2030
BY THE NUMBERS

The 2017 summary of
the AIA 2030 Commitment

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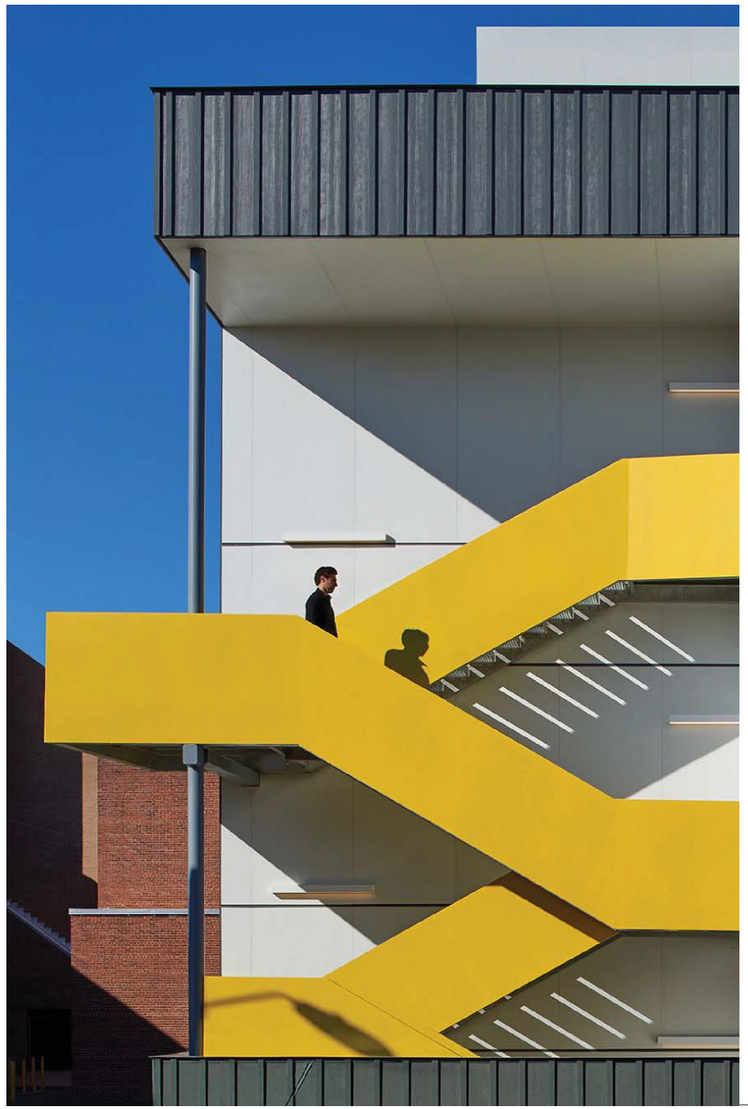
Published November 2018

INTRODUCTION



Our carbon footprint: The stakes are growing

Devastating wildfires in the Western United States. Pounding hurricanes from the Eastern states to the Caribbean. Record-breaking high-tide flooding[1] along the coasts. The drumbeat of news about effects related to a changing climate—and the resulting loss of life and property—refuses to stop. Meanwhile, the World Health Organization echoes the concerns of much of the public health community as it warns "the overall health effects of a changing climate are likely to be overwhelmingly negative."[2]

In the midst of this, the federal government is withdrawing from the Paris Agreement, striking references[3] to climate change from public documents, and generally taking a back seat in driving solutions. Now, more than ever, architects play a key role in combating climate change. With nearly 40 percent of US energy consumed by buildings,[4] architects must play a key role in combating climate change.

Architects are meeting the challenge

The 2030 Commitment is a powerful platform used by AIA members to affirm climate leadership. Launched nearly a decade ago, the 2030 Commitment provides a consistent national framework and multifaceted data analysis tool to guide and measure the impact of design decisions on energy use. It also offers resources, support, and training for architects to build expertise in developing low- to zero-carbon projects.

Especially encouraging is the fact that the program continues its steady expansion. In 2017, 212 firms—including sole practitioners and multinational companies with more than 1,000 employees—submitted portfolios, a 21 percent increase over 2016. In total, as of July 2018, 525 firms have signed the 2030 Commitment to a carbon-neutral built environment.

The 2030 Commitment is making a meaningful impact

Most important, the collective efforts of 2030 participants amount to meaningful impact. This year alone saw 17.8 million metric tons of carbon savings over the 2030 baseline equivalent buildings and savings of $3.2 billion in annual operating costs.

The overall average predicted energy use intensity (pEUI) percent savings rose again this year to 44 percent, with a two percent increase over 2016. The increase is driven by a combination of expanded energy modeling and more stringent energy codes in many states. Five hundred sixty projects met the 2017 target of 70 percent savings or above, with 99 projects reaching net zero.

In sum, 2017 represented another year of incremental progress, with each improvement an important step in the right direction. We also recognize that we'll need to enhance our performance more rapidly if we want to reach the goal of designing 100-percent carbon-neutral buildings by 2030.

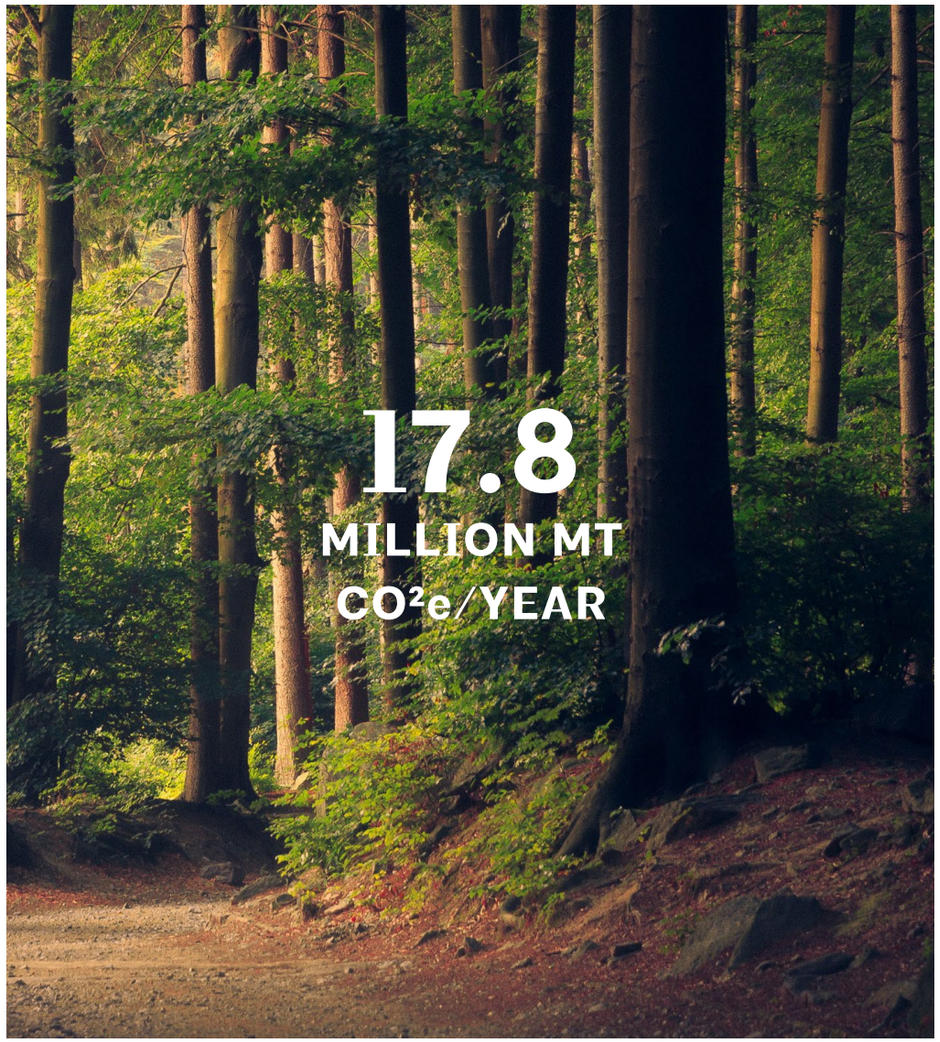
Knowledge is power

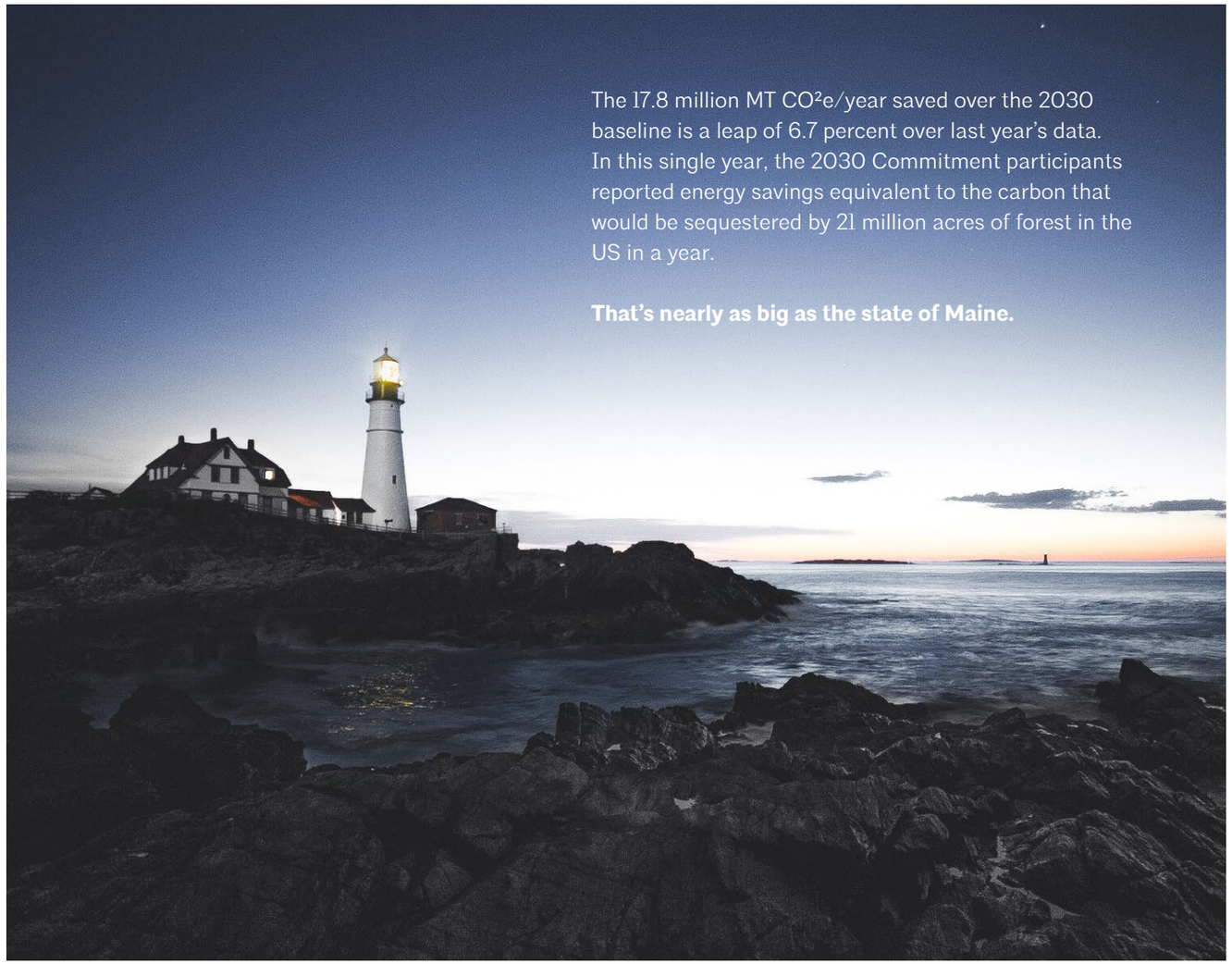
A key component of the 2030 Commitment is the Design Data Exchange (DDx), a sophisticated software suite that empowers users to collect, report, and analyze their data in ways that continually expand our knowledge about how and where progress is happening. That knowledge is power: Power to further cut greenhouse gas emissions and to design a built environment that reflects ingenuity and mindful progress, starting with our ongoing work to meet our 2030 goals.

Looking at the next decade—a critical period in fighting climate change in the built environment—the 2030 Commitment provides a model of success for voluntary efforts to move deliberately and effectively toward a sustainable, healthy, carbon-neutral future.

SECTION 1.

