFINING GREEN BUILDING

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# What is Green Building?

## Green Building

*...is better siting, design, construction, operation, and maintenance*

*that increases the efficiency with which buildings and their sites use and harvest energy, water and materials,*

*and reduces building impacts on human health and the environment.*



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# Brief History of Green Building



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# BRIEF HISTORY OF GREEN BUILDING



## RAMMED EARTH

3000 BC

Rammed Earth construction, rain water collection and passive heating and cooling (basis of design) are utilized

## GREEN ROOF

2000 BC



Earth sheltered/vegetated roofing is used

Population: 35 Million

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# BRIEF HISTORY OF GREEN BUILDING



## ELECTRIC CAR

1835



Electric car is invented in Holland

## NATURAL PLASTIC

1855



Invention of natural plastic

Population: 1.2 Billion

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# BRIEF HISTORY OF GREEN BUILDING



BIODIESEL

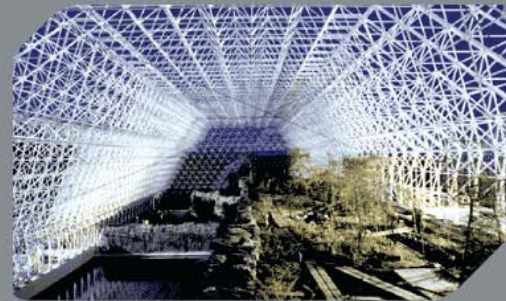
1937



G. Chavanne (Belgium) receives patent for biodiesel fuel

BIOSPHERE

1987



Construction begins on Biosphere II, "artificial closed ecological system," outside of Tucson, AZ

Population: 5.0 Billion

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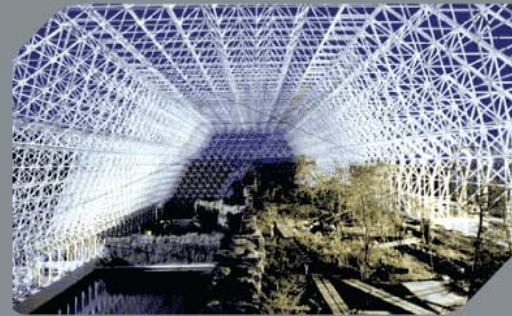


# BRIEF HISTORY OF GREEN BUILDING



BIOSPHERE

1991



Biosphere construction is completed, used for intended purpose through 1994

LEED  
STANDARDS

1998



LEED (Leadership in Energy and environmental Design) standard created to promote green building practices

Population: 6.0 Billion

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# **METRICS & THE LEED RATING SYSTEM**

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# Metrics

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- Greenroads
- City of Seattle Green Factor
- Built Green
- Washington State Energy Code
- International Green Building Code
- Living Building Challenge







# USGBC

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## USGBC MISSION

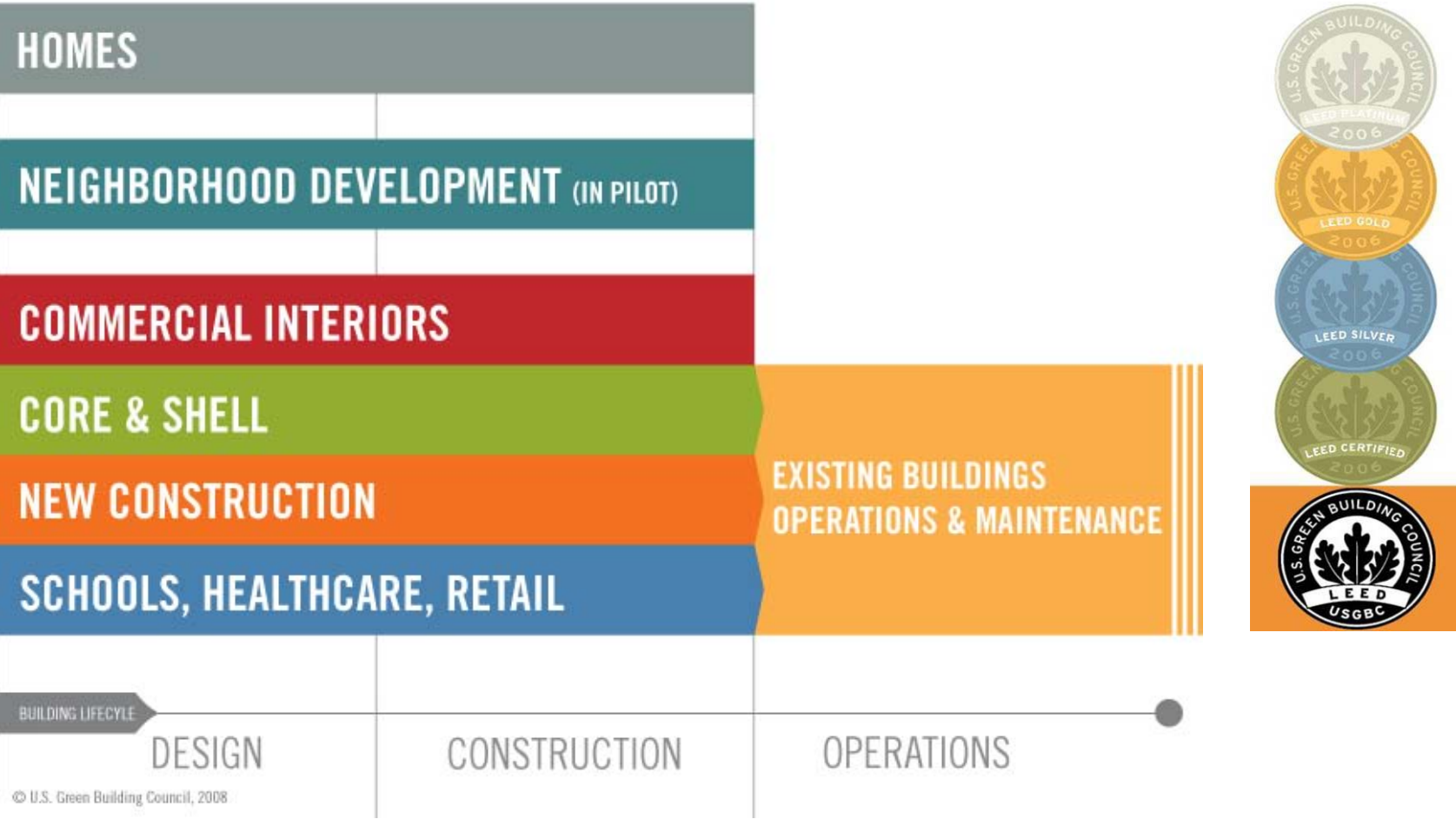
To transform the way buildings and communities are designed, built and operated, enabling an environmentally and socially responsible, healthy, and prosperous environment that improves the quality of life.

