



Architecture 2030

March 26, 2014, MWCOG CEEPC
Roger Chang

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About Your Speaker

- ▶ Roger Chang, PE
 - ▶ Westlake Reed Leskosky
 - ▶ Principal, Director of Engineering
 - ▶ Founded in 1905, 140 person A/E firm
 - ▶ Catholic University of America Faculty
 - ▶ DC and AIA Green TAG
 - ▶ Projects
 - ▶ Wayne Aspinall Federal Building
 - ▶ Smithsonian Institution Renwick Gallery
 - ▶ FutureGen 2.0



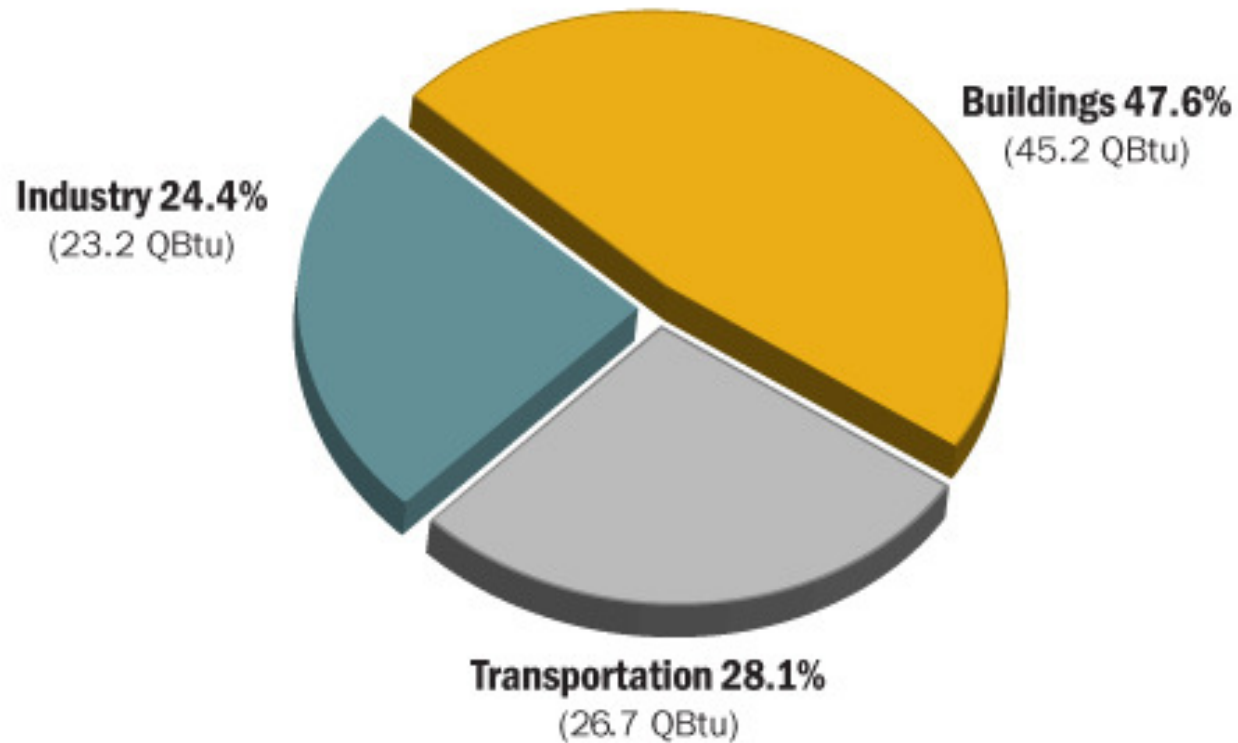
Today's Content

- ▶ Overview of 2030 Challenge
- ▶ What is IgCC?
- ▶ Local Government Actions?
 - ▶ Existing Participation
 - ▶ How to Participate?
- ▶ Private Sector Role
- ▶ Relation to National Initiatives



