2013 PROGRESS REPORT

AIA 2030 Commitment

Acknowledgements

AIA National Committee on the Environment

AIA|DC Committee on the Environment

Architecture 2030

Boston Society of Architects

Chicago 2030 Round Table

Large Firm Roundtable

Lawrence Berkeley National Laboratory

Mary Ann Lazarus, FAIA

Mid-Atlantic Committee on the Environment

Seattle 2030 Round Table

Sustainable IQ

U.S. Department of Energy

U.S. Environmental Protection Agency

2030 Commitment Working Group

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High-performance buildings have gone beyond rhetoric and research-backed experiments to standard practice.

Foreword

By Robert Ivy, FAIA
EVP|Chief Executive Officer
The American Institute of Architects

It's a great time to be an architect. Despite years of unprecedented economic challenges that have hit the design and construction industry particularly hard, today we can confidently claim that how and what we build are vital to address the challenges of the 21st century, most obviously the dynamic interplay of climate change, resilience, and energy consumption.

Even before the beginning of this century, there was a growing appreciation outside our profession that these challenges are uniquely receptive to design thinking. The key was energy, which first made its way into the public consciousness not as an ecological issue, but rather as a matter of economics and national security as we became dangerously dependent on foreign oil. Forward-thinking architects, especially those who were convened by the AIA Research Corporation, made a bold claim: Architects could help turn this around.

A growing number of architects saw value in designing projects less costly to operate because they were less dependent on the energy generated by fossil fuel. In time, this dedication to serve a client's best interests lined up with a growing body of scientific evidence that an economy based on fossil fuel posed more than a potential inconvenience, that, in fact, the stakes were much higher—the fate of planet Earth. Enter the launch in 2009 of the AIA's 2030 Commitment, which enlisted architecture firms to design with a goal of zero carbon emissions by 2030.

Five years into that commitment, the founder and CEO of Architecture 2030, Ed Mazria, AIA, spoke at the AIA's National Convention in Chicago, he delivered an upbeat report. Thanks to a number of positive developments, both market-driven and policy-based, America's architects are making progress toward the goal of carbon neutrality in new and retrofitted buildings. Convention attendees were shown a graph of how buildings would be performing today if architects had done nothing. That same graph showed how they are in fact performing because architects are taking a leadership role. The difference was startling.

More good news: Less than two months later, at the meeting of the International Union of Architects (UIA) in Durban, South Africa, member organizations representing 124 countries worldwide unanimously adopted the 2050 Imperative, a Declaration committing the world's architects to promote environmental and social sustainability in the built environment.

Hard on the heels of the action in Durban, the AIA is poised to release the AIA 2030 Design Data Exchange. Developed in cooperation with the U.S. Department of Energy, the AIA 2030 Design Data Exchange is an online reporting tool to better track the predicted performance of design projects, which will provide AIA members with credible data to inform their own design process, especially the critical interaction between architects and their clients.

Let there be no mistake: we have a long way to go to achieve the goal of carbon neutral design. However, we are making a difference; we are moving from being part of the problem to being key to achieving the goals of a healthier, resilient, and sustainable planet. The news today is that high-performance buildings have gone beyond rhetoric and research-backed experiments to standard practice. It's a great time to be an architect.

Key Takeaways

The architecture industry is making a positive impact on the built environment's energy efficiency and carbon emissions. We are making progress toward the 2030 goals and there is a lot to celebrate. With the AIA 2030 Commitment pEUI target increasing to 70% in 2015, architects and engineers need to further their understanding of how building form and design reacts to its environment and occupants to achieve a carbon neutral built environment. The industry is poised to accomplish this goal through advances in building technology, increased use of analysis tools and thoughtful design.

The AIA is Committed

The AIA is enhancing strategic partnerships to assess the program through a 2030 Working Group consisting of:

- AIA members and signatory firm representatives;
- U.S. Department of Energy;
- U.S. Environmental Protection Agency; and
- Architecture 2030.

The AIA 2030 Commitment is advancing literacy in energy modeling within architectural practice by providing a mechanism for firms to evaluate the predicted energy performance of their portfolio. Enhancements to reporting will help firms use the information in new ways:

- The enhanced user interface will improve work flow.
- Firms will have access to a larger variety of report options to evaluate portfolio progress.
- Research functionality will allow firms to anonymously compare projects by numerous parameters such as building type, size and location.

Architectural Firms are Committed

Reporting firms are advocates for improved performance through the 2030 Commitment. Firms are sharing experiences and data with each other for a common goal through roundtables and peer groups. These groups are important to the advancement of the program at local and national levels:

- Boston Society of Architects.
- Chicago 2030 Roundtable.
- Seattle 2030 Roundtable.
- Large Firm Roundtable.

Firms actively participate in the development of the AIA 2030 Commitment program. Fourteen firms support the program at the national level through Committee on the Environment and the AIA 2030 Commitment Working Group.

The Built Environment is Making an Impact

Data from the fourth reporting year demonstrates the increasing impact the program has on the built environment. More projects than ever are meeting and exceeding the 2030 targets.

+ Building area reported increased to 1.6B GSF.

We are making progress toward the 2030 goals and there is a lot to celebrate.

TABLE 1. 2013 Summary: AIA Aggregated Program Data

99	number of firms submitting reports	10% decrease
1.6 BILLION	total amount of gross square feet (GSF)	9% increase
2464	number of projects reported	150% increase
34%	average Predicted Energy Use Intensity (PEUI) reduction	3% decrease
7%	percent of total GSF meeting the current 60% reduction target	7% decrease
66%	percent of total GSF using energy modeling to predict energy consumption	14% increase
401	number of projects meeting the 60% reduction target	200% increase
73	number of net zero energy projects	500% increase
3,941	number of interiors only projects	
19%	average Lighting Power Density reduction for interiors projects	2% increase

+ The number of projects meeting the 60% pEUI reduction target increased by 200%
+ The number of net zero buildings reported increased by 500%.
+ Every project type and size category had projects that met the 60% pEUI reduction target signaling the goals are achievable.

Energy simulation is the key to achieving the pEUI reduction targets. Simulating systems and evaluating results allows project teams to maximize efficiency strategies.

+ Energy modeling improves projected project performance by an average of 8%.
+ Projects teams that closely track the detailed systems in their projects predicted average pEUI performance 10% better than the national average.
+ Eleven percent of modeled projects met the 60% pEUI reduction target and another 15% of modeled projects exceeded a 50% pEUI reduction threshold.
+ Eighty-eight percent of non-modeled projects fell below the 40% pEUI reduction threshold.