ARCHITECTS ARE CLIMATE LEADERS

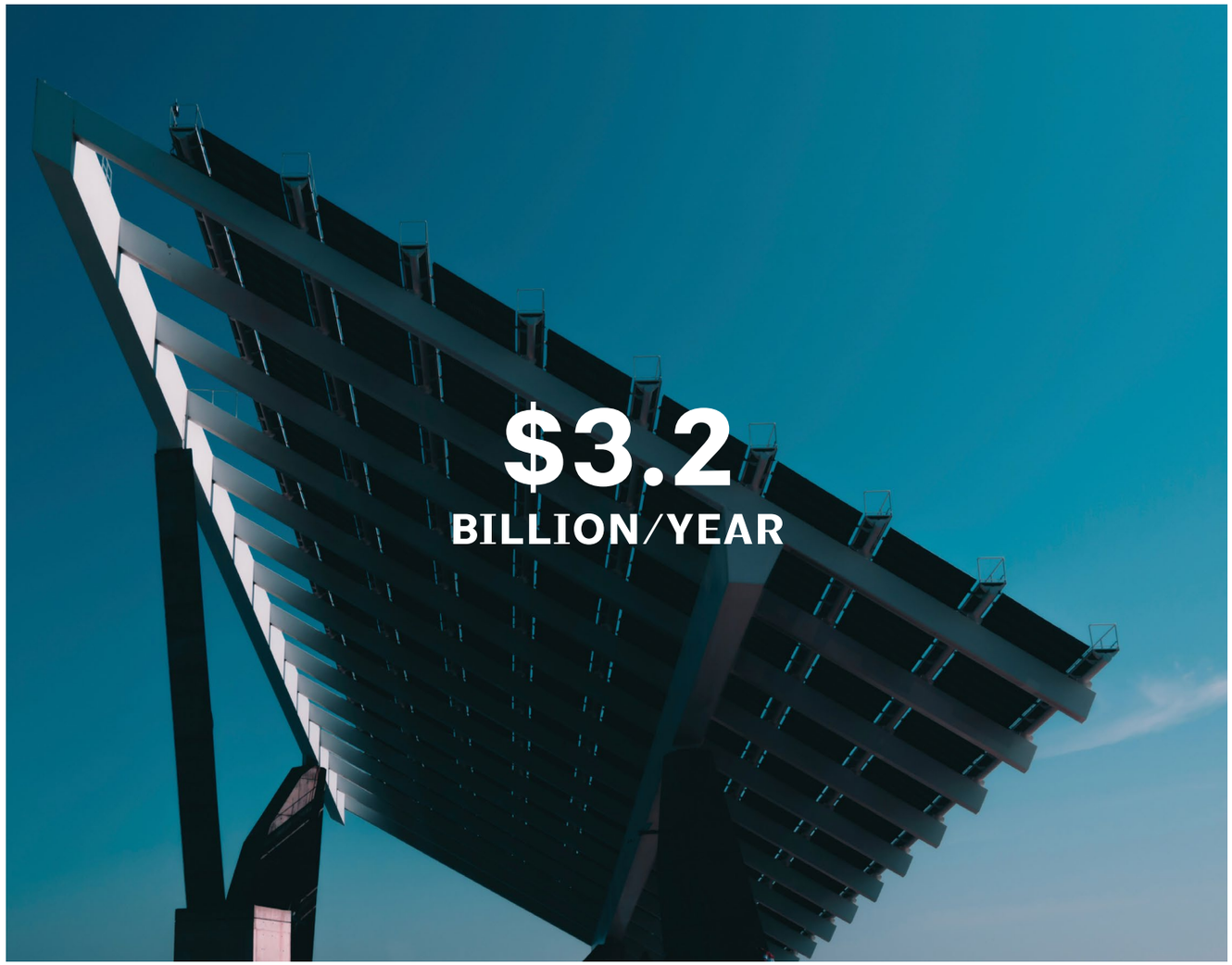


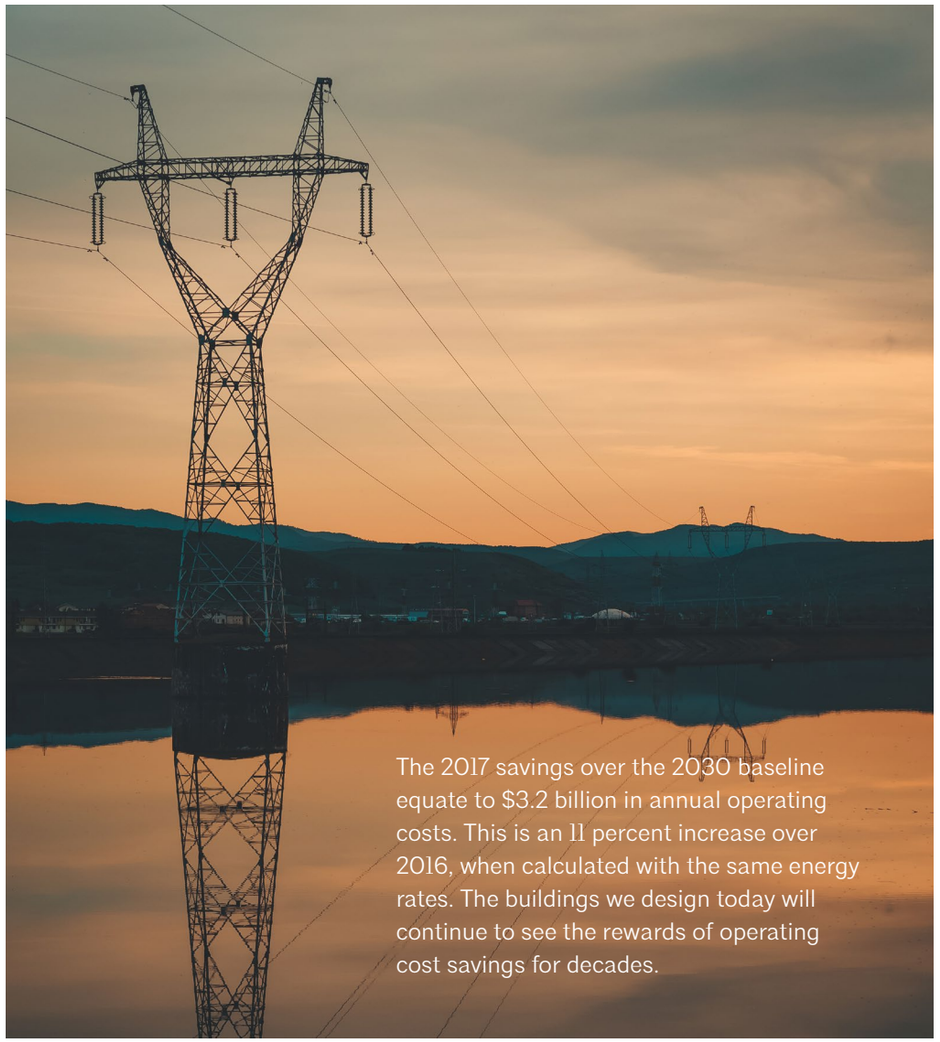


The 17.8 million MT CO^2e/year saved over the 2030 baseline is a leap of 6.7 percent over last year's data. In this single year, the 2030 Commitment participants reported energy savings equivalent to the carbon that would be sequestered by 21 million acres of forest in the US in a year.

That's nearly as big as the state of Maine.

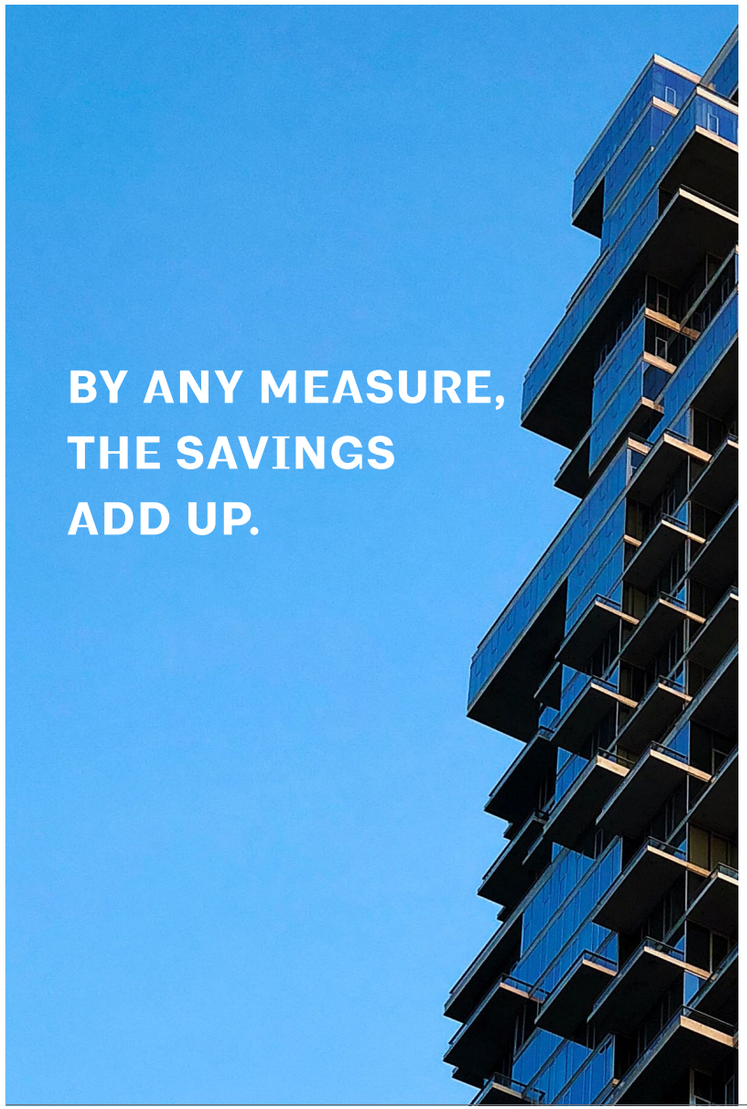
See appendix for the projected CO2 equivalent (CO^2e) emissions reduction calculation methodology.





The 2017 savings over the 2030 baseline equate to $3.2 billion in annual operating costs. This is an 11 percent increase over 2016, when calculated with the same energy rates. The buildings we design today will continue to see the rewards of operating cost savings for decades.

See appendix for the design energy projected cost savings calculation methodology.



COMMERCIAL SAVINGS

A typical 100,000 square foot commercial office building in New York City designed to perform 70 percent better than the 2030 baseline would yield the following annual savings:

~2,150 mWh
less energy

~$194,000
in projected energy cost savings

~537
metric tons of CO^2e reductions, which equals the amount of electricity about 80 homes use in a year

RESIDENTIAL SAVINGS

Meanwhile, a typical 2,500 square foot single-family home in Mobile, Alabama, designed to perform at 70 percent better than the 2030 baseline would equate to the following annual savings:

~23 mWh
less energy

~$2,000
in projected energy cost savings

~9
metric tons of CO^2e reductions or about the same as the carbon that is sequestered by preserving 10.6 acres of trees

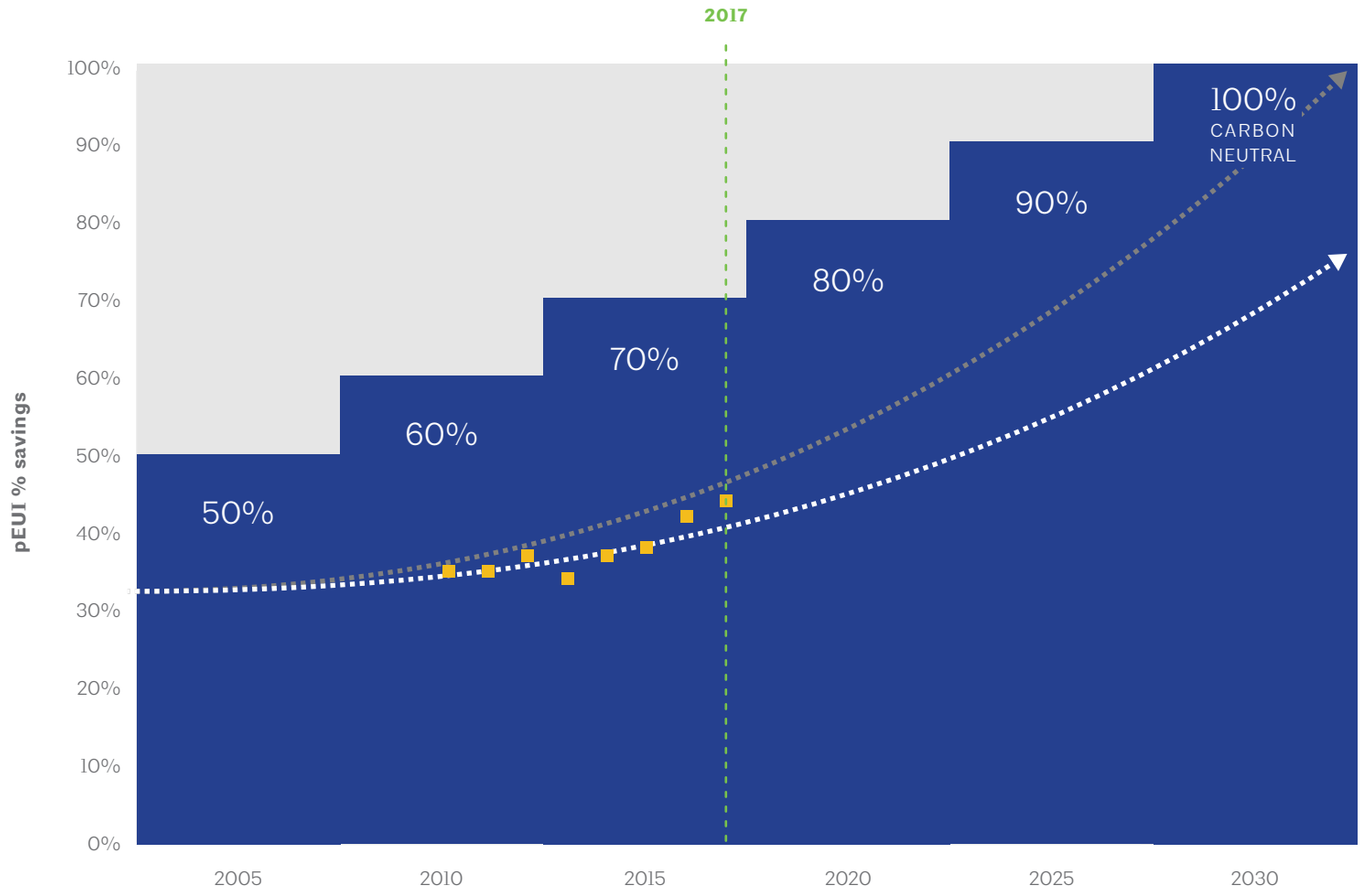
See appendix for the projected CO^2e equivalent emissions reduction calculation and design energy projected cost savings calculation methodologies.