- 79 local chapters
- 14,141 member companies & organizations
- 175,023 LEED Professional Credential holders





# LEED Rating System



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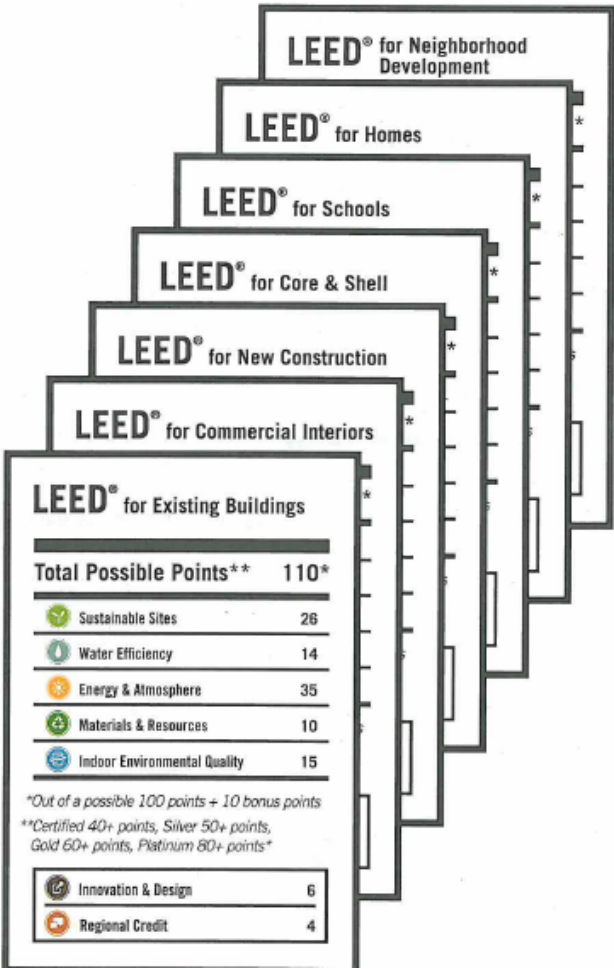




# LEED Rating System

## LEED POINTS SYSTEM

Building Design & Construction	110
Interior Design & Construction	110
Building Operations & Maintenance	110
Neighborhood Development	110
<i>(All above = 100 + 10 bonus points)</i>	
+	
Homes	136