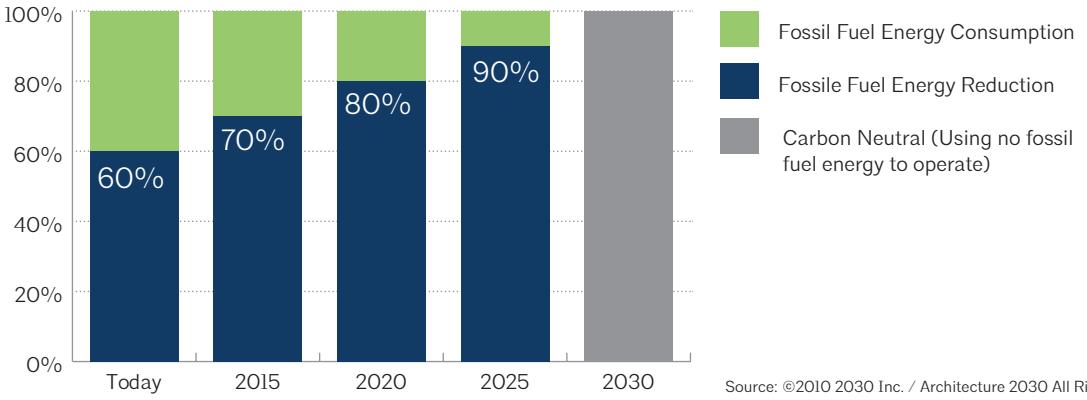
The AIA 2030 Commitment Program

Architects play a unique role in defining and managing the use of energy throughout the programming and design of a project. Architects not only design the building form and characteristics, they orchestrate the symphony of design by coordinating with clients, engineers, contractors and the community to develop building projects. These primary designer and convener roles play a significant part in solving for both passive and active energy efficiency problems in any design project.

Efficient design begins with building form and orientation then progressing to envelope system, thus reducing load in mechanical and electrical systems. The designer can make the largest impact to energy efficiency by maximizing passive strategies. These include strategies such as building mass to mitigate or optimize solar access and daylight, and incorporating prevailing winds with natural ventilation methods for thermal comfort and humidity control. The design focus then moves toward envelope systems with thermal breaks, effective window to wall ratio, and efficient roofing insulation and materials. Once passive and envelope strategies are defined to reduce energy consumption, active mechanical and electrical systems and controls can be designed. Maximizing efficiency early in the process allows for downsizing of mechanical and electrical systems and possible saving costs related to those components. Only after all other efficiency strategies are maximized, should on-site energy systems be added to the project.

AIA's 2030 Commitment is a method to track the performance of signatory architecture firms against Architecture 2030's established benchmarks in the 2030 Challenge. The 2030 Challenge consists of increasing carbon reduction goals to achieve a carbon neutral built environment by the year 2030 (Figure 1). In addition to

FIGURE 1. 2030 Challenge Goals



designing projects to meet the 2030 goals, signatory firms develop sustainability action plans outlining how each firm will improve operational efficiency. These plans consist of both short-term operational adjustments to energy use, waste, transportation and meetings as well as long-term plans for operational excellence.

Background

In December 2005, AIA Board of Directors adopted a Sustainable Architectural Practice Position Statement targeting industry carbon neutrality by 2030. This position statement was, in part, a direct response to the development of the 2030 Challenge by .Architecture 2030. In 2009, AIA staff, in conjunction with key AIA members, developed the AIA 2030 Commitment program to track implementation of the board policy. The program provides a platform for firms to track predicted building performance to measure progress toward the 2030 carbon neutral goals. Desired outcomes of the AIA 2030 Commitment include: improving architectural knowledge of energy efficiency strategies by incorporating energy analysis early in the design process then continually as the design develops; providing increased client value through lower operational costs; and, of course, meeting the 2030 Challenge reduction targets.

Member communities were integral in creating and implementing the AIA 2030 Commitment and its reporting process. The Commitment program and the associated spreadsheet reporting tool were developed through collaboration between members of the AIA Committee on the Environment (COTE), the Large Firm Roundtable, regional 2030 roundtables and numerous individuals from AIA member firms. These groups came together at USGBC's 2009 Greenbuild conference in Phoenix to build a consensus on how to measure industry progress toward the 2030 goals. The AIA deeply appreciates member involvement in defining and expanding the program.

The Roadmap to Zero Emissions and the AIA 2030 Commitment

A seminal moment occurred at International Union of Architects (UIA) World Congress and Assembly in August, 2014. The UIA, including 124 national member sections, representing approximately 1.3 million architects worldwide, unanimously adopted the 2050 Imperative committing to environmental and social sustainability. AIA President, Helene Combs Dreiling, FAIA, represented AIA in support of the historic declaration in Durban, South Africa. The 2050 Imperative incorporates action items outlined in Architecture 2030's Roadmap to Zero Emissions guidance to achieving a carbon neutral environment by 2050.

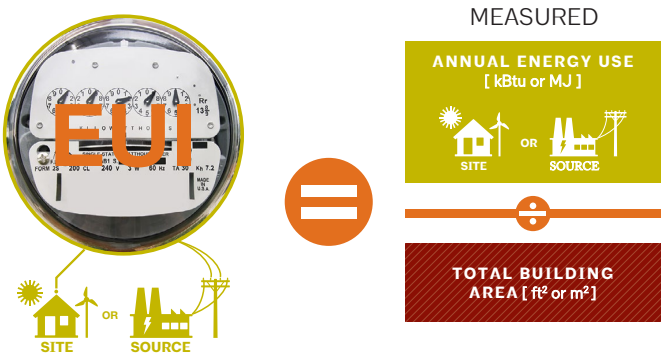
The AIA National Board reinforced that commitment in September 2014, by unanimously adopting two motions supporting the effort. The AIA 2030 Commitment contributes to this effort by serving as a component of an overall toolkit to achieve carbon neutrality in all U.S. buildings by 2030.

How Does the AIA 2030 Commitment Measure Energy Efficiency?

The AIA 2030 Commitment is measured using predicted energy use intensity to a baseline; metered energy use intensity (EUI) derived from the 2003 Commercial Building Energy Consumption Survey and the 2001 Residential Energy Consumption Survey. Both surveys are administered by the Energy Information Administration (EIA) and include a representative sampling of U.S. building stock. Predicted energy use intensity (pEUI) is measured in KBtu/GSF/year.

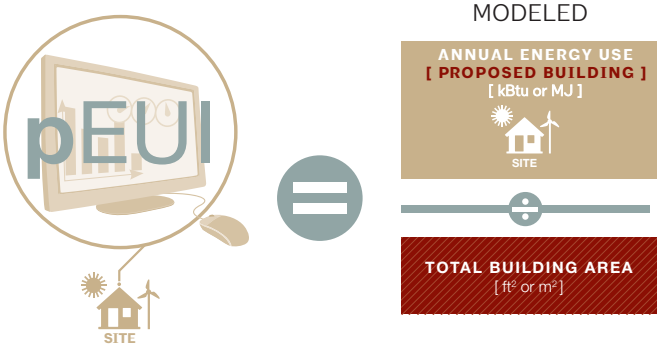
EUI is a measure of building energy use per unit area and is measured in thousands of British thermal units per square foot per year denoted as kBtu/GSF/yr. The U.S. Department of Energy's Commercial Buildings Energy Consumption Survey (CBECS)—specifically the 2003 CBECS database—serves as the widely adopted baseline EUI for measuring operational energy use and

EUI vs. pEUI



EUI = Energy Use Intensity

[MEASURED/METERED Energy—based on utility bills and building operation and use]



pEUI = predicted Energy Use Intensity

[MODELED Energy—based on proposed building model and design assumptions]

reductions. The AIA 2030 Commitment uses the term pEUI to differentiate from actual operational or metered energy use. Whereas the CBECS records actual use data from existing buildings, pEUI measures the intended or anticipated building energy consumption based on an energy simulation of the project's design. Additionally, reporting is based on site EUI which measures the energy used at the building site, as opposed source EUI. Source energy reflects what's used not only at the building level, but also for electricity generation, transmission, storage. Source EUI is an important measure of energy—and a vital part of calculating "carbon footprint." However, the focus of this reporting is to start with analyzing the intended energy performance by using site EUI baseline (derived from CBECS or other national surveys) for the design work of AIA member firms.