Architecture 2030

- ▶ Founded in 2003 by Edward Mazria

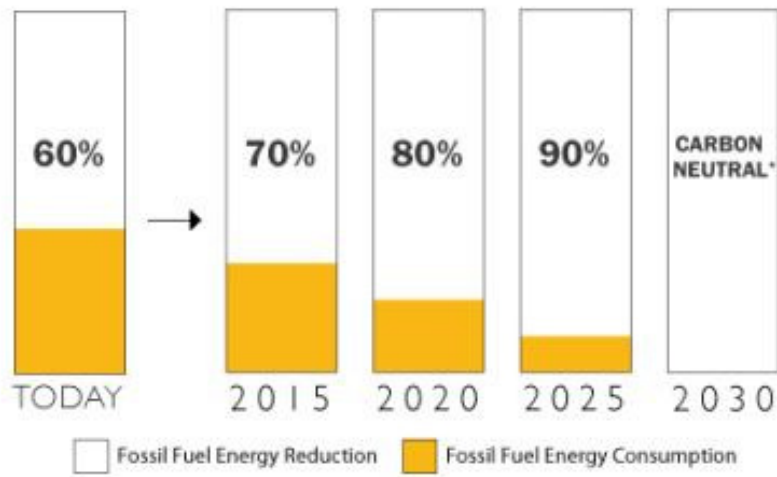


U.S. Energy Consumption by Sector

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Data Source: U.S. Energy Information Administration (2012).

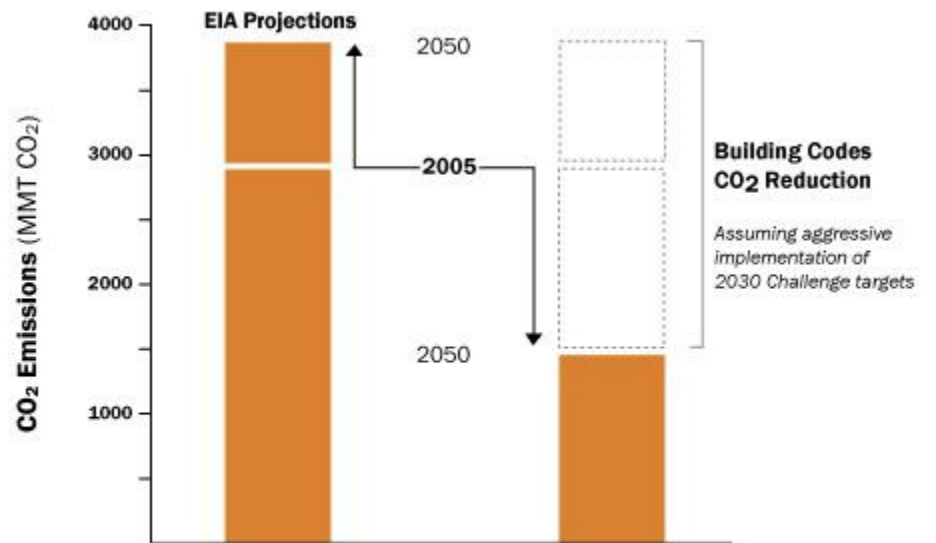


2030 Targets



The 2030 Challenge

Source: ©2010 2030, Inc. / Architecture 2030. All Rights Reserved.
 *Using no fossil fuel GHG-emitting energy to operate



U.S. Building Sector CO₂ Emissions

Source: ©2010 2030, Inc. / Architecture 2030. All Rights Reserved.
 Data Source: U.S. Energy Information Administration.



Path to 2030 Targets

- ▶ Energy Codes
- ▶ ENERGY STAR



Design Energy and Emission Results

Metric	Design Project	Median Property	Estimated Savings
ENERGY STAR Score (1-100)	52	50	N/A
Energy Reduction (from Median)(%)	-2.31	0	N/A
Source Energy Use Intensity (kBtu/ft2/yr)	195	199	4
Site Energy Use Intensity (kBtu/ft2/yr)	76	78	2
Source Energy Use (kBtu/yr)	6,270,149	6,414,563	144,414
Site Energy Use (kBtu/yr)	2,448,510	2,505,438	56,928
Energy Costs (\$)	66,385	67,929	1,544
Total GHG Emissions (MtCO2e)	275	281	6



