

# Climate change mitigation

April 2017

*The following commentary relates to AIA's Public Policies and Position Statements on Sustainability, specifically Category II: The Practice, Public Policy IIC: Architects Are Environmentally Responsible, Position Statements 1-6.*

## The architect's critical role in climate change mitigation

Climate change caused by human activity remains one of the most urgent challenges of the 21st century. Rising levels of carbon dioxide and other greenhouse gases already are causing rising sea levels, extreme weather events, and degradation of natural resources. These trends are projected to continue and possibly accelerate, posing significant risks to national security, human health, food supply, global economies, and natural ecosystems; many of these result in refugee crises. The threat of climate change is understood by climate scientists<sup>i</sup>, the US Department of Defense<sup>ii</sup>, the general public<sup>iii</sup>, and the financial and insurance industries<sup>iv</sup>.

The built environment accounts for the majority of human-caused carbon emissions globally<sup>v</sup>, and as such it is an ethical and practical obligation of every architect to work to combat climate change. To do this, each of us must educate ourselves on the consequences of climate change on the built environment so we can educate our clients and make decisions that protect people and the planet.

This includes extreme temperatures and precipitation, drought and wildfires, and sea level rise. Architects need to plan and design to adapt to these future conditions and mitigate the impacts of a changing climate by focusing on ways to reduce carbon dioxide and other greenhouse gas emissions. We must also learn how to work more effectively with our collaborators to deliver projects with robust energy savings and carbon reductions.

## Climate change urgency

Since AIA's sustainability position statements were approved in December 2007, we have experienced an unprecedented rise in global temperatures. Every month from May 2015 through July 2016 presented a new record high for that month's global temperature, with July and August 2016 tying for the hottest months on record.<sup>viii</sup> Just over a year ago the world came together in Paris for the **21st Conference of the Parties (COP21) of the UN Framework Convention on Climate Change (UNFCCC)**, and signed an historic agreement to keep the global average temperature increase to *"well below 2°C above pre-industrial levels and to pursue efforts to limit the temperature increase to 1.5°C."* To meet this target, the world must reach zero fossil fuel CO2 emissions in the built environment by about 2050, and zero total global greenhouse gas emissions by

2060 to 2080<sup>viii</sup>. Just days after the Paris Agreement went into force, the UN hosted the second ever ‘Buildings Day’<sup>ix</sup> at COP22 in Morocco. ‘Buildings Day’ highlighted the importance of the building and construction industry in addressing climate change, and laid out a framework for the actions required to reach the goals of the Paris Agreement.

In recognition of these events, this commentary expands on the language in the existing AIA Public Policy and Position Statements with increased urgency. AIA’s public policy, “Architects are Environmentally Responsible” states: *“The creation and operation of the built environment require an investment of the earth’s resources. Architects must be environmentally responsible and advocate for the sustainable use of those resources.”*

The supporting position statements go beyond the investment of earth’s resources and touch on resource consumption in both material selection and building operations, as well as energy efficiency and renewable energy generation as a form of resource conservation. In addition, the position statement on resilience advocates for the need for adaptation to climate change. These position statements are tied together by their recognition of the profound impact that the built environment has on the natural environment.

### **The architectural profession mobilizes to address climate change**

AIA, as well as the International Union of Architects (UIA)<sup>x</sup> and other architectural member organizations, have recognized that architects and our collaborators practice within the context of climate change, and have a responsibility to the general public to reduce our industry’s emissions.

Today, more than half of the world population lives in urban areas, with cities generating more than 70% of global greenhouse gas emissions, mostly from buildings. By 2030, world population is expected to increase by 1.1 billion people, with all of that occurring in urban areas. This provides an unprecedented opportunity to reduce fossil fuel CO<sub>2</sub> emissions by setting the global building sector on a path to phase out CO<sub>2</sub> emissions by 2050.

Many formal endorsements of climate imperatives and commitments to collective action have already been undertaken by AIA, some examples include:

- In 1973, AIA formed the National Advisory Committee on Research in Energy Conservation.
- In 1990, AIA created the National Committee on the Environment (COTE).
- In 2009, AIA created the AIA 2030 Commitment, in response to the 2030 Challenge, helping firms measure progress towards carbon neutrality by 2030.
- In 2014, AIA introduced and endorsed the 2050 Imperative to the UIA, recognizing the goal of phasing out CO<sub>2</sub> emissions from worldwide power and industrial sectors by 2050 (including buildings) as established at COP 21 in 2015.