For each project that is not interior-only, the percentage reduction of pEUI is subtracted from the average EUI and is multiplied by the project's gross square footage (GSF). The sum of these products is divided by the total GSF of the same projects to yield a weighted average percentage reduction from the average. This number represents the firm's progress toward the 2030 goals. The approach allows for two key features: first, member firms of differing sizes to report on an equal basis; and second, it emphasizes the importance of project size, as larger projects within a firm's portfolio have a larger impact.

For interiors-only design work, the AIA 2030 Commitment measures designed lighting power density (LPD). Generally, the ability of an interior design project to affect building EUI is limited mostly to lighting design. Since interiors only projects tend to not include HVAC system or envelope modifications, LPD is the criterion most applicable to this work. The LPD metric is the sum of wattage required for all lighting equipment (as calculated per American Society of Heating, Refrigerating and Air Conditioning Engineers (ASHRAE) methodologies) divided by project area. The wattage (W) in the W/s.f. is determined by the power rating of the lighting fixtures selected. LPD is different from actual lighting energy use (which could be determined if the lighting was sub-metered and the power for lighting was measured over time). LPD is also different from lighting use intensity (LUI) which can be derived only from energy modeling, which is seldom employed for interiors-only projects.

Per ASHRAE 90.1-2007, installed interior LPD includes all power used by luminaires with a number of exceptions, including essential display or accent lighting, lighting that is integral to equipment, lighting specifically designed for use only during medical or dental procedures, and exit signs. ASHRAE 90.1-2007 offers two methods for determining a project's LPD and allowance: the Building Area Method and the Space-by-Space Method. The Building Area Method sets a single

allowance for the entire project, while the Space-by-Space Method compiles varying allowances for multiple space types within a single project.

What's Next for AIA 2030 Commitment Reporting?

In 2013, AIA and the 2030 Commitment Working Group partnered with the U.S. Department of Energy (DOE) and the Lawrence Berkeley National Lab (LBNL) to develop an online reporting portal. The AIA 2030 Commitment Design Data Exchange will better track design projects providing members and their signatory firms more robust reporting information for internal use and communication to clients. At the core of the partnership is a shared interest in quantifying the role of energy analysis during the design process. During the 2013 reporting cycle, an additional set of inputs were incorporated, which will allow firms deeper insight into their portfolio and how it compares to the growing dataset of AIA 2030 Commitment projects. In addition, completing these additional inputs for projects in the AIA 2030 Design Data Exchange will enable other types of analysis that further add value for signatory firms in the AIA 2030 Commitment Program. The underlying database for the AIA 2030 Design Data Exchange is utilizing DOE's SEED (Standard Energy Efficiency Data) platform, which establishes a strong foundation for integration with other tools and databases. Eventually, the goal is to connect best practices by building type and region as well as linking predicted and actual energy performance.

Additional project detail will also flow into the SEED database connecting to DOE's new Asset Score tool. Linking the AIA 2030 Design Data Exchange to Asset Score allows for project data import into Asset Score, thus setting up an EnergyPlus energy model. The energy model will generate an Asset Score and summary report the design team can utilize for further efficiency measure investigations. Data from the 2030 reporting cycle will be populated in the new AIA 2030 Design Data Exchange database when it goes live for firm evaluation.

Members and their architectural firms benefit by understanding performance relative to others by project type and region among other parameters. This allows firms to see how their building design stacks up to similar projects. This new data can be presented to clients to demonstrate added value. Larger practices can measure the performance of different project teams and offices within the firm. The AIA 2030 Design Data Exchange marks the creation of a "design energy" performance database. This database, when linked to DOE's Building Performance Database, provides firms the ability to explore, investigate, track and learn from the relationship of design energy to actual performance for buildings. Project teams will interact with the AIA 2030 Design Data Exchange to establish an emission target through its connection to the EPA'S ENERGY STAR Target Finder/Portfolio Manager tool. Project data can be managed as the design progresses and comparisons made to similar projects inform the team. Architects can use this information to advise clients of their building's performance compared to similar projects in the database. The AIA 2030 Design Data Exchange will enable firms to influence design culture and change behavior without the cost burden of software development.

This is the age of big data. The industry is at point where project data can be leveraged in increasingly interesting ways to assist in raising the performance bar of the built environment. When big data is mentioned, a discussion about data privacy is never far behind. The AIA 2030 Design Data Exchange will incorporate a number of privacy measures to ensure that firms' project data is secure and confidential.

Partnerships

Enhanced partnerships around the AIA 2030 Commitment strengthen and advance progress toward aligned energy efficiency and carbon emission reduction goals across the built environment. Numerous member groups and individuals contributed to the development and advancement of the AIA 2030 Commitment

The new AIA 2030 Design Data Exchange creates and expands knowledge sharing between practices through research functionality.

program. A new AIA 2030 Commitment Working Group was convened in late 2013 to address reporting, benefits, and progress toward the Commitment goals. Members representing diverse firm demographic sets and project types assembled to tackle issues both shared and unique to their areas of focus. Representatives from DOE, LBNL, the U.S. Environmental Protection Agency (EPA), and Architecture 2030 joined engaged members to further enhance program goals and impacts across the building industry.

Beyond the AIA 2030 Commitment Working Group, the AIA engaged stakeholders across the country to elicit feedback on AIA 2030 Design Data Exchange functionality and performance in project team work flow. Many of these groups were engaged in the early development and adoption of the AIA 2030 Commitment program. The AIA appreciates the time, dedication and hard work of these members and organizations. A full list of stakeholder participants is included in the Resources and Acknowledgments section of this report. The AIA offers eternal gratitude for their participation in the AIA 2030 Commitment program and AIA 2030 Design Data Exchange development.

DOE provided significant funding and staff time to connect the AIA 2030 Design Data Exchange to its SEED database platform in partnership with LBNL The long-term goal is for AIA's SEED database to link with DOE's Building Performance Database to demonstrate the effectiveness of their energy modeling programs. The AIA 2030 Design Data Exchange will also connect to DOE's new Asset Score tool when it is launched. The Asset Score will receive building systems data from AIA's SEED instance and run a basic energy model to identify opportunities to increase system efficiency.

EPA is working with the AIA to give architecture and engineering firms, and building owners resources to set targets to meet carbon reduction goals. Many firms participating in the AIA 2030 Commitment use ENERGY STAR Target Finder and Portfolio Manager tools to obtain EUI and CO2 targets for AIA reporting requirements. The defining metrics of these tools are the ENERGY STAR 1–100 score and percent energy reduction compared to a median building. These metrics help project teams assess the relative efficiency that predicted energy use will have on building performance by rank ordering design EUI against that of similar buildings or the median EUI. The new AIA 2030 Design Data Exchange connects to ENERGY STAR Target Finder/ Portfolio Manager to easily set project reduction targets.