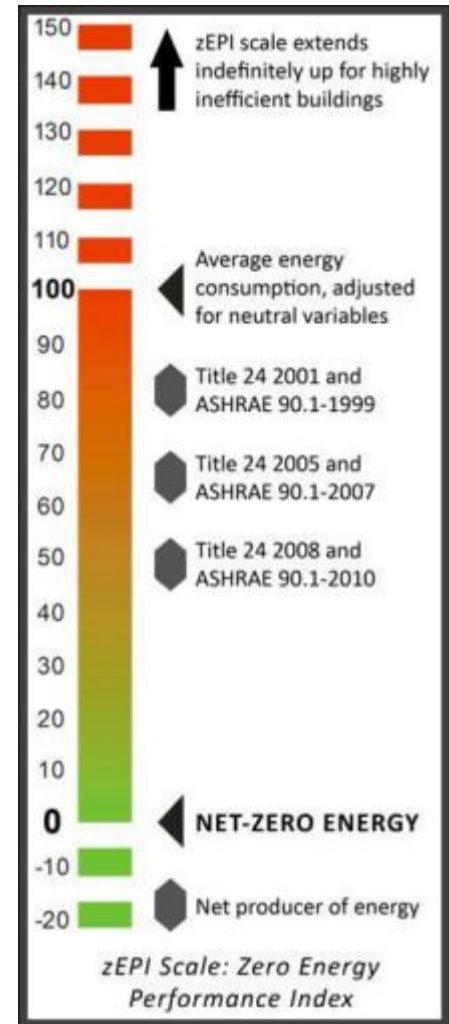
IgCC

- ▶ V2.0 released in 2013
- ▶ Very few jurisdictions have adopted IgCC
- ▶ Covers similar areas as LEED rating system
 - ▶ Silver to Gold equivalency
- ▶ Energy component very stringent
- ▶ Meant as overlay to I-Codes

