The American Institute of Architects

2030 by the numbers

The 2016 summary of the AIA 2030 commitment

July 2017

BROCK ENVIRONMENTAL CENTER

In the context of a rapidly shifting global landscape on climate change, including the June 2017 announcement that the United States would start the process to formally withdraw from the Paris Climate Agreement, the role of the private sector in a low-carbon future is more pronounced than ever. The design of the built environment is a crucial part of that future.

Therefore, all progress we collectively make toward meeting our 2030 Commitment targets is a step in the right direction. As the 2016 numbers show, we've seen growth in the program and progress toward goals, though not yet at the pace required by the urgency of climate change. This report provides a snapshot of what we've accomplished, while also demonstrating the need to accelerate our efforts.

The program is growing

In 2016, 175 firms—representing sole practitioners to companies with more than 1,000 employees—demonstrated their commitment to reaching our collective goals by aggregating and sharing their project data, a 15% increase in reporting firms from 2015. Additionally, 53 new firms joined the Commitment, bringing the overall number of signatories to more than 400.

Our goals are ambitious - but achievable

The average predicted energy use intensity (pEUI) percent savings increased again this year, climbing to 42% from 38% in 2015. While more work is needed to reach the current overall target of 70% or more, there are firms and projects demonstrating that this is possible: In 2016, six firms reported an overall pEUI reduction of 70% or greater for their portfolio, and across the board, 331 individual projects representing a variety of sizes and use types also met this ambitious target.

The impact is significant

Taken together, the potential energy savings from 2016 projects represent approximately 16.7 million metric tons of greenhouse gas emissions, the equivalent of running almost five coal-fired power plants or powering 1.76 million homes in a year*. These designed project savings represent progress for our environment—and good news for our economy. In the U.S. alone, 2016 projects as designed represent a projected annual cost savings of approximately $1.43 billion**.

Energy modeling is key

Our numbers continue to demonstrate that energy modeling is an essential component of success. The numbers also indicate that we must better understand the strategies, tools, and resources necessary to integrate energy modeling into the design culture of architecture firms.

As we look to 2017 and beyond, the importance of voluntary efforts like the 2030 Commitment will remain critical catalysts for a carbon-neutral future, helping to reduce the threat of climate change facing future generations. To learn more about the 2030 Commitment, including how to become a signatory, as well as upcoming in-depth reports and case studies on the 2016 numbers, visit the 2030 Commitment page on aia.org.

* EPA Greenhouse Gas Equivalencies Calculator

** Calculated using U.S. average commercial rates for electricity and natural gas for all project types

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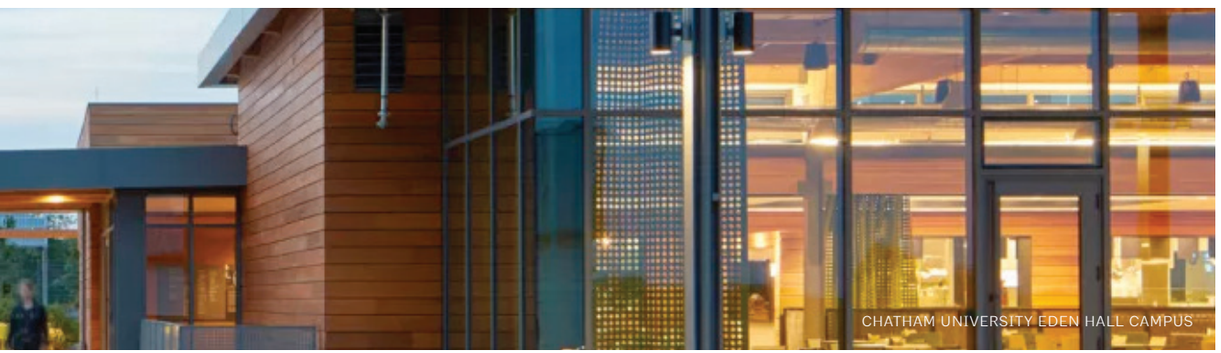
AIA 2030 Commitment Working Group & Co-chairs
Greg Mella, FAIA–Smithgroup JJR
Heather Gayle Holdridge–Lake | Flato Architects



CHATHAM UNIVERSITY EDEN HALL CAMPUS

IMPACT

Projected CO^2 emissions reduction in 2016 projects

16.7

million MT CO2e/yr

That's equivalent to removing 4.9 coal-fired power plants*.