Architecture 2030 participates in the AIA 2030 Commitment Working Group through its Director of Research and Operations, Vincent Martinez. The AIA 2030 Commitment establishes a framework for architects to track building energy performance, as well as identify areas that require a design focus in order to meet the 2030 Challenge targets. Architecture 2030 is a proud participant in this AIA Working Group and to actively provides its expertise and experience with 2030 Challenge adopters around the world to inform and expand the AIA 2030 Commitment.

Architecture 2030 participates in the AIA 2030 Commitment Working Group through its Director of Research and Operations, Vincent Martinez. Architecture 2030 is pleased to participate in this AIA Working Group and to provide its expertise and experience with 2030 Challenge adopters around the world to inform and expand the AIA 2030 Commitment.

The new AIA 2030 Design Data Exchange epitomizes AIA's effort to reposition the Institute. It creates and expands knowledge sharing between practices through research functionality. New data collected through the Design Data Exchange will be used to elevate public awareness of building energy use and the power architects have to increase efficiency thus decreasing operational expenses. Additionally, the AIA 2030 Design Data Exchange will facilitate advocacy for the profession through integration with and enhancement of DOE and EPA programs. The highest benefit to the Institute is at that provided its members through portfolio tracking and research.

2030 Data Case for Energy Modeling

An increasing number of project teams run energy simulation models for their building designs. Modeled projects increased from 52% in 2012 to 66% of total project reported in 2013 (Figure 2). This is the biggest increase in modeled projects since the program began. The AIA 2030 Commitment program is increasing energy simulation literacy by showcasing the impact of energy modeling on predicted energy performance. There were 401 total projects that met the 60% pEUI reduction target, more than double that of 2012. Net zero energy (NZE) projects increased five-fold from 14 projects to 73 projects in 2013. This remarkable increase is a testament to the power of the design team to reduce the carbon impact of buildings by using tools that help drive energy efficient design decisions.

Evaluating how a project will use energy early and throughout the design process can make a profound impact on carbon reduction in the built environment. This connection is clearly demonstrated when comparing modeled vs. non-modeled projects' efficiency projections (Figure 3). The average pEUI reduction of modeled projects outpaced non-modeled projects by 8%. Those projects that set energy goals to meet a 3rd party certification such as LEED, Living Building Challenge or Green Globes achieved even lower pEUI performance with a 44.12% average pEUI reduction.

Modeled projects were able to provide more focused and precise pEUI reductions than the non-modeled projects. (Figure 4). Eleven percent of projects that ran energy simulation met the 60% target with another 15% meeting a pEUI reduction range of 50%–60%. That equates to 26% of modeled projects at or near the 60% reduction target. This demonstrates that design responsive to energy simulation is the solution to meeting current and increasing carbon reduction targets.

Additional information requested in the 2013 reporting cycle included energy modeling information on what software tools were used and which project team member ran the energy simulation. Consulting engineers modeled the energy usage for nearly 60% of the project with architects simulating only 13% (Figure 5). There are opportunities for architects to perform their own analyses early in the process approaching design decisions more iteratively and with more information than just coordinating energy simulation with consultants. With energy modeling in the architect's control, they can quickly test changing design parameters to gauge impact on overall energy efficiency.

FIGURE 2. Percent Total GSF Modeled vs. Non-Modeled

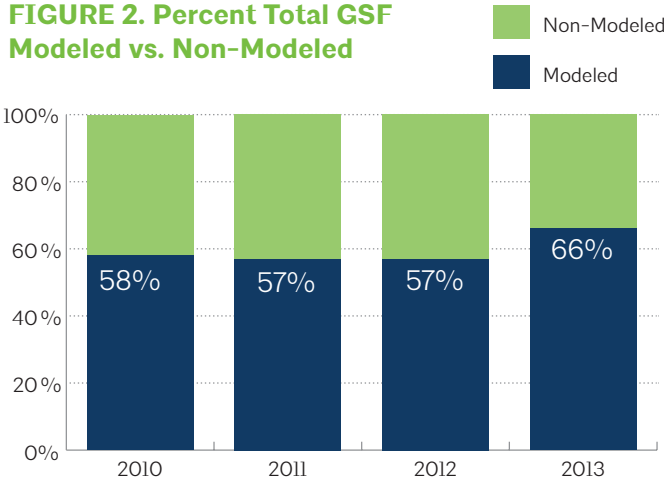
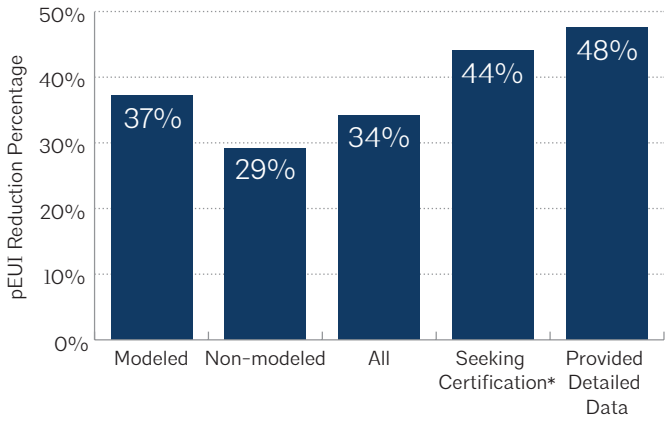
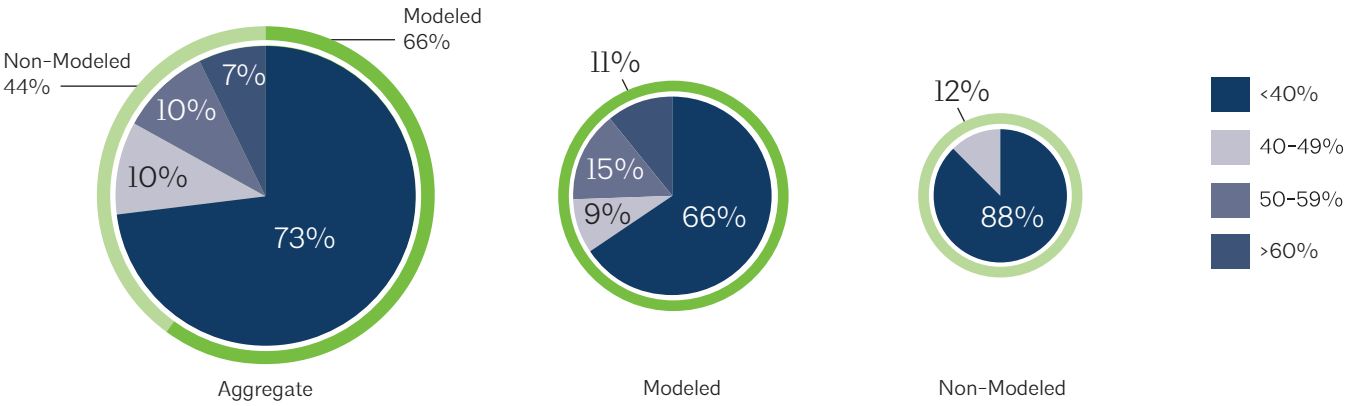