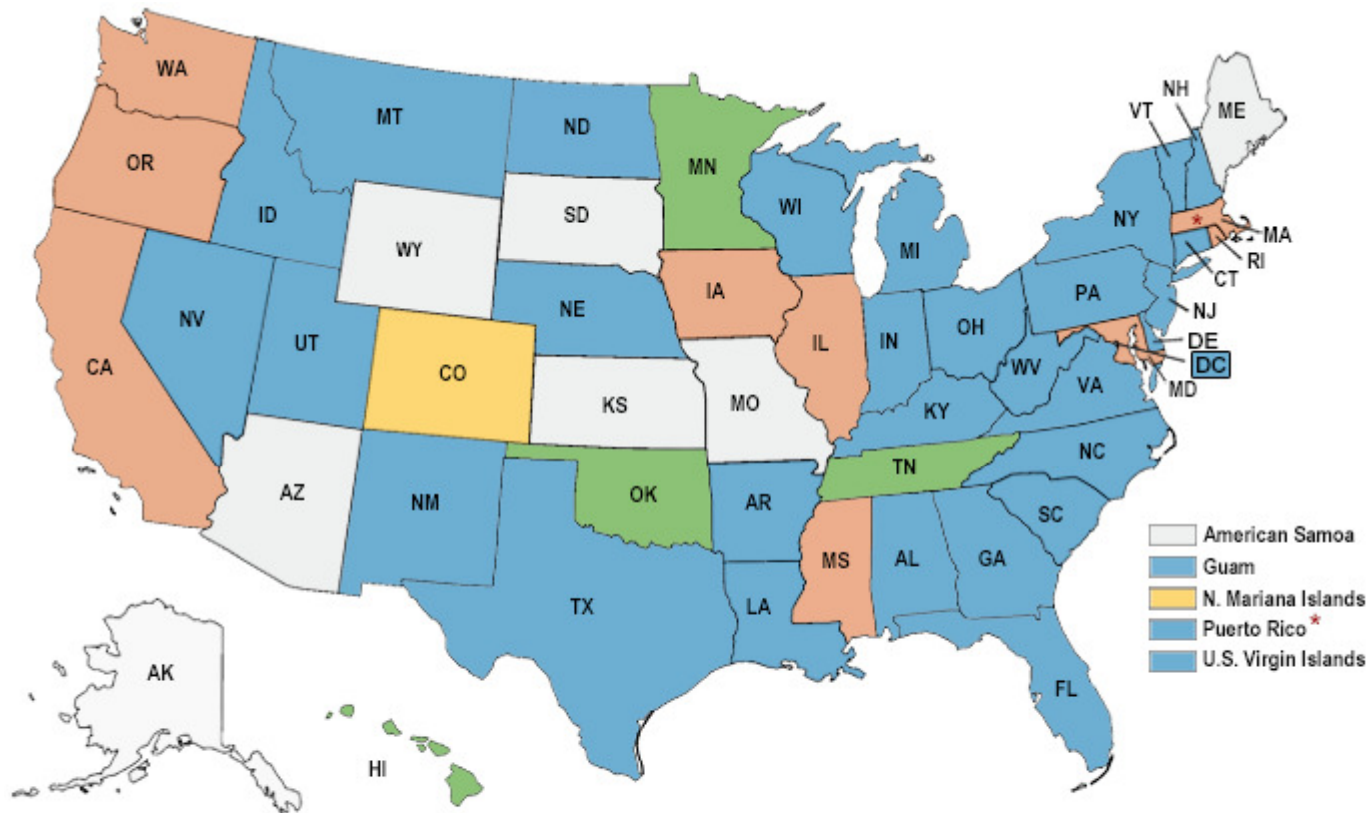


IgCC and Energy

- ▶ Zero Energy Performance Index, zEPI
 - ▶ My building is 50% more efficient than *code*”
 - ▶ IECC 2012 is:
 - ▶ 25% more stringent than IECC 2009
 - ▶ zEPI = 100 = Year 2000
 - ▶ zEPI = 57 = IECC 2012
 - ▶ zEPI = 51 = IgCC 2012
 - ▶ zEPI = 40 = **Current 2030 Target**



What is happening nationally?