However, it is critical to recognize that actual progress toward these goals has been nearly negligible when compared to all new construction and renovation in the US. For these necessary and disruptive changes to occur, AIA members need resources and support to serve their clients and communities better in accordance with these commitments. AIA is accelerating efforts to provide these resources.

## The architects' role in fighting climate change

Unfortunately, even with global awareness of and commitment to acting on climate change, we cannot rely on public policy mandates in the US to drive the important changes needed in creating the built environment.

As stewards of the built environment, architects and our collaborators must be leaders in providing a powerful response to climate change. In order to achieve carbon neutral design as standard practice by 2030, we need to urgently shift our practices to apply passive design techniques, energy efficiency measures, embodied carbon reduction strategies, and renewable energy in all of our projects. By implementing these techniques, architects provide our clients with increased value, through benefits to human health and productivity, energy cost savings and resilience.

Architects must also expand our roles beyond design practice, by engaging in public policy to ensure the design, preservation, and construction of sustainable communities and high-performance buildings. This requires our active participation and leadership in the development, evaluation, and use of codes, standards, evidence-based rating systems and financial mechanisms.

The early design of a building is a fluid, non-linear process that has great potential for unique solutions that result in beautiful, successful spaces and significant energy savings. If architects are to be leaders of the design process, we need to engage more fully in understanding and communicating the energy use and carbon emissions of our buildings, alongside the many other challenges we take on in early design. This requires each of us to achieve a higher level of understanding and ability to speak about energy and carbon issues with our clients, to obtain education to interact with our collaborators to be part of solutions, and to deliver projects with robust energy savings and carbon reductions.

Architects are uniquely positioned as coordinators and collaborators to identify and deliver energy savings and carbon reductions for our clients. **Working towards the goals of the 2030 Challenge, three areas are especially important:**

**1. Engage in education.** Architects, through AIA, have created education materials such as the **AIA+2030 Series**, the **Energy Modeling Design Guide**, **Knowledge Communities**, as well as many courses on **AIAU** and at the **AIA Conference on Architecture**. Architects need to be educated on these issues well enough to comfortably discuss energy, carbon, material, and resilience goals and implementation strategies with our clients and collaborators. With education, we can lead the process to meet the needs for incentives, risk aversion, and resilience that our clients require. Even without a client mandate for specific energy reduction goals, we have opportunities on every project to make wise and responsible decisions about the energy and carbon emissions impacts of our designs.

**2. Engage in energy modeling.** Architects are largely responsible for the passive energy use systems of a building—the orientation, fenestration, envelope, and massing of our buildings. Each of these has a profound effect on resulting energy use, carbon emissions, and mechanical system size and cost. AIA's 2030 Commitment Report states that energy modeling is the key to meeting the 2030

Challenge. As leaders of the design process, we need to understand how to make better early design decisions about passive and active systems in our buildings. This involves learning how to get more assistance from energy modeling and energy consultants to help make the right early decisions towards meeting our 2030 Challenge goals and our clients' quality and budgetary goals.

**3. Engage in policy-making.** Architects have a deep understanding of the design and construction process, and command respect within policy circles because of this. We have opportunities to influence building codes, legislative efforts, policies, and our communities. This can happen by actively seeking out leadership positions within code-authoring and adopting bodies, convening collaborators to discuss issues or comment on legislative and code proposals, and seeking out ways to improve our design processes. This is happening in numerous states and cities, as well as at the federal level, but much more engagement is needed.

To meet the mitigation goals of the Paris Agreement and the adaptation required to manage climate-related disasters, which have become more frequent and intense, two additional areas are especially important:

- **Embodied carbon.** The carbon emissions and negative environmental impacts of building materials and construction processes, as well as those affecting human health, must be drastically reduced or eliminated. To achieve this, we must include whole-building life cycle assessment alongside material transparency within our design process, as well as retrofit existing buildings to save embodied energy as described in the [Deep Energy Retrofits guide](#).
- **Resilience and climate adaptation.** Resilient and adaptable buildings and communities must be a central tenet of design in order for buildings to remain safe and operational into the future, especially as we are faced with adverse conditions triggered by climate-related hazards and other shocks and stresses. To achieve this, we must design to manage greater extreme temperatures, increased intensity and frequency of climate-related events, and sea level rise. Designing this way provides more comfortable, sustainable and functional environments under both normal conditions and extreme conditions. AIA offers a range of [information and resources](#) on resilience and adaptation.