*EPA Greenhouse Gas Equivalencies Calculator https://www.epa.gov/energy/greenhouse-gas-equivalencies-calculator.
The careful observer will note that this is less than was reported in the 2015 annual report. This is do to a more precise methodology used this year that accounted for location and use type. Using the same methodology applied to 2015 data, the carbon reduction would be 15.1 million MT CO2e/yr.

The built environment is associated with the majority of human-caused carbon emissions, giving architects significant influence in the response to climate change. The projected reductions in carbon emissions from the 2016 projects in the 2030 Commitment demonstrate just how powerful the impact of architects and design choices can be.

Projected savings in 2016 projects

$1.4B

in the U.S.

The energy reduction projections from 2016 projects aren't only good for the environment – they are good for the economy as well. Based on the average U.S. commercial rates for electricity and natural gas, the projected carbon reductions translate into a potential annual savings of $1.4 billion for domestic projects, and $3.1 billion when considering domestic and international projects together.

$3.1B

U.S. & global

* Design energy cost savings calculation: 1) The project use type was used to determine the percentage of electricity and natural gas for each project in the United States and Canada [1]; 2) the whole building and interior only project energy savings were totaled; 3) The electricity and natural gas design energy savings were multiplied by the US average commercial rate for electricity [2] and natural gas [3].

[1] – ENERGY STAR Portfolio Manager: Technical Reference: Estimating Fuel Mix and Energy Cost (August 2016). hyperlink – https://portfoliomanager.energystar.gov/pdf/reference/FuelMixandCost.pdf
[2] – EIA Electricity US Average – https://www.eia.gov/electricity/monthly/epm_table_grapher.php?t=epmt_5_6_a
[3] – EIA Natural Gas US Average – https://www.eia.gov/naturalgas/monthly/pdf/table_03.pdf

Every improvement makes a difference

Taken in the context of a typical 100,000 sq ft commercial building, **the savings from a building designed to perform 70% better than the 2030 baseline would lead to $140,000 in energy cost savings***, and ~688 metric tons CO^2e savings annually (equivalent to removing 145 passenger cars from the road for a year).**

For every **100 kBtu of electricity saved**, just over **15 kg of CO^2 equivalent emissions are eliminated**. The energy cost savings are: $4.11 for a residential building, $3.34 for a commercial building, and $2.15 for an industrial building.

For every **100 kBtu of natural gas saved**, **5.3 kg of CO^2 equivalent emissions are eliminated**, with cost savings from $1.04 to $0.39, depending on building type.

*Using 56% electricity and 44% natural gas
**EPA Greenhouse Gas Equivalencies Calculator https://www.epa.gov/energy/greenhouse-gas-equivalencies-calculator

Ambitious, but achievable, goals

In 2006 Architecture2030 set an ambitious road map to achieve carbon neutrality in new buildings by 2030 with incremental targets increasing every 5 years. Since 2009 the AIA 2030 Commitment has provided an actionable tool to track progress.

A key challenge facing the 2030 Commitment is how to accelerate our progress to meet the target, especially as firms and projects demonstrate that meeting the target is possible.

6 firms

reported an average pEUI savings of 70% or greater across their portfolio

16 firms

reported portfolio average pEUI savings between 60 and 70%

331 projects

met the target of at least 70% pEUI savings–and over a third of those projects were 100,000 sq.ft. or greater