9 ASHRAE 90.1-2010/2012 IECC equivalent or more energy efficient.	33 ASHRAE 90.1 - 2007/2009 IECC equivalent or more energy efficient.	4 ASHRAE 90.1 - 2004/2006 IECC equivalent or more energy efficient.
2 ASHRAE 90.1 - 2001/2003 IECC equivalent or less energy efficient.	8 No Statewide Code	

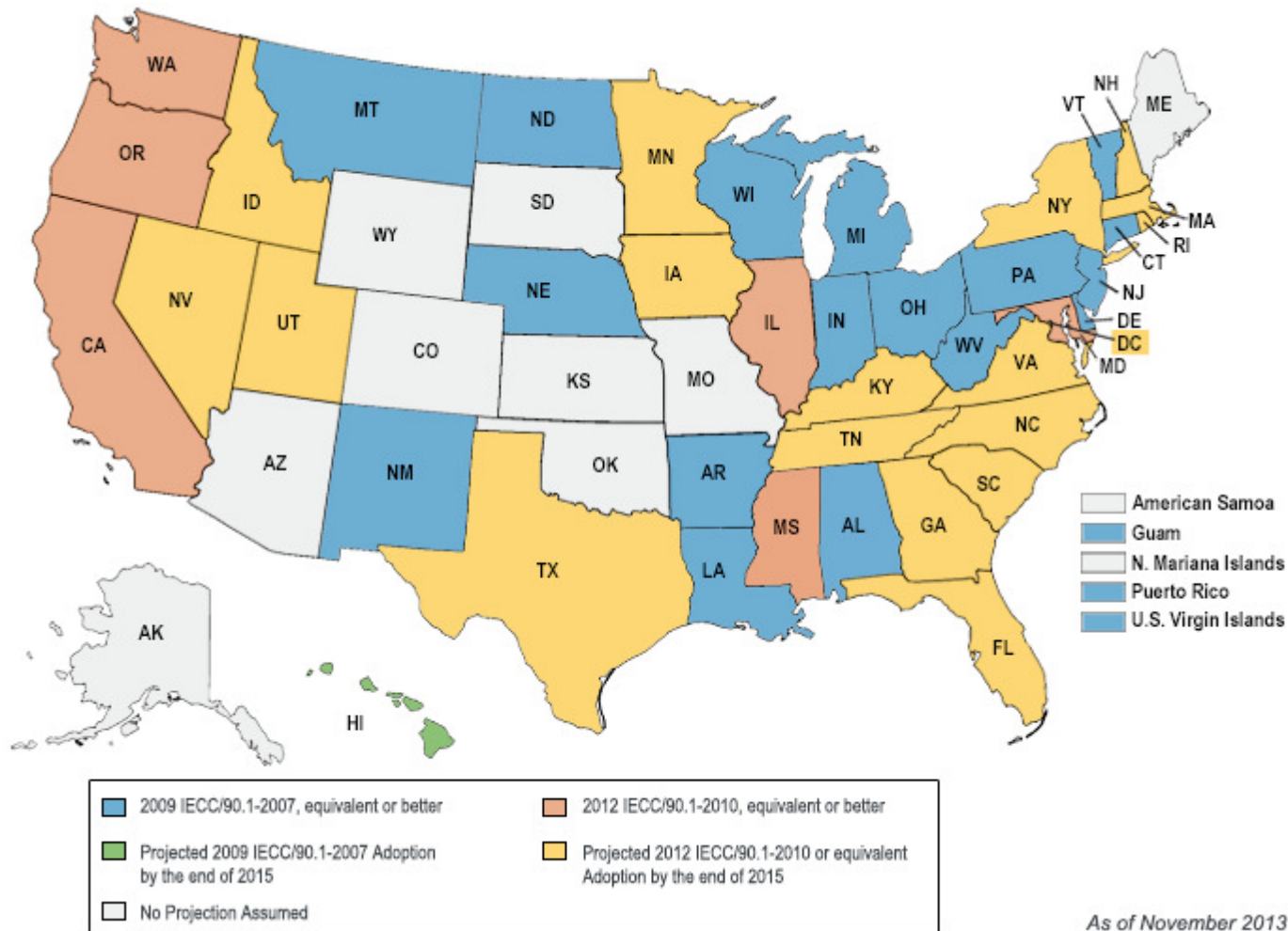
* Adopted new Code to be effected at a later date