With the Paris Climate Agreement ratified and in effect as of November 4, 2016, substantive national and international action on mitigating climate change is slated to occur soon. But because architects and our collaborators hold the key to meaningful reductions in carbon emissions, we need to ensure that every member plays an active part in local, national, and international solutions to combat climate change.

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<sup>i</sup> NASA <http://climate.nasa.gov/scientific-consensus/> 97 percent or more of actively publishing climate scientists agree that climate-warming trends over the past century are extremely likely due to human activities.

<sup>ii</sup> US DEPARTMENT OF DEFENSE <http://www.defense.gov/News/Article/Article/612710> Climate change is a security risk, and will aggravate problems such as poverty, social tensions, environmental degradation, ineffectual leadership and weak political institutions that threaten stability in a number of countries.

<sup>iii</sup> GALLUP POLLS <http://www.gallup.com/poll/190010/concern-global-warming-eight-year-high.aspx> Since 2001, 50 percent or more of Americans have agreed that climate change is due more to human activity than to natural changes in the environment that are not due to human activities. Fifty-seven percent see it as a "serious threat."

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<sup>iv</sup> **S&P GLOBAL MARKET INTELLIGENCE**

[https://www.globalcreditportal.com/ratingsdirect/renderArticle.do?articleId=1628260&SctArtId=386349&from=CM&nsI\\_code=LIME&sourceObjectId=9618053&sourceRevId=3&fee\\_ind=N&exp\\_date=20260504-22:22:57](https://www.globalcreditportal.com/ratingsdirect/renderArticle.do?articleId=1628260&SctArtId=386349&from=CM&nsI_code=LIME&sourceObjectId=9618053&sourceRevId=3&fee_ind=N&exp_date=20260504-22:22:57) The impact of climate change on banks, insurers, and asset managers (financial services companies) is likely to be multilayered and significant over the long term. S&P Global Ratings considers that if authorities further delay taking the necessary steps to address climate change, the negative long-term effects on financial services as a whole could be profound.

<sup>v</sup> Seto, K. and S. Dhakal (2014) 'Chapter 12: Human Settlements, Infrastructure, and Spatial Planning', in Climate Change 2014: Mitigation of Climate Change. Contribution of Working Group III to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change: 935.

<sup>vi</sup> **National Oceanic and Atmospheric Administration** <http://www.noaa.gov/news/july-was-hottest-month-on-record-for-globe> July 2016 was 1.57 °F above the 20th-century average, breaking the prior year's record for the warmest July on record. The average global temperature for 2016 up to that date was 1.85°F above the 20th-century average.

<sup>vii</sup> **National Aeronautics and Space Administration** <https://data.giss.nasa.gov/gistemp/news/20160912/> August 2016 was the warmest August in 136 years of modern record-keeping, according to a monthly analysis of global temperatures by scientists at NASA's Goddard Institute for Space Studies (GISS) in New York. Although the seasonal temperature cycle typically peaks in July, August 2016 wound up tied with July 2016 for the warmest month ever recorded.

<sup>viii</sup> **Architecture 2030** <http://architecture2030.org/paris-to-world-an-end-to-the-fossil-fuel-era/> At the heart of the Paris Agreement is the "long-term goal" committing almost 200 countries—including the US., China, India, and the European Union nations—to keep the global average temperature increase to: "well below 2°C above pre-industrial levels and to pursue efforts to limit the temperature increase to 1.5°C."

<sup>ix</sup> **UNFCCC Buildings Day** <http://newsroom.unfccc.int/lpaa/building/> Real estate represents about 50 percent of global wealth. Creating this transformation requires investing around an additional US\$220 billion by 2020—an almost 50 percent increase on 2014 investment in energy efficient buildings—but less than 4 percent of the current total global annual investment in construction activity (\$8.5 trillion/yr). Returns on this investment could be as high as 124 percent if investments in ambitious policy and technology actions are being made now.

<sup>x</sup> **UIA World Congress**, "Declaration 2050 Imperative" (2014), [http://www.uia.archi/sites/default/files/EN\\_Declaration\\_Durban.pdf](http://www.uia.archi/sites/default/files/EN_Declaration_Durban.pdf)