FIGURE 3. Average pEUI Reduction by Modeling



* Certification denotes projects pursuing 3rd party verification such as LEED, Living Building Challenge or Green Globes

FIGURE 4. Percent Improvement by pEUI Reduction Bins



The primary tool used for energy simulation is eQUEST with 29.2% of projects, despite the fact that it uses an the DOE-2 software platform that hasn't been updated since 2001 (Figure 6). This indicates that most energy modelers prefer to use familiar tools rather than the latest technology despite the improved simulation benefits of newer platforms such as EnergyPlus. Trane's Trace 700 closely trails eQUEST with 24% of project teams using it for simulation. This further demonstrates the engineers' dominance as the energy modeling team member. Trace 700 does double duty analyzing energy simulation and sizing mechanical systems adding value to the process. One of the obstacles to energy simulation is the lack of interoperability of most software with other building information modeling (BIM) tools such as Revit, Bentley BIM, and Vectorworks. Developing tools that work seamlessly with the design workflow would empower design teams to more easily incorporate energy modeling into the design process.

Simulation tools are revolutionizing the industry. As design teams incorporate these tools into their process, value is added to the owner through energy savings signifying a change in architectural practice, a key to advancing the architecture profession in the 21st century.

FIGURE 5. Team Member Responsible for Energy Simulation

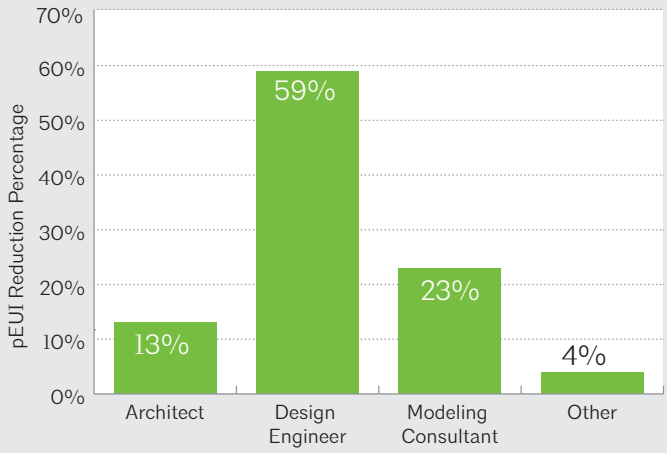
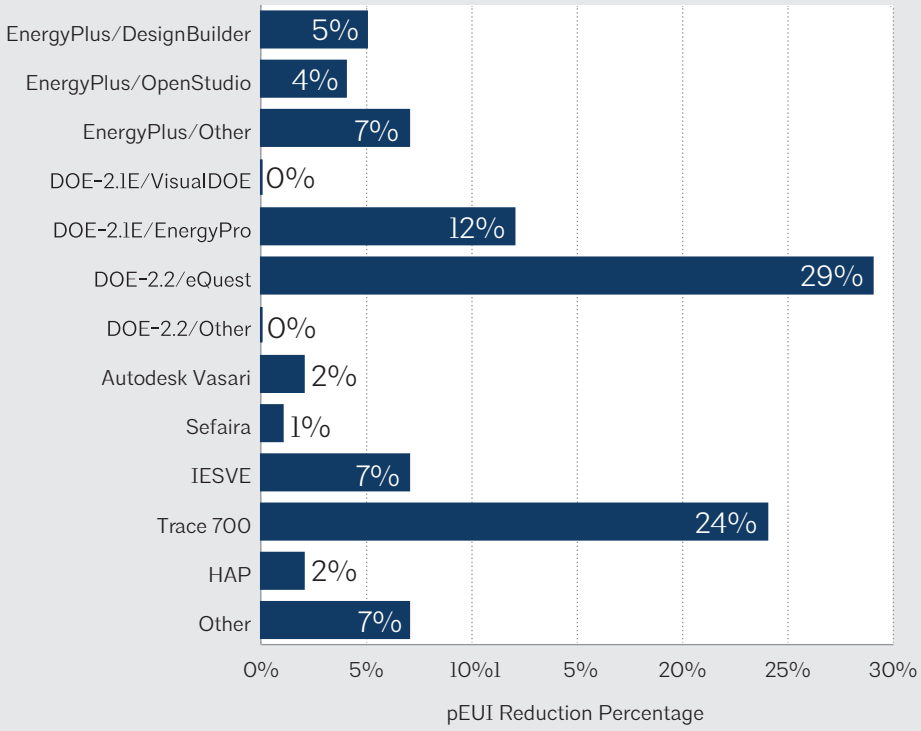


FIGURE 6. Energy Simulation Tools



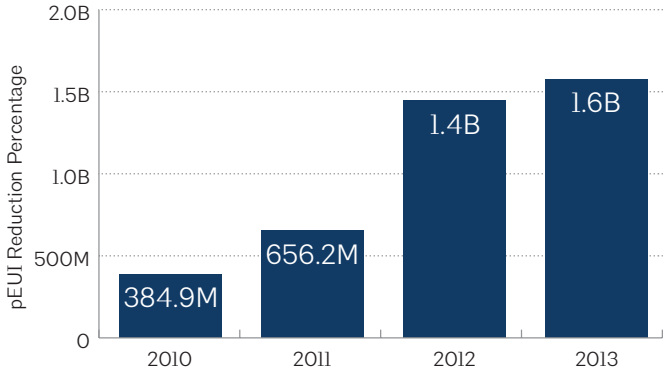
2030 Commitment Data

Firm Demographics

Total area of reported projects rose again in 2013 to 1.6 billion gross square feet (GSF), a 9% increase over 2012 (Figure 7) increasing the impact of the AIA 2030 Commitment program on the built environment. The total area represents 2,464 total projects reported. Project GSF growth continued despite a 10% drop in firm reporting levels (Figures 8 & 9). Of the 291 signatory firms to the AIA 2030 Commitment in 2013, 99 reported project data equating to a 34% follow-through. The 10% drop in firm reporting is under investigation by the AIA. Large firm reporting has remained stable through the life of the program whereas smaller firm participation has dropped. Small and medium sized firms are more challenged to report over time, although they make up the majority of architectural practice. The Institute will continue to work to assist these firms with the resources they need to fully participate in the 2030 Commitment. Reporting project portfolio performance demonstrates leadership and dedication to the profession by firms of all sizes.

New in the 2013 reporting process was the request for an increased level of optional detail for reported projects. The additional detail was part of a transition from the spreadsheet tool to the online database. The AIA 2030 Commitment Working Group collaborated closely with the DOE to incorporate the increased detail into the reporting tool. The AIA recognizes the difficulty involved in providing this increased level of detail and thanks the 27 firms that went the extra mile to provide additional detail on project systems and process. The AIA National COTE also deserves recognition for supporting the detail request by their own firms as well as reaching out to every signatory firm to convey support for providing additional program detail. The detailed data did not include a large enough sampling to draw a conclusion on impact to the program, but will be imported into the online database for firm analysis when the tool is launched. Understanding the impact of the building system detail requested is significant to understanding energy performance of a building through the energy simulation process. The projects where detailed data was collected performed 13.4% better than the average project pEUI reduction with an average 47.6% pEUI reduction over the 2003 CBECS baseline. Clearly, evaluating and incorporating the effects of these systems on energy efficiency makes a significant impact on pEUI reduction.