“The AIA 2030 Commitment has been an essential platform for expanding Leddy Maytum Stacy Architects’ continued commitment towards a zero carbon future. Every firm should join the movement. This resource is a valuable guide towards helping designers track progress and ultimately make an impact as leaders in designing regenerative, healthy, and resilient communities.”

Marsha Maytum, FAIA, LEED AP
Principal at Leddy Maytum Stacy Architects, recipient of AIA’s 2017 Architecture Firm Award

SECTION 2.

THE 2030 COMMITMENT RETURNS RESULTS



Annual predicted energy use intensity (pEUI) savings is a weighted average of whole building project gross square feet (GSF). pEUI savings is relative to the 2030 Baseline–2003 Commercial Building Consumption Survey (CBECS)[5] and 2001 Residential Consumption Survey (RECS).[6]

PICK UP THE PACE TO MEET OUR 2030 GOALS

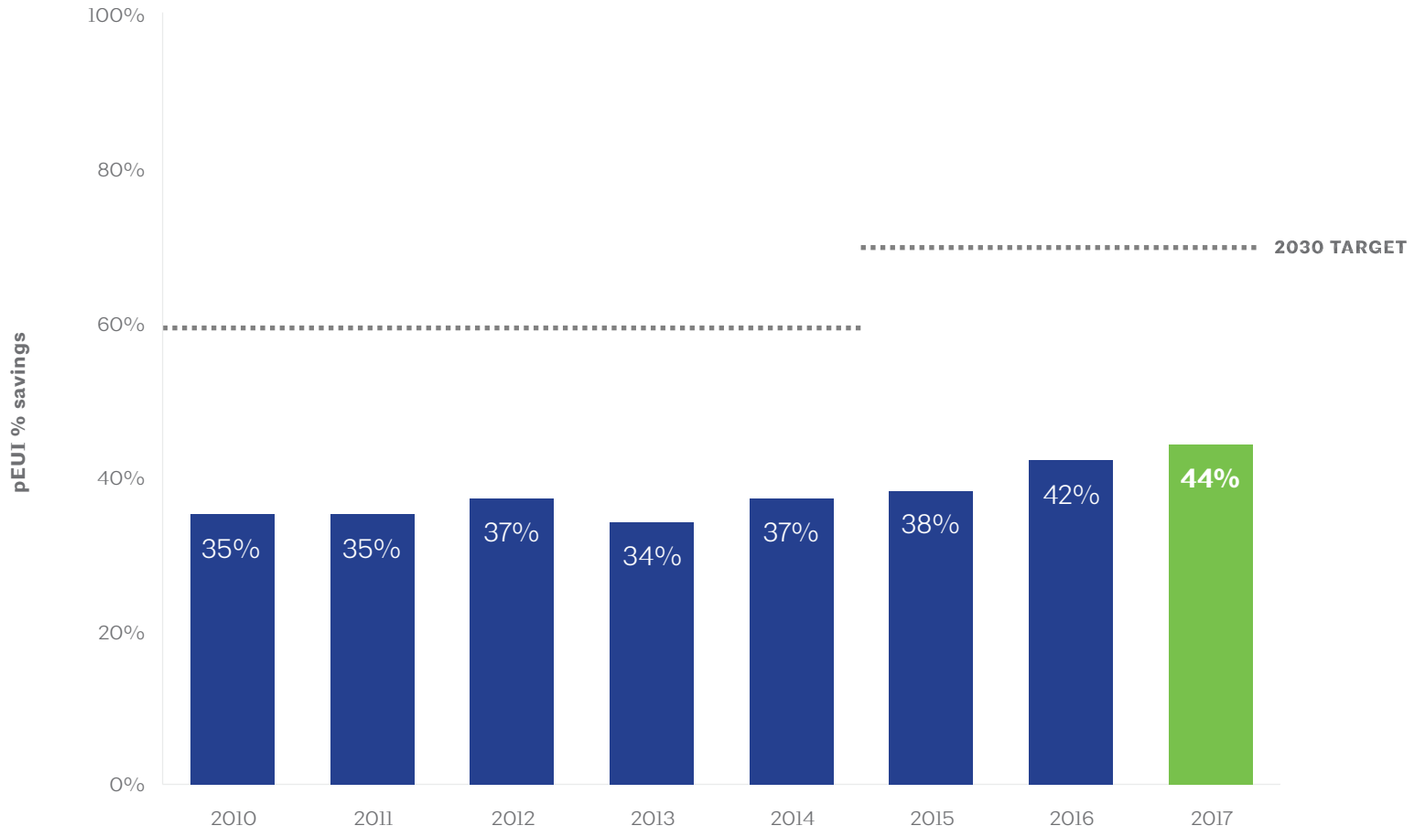
Each year we make progress toward achieving the 2030 goals, but the current trajectory suggests we'll need more time to achieve 100 percent carbon-neutral design. Improvements could happen faster with stricter codes, more energy modeling, and other market motivators.

Key

- *2030 Commitment pEUI % savings goals*
- *Average annual pEUI tracked by the 2030 Commitment*

2 dotted projection paths:

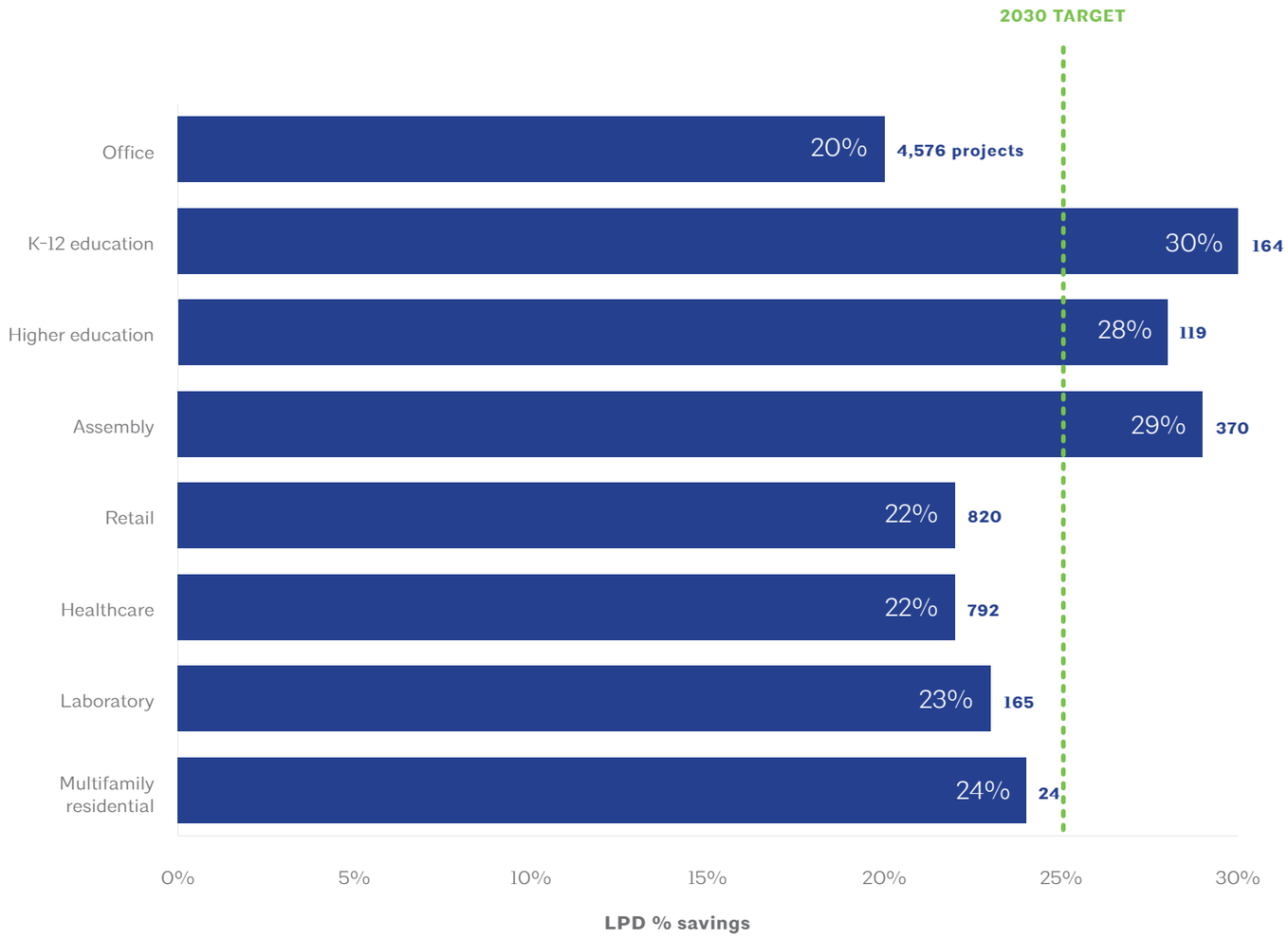
- *Meeting 2030 goals*
- *Current pace*



Annual predicted energy use intensity (pEUI) savings is a weighted average of the whole building project gross square feet (GSF). pEUI savings is relative to the 2030 Baseline—2003 Commercial Building Consumption Survey (CBECS) and 2001 Residential Consumption Survey (RECS).

44% pEUI savings, the best year on record

2030 targets are achievable, and the results show the culture is changing. Year after year and kilowatt hour by kilowatt hour, architects are measurably moving the needle and reducing energy consumption.

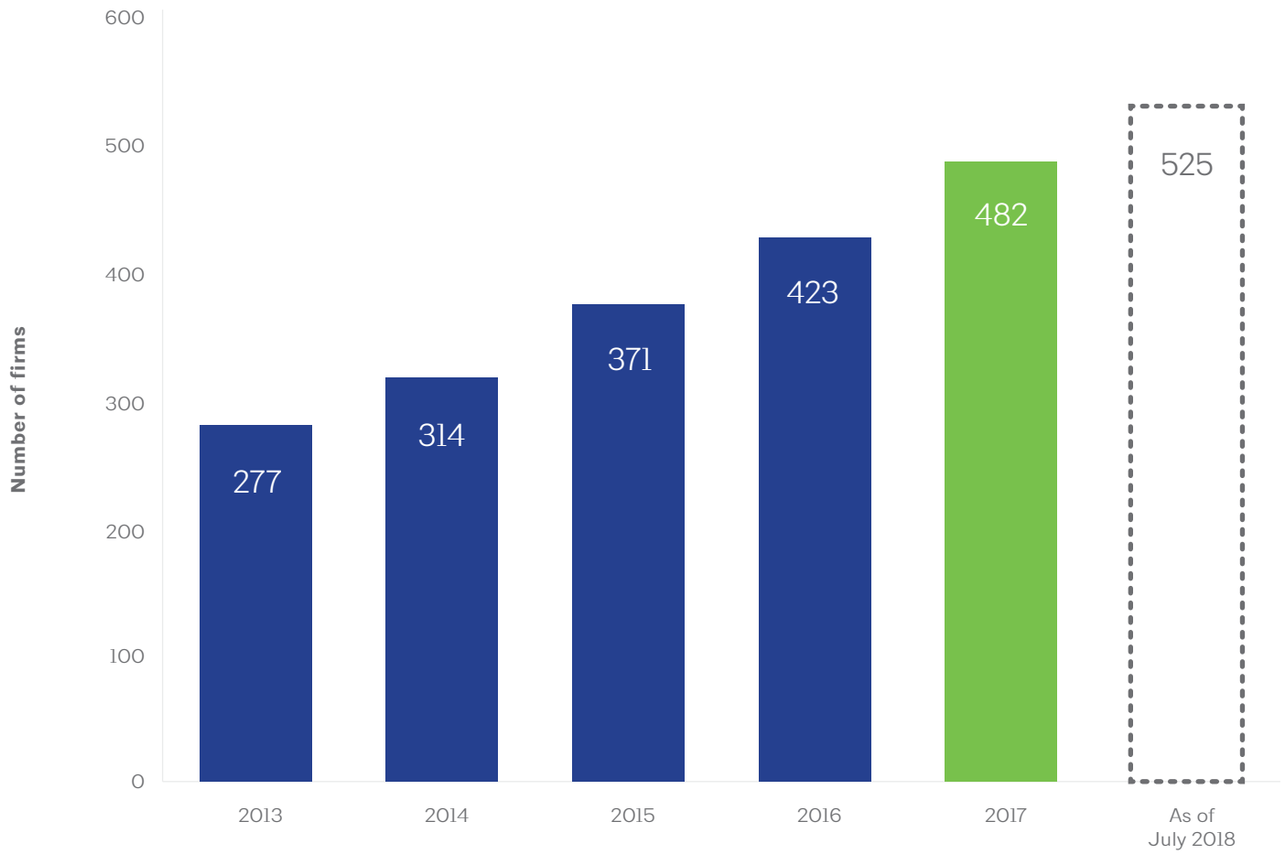


Lighting power density (LPD) savings is a weighted average of GSF of interiors projects. LPD savings is relative to the 2030 baseline for interiors projects—ASHRAE 90.1 2007.