STANFORD UNIVERSITY CENTER

GROWTH

Growth in firm engagement

BROCK ENVIRONMENTAL CENTER

15% increase in reporting firms

Over 400 firms have signed the AIA 2030 Commitment

Who's participating-AIA 2030 Commitment engaged signatories

5 + years reporting

Adrian Smith + Gordon Gill Architecture
Albert Kahn Associates
Alliiance (formerly Architectural Alliance)
Ayers/Saint/Gross
Bergmeyer Associates
BNIM Architects
Bora Architects
CallisonRTKL
CannonDesign
Cooper Carry
Cunningham | Quill Architects
DLR Group
EHDD
English + Associates Architects, Inc.
Epstein
Eskew+Dumez+Ripple
EYP
FXFOWLE
Gensler
GGLO
Goettsch Partners
Gresham Smith and Partners
Hahnfeld Hoffer Stanford
Harley Ellis Devereaux
High Plains
HKS
HOK
Hord Coplan Macht
IKM Incorporated
Jones Studio, Inc.
Kipnis Architecture and Planning
KMD Architects
L.M. Holder III, FAIA
Lake|Flato Architects
Landon Bone Baker Architects
Leddy Maytum Stacy Architects
Legat Architects
Lehrer Architects LA, Inc.
Little Diversified Architectural Consulting
Lord, Aeck & Sargent
LPA, Inc.
LS3P
Mahlum
Mazzetti Nash Lipsey Burch
Mithun
Moseley Architects
NBBJ
Orcutt Winslow
Page
Paul Poirier + Associates Architects
Payette Associates, Inc.
Pei Cobb Freed & Partners Architects LLC
Perkins+Will
Pickard Chilton
Quattrocchi Kwok Architects
Quinn Evans Architects
RVK Architects, Inc.
SERA Architects
Serena Sturm Architects, Ltd.
SHP Leading Design
SmithGroupJJR
Solomon Cordwell Buenz
SOM (Skidmore, Owings & Merrill) LLP
STUDIOS Architecture
The Beck Group
The Miller Hull Partnership
The Sheward Partnership, LLC
The SLAM Collaborative
TLC Engineering for Architecture
TRO Jung | Brannen
Valerio Dewalt Train Associates
Vanderweil Engineers
Weber Thompson
Wight & Company
William Rawn Associates, Architects, Inc.
WLC Architects, Inc.
Yost Grube Hall Architecture
ZeroEnergy Design
ZGF

3-4 years reporting

Ann Beha Architects
ARC/Architectural Resources Cambridge, Inc.
Archimania
Atelier Ten
Bard, Rao + Athanas Consulting Engineers LLC
Braun and Steidl (formerly Braun+Yoshida Architects, P.C.)
Buro Happold Consulting Engineers Inc.
BWBR
Coolearth Architecture Inc.
Cuningham Group Architecture, Inc.
Dattner Architects
Davis Partnership Architects
Dewberry
DSGN Associates, Inc.
DWL Architects + Planners
Ellenzweig
Engberg Anderson
Farr Associates
Goody Clancy
Guidon Design
GWWO, Inc./Architects
Hacker (Formerly known as THA Architecture)
Hartshorne Plunkard Architecture
HDR, Inc.
Helix Architecture + Design
HMC Architects
Jacobs Global Buildings
Krueck+Sexton Architects
Leers Weinzapfel Associates
mode associates
MSR
OPN Architects
Overland Partners
Perkins Eastman
RB+B Architects, Inc.
Sasaki
Shepley Bulfinch
Smith Seckman Reid
SMMA
Willoughby Engineering LLC
Wilson Architects
WRNS Studio

1-2 years reporting

Ankrom Moisan
BAR Architects
BLT Architects
Bohlin Cywinski Jackson
Booth Hansen
Boulder Associates
Bruner/Cott
CBT Architects, INC
Clark Nexsen
CO Architects
Coulson
David Baker
DiMella Shaffer
DRAW architecture + urban design (formerly Davison Architecture + Urban Design)
green|spaces
Handel Architects
HarrisonKornberg Architects
Hastings
Hennebery Design
HGA Architects & Engineers
HMFH Architects
JAHN
Lionakis
McGranahan Architects
Miller Dyer Spears
Moody Nolan
NADAAA
Opsis Architecture
Pelli Clarke Pelli
RATIO ARCHITECTS
RMW
RNL
Robert AM Stern
Shive-Hattery
Siegel & Strain
Snow Kreilich Architects
SRG Partnership
Studio Nigro
Ziger/Snead Architects