FIGURE 7. Total Area (GSF) of Projects in an Active Design Phase*



*active design phase denotes conceptual, schematic, design development or contract documents phases

FIGURE 8. Number of Reporting Firms by Staff Size

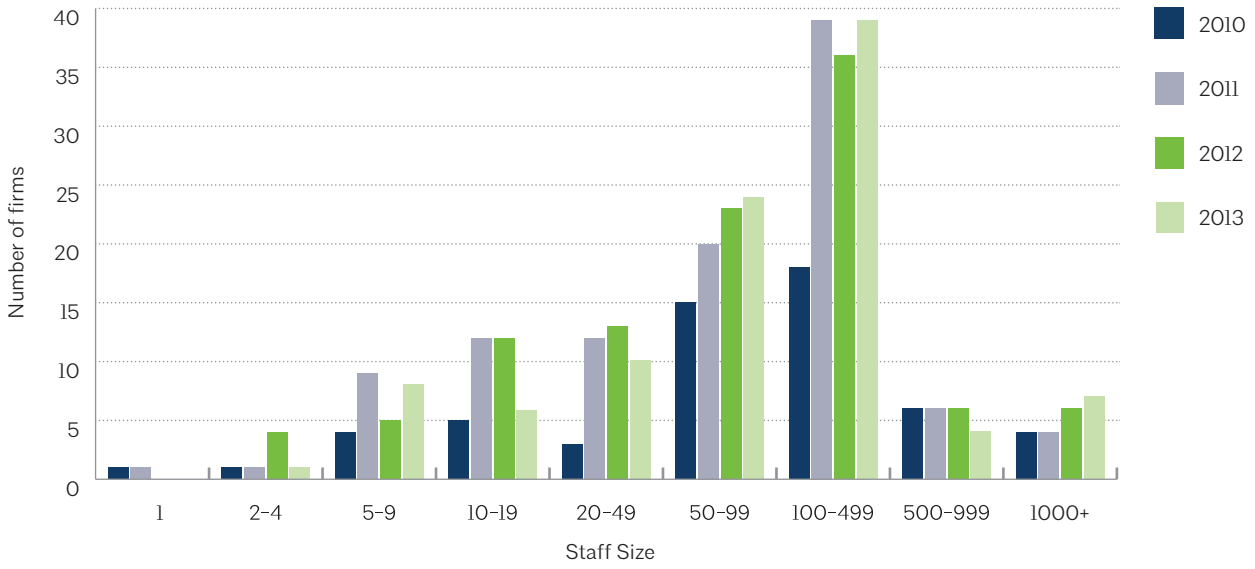
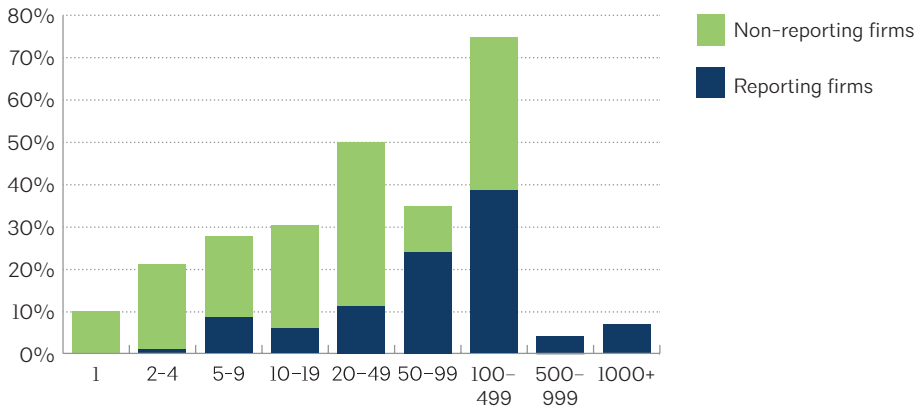


FIGURE 9. Signatory Firms Reporting Rates by Size by Year



2030 COMMITMENT SIGNATORY FIRMS REPORTING DETAILED DATA FOR 2013

Bergmeyer
Cannon Design
Cooper Cary
DSGN
EHDD
Garcia
GGLO
HDR
HOK
Kipnis
Lehrer
Leo A Daley
LMN
Payette
Ratcliff Architects
Ross Barney
SERA
SHW
Skidmore, Owings & Merrill LLP- SF
SmithGroup
SOM
TROJB
Vanderweil
WBRCMe
Willoughby
WRNS
YHG

AIA 2030 COMMITMENT NEW SIGNATORY FIRMS IN 2013

Ambient Energy
Architekton
DSGN Associates, Inc.
ELS Architecture and Urban Design
GHT Limited
Greele and Hanson
Meyer Scherer & Rockcastle, LTD
Symmes Maini & McKee Associates (SMMA)
Tim Brown Architecture
Tom Bush Architect LLC
VERBarchitecture
Willoughby Engineering
Ellenzweig

Thirteen new architecture firms joined the AIA 2030 Commitment in 2013. The increase in reporting firms shows willingness of firms to collaborate across practices toward a common goal to benefit of the industry and the public their buildings serve.

The number of firms intending to collect actual consumption data decreased to 25% (Figure 7). Post-Occupancy Evaluation (POE) is an enormous opportunity to increase architectural services and connect predicted to actual performance. As more and more cities adopt energy disclosure requirements, architects find opportunities to offer new services for their client.

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Project Reporting Data

Average pEUI reduction across all whole-building projects dropped to 34% in 2013 (Figure 10). However, this slight drop in the average pEUI reduction does not tell the whole story. The number of projects meeting the 60% target increased 200% in 2013 while the GSF meeting the reduction goal dropped by 7% (Figure 11). Thirteen percent of projects met the 60% target while only 7% of GSF met the goal (Figures 12 and 13). This is a profound indication that big projects make a big impact. Projects greater than 1M square feet predicted performance below the national average, while all other project sizes predicted performance above the national average.

Project pEUI reduction rates improved across all project types with the exception of projects over 1M GSF. The improvement of smaller projects indicates an improved understanding of energy use in buildings. More, smaller projects met the goal than larger projects; however the larger projects make a bigger impact on GSF reduction and overall energy use.

2030 COMMITMENT SIGNATORY FIRMS REPORTING FOR 2013

Adrian Smith + Gordon Gill Architecture

Albert Kahn Associates

Architectural Alliance

Ayers Saint Gross

Bergmeyer Associates

Boora Architects

Callison

Cannon Design

Coolearth Architecture Inc.

Cooper Carry

CS&P Architects Inc.

Cuningham Group Architecture, Inc.

DSGN Associates, Inc.

Dull Olson Weekes-IBI Group Architects, Inc.

EHDD

Ellenzweig

ELS Architecture and Urban Design

Epstein

EYP

FXFOWLE

Garcia Architecture+ Design

Gensler

GGLO

GHT Limited

GKKworks

Gresham Smith

GWWO, Inc./ Architects

HDR, Inc.