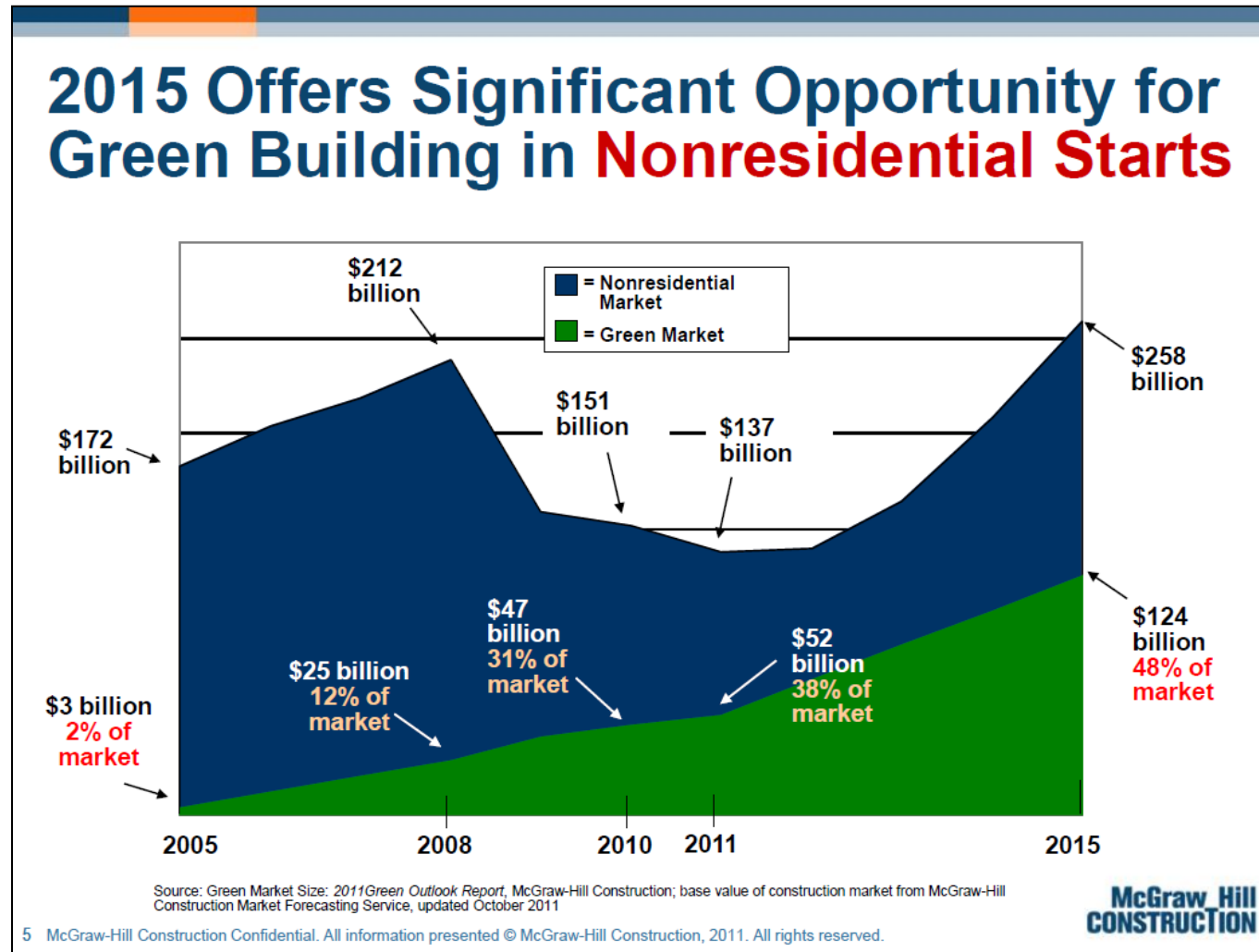




# **FUTURE FORECAST**



# Green Projections



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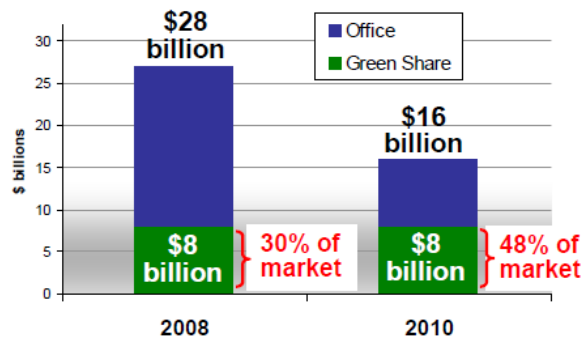
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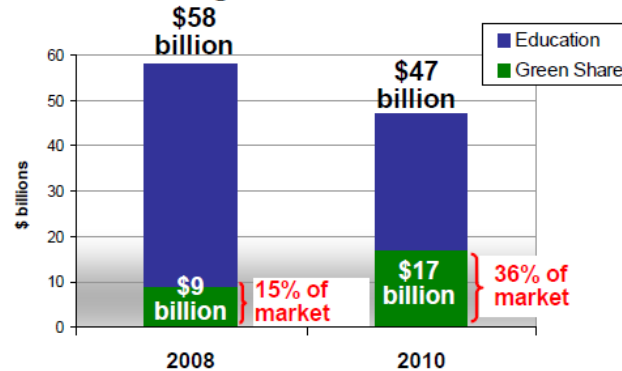
# Green Projections