Who's participating-AIA 2030 Commitment new signatories

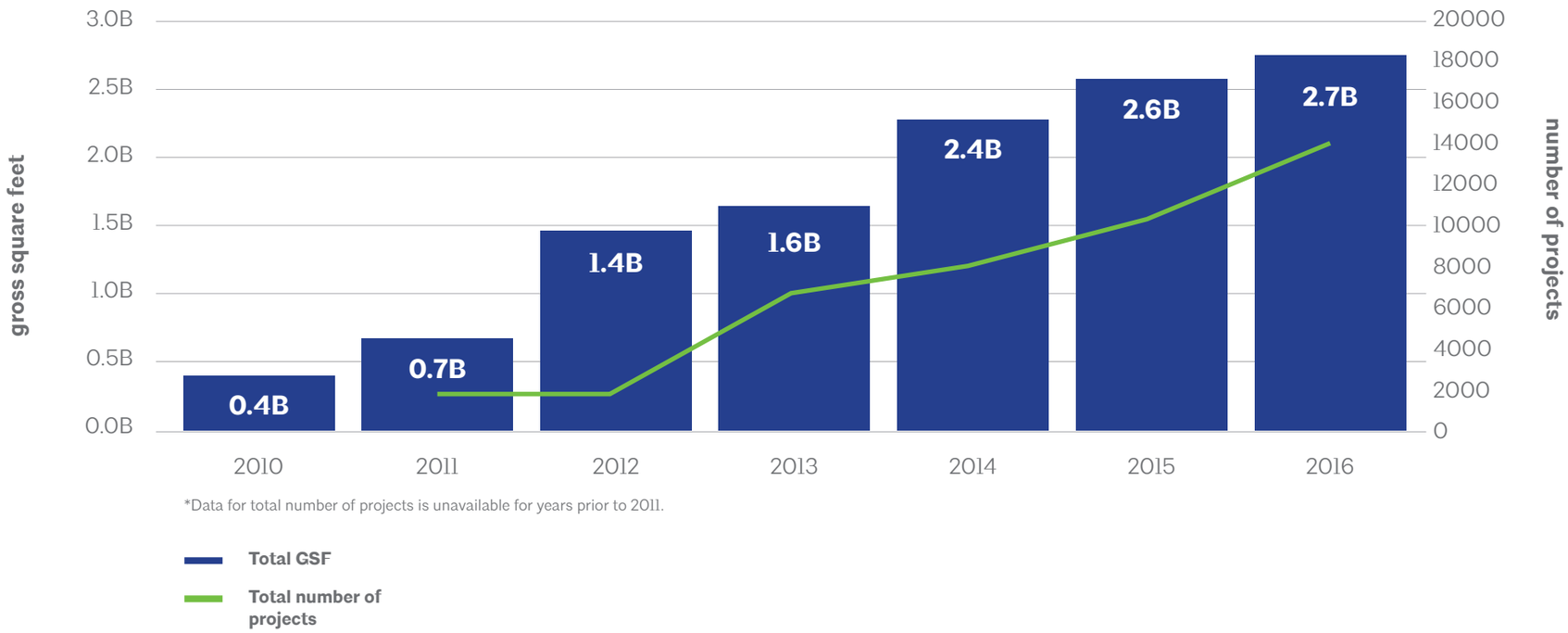
2016 Signatories

4240 Architecture Inc.
AC Martin Partners, Inc.
Aecis Arkitektura
Architecture is Fun, Inc.
Arkin Tilt Architects
Arrowstreet
Bernardon
Beyer Blinder Belle
Blackbird Architects
BLGY Inc.
BROOKS + SCARPA
Browning Day Mullins Dierdorf
CTA Architects Engineers
Dake Wells Architecture
Dekker Perich Sabatini
Dore & Whittier
Elizabeth Eason Architecture LLC
Elkus Manfredi
Emersion Design
Feldman Architecture
Finegold Alexander Architects
Flad Architects
GarthShaw
GBD Architects Incorporated
Grimm+Parker
GSBS Architects
Holly & Smith Architects
ICON Architecture
Interface Engineering-Chicago
INVISION
Jer Greene, AIA + CPHC
LHB, Inc.
Limbacher & Godfrey Architects
Maryann Thompson Architects
Murphy Burnham & Buttrick
Neumann Monson
Office for Local Architecture (OLA)
Perry Dean Rogers Partners Architects
Ryall Porter Seridan Architects
Sheldon Pennoyer Architects
Sink Combs Dethlefs
Spector Group
Stanley Studio
Stephen Tilly, Architect
TBDA
The Design Alliance
The Green Engineer Inc.
TK-Architecture
Touloukian Touloukian Inc.
Trapolin-Peer Architects
VMDO Architects
WDG
Wiemann Lamphere Architects