As of March 2014

energycodes.gov



What is happening nationally?



2015 Outlook

As of November 2013

energycodes.gov



IECC Compliance - 2012

1 ● 90.1-2010

OR

- 2**
- C402 - Envelope
 - C403 - Mechanical
 - C404 - SWH
 - C405 - Lighting

AND

● Pick One:

- C406.2 – Eff. HVAC Performance
- OR
- C406.3 – Eff. Lighting Systems
- OR
- C406.4 – On-site Renewable Energy

OR

- 3**
- C407 – Total Building Performance
 - C402.4 – Air Leakage
 - C403.2 – Provisions applicable to all mechanical systems
 - C404 - SWH
 - Lighting Mandatory Sections
 - C405.2
 - C405.3
 - C405.4
 - C405.6
 - C405.7
 - Building energy cost to be $\leq 85\%$ of standard reference design building



Washington DC and IgCC 2012

▶ Applicability

- ▶ All new projects will need to follow IgCC (2012 IBC)
- ▶ Commercial Projects
 - ▶ > 10,000 sf
- ▶ Multi-Family Residential
 - ▶ 4 stories and > 10,000 sf

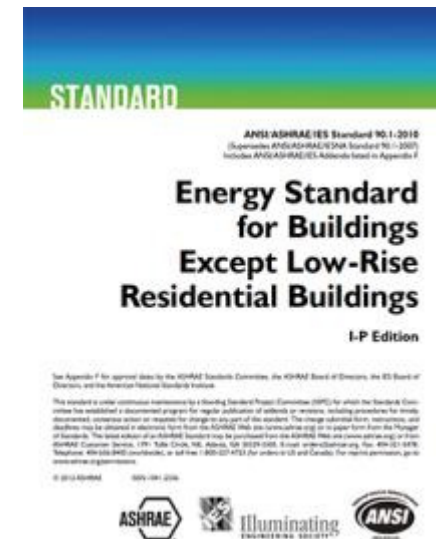
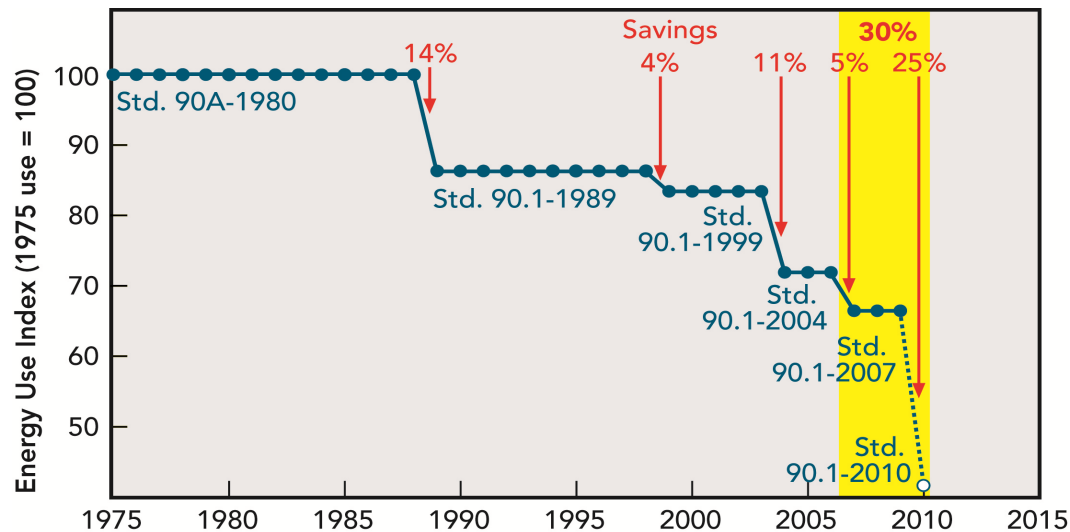
▶ Compliance