## Green Share of U.S. Nonresidential Buildings

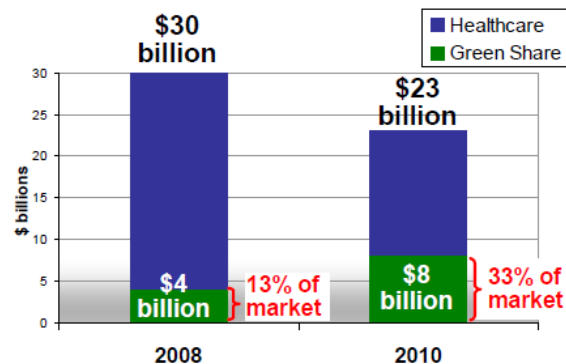
Green Building Share of **Office** Starts



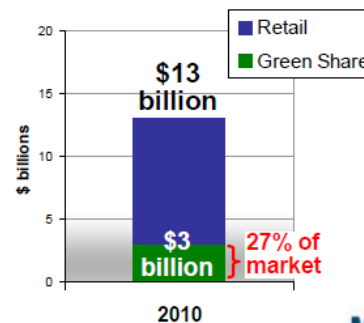
Green Building Share of **Education** Starts



Green Building Share of **Healthcare** Starts



Green Building Share of **Retail** Starts



Source: McGraw-Hill Construction, October 2011

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**McGraw Hill**  
CONSTRUCTION

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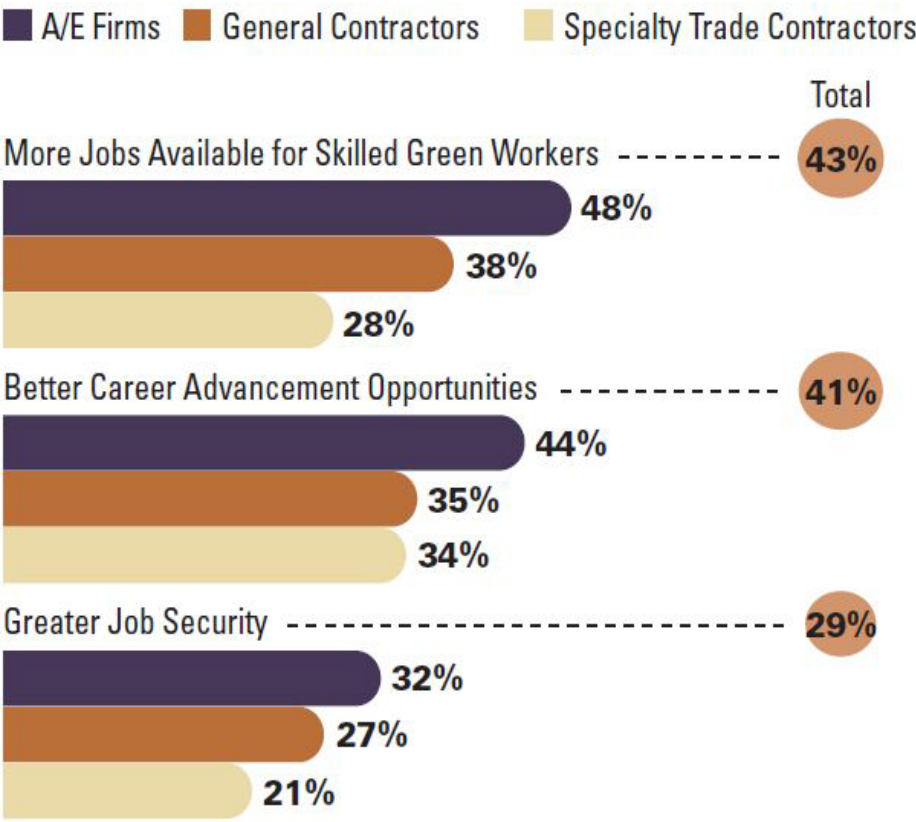
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# Green Projections