BRISTOL COMMUNITY COLLEGE

33% increase in reported projects

Total reported area (GSF) of projects & total number of projects

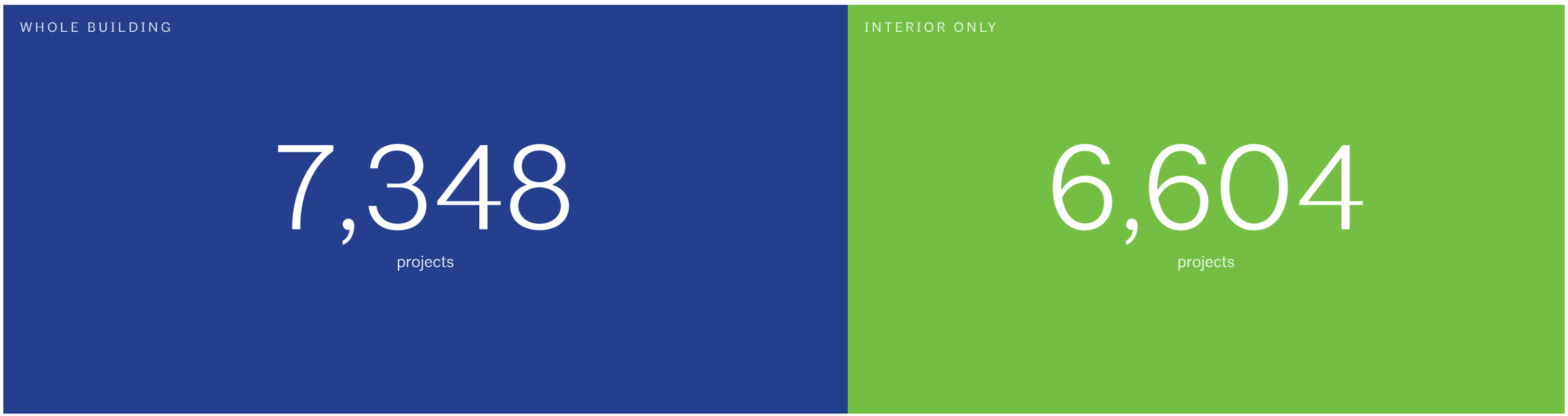


*Data for total number of projects is unavailable for years prior to 2011.

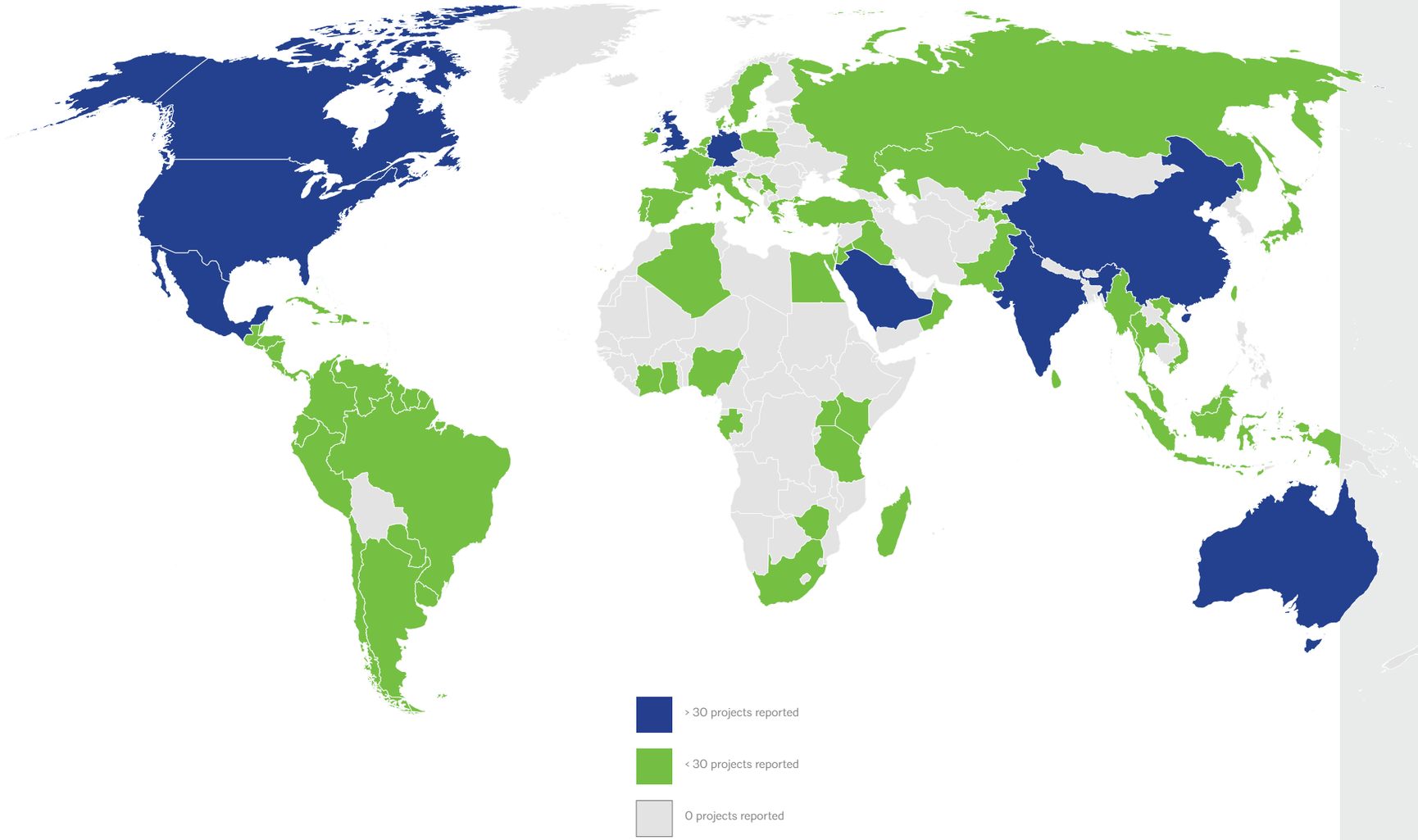
While both overall reported project area (GSF) and the total number of projects continued to grow, the number of projects increased at a greater rate. This reflects an increased reporting of smaller-size projects, with the median size of whole building projects moving from 109k GSF in 2015 to 90k GSF in 2016.