23% LPD savings

The 2030 Commitment sets a 25 percent savings goal for the GSF weighted average lighting power density (LPD) of interiors projects. Of the 212 firms reporting their projects for the 2030 Commitment, 134 firms tracked 7,100 interiors projects.

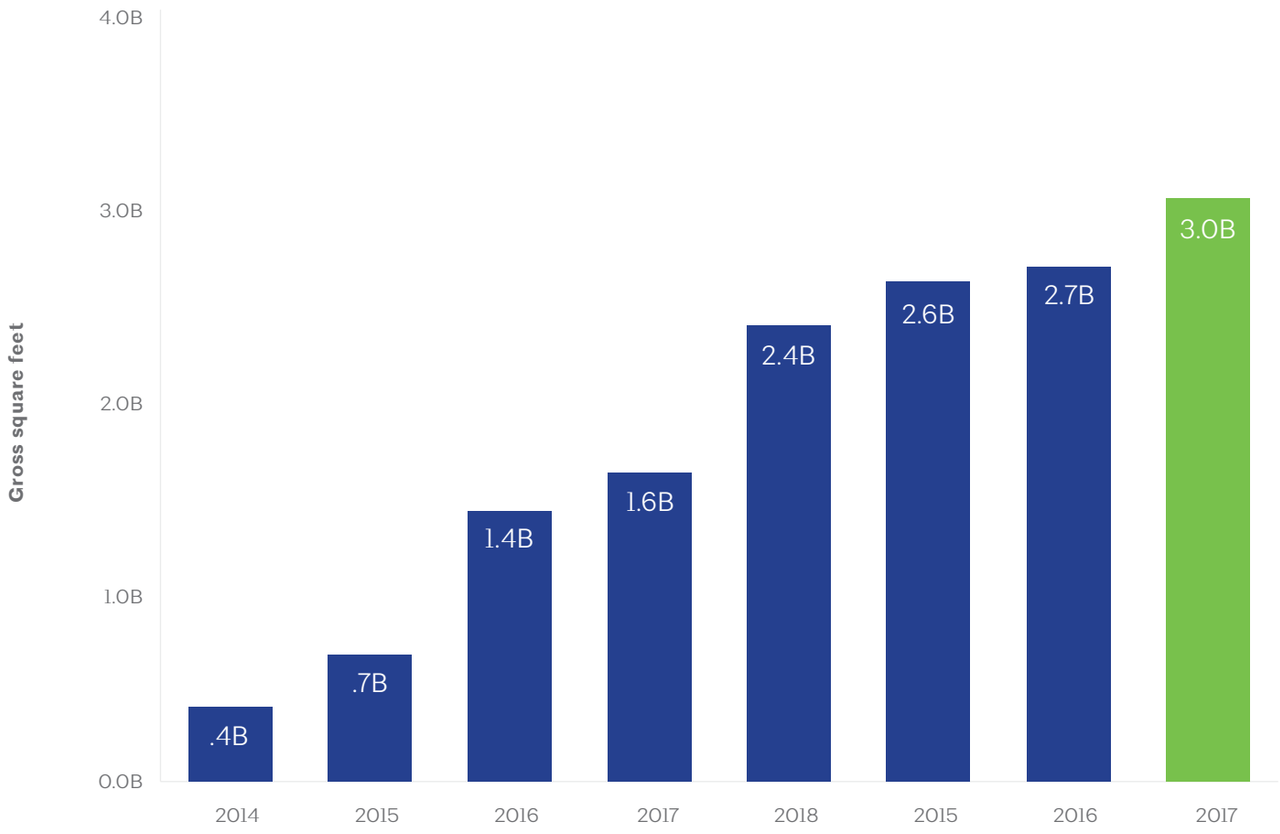
This year's data showed an average of 23 percent savings, which not only comes closer to meeting the goal but also had fewer outliers and data anomalies. For example, last year the overall percent reduction jumped almost five points by adjusting just the office-use projects to meet the LPD code threshold minimum within eight of the most frequently used energy codes. This year we calculated the data the same way and our overall savings changed by just one percent. We believe this indicates that architects better understand what LPD values are reasonable for their projects and how to calculate the LPD or frame the request to their consultants, and that firms can more accurately benchmark and target their LPD goals when looking at LPD by use type.



21% Increase

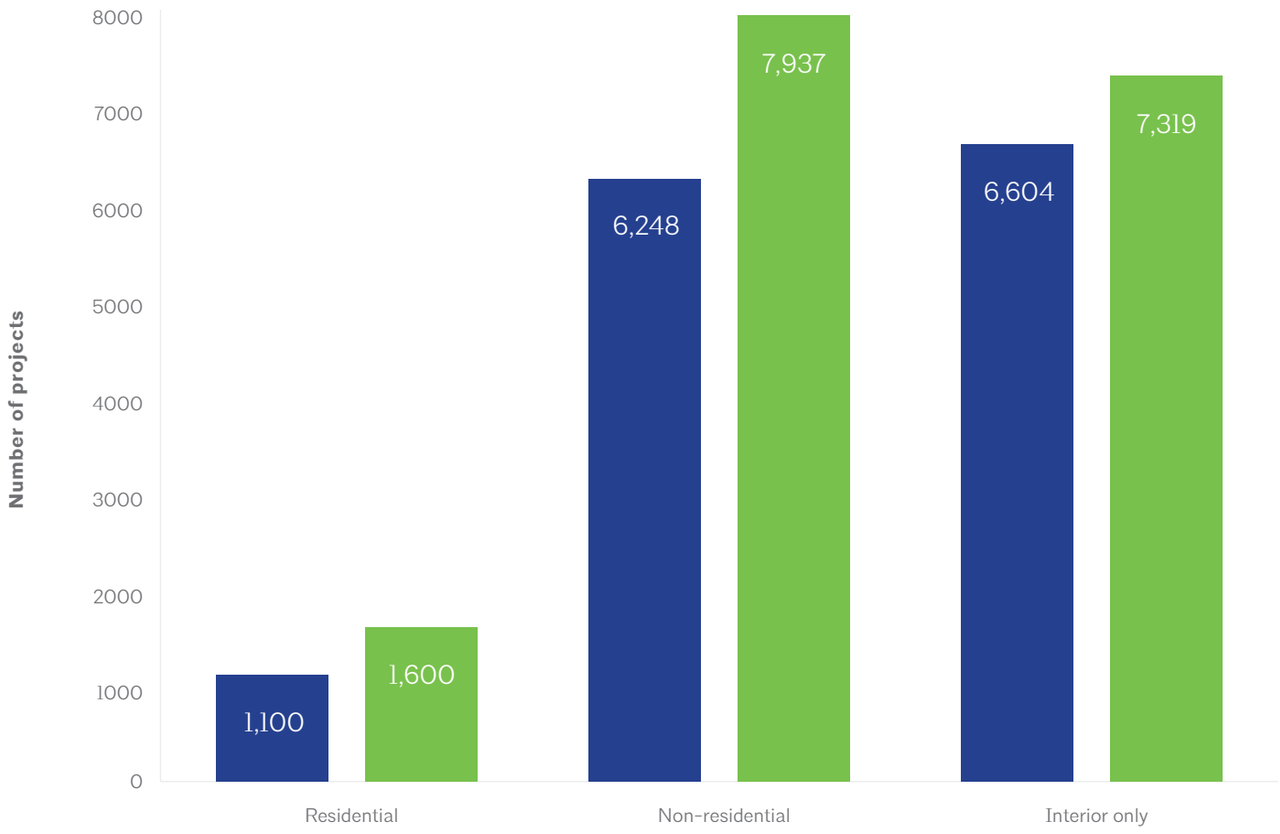
212 firms submitted portfolios in 2017 compared to 175 in 2016, a 21 percent increase.

As of July 2018, 525 firms have made the 2030 commitment. We hope to see continued growth through the remainder of 2018 and an even bigger reporting year next year.



More than 3 billion GSF

Total gross square feet (GSF) grew by 13 percent over last year to more than 3 billion GSF. This is a more than sevenfold increase since the 2030 Commitment launched in 2010.



16,856 Total projects

The number of projects reported in 2017 grew by 21 percent. There was growth across all project types, but total residential and whole building projects saw greater proportional upticks than interiors.

Key

2016

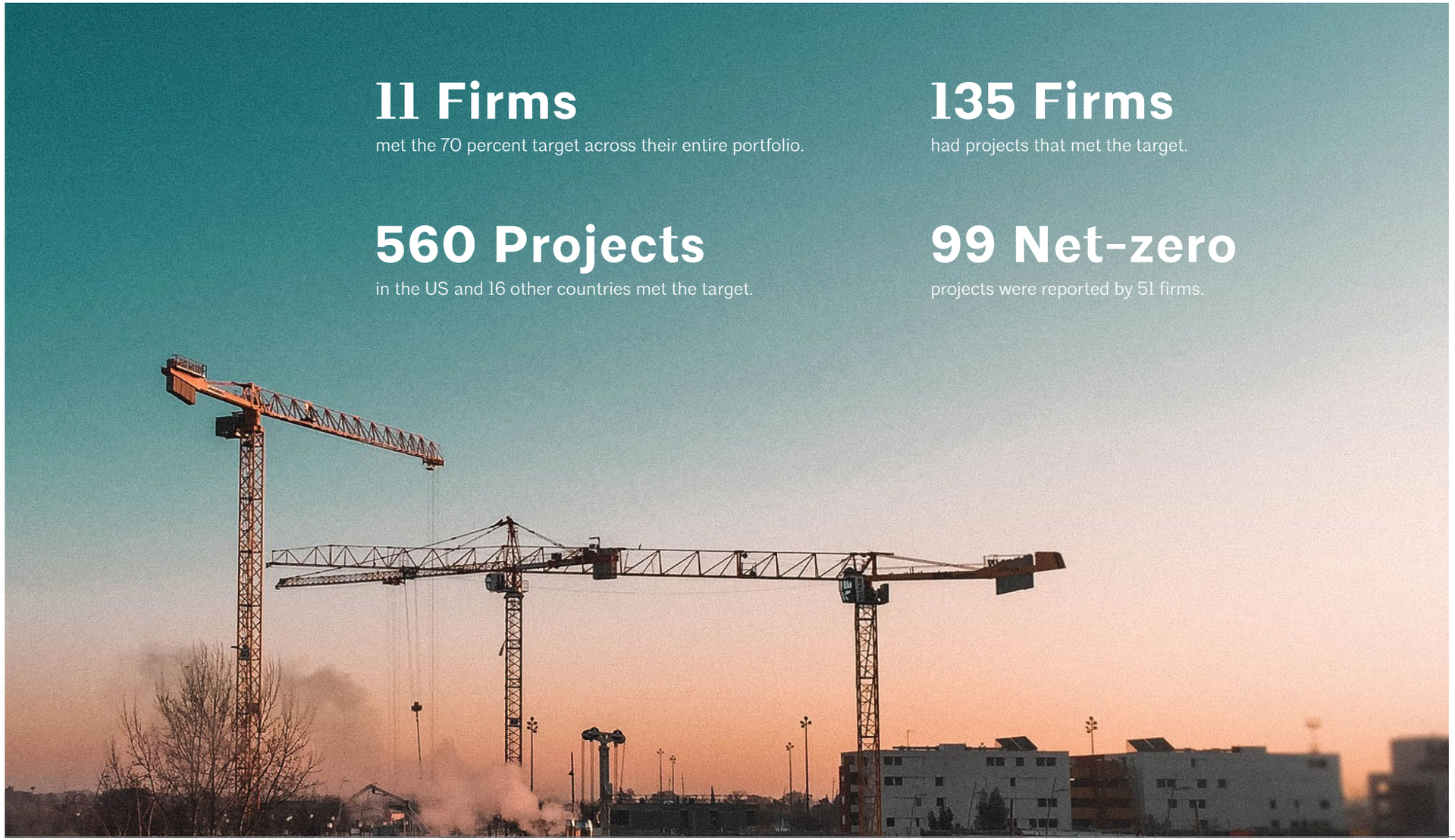
2017

THE GSF OF 2030 DESIGN PROJECTS IS COMPARABLE TO **MORE THAN ONE-THIRD OF THE 2017 CONSTRUCTION START MARKET.***

**ConstructConnect[7] data tracks "new" and "addition" construction starts in the US by square footage. The ConstructConnect square footage calculations are for 'new' and 'addition' nonresidential construction. For 'alteration' work, there is no square footage calculation. The 2030 GSF represented is a subset of the data that excluded international, interiors projects, residential, renovations, and phases other than "design closeout final."*

SECTION 3.