## Benefits of Green Jobs (by Player)

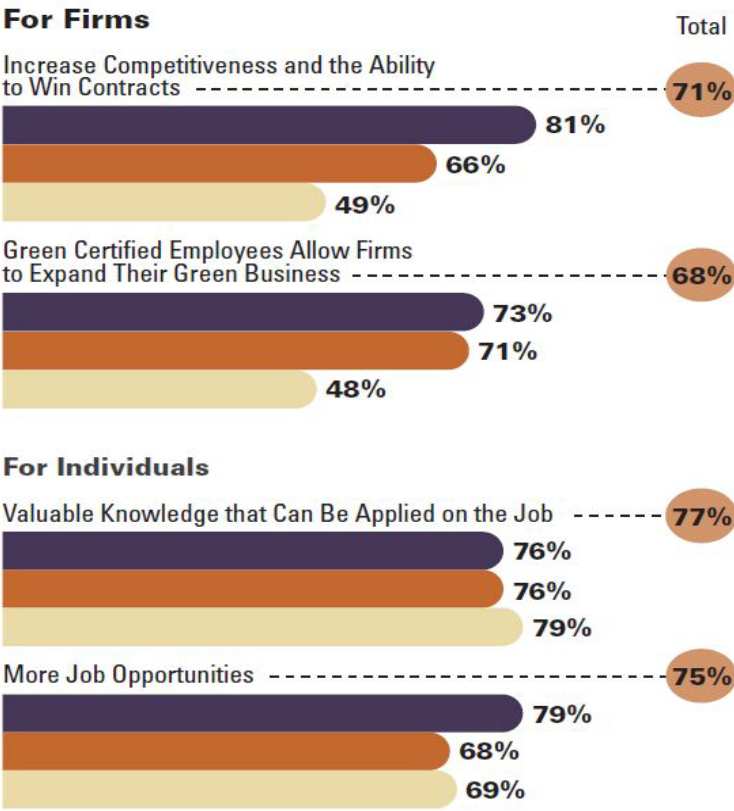
Source: McGraw-Hill Construction, 2012



## Benefits of Certification

Source: McGraw-Hill Construction, 2012

■ A/E Firms ■ General Contractors ■ Specialty Trade Contractors

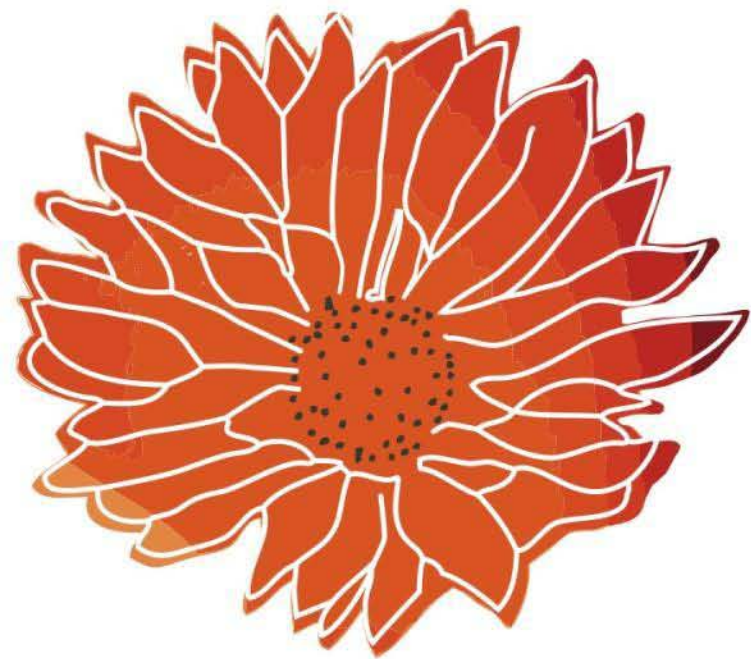


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INTERNATIONAL  
**LIVING BUILDING**  
INSTITUTE™

THERE ARE DOZENS OF  
PROJECTS IN PURSUIT OF  
THE CHALLENGE...



Sustainable Energy Centre at Cambrian College  
Castellan James + Partners



Oregon Sustainability Center  
GBD + SERA Architects





# GREEN BUILDING & SAFETY

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# Safety Statistics

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According to OSHA, out of 4,206 worker fatalities in private industry in 2010, 774 or **18.7%** were in construction.

- **Falls** – 264 out of 774 total deaths in construction in 2010 (**34%**)
- **Electrocutions** – 76 (10%)
- **Struck by Object** – 64 (8%)
- **Caught-in/between** – 33 (4%)