Whole building versus interior projects

33% growth in overall number of project reported in 2016, while interior-only projects increased by 48%.



Growth in number of countries



24%

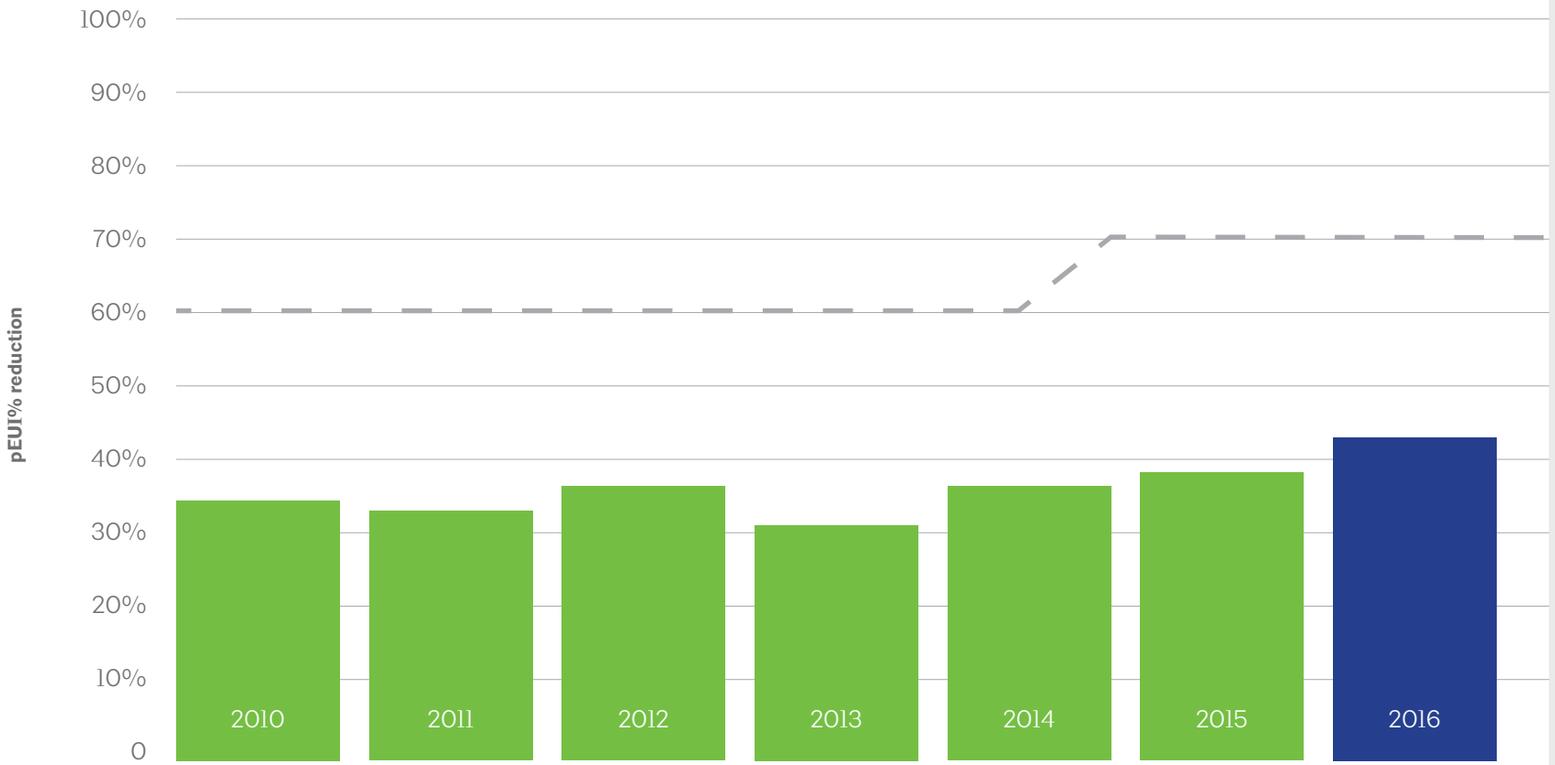
growth in number of countries represented, with projects representing 94 countries reported in 2016

International projects tend to be much larger than domestic projects. While only 10% of all reported projects were international, these projects represent 42% of the overall GSF.