KNOWLEDGE IS POWER



11 Firms

met the 70 percent target across their entire portfolio.

135 Firms

had projects that met the target.

560 Projects

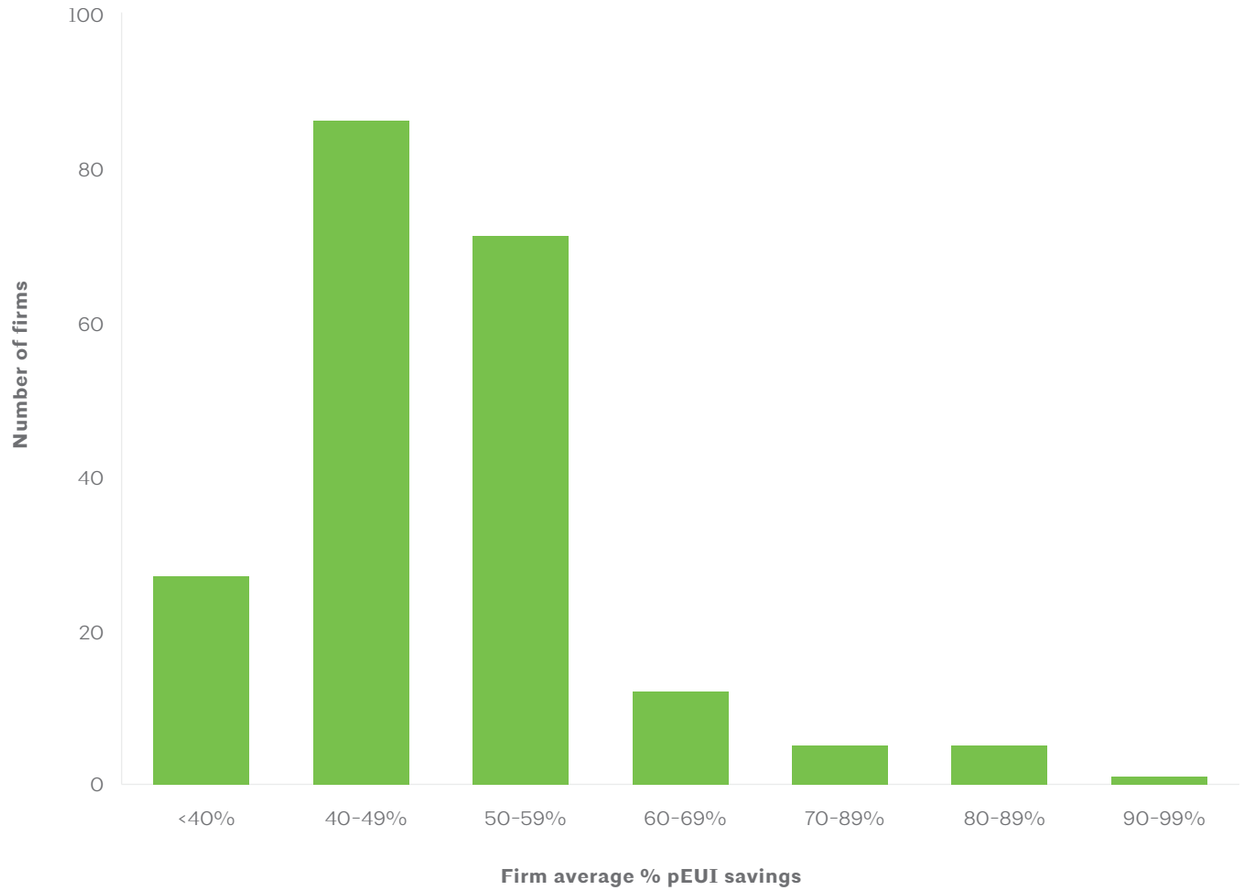
in the US and 16 other countries met the target.

99 Net-zero

projects were reported by 51 firms.

MEETING GOALS

The goals set forth in the 2030 Commitment are not easy targets, and reaching net zero is no small feat. For those who do not meet the goals, each step along the way still represents progress and another opportunity to further embed the principles of the 2030 Commitment into firm culture.



48% Median firm pEUI savings

The majority of reporting firms are in the 40 percent to 60 percent savings range, a reminder that tracking energy metrics is the most important step in making—and learning from—steady progress.

These 10 firms achieved a 70% pEUI savings across their entire portfolio!

Coldham & Hartman Architects
COULSON
ehdd
Green Hammer
Lehrer Architects LA, Inc.
Maclay Architects
McGranahan Architects
Mithun
mode associates
Yost Grube Hall
ZeroEnergy Design

Adrian Smith + Gordon Gill Architecture
Albert Kahn Associates, Inc.
Alliiance
Ankrom Moisan Architects, Inc.
Ann Beha Architects
ARC/Architectural Resources Cambridge, Inc.
archimania
Arrowstreet
Ashley McGraw Architects
Atelier Ten
Ayers Saint Gross
Ballinger
BAR Architects
Bard, Rao + Athanas Consulting Engineers, LLC
Bassetti Architects
Bergmeyer Associates
Beyer Blinder Belle Architects & Planners, LLP
Blair + Mui Dowd Architects, PC
BLT Architects
BNIM Architects
Bohlin Cywinski Jackson
Bora Architects
Boulder Associates, Inc.
Braun and Steidl Architects
Brooks + Scarpa Architects, Inc.
Browning Day Mullins Dierdorf
Bruner/Cott & Associates
BuroHappold Engineering
BVH Architecture
BWBR
CallisonRTKL
Cannon Design
CBT Architecture
Clark Nexsen
CO Architects
Coldham & Hartman Architects
Cooper Carry
COULSON
CTA Architects Engineers
Cuningham Group Architecture, Inc.
Cunningham | Quill Architects
Dake Wells Architecture
Dattner Architects
David Baker Architects
Davis Partnership Architects
Dekker/Perich/Sabatini
Dewberry
DIALOG
DIGSAU
DiMella Shaffer
DLR Group
DRAW Architecture + Urban Design
DSGN
Duda Paine Architects
DWL Architects + Planners, Inc.
ehdd
Ehrlich Yanai Rhee Chaney Architects
Elkus Manfredi Architects
Ellenzweig
Elness Swenson Graham Architects, Inc.
Engberg Anderson Architects
English + Associates Architects, Inc.
Ennead Architects
Eskew+Dumez+Ripple
EwingCole
EYP
Farr Associates
Feldman Architecture
Finegold Alexander Architects
Flad Architects
Frederick + Frederick Architects
FXFOWLE
GBD Architects Incorporated
Gensler
GFF
GGLO
Goettsch Partners
Goody Clancy
Gould Evans
Green Hammer
Gresham, Smith and Partners
Grimm and Parker
GSBS Architects
Guidon Design
GWWO, Inc. Architects
Hacker
Hahnfeld Hoffer Stanford
Handel Architects, LLP
Harley Ellis Devereaux
HarrisonKornberg Architects