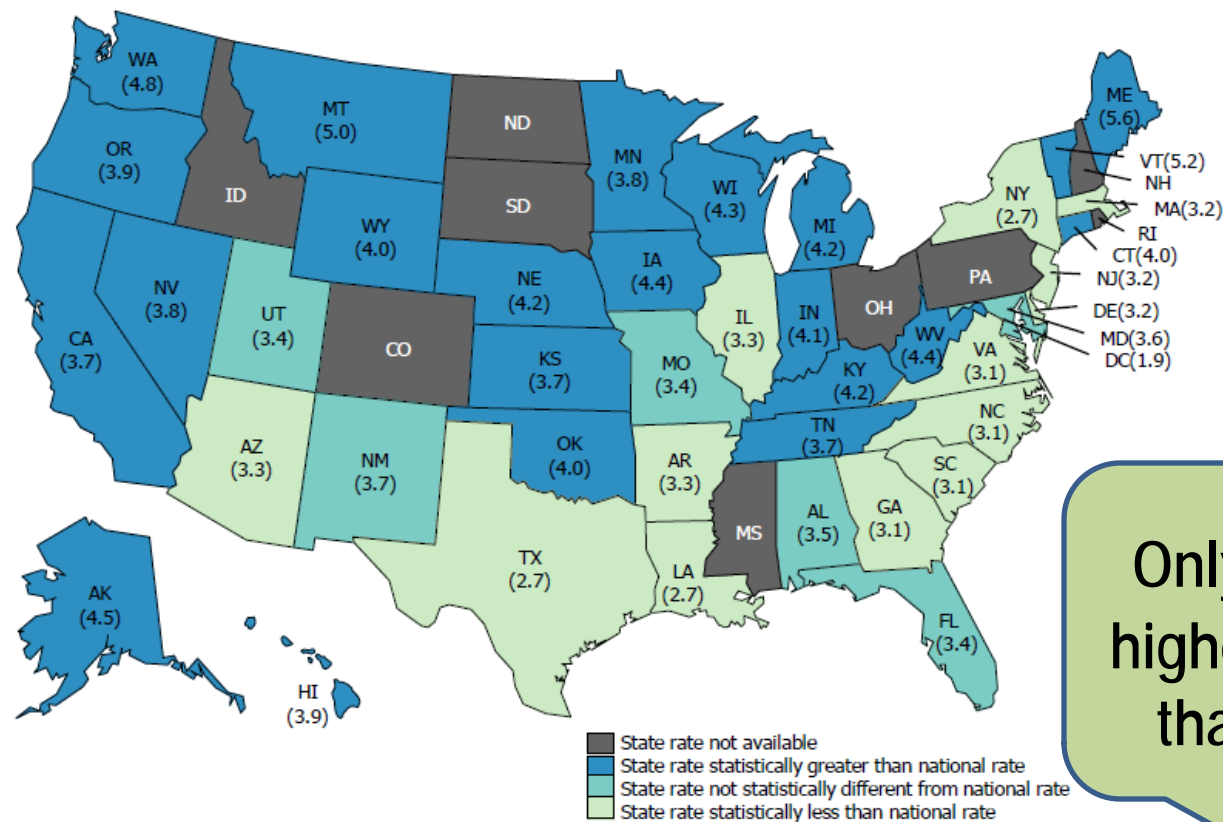


In addition to 774 deaths, the construction industry had 195,900 nonfatal injury and illness incidents in 2010



# Safety Statistics

Chart 4. State nonfatal occupational injury and illness incidence rates\* compared to the national rate, private industry, 2010



Only 3 states have higher incident rates than Washington

\* Total recordable case (TRC) incidence rate per 100 full-time workers





# Safety Statistics

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In 2010 the building industry in Washington State had **10,330** nonfatal injury and illness incidents broken down as follows:

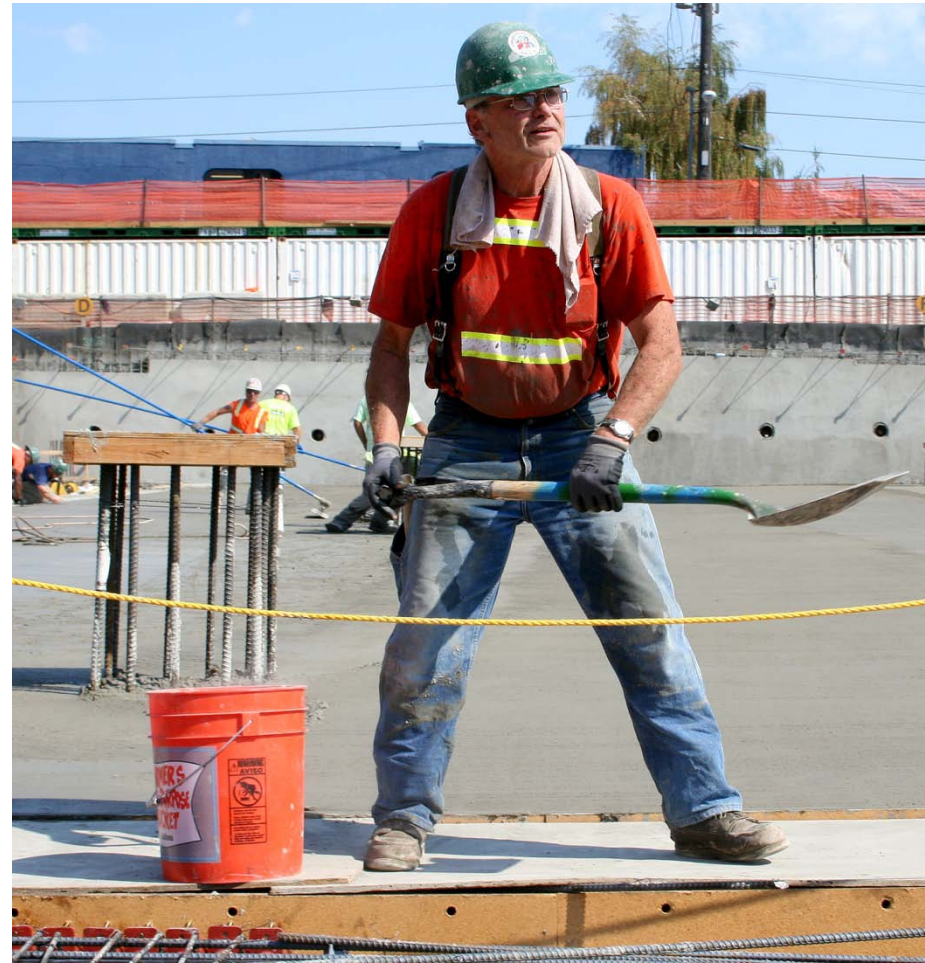
- Construction and extraction occupations – **2,660**
- Carpenters – **880**
- Electricians – **310**
- Laborers and freight, stock, and material movers, hand
- Installation, maintenance, and repair occupations – **2,2**
- Building and grounds cleaning and maintenance occup
- First-line supervisors/managers of landscaping, lawn s
- groundskeeping - **360**