R.W. KERN CENTER

PERFORMANCE

An ambitious pEUI% reduction target



We are making important progress, but must accelerate our pace in order to meet our goals.

In whole building projects for 2016, pEUI savings averaged 42%–a continuation of the positive trend we've seen over the past several years, but still short of 70% target.

*Annual project average pEUI % reduction as compared to the Architecture2030 target

Performance of interior projects

21%*

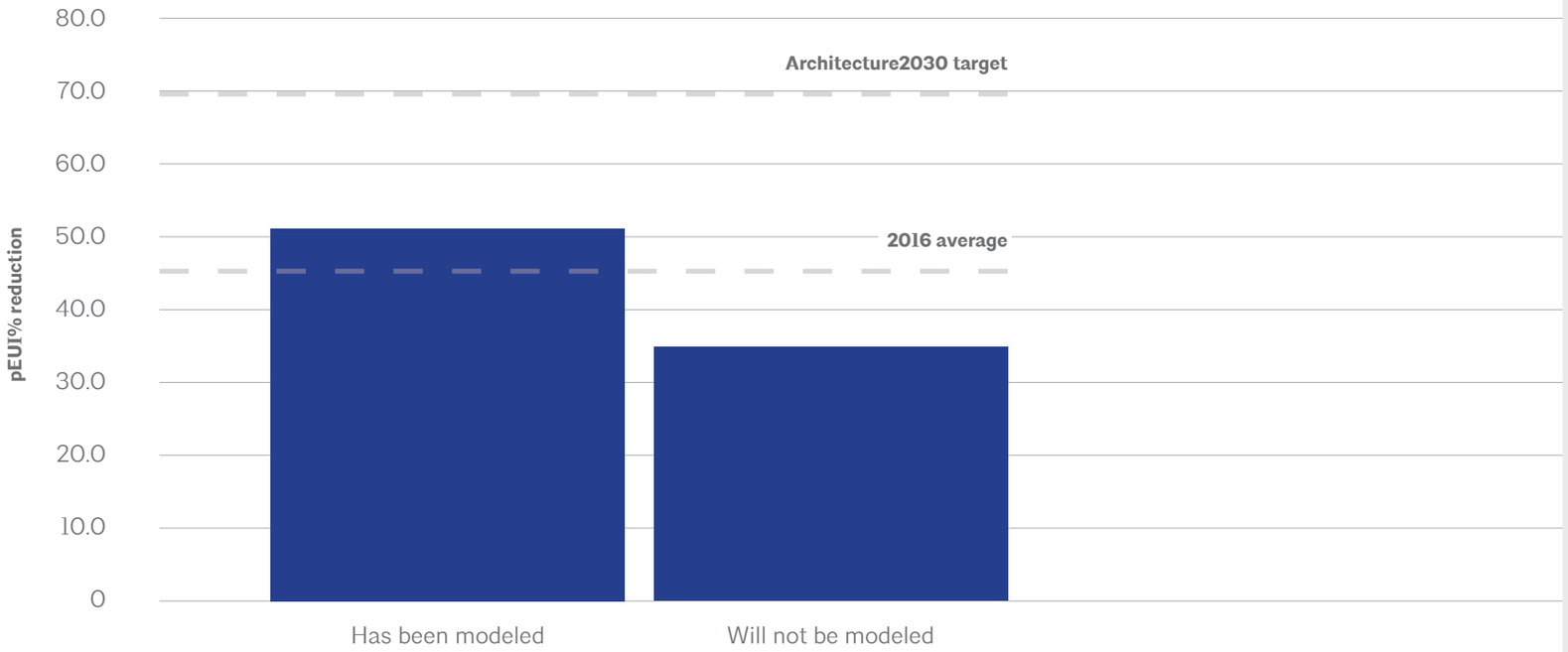
project average LPD savings in 2016

Overall, projects are coming close to meeting the 2030 Commitment target of 25% savings over ASHRAE 90.1-2007 baselines—which is not surprising, given industry improvements in efficient lighting options such as LED and the increased integration of performance-based interior design strategies, including using daylight sensors and utilizing task and ambient lighting. Code has also been a critical driver for making these improvements. Going forward, architects can drive additional improvements through advocating for further code improvements, embracing performance-based design strategies in all project types, and continuing to make calculating LPD values a priority in project reporting.