- ▶ Prescriptive: IECC 2012 with some enhancements
- ▶ Performance: ASHRAE 90.1-2010 Appendix G + 10%



IECC 2012 versus ASHRAE 90.1-2010

- ▶ Similar level of stringency
- ▶ Some differences in execution
- ▶ ASHRAE 90.1-2010, may be a consideration for LEED v4.0 or IgCC performance path
- ▶ Do not mix and match between IECC and 90.1



Local Government Participation

- ▶ Adopt latest energy code – 90.1 or IECC
- ▶ Utilize IgCC or ASHRAE 189.1 – “stretch code”
- ▶ Encourage energy auditing, energy benchmarking, and energy disclosure
- ▶ Zoning practices – 2030 districts



Private Sector Role **AIA 2030** Commitment

- ▶ **AIA 2030 Commitment**
 - ▶ Requires annual reporting of predicted energy use in design phase
 - ▶ Requires energy modeling
 - ▶ Model ≠ actual use
- ▶ Hundreds of signatories – voluntary program
- ▶ Relatively few actually submit reports

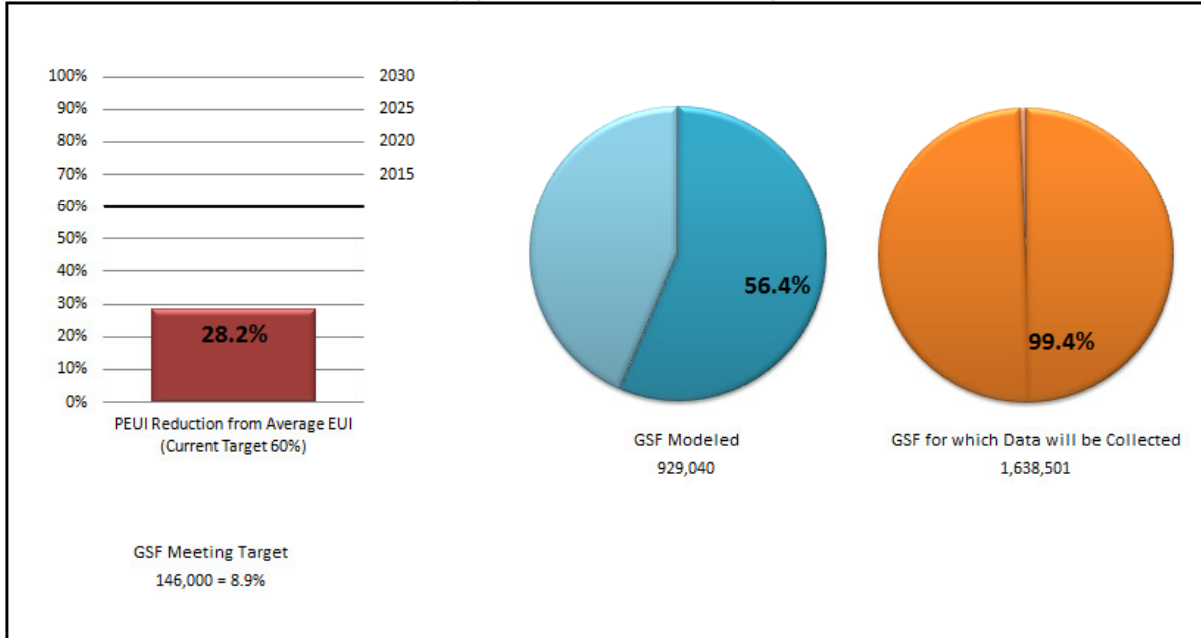


Reporting Procedure

AIA 2030 Commitment Annual Report
Westlake Reed Leskosky
Design Work 2012

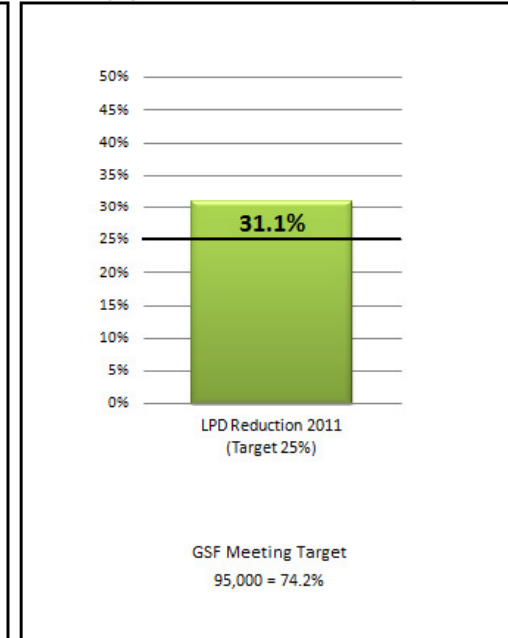
Whole Building/Additions Projects

45 projects and 1,648,501 GSF included in analysis.



Interior-Only Projects

9 projects and 128,000 GSF included in analysis.