**In 2010 the  
construction  
industry in WA had  
10 fatalities**



# Typical Safety Concerns

- Personal Protective Equipment
- Health Hazards
- Scaffolds
- Stairs and Ladders
- Falls
- Electrical
- Caught-in or Between
- Struck-by
- Excavations



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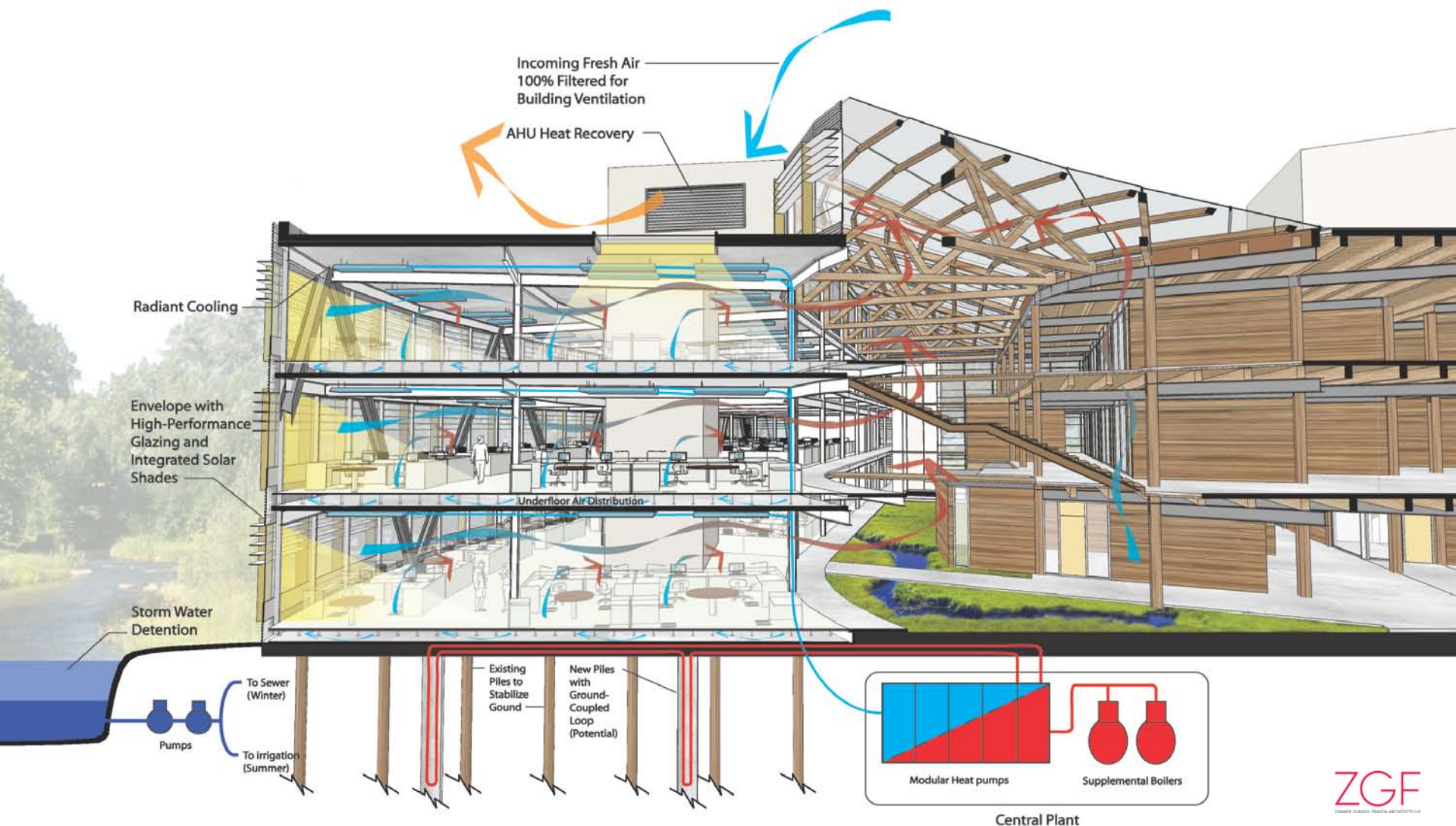
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# Eliminating the Unknown