Helpern Architects, PC

High Plains Architects

HKS

HOK

Hord Coplan Macht/ SLATERPAULL Architects

IKM Incorporated

Integral Group

Interface Engineering

Jacobs Global Buildings/ KlingStubbins

Jones Studio, Inc.

Kaplan Thompson Architects

Kipnis Architecture and Planning

KMD Architects

Lake|Flato Architects

Landon Bone Baker Architects

Legat Architects

Lehrer Architects LA, Inc.

LEO A DALY

Little Diversified Architectural Consulting

LMN Architects

LMS

LPA, Inc.

LS3P

Mahlum

Mazzetti

Meyer Scherer & Rockcastle, LTD

Mithun

Moseley Architects

MSR Design

NBBJ

Orcutt Winslow

Page

Payette Associates, Inc.

Pei Cobb Freed & Partners Architects LLC

Pickard Chilton

Quattrocchi Kwok Architects

Quinn Evans Architects

R.G. Vanderweil Engineers

Ratcliff Architects

Ross Barney

RTKL Associates Inc.

RVK Architects, Inc.

Sclater Architects

SERA Architects

Serena Sturm Architects, Ltd.

Shepley Bulfinch

SHP Leading Design

SHW

Skidmore, Owings & Merrill LLP

SmithGroupJJR

SMMA

Steffian Bradley

Studio2G Architects, LLP

STUDIOS Architecture

The Beck Group

The Miller Hull Partnership

The S/L/A/M Collaborative

TROJB

tvsdesign

Valerio Dewalt Train Associates

VOA Associates Inc.

WBRC Architects-Engineers

Weber Thompson

Westlake Reed Leskosky

WHR Architects

Wight & Company

Willoughby Engineering LLC

WRNS Studio

Yost Grube Hall Architecture

ZeroEnergy Design

ZGF

FIGURE 10. Percent Average pEUI Reduction from the National Average

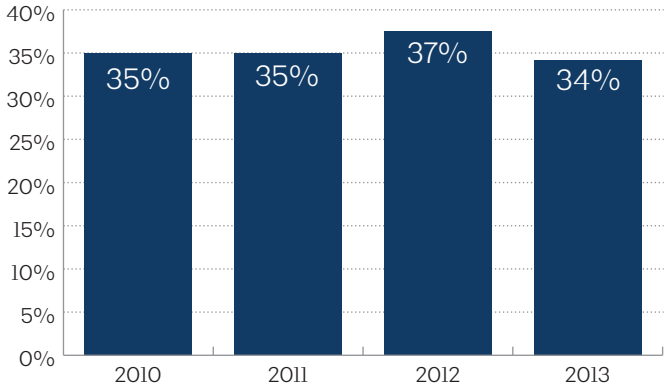
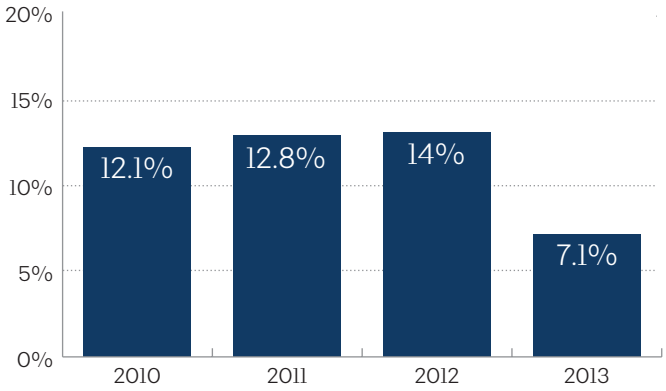


FIGURE 11. Percent Total GSF Meeting the 60% Target



It is notable is that projects in every size category met the 60% reduction target, proving that projects of all sizes are capable of meeting the goals.

Project use type also plays a significant role in energy performance. The highest performing sectors in 2013 are those that are owner-occupied (Figure 15). K-12 Education projects earned the highest pEUI efficiency with an average 43.29% improvement over the baseline.

Projects in every size category met the 60% reduction target, proving that projects of all sizes are capable of meeting the goals.

Laboratories took a close second with 42.83% pEUI reduction. These projects perform well because owners who operate their buildings have incentive to include energy efficiency measures to reduce operating costs throughout the life of the building. The potential for operational cost savings drive the owner include energy performance criteria in RFPs. Owner-operators are also more likely to evaluate and request energy services when evaluating team qualifications.

As with project classification by size, all categories have projects meeting the 2030 target for 2013 showing that any project can meet the goal.

The AIA 2030 Commitment also included 3,941 interiors-only projects. These represent the enormous amount of work where energy modeling is beyond the scope of work. Lighting efficiency improved by 2% over 2012 coming points closer to a 25% LPD reduction goal (Figure 16).

FIGURE 12. pEUI Reduction by Number of Projects

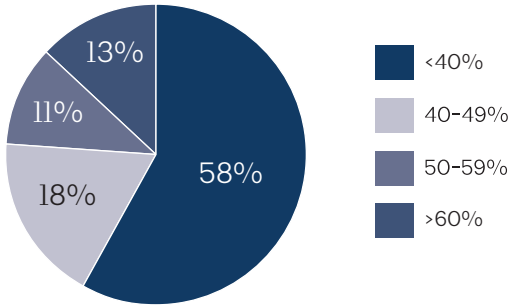


FIGURE 13. pEUI Reduction by GSF

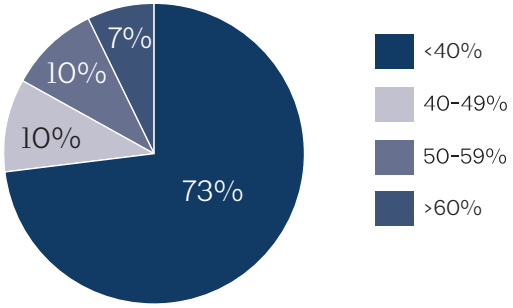


FIGURE 14. Average pEUI Reduction by Project Size

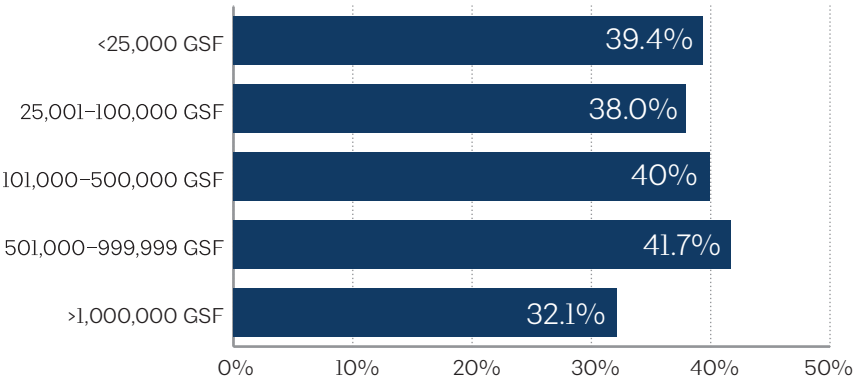


Table 2. Projects by Size

Project Size	2012 Ave. pEUI Reduction	2013 Ave. pEUI Reduction	GSF	No. of Projects	No. of Projects Meeting 60% Target
<25000 GSF	36.7%	39.4%	6777009	708	62
25001–100,000 GSF	34.7%	38.0%	37306303	615	80
101,000-500,000 GSF	35.7%	40.0%	177871201	714	120
501,000–999,999 GSF	36.2%	41.7%	128024047	180	38
>1,000,000 GSF	39.4%	32.1%	1029457532	247	17