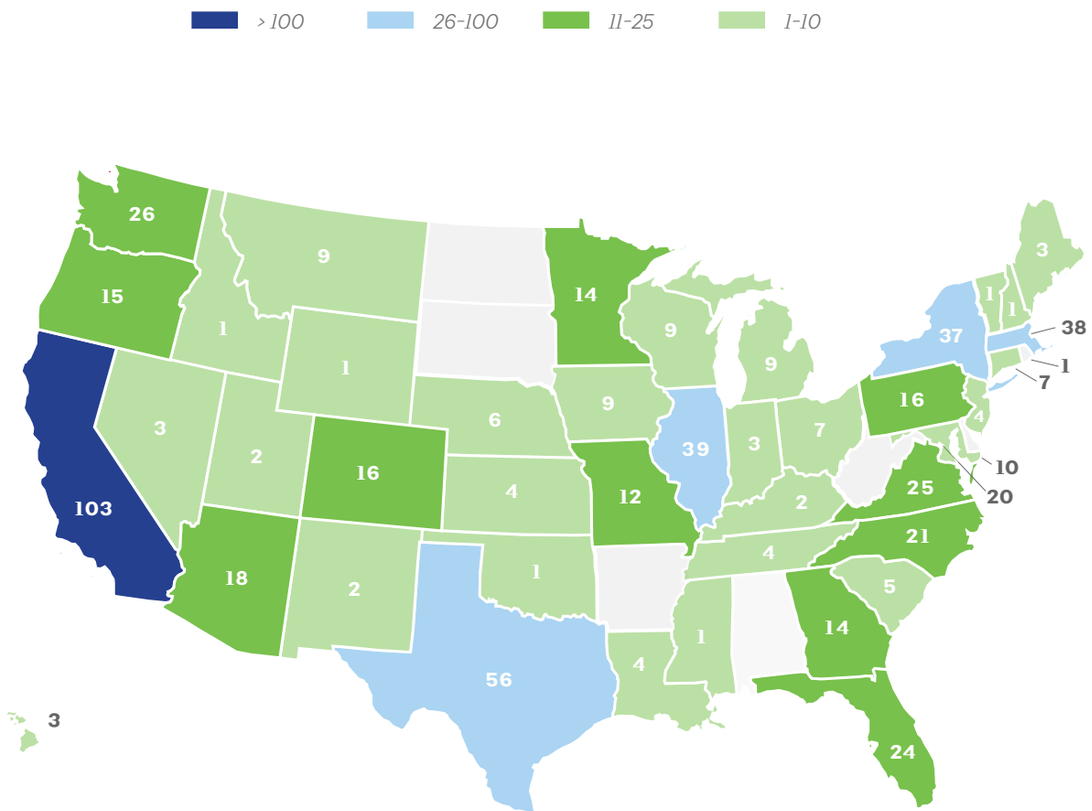
continued on next page

KNOWLEDGE / Participating firms

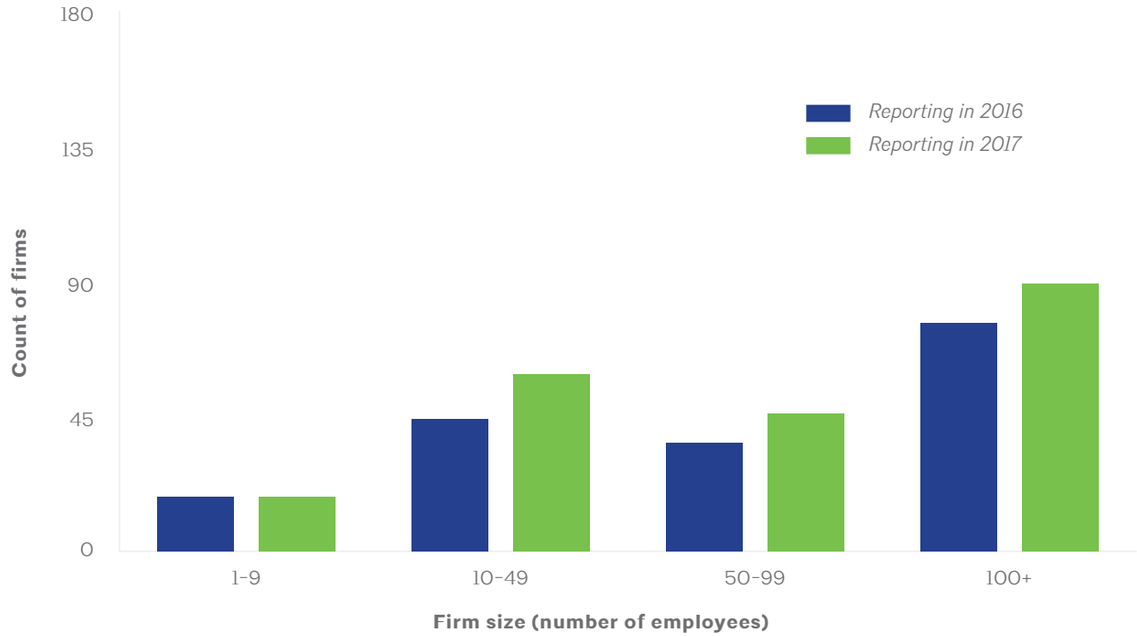
Hartshorne Plunkard Architecture
Hastings Architecture Associates, LLC
HDR
Helix Architecture + Design
Hennebery Eddy Architects, Inc
HGA Architects and Engineers
High Plains Architects
HKS
HMC Architects
HMFH Architects, Inc.
HOK Inc.
Holst Architecture
Hord Coplan Macht
ICON Architecture, Inc.
IKM Incorporated
INVISION
Jacobs Global Buildings Design
JAHN
Jer Greene, AIA + CPHC
Jones Studio, Inc.
Kaplan Thompson Architects
Kipnis Architecture + Planning
KMD Architects
Krueck + Sexton Architects
L M HOLDER III FAIA
Lake|Flato Architects
Landon Bone Baker Architects
Leddy Maytum Stacy Architects
Leers Weinzapfel Associates
Legat Architects
Lehrer Architects LA, Inc.
Lionakis
Little Divsersified Architectural Consulting
LMN Architects
Lord Aeck Sargent
LPA, Inc.
LS3P
Maclay Architects
Mahlum Architects
Marlene Imirzian & Associates Architects
Mazzetti
McGranahan Architects
Miller Dyer Spears, Inc.
Mithun
mode associates
Moody Nolan
Moseley Architects
MSR
NAC Architecture
NBBJ
Neumann Monson Architects
Office for Local Architecture, LLC
Olson Kundig
OPN Architects
Opsis Architecture
Orcutt | Winslow
Overland Partners Architects
Page
Paul Poirier + Associates Archtiects
Payette
Pei Cobb Freed & Partners Architects, LLC
Pelli Clarke Pelli Architects
Perkins+Will
Perkins Eastman
Pickard Chilton
Quattrocchi Kwok Architects
Quinn Evans Architects
Ratcliff
RATIO Architects, Inc.
RB+B Architects, Inc.
Richärd + Bauer
RMW architecture & interiors
Robert A.M. Stern Architects
Ross Barney Architects
RVK Architects, Inc.
Schadler Selnau Associates, PC
SERA Architects
Serena Sturm Architects
Sheldon Pennoyer Architects
Shepley Bulfinch
SHP Leading Design
siegel & strain architects
Smith Seckman Reid, Inc.
SmithGroupJJR
SMMA
Snow Kreilich Architects
Solomon Cordwell Buenz
SOM
Steffian Bradley Architects
Steinberg Architects
STUDIOS architecture
Substance Architecture
TBDA
The Beck Group
The Green Engineer, Inc.
The Miller Hull Partnership
The Sheward Partnership
The SLAM Collaborative
Thornton Tomasetti
Tilton, Kelly + Bell, LLC
TLC Engineering for Architecture
Touloukian Touloukian, Inc.
Trapolin-Peer Architects
TreanorHL
Trivers Associates
TRO
Valerio Dewalt Train Associates
Vanderweil Engineers
VMDO Architects
WBRC Architects/Engineers
WDG Architecture
Weber Thompson
Wight & Company
William Rawn Associates
Wilson Architects
WLC Architects, Inc.
WRNS Studio
WRT
Yost Grube Hall
ZeroEnergy Design
ZGFArchitects, LLP
Ziger/Snead

5G Studio Collaborative
aecom
Aidlin Darling Design
Allison Blanks, Architect, PLLC
Ashley McGraw Architects
Bassetti Architects
COOKFOX Architects
CSNA Architects
Curtis + Ginsberg Architects, LLP
david cunningham architecture planning pllc
Design Collective, Inc.
designLAB architects
DIALOG
Elness Swenson Graham Architects, Inc
ESG Architecture & Design
Fentress Architects
FFA Architecture and Interiors, Inc.
GFF
GREC
Green Hammer
Hamilton Anderson Associates
Hanbury Evans Wright Vlattas + Company
Hickok Cole Architects
Holst Architecture
HPZS
In Balance Green Consulting
JP Copoulos, Architect
KieranTimberlake
KLUGER ARCHITECTS, INC
KPMB Architects
LOHA
M+A Architects
Maclay Architects
MASS Design Group
MF Architecture
MKK Consulting Engineers
nARCHITECTS
Natalye Appel + Associates Architects, LLC (NA+AA)
NC-office
NO ARCHITECTURE, PLLC
Olson Kundig
P6PA+Architects
Peckham Architecture
Pill-Maharam Architects
Precipitate, PLLC
Retail Design Collaborative & Studio One Eleven
Richärd + Bauer
RNT Architects
Rodwin Architecture
Ross Barney Architects
Schadler Selnau Associates, PC
Steinberg Architects
Sterner Design
Stonorov Workshop
Studio G Architects
Studio Ma
Tilton, Kelly + Bell, LLC
Trakref
Trivers Associates
Urban Design Perspectives
UrbanWorks, Ltd.
Vermont Integrated Architecture
waterleaf architecture
ZH Architects

COUNT OF 2030 OFFICE LOCATIONS THAT CONTRIBUTED 2017 DATA



COUNT OF PORTFOLIO SUBMISSIONS

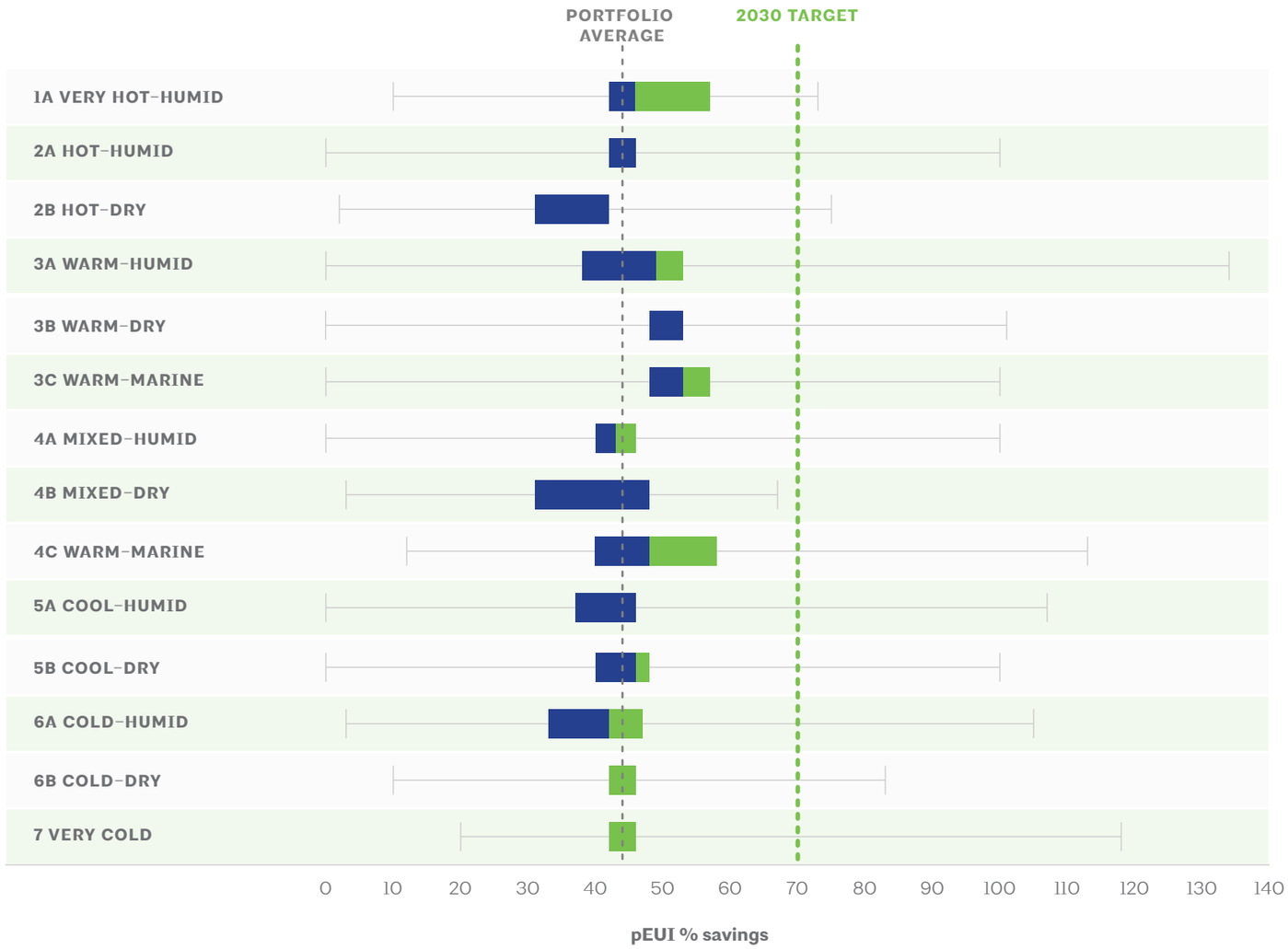


PARTICIPATION IS GROWING & THERE ARE RESOURCES TO HELP

Between local 2030 networks, the peer mentorship program coordinated by AIA national, and the AIAU+2030 online series, numerous resources exist to help firms get started and learn more about what adopting the 2030 Commitment can mean to their practice. Visit aia.org/2030commitment to learn more or email 2030commitment@aia.org.

“The AIA 2030 DDx is much more than a reporting tool. Design teams use it to benchmark, actively establish targets, and incorporate this data into their design goals. Fully embracing the 2030 Commitment creates value for the firm, for our clients, and for future generations. A triple bottom-line win for 21st century architecture!”

Rand Ekman, FAIA, LEED Fellow
Associate Principal, Chief Sustainability Officer, HKS Architecture

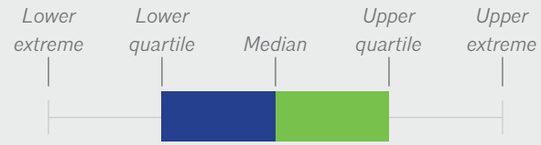


Data filtered to exclude international use projects, interiors projects, and any climate zones with fewer than 30 projects. Climate zones are described by the ASHRAE climate zone map.

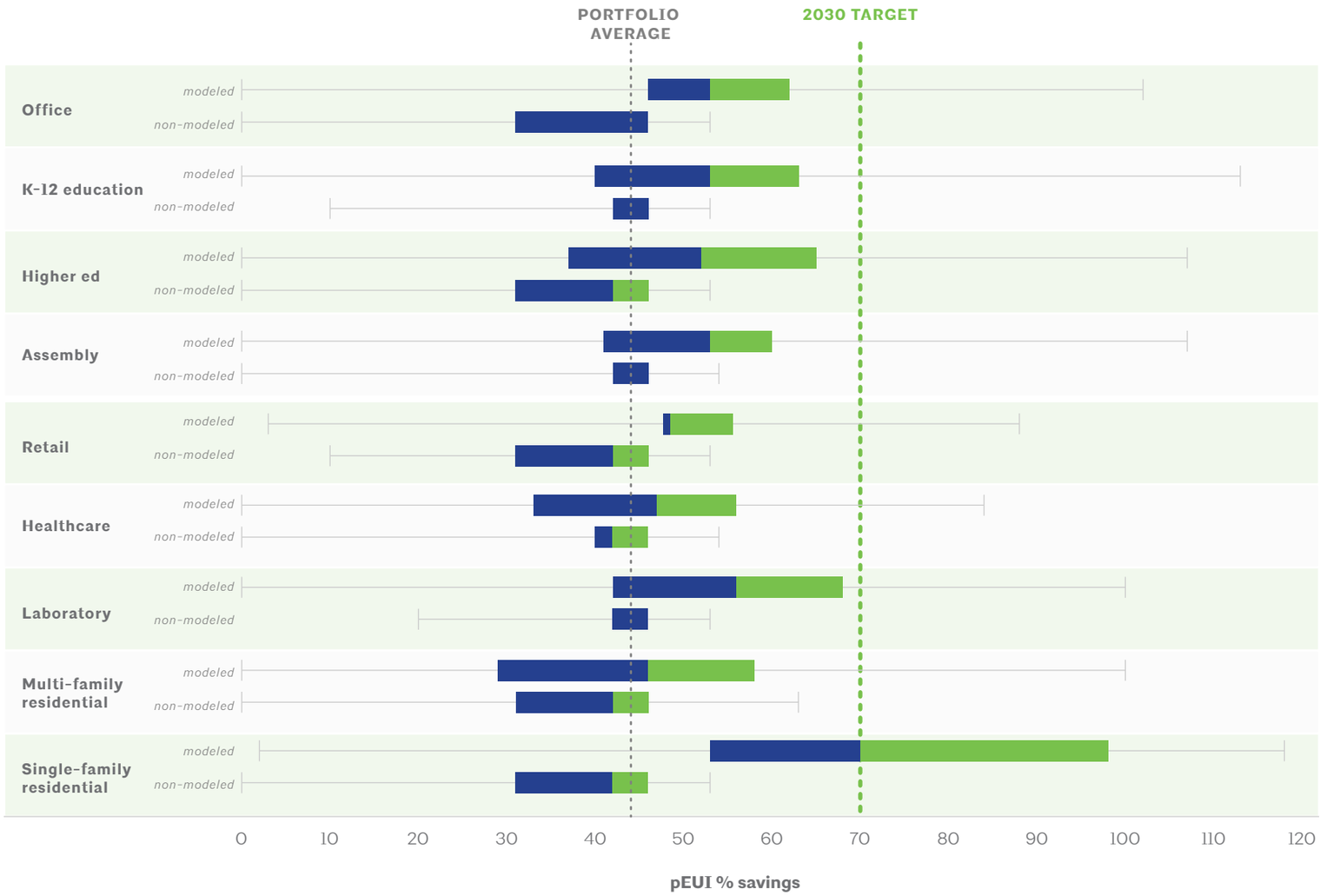
2030 TARGETS ARE ACHIEVABLE IN ALL REGIONS

Project location and use type have the biggest impact on energy use. Looking at the portfolio of reported 2017 projects by climate zone and use types can help set expectations and encourage project teams to exceed median performance and make incremental improvement toward 2030 targets.