*Because of certain reporting discrepancies, the 21% savings reflects an adjustment to code minimum LPD % savings within eight frequently used energy design codes in the office use type, encompassing the majority of projects. The 2030 Commitment will continue to examine methods to improve reporting in this area.

BRISTOL COMMUNITY COLLEGE

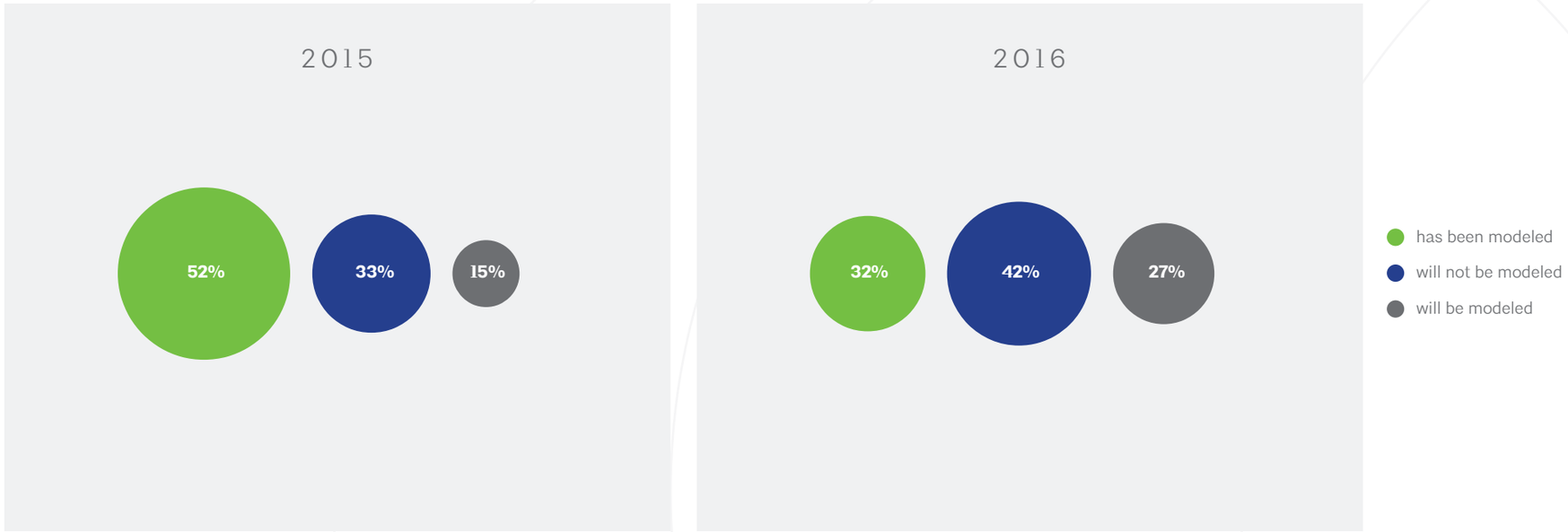
Modeling=better performance



Projects using energy modeling predict an average of 16 percentage points more energy reduction.

Increasingly stringent codes are the driver for improvement for non-modeled projects.

Decrease in energy modeling



Despite a decrease in the average use of energy modeling in 2016, the overall pEUI % reduction improved. This reflects the role of more stringent energy codes.

A focus of our work moving forward is understanding the barriers to modeling, strategies and tools for overcoming them, and continuing to support and advocate for adoption of more stringent energy codes.

What you can do

STANFORD UNIVERSITY CENTRAL ENERGY FACILITY

Take a step forward

If you haven't already, join the 2030 Commitment

Explore the AIA+2030 Online Series on AIAU

Track your firm's progress toward 2030 carbon neutral goals with the DDx (DDx help pages)

Use energy modeling as well as resources in the DDx

As signatories our firm is much more efficient and we have happier clients. The DDx allows us to take advantage of a robust set of data to enhance and inspire our design processes and focus our time and efforts in the areas that will best serve our clients.

Stacey White, AIA, LEED AP BD + C,
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a small firm in San Luis Obispo, CA

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