ZGF  
JOHN E. GUNDEL FRANK R. ARCHITECTS LLP

# Are Green Buildings Less Safe?

## New study *Identification of Safety Risks for High Performance Sustainable Construction Projects* and it's implications for the industry

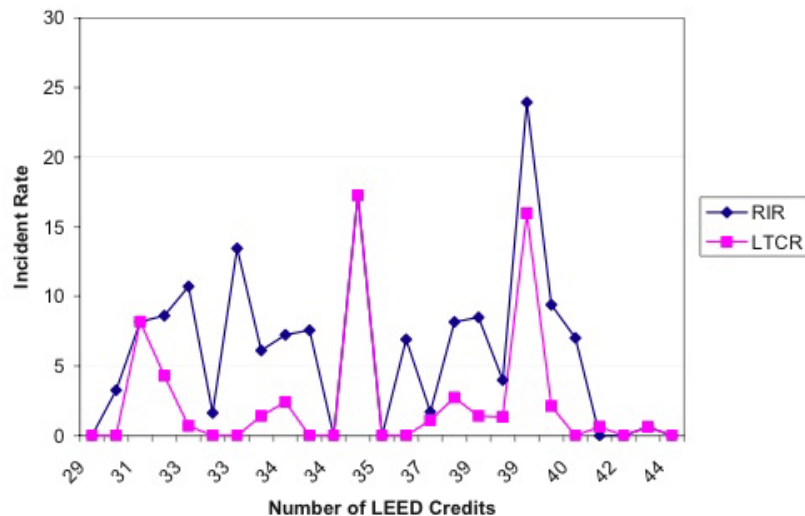
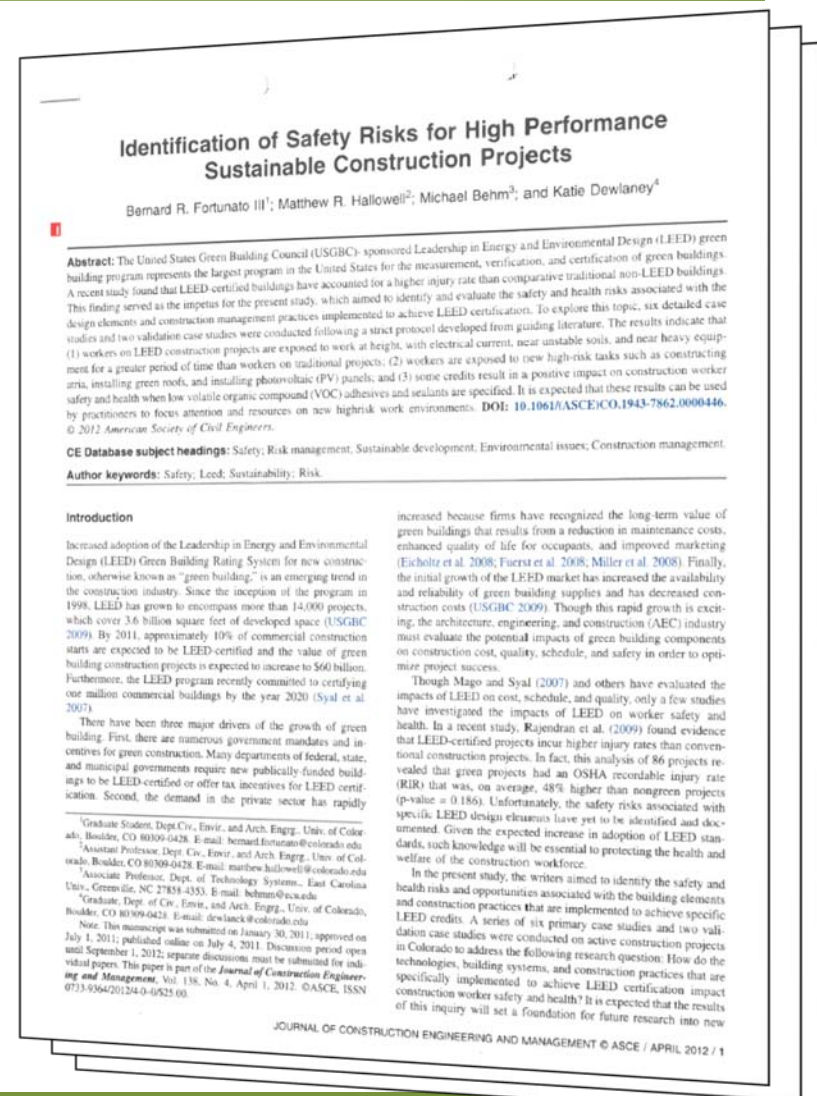


Fig. 4. Comparison of LEED credits and safety performance







# WHAT ISSUES NEED TO BE ADDRESSED?



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# WHAT ARE THE SKILLS NEEDED?



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