Key



KNOWLEDGE / Impact of energy modeling on pEUI savings by use type

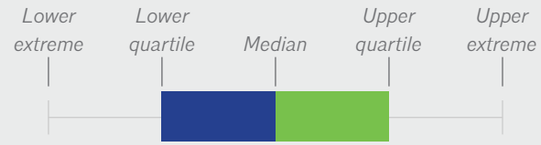


Data filtered to exclude interiors projects, some use types, and projects submitted as "will be modeled."

MEDIAN MODELED SINGLE FAMILY PROJECTS MEET 2030 TARGETS

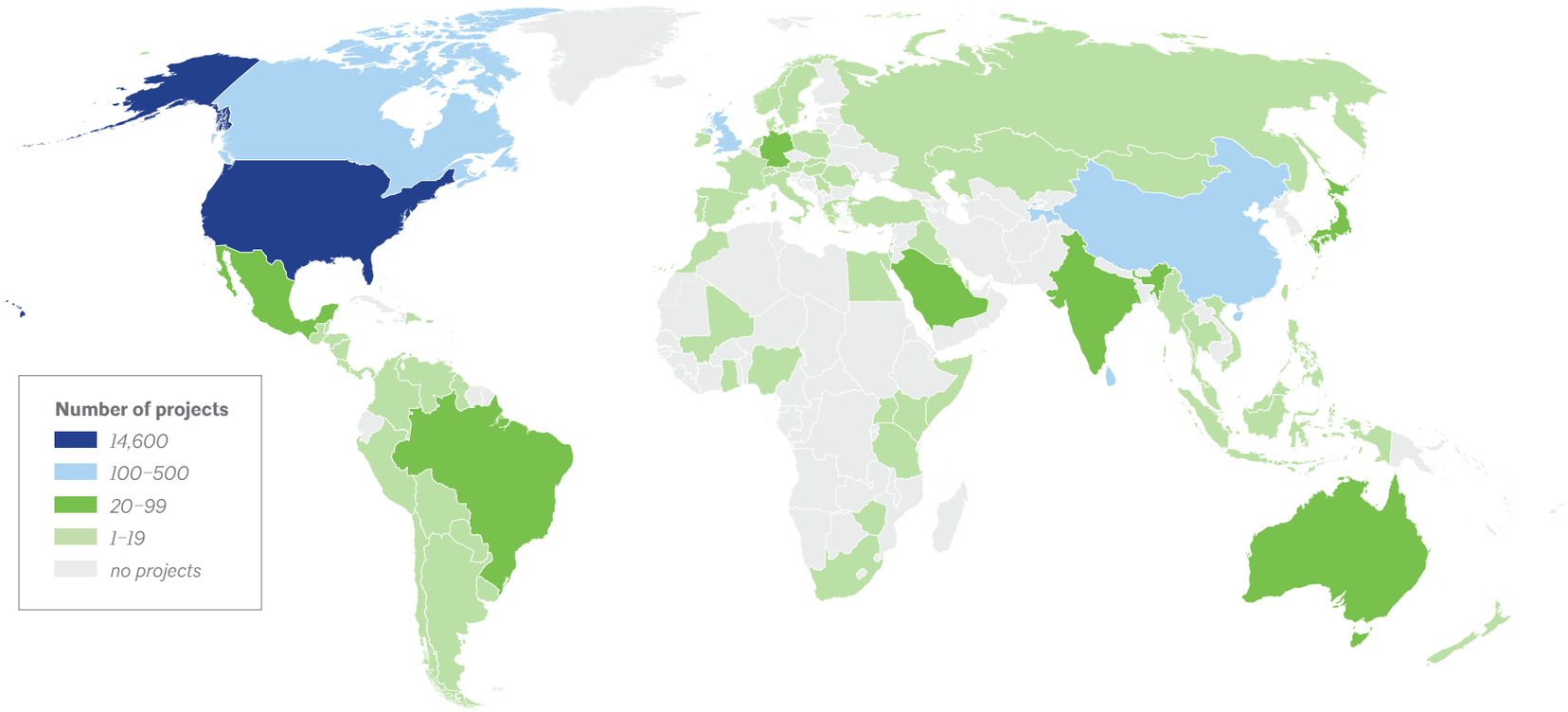
All use types can meet the 2030 targets if using energy modeling. The median performance for single family projects actually hit the 70 percent target in 2017. Energy modeling is also the only way to predict savings that meet the 2030 targets, but code improvements help drive the broader market improvement.

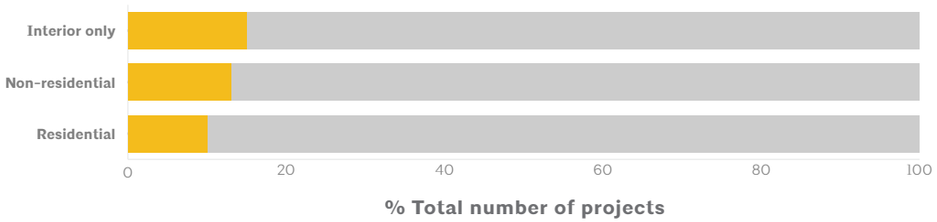
Key

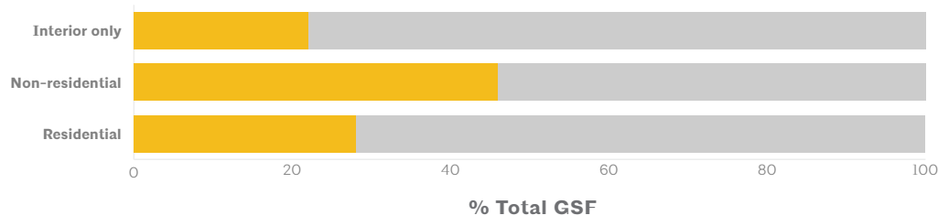


“The AIA 2030 Commitment is a powerful first stepping stone in our dialogue about sustainable design with new clients. From there we are able to successfully leap forward together into different approaches and certification programs—like Passive House, NZEB, and Living Building Challenge—that can otherwise be too overwhelming and specific for starting out. With the weight of AIA behind it and alignment with our Minnesota B3 requirements, the 2030 Commitment is a trusted, neutral program that can act as a critical foundation and catalyst for advancing all sustainable design initiatives.”

Carly Coulson, AIA, LEED AP
Founder & Principal, Coulson







40% Of total GSF

Projects reported in 2017 represent 93 different countries. These international projects represent 13 percent of the total number of projects and 40 percent of the GSF, or 1.2 billion GSF. US architects have a role in leading energy efficiency efforts globally and are making an impact.

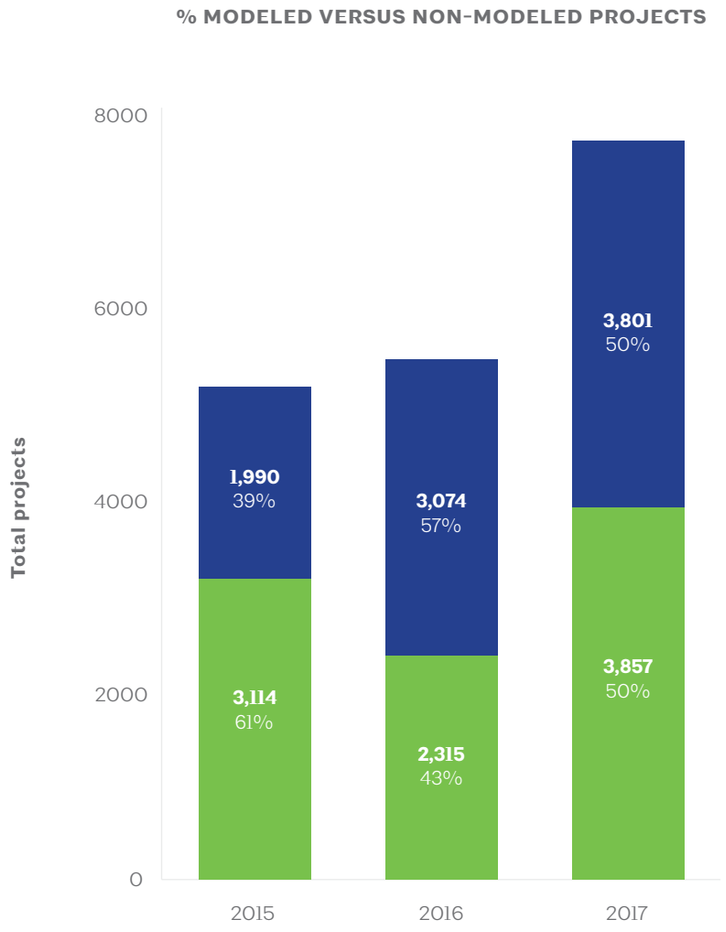
Key

International

Domestic

SECTION 4.

THE 2030 COMMITMENT DRIVES IMPROVEMENT



Data filtered to exclude interiors projects and projects submitted as "will be modeled."

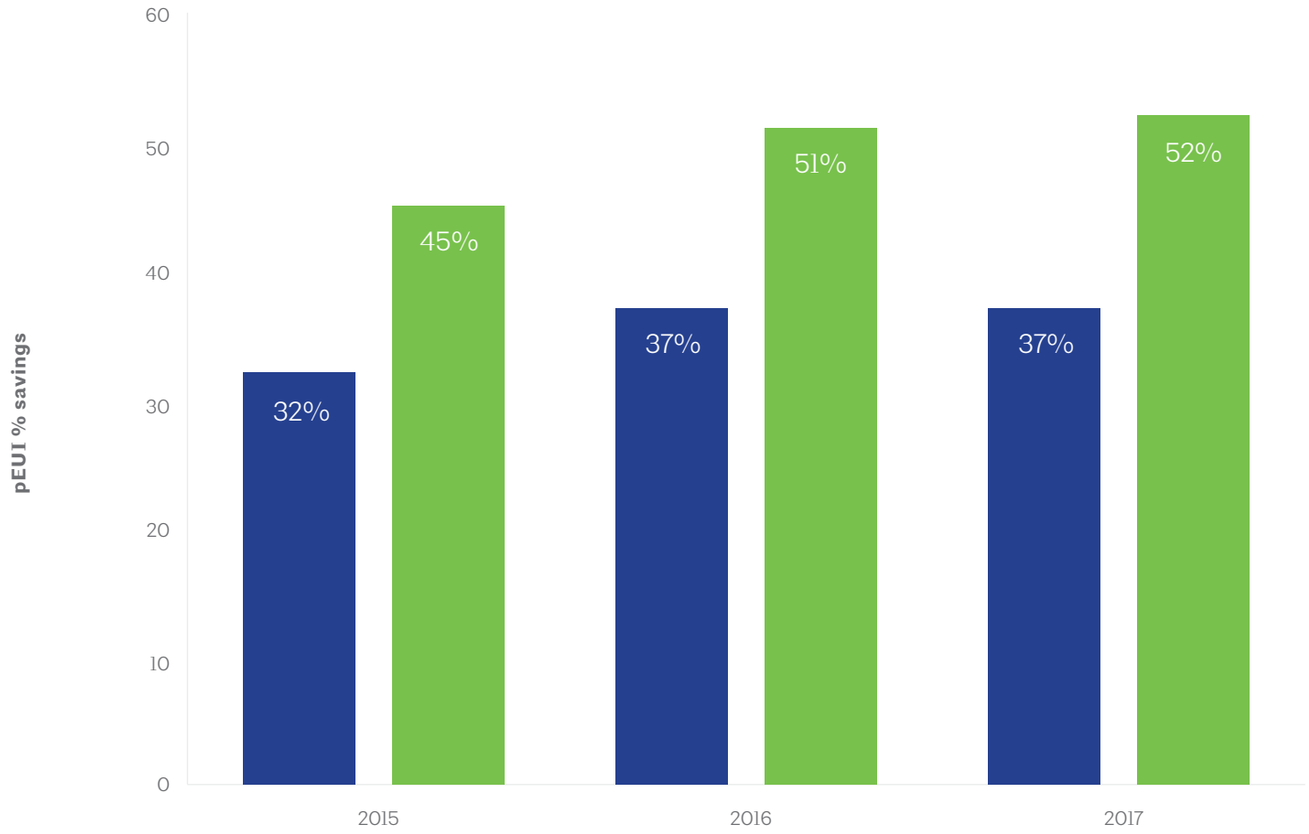
50% Of projects are using energy modeling

3,857 projects used energy modeling in 2017. Although the proportion of modeled versus non-modeled projects did not exceed 2015, the growth in overall projects means more were modeled in 2017 than any previous year.