Figure 15. Average pEUI Reduction by Project Use Type

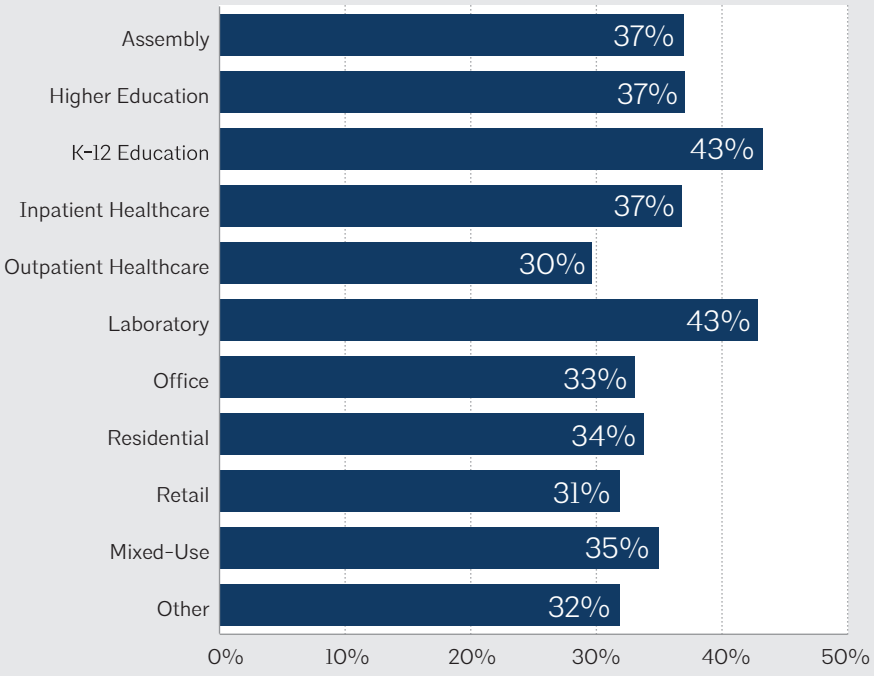
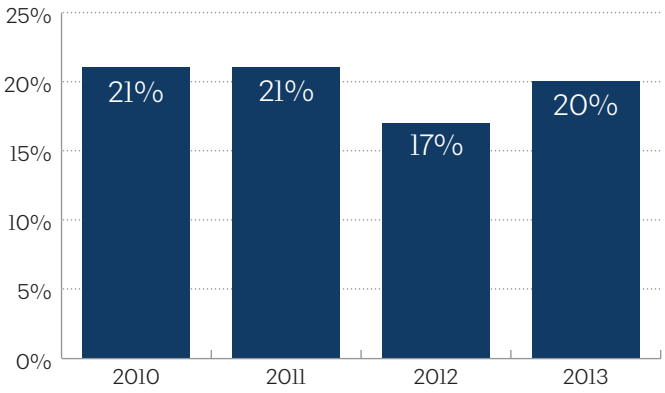


Table 3. Project Use Type

Project Type	2012 Ave. pEUI Reduction	2013 Ave. pEUI Reduction	GSF	No. of Projects	No. of Projects Meeting 60% Target
Assembly	37.7%	37.0%	34064086	182	18
Higher Education	36.7%	37.1%	24325322	189	22
K-12 Education	39.4%	43.3%	18591306	257	38
Inpatient Healthcare	33.1%	33.1%	57167446	131	9
Outpatient Healthcare	31.6%	29.6%	11183080	130	12
Laboratory	43.2%	42.8%	12776363	76	15
Office	37.0%	33.1%	688452740	641	104
Residential	34.8%	33.8%	33564531	218	31
Retail	25.7%	31.9%	25346672	122	1
Mixed Use	42.8%	35.0%	394952821	266	23
Other	30.2%	31.9%	56047926	279	30

Figure 16. Average LPD Reduction



Unique Elements of the AIA 2030 Commitment Data

The data collected for the AIA 2030 Commitment is unique due to a vast range of project variables. Assumptions developed by the AIA and member partners provide parameters for the reporting process. Most notably, projects are reported annually across all project stages according to traditional design phases (Conceptual, Schematic Design, Design Development, and Contract Documents). Projects are often reported over multiple years at various stages of design to assess performance at the firm, portfolio level. Projects fall into various stages of energy simulation as well. Although AIA encourages energy modeling early in conceptual design, projects teams start simulating energy use at varying points throughout the process. Some design teams report goals for projects that will be modeled at a future time (will be modeled-target set). Other projects show they will be modeled, but have not set a target (will be modeled-target not established).

Assumptions

- LPD meeting or exceeding 25% W/s.f. efficiency improvement over ASHRAE 90.1-2007 is the interior project equivalent to meeting the AIA 2030 Commitment targets.
- New Building Institute (NBI) code equivalents were used to translate code compliance to pEUI reduction (Table 4).
- Accurate and useful energy simulation is predicated on quality inputs.
- Scheduling assumptions vary between simulation defaults pEUI vs. actual EUI.
- Projects reporting “Will be modeled in the future. Target EUI has been established” were classified as “Modeled” and considered an iterative model that informs the design process.
- Projects reporting “Will be modeled in the future. Target EUI has not been established” were classified as “Non-Modeled” and considered a compliance model that follows the design process.

Data limitations

- The 2030 data is a subset of projects reported by signatory firms focused on energy performance and may not be representative of the entire architectural market
- Only data submitted prior to the March 31, 2014 deadline was included in the report analysis. Firm data reported after the deadline was included in the firm demographic information, but not the predicted building performance metrics.

Table 4. NBI pEUI reduction equivalents to code

Code	Approximate Percent Reduction from Average
ASHRAE 90.1-1999	10%
ASHRAE 90.1-2001	10%
ASHRAE 90.1-2004	20%
ASHRAE 90.1-2007	25%
ASHRAE 90.1-2010	40%
California Title 24 2005 for high rise residential	35%
California Title 24 2005 for single family residential	30%
California Title 24 2008	40%
IECC 2003	10%
IECC 2006	20%
IECC 2009	35%
IECC 2012	40%
Older than 1999	0%
Oregon Energy Code	25%
Washington Energy Code	25%

Note: These are estimates of code comparison based on analyses by Pacific Northwest National Laboratory, New Buildings Institute, and Architecture 2030. These percentages are provided to enable the inclusion of non-modeled projects in analysis for the AIA 2030 Commitment.

Resources

2030 Commitment: Measuring Industry Progress to 2030 (AIA, 2013)

An Architect's Guide to Integrating Energy Modeling in the Design Process (AIA, 2013)

Architecture 2030 (architecture2030.org)

History of Energy Modeling (BEMBook, 2012)

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