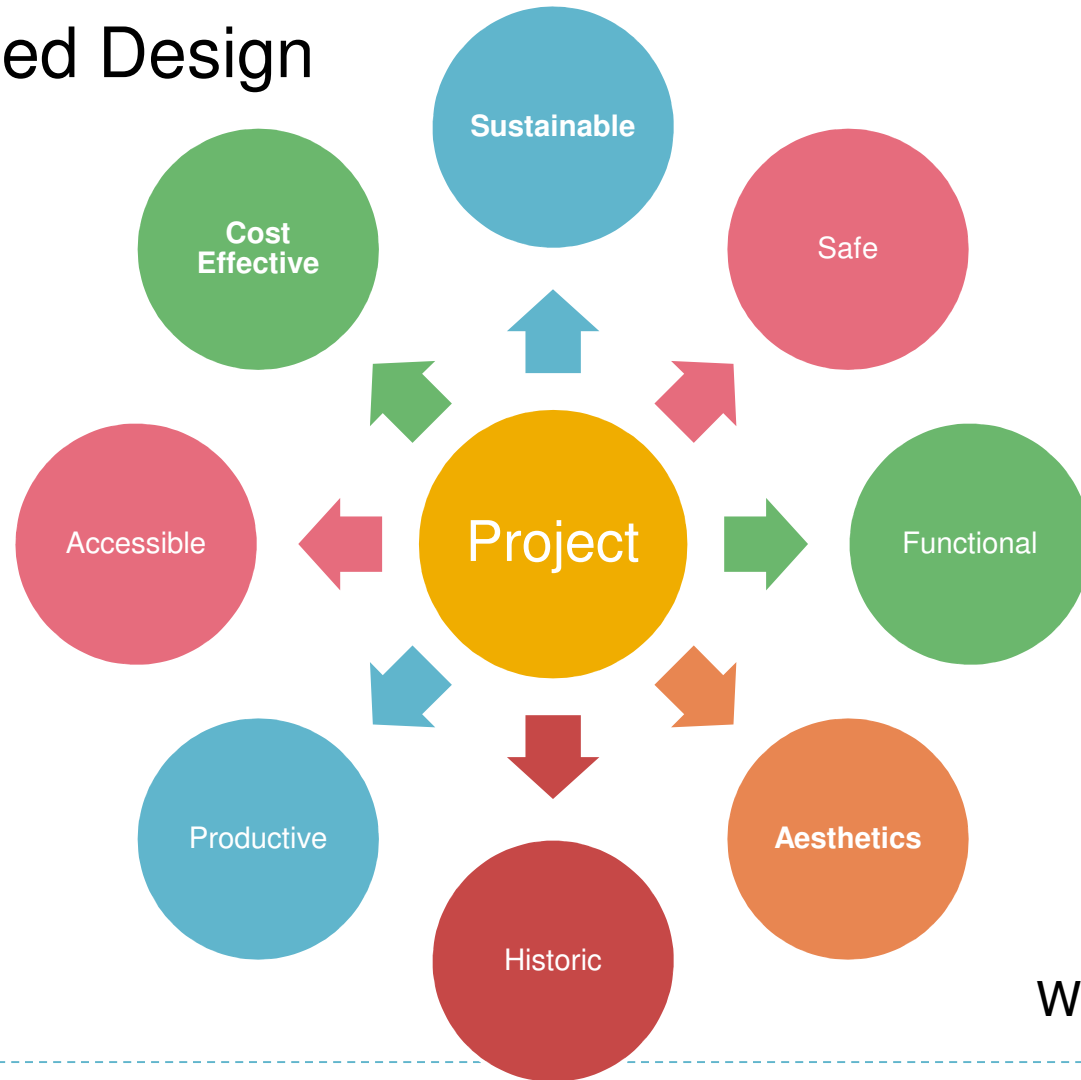
Private Sector – WRL Perspective

- ▶ Architect Magazine ranking
 - ▶ #3 overall, #5 sustainability
- ▶ Integrated practice model
- ▶ Benefits
 - ▶ Staff morale
 - ▶ Client engagement
 - ▶ Project pursuits
- ▶ Challenges
 - ▶ Green washing
 - ▶ Data collection



Codes and Design

► Integrated Design



WBDG



National Initiatives

- ▶ **Federal government already embraces 2030 targets**
 - ▶ Energy Policy Act of 2005 (179D Tax Deduction)
 - ▶ Energy Independence and Security Act of 2007 (EISA)
 - ▶ Executive Order 13514
 - ▶ ARRA Requirements
- ▶ **Better Buildings Challenge**
 - ▶ 20% reduction in portfolio energy use
 - ▶ Not as aggressive as 2030, but potentially more realistic



Questions?

- ▶ rchang@wrldesign.com
- ▶ www.wrldesign.com
- ▶ www.recool.com


The screenshot displays the recool website interface. At the top, the 'recool' logo is on the left, and navigation links for 'About Us', 'Projects', 'Products', and 'Blog' are on the right, along with a search bar. Below the navigation is a green banner with the title 'Sustainability in Architecture' and a welcome message: 'Welcome to recool, a new platform for the exploration and discussion of design and technology solutions for the built environment. recool: solutions for a warming planet.' A large photograph of the Wayne Aspinall Federal Building is shown below the banner. Underneath the photo is a section titled 'Featured Projects' with the heading 'Wayne Aspinall Federal Building'. The text describes the building's location in Grand Junction, CO, and its construction in 1915. Below this, there are two columns of 'FAST FACTS': 'SF 41,882' and 'LEED-NC v2.0 Platinum (Certified)' on the left; 'ENERGY STAR 100 (Enclosed)' and '(WY)100 (v2.0) 85.7% (ASHRAE 90.1-2007)' on the right. The bottom section is titled 'Recent Highlights' and contains two columns of text. The left column, dated 2014, mentions 'recool wishes its visitors a great New Year...' and includes a 'CONTINUE READING' button. The right column mentions 'recool named among "10 Architecture Firm Blogs to Watch in 2013"' and includes another 'CONTINUE READING' button.

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Sustainability in Architecture

Welcome to recool, a new platform for the exploration and discussion of design and technology solutions for the built environment. recool: solutions for a warming planet.



Featured Projects

Wayne Aspinall Federal Building

The Wayne Aspinall Federal Building & U.S. Courthouse is located in Grand Junction, CO. The building was constructed in 1915 as a United States Post Office and Courthouse under the supervision of the...

FAST FACTS

SF 41,882	ENERGY STAR 100 (Enclosed)
LEED-NC v2.0 Platinum (Certified)	(WY)100 (v2.0) 85.7% (ASHRAE 90.1-2007)

Recent Highlights

2014

recool wishes its visitors a great New Year. We look forward to providing updates on several of our major projects around the world.

CONTINUE READING

recool named among "10 Architecture Firm Blogs to Watch in 2013"

recool was noted by Architecture Record as one of the 10 top architecture firm blogs to watch in 2013. recool is honored to be recognized and looks forward to a year of thoughtful discussion and evaluation of solutions to address climate change.

CONTINUE READING