The AIA 2030 Commitment continues to encourage more energy modeling as the only way to track predicted energy improvements above and beyond energy code.

Key

Non-modeled
Modeled



52% pEUI savings for modeled projects

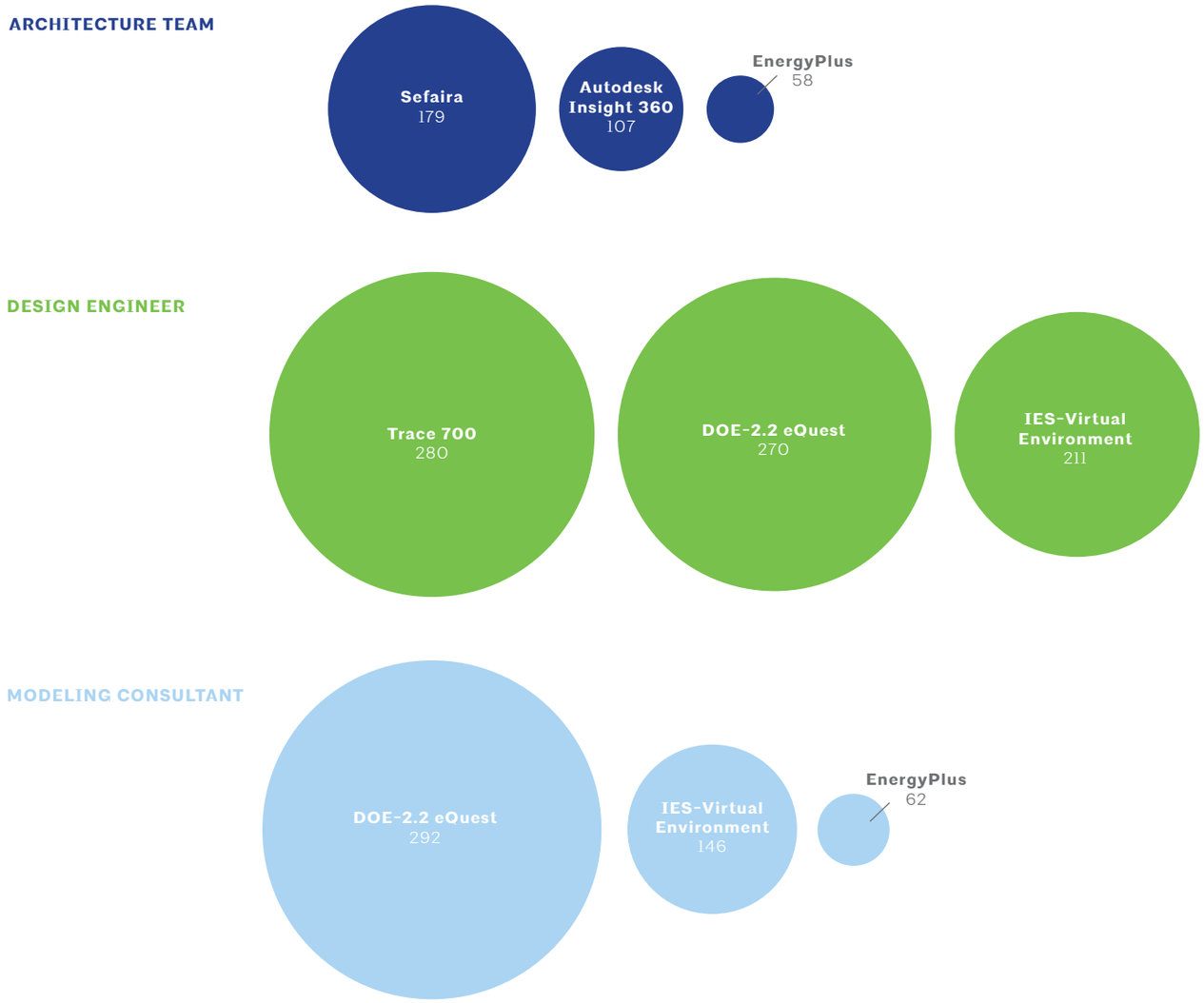
There are two ways to achieve greater energy savings: Set ambitious targets and use energy modeling to track progress toward meeting these targets, or design to more stringent energy codes. Both play an important role. Modeling enables more precise measures and further integrated design, and it provides a baseline to inform advocacy for stronger codes that automatically increase savings.

Key

Non-modeled

Modeled

Data filtered to exclude interiors projects and projects submitted as "will be modeled."

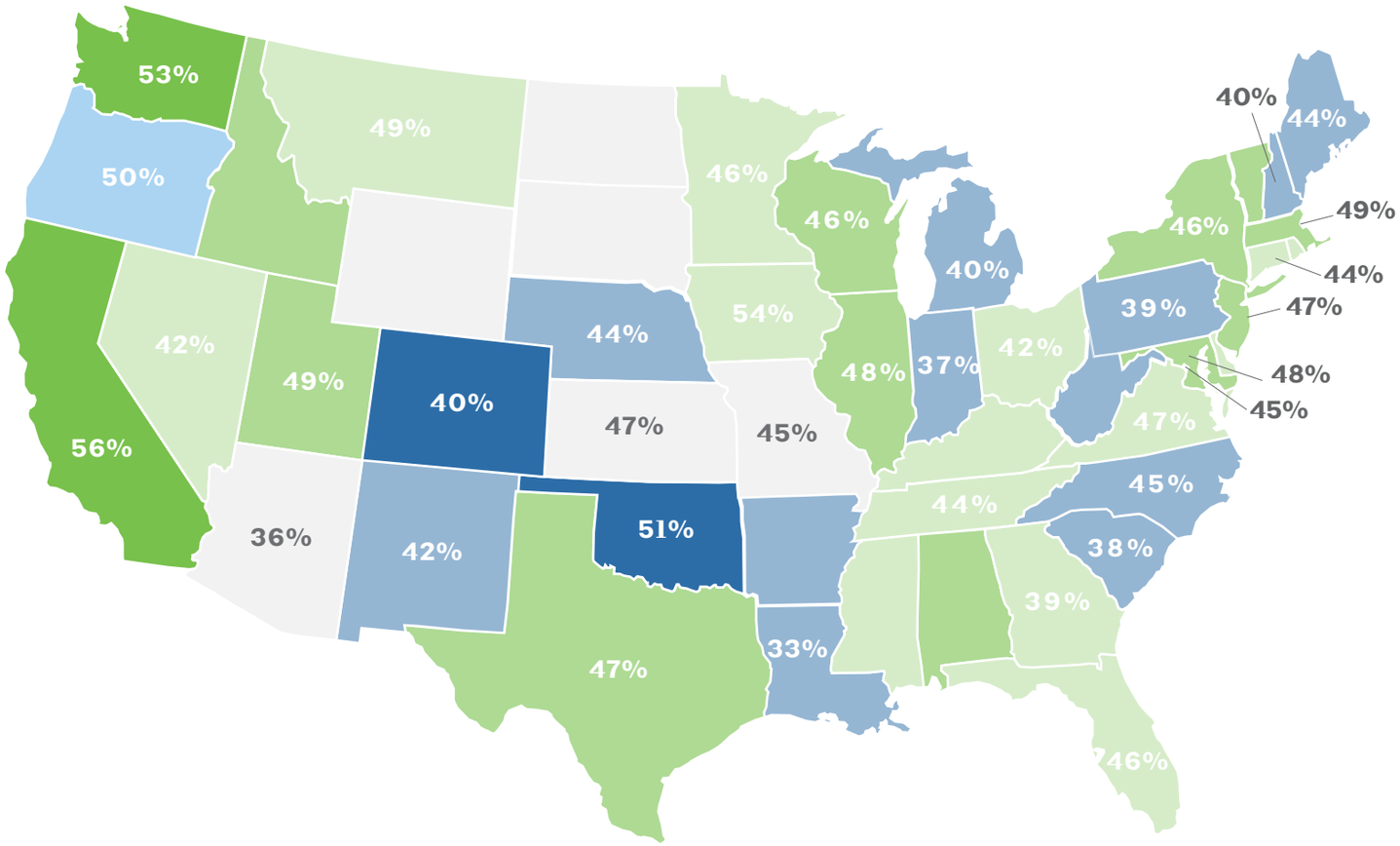


The scale of the bubble is relative to total number of projects.

TOP THREE TOOLS BY TEAM

Engineers and consultants did the energy modeling work for the majority of projects that were reported. However, tools and expertise exist for all members of the project team to improve performance through modeling and communicating shared targets.

IMPROVEMENT / State pEUI savings by code baseline & reported



This map shows the state-by-state weighted average pEUI savings in the labels and the pEUI savings prescribed by the adopted energy code in each state coded by the color legend. The state-adopted energy code[8] is shown aligned with the percent pEUI savings analysis relative to 2030 baselines and is described in the AIA 2030 DDx help pages.[9] Data is filtered to show non-residential whole building projects and states with less than 30 projects are not labeled.

STATE-BY-STATE COMPARISON

States with more stringent codes report greater pEUI savings, and initiatives like the 2030 Commitment drive improvement and help fill regulation gaps. Architects with the knowledge and experience to design high-performing buildings can lead advocacy efforts for more stringent codes, and their work demonstrates progress beyond code thresholds is both possible and valuable.

Color legend
Energy code prescribed savings

- *</= 25%*
- *31%*
- *40%*
- *42%*
- *46%*
- *48%*
- *None or home rule*

State labels
2017 average pEUI savings %

“When it comes to affecting the long-term environmental footprint of a city, there’s no such thing as a ‘small’ reduction in building energy use. Each advance architects make in designing low- and no-carbon buildings today brings positive results that will last a generation. Equally important, it helps raise performance expectations and sets the bar higher for the designs of the future.”

Karen Weigert
Senior Fellow for Global Cities, Chicago Council on Global Affairs,
and former Sustainability Officer for the City of Chicago

2030 Participants are leaders

By participating in the 2030 Commitment, architects are the leaders we need in the built environment, business, government, and society. As this year's report shows, the 2030 Commitment is making significant positive impact, creating healthier environments and businesses. As we get closer to carbon neutral, we know there is still work to be done—that's where you come in.

Join us

If you haven't already, join the 2030 Commitment. Connect with your peers locally or through the 2030 mentorship program to exchange ideas and share strategies. Enhance your practice through AIAU's 10-part AIA+2030 Online Series. And of course, use energy modeling and the DDx resources to track your firm's progress toward 2030 carbon neutral goals and contribute to the body of data-based evidence that points the way forward.

All hands to reach net zero

We all need to push for a paradigm shift in the architecture and design community. Supporting stronger and stricter energy codes, incorporating 2030 goals into project requirements, and collaborating with participating firms to track progress toward these goals will help us achieve the best results. Together, we can get to carbon neutral.

Projected CO^2e emissions reduction calculation

1) The project use type was used to determine the percentage of electricity and natural gas for each project in the US and Canada.[10]

2) For US and Canadian projects, the eGrid subregion was determined based on the project zip code.[11]

3) The eGrid subregion was used to define the CO^2e emissions factors for electricity and natural gas, which were multiplied by the fuel source energy savings.[12]

4) For international projects, the country name was used to determine the CO^2e emissions factor, which was multiplied by the energy savings.

Design energy projected cost savings calculation

1) The project use type was used to determine the percentage of electricity and natural gas for each project in the US and Canada.[13]

2) For simplicity, all project energy savings for international projects were considered electricity savings.

3) For interior projects in all locations, all project energy savings were considered electricity savings.

4) Whole building and interior-only projects projected energy savings were totaled.

5) The electricity and natural gas design energy savings for all projects were multiplied by the US average commercial rate for electricity[14] and natural gas.[15]

CO^2e and carbon sequestration equivalencies (such as acres of trees sequestered) were calculated using the EPA Greenhouse Gas Equivalencies Calculator.[16]

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ACKNOWLEDGMENTS

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GTECH-EBB5.jpg (1) (and Jonathan Hillyer)
69% Predicted reduction from national average EUI for building type.

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Mundo Verde at Cook Campus
Studio Twenty Seven Architecture
Anice Hoachlander, Hoachlander Davis Photography
58.8% Predicted reduction from national average EUI for building type.

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Nancy and Stephen Grand Family House
Leddy Maytum Stacy Architects
Roger Swanson
2018 FH COTE_02 Community 1.jpg
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Sonoma Academy's Janet Durgin Guild and Commons
WRNS Studio
Celso Rojas
SonomaAcademy_key.jpg
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San Francisco Art Institute
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Bruce Damonte
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Page 30
Nancy and Stephen Grand Family House
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2018 FH COTE_10 Discovery_k.jpg
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