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“Saving Energy: Legislation to Improve Energy Efficiency and Storage”

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Committee on Energy and Commerce, Subcommittee on Energy
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Good morning Chairman Rush, Ranking Member Upton, and members of the Committee. Thank you for the opportunity to testify about the legislation before you today. Building sector energy use is a deeply important issue to me and my profession, and I appreciate the opportunity to provide feedback for the committee's consideration.

I am a licensed architect with the firm HKS, which has twenty-four offices around the country and across the world. I am a Principal and the Director of Integration, based in our Dallas headquarters office. I am also a member of the American Institute of Architects, a professional association of over 95,000 architects and allied professionals who work to advance our nation's quality of life through design. Since 1857, the AIA has fought to protect the public's health, safety and welfare. Both HKS and the AIA believe that architects have an obligation to find elegant solutions for the challenges confronting the communities we serve.

I am also the 2020 Chair of the AIA's Committee on the Environment (COTE). COTE is a knowledge community of AIA members who have been pushing for sustainable policy in the built environment for the last 30 years. I am honored to represent each of these experiences with my testimony today.

I applaud the House Energy & Commerce committee for their serious work to consider how the built environment is contributing to our nation's climate crisis-- and how it may become part of the solution. **The building sector alone accounts for almost 40% of greenhouse gas emissions (GHG).** "Embodied carbon," meaning the carbon emissions produced by the creation and installation of building materials and building construction, accounts for about 11% global GHG emissions. Building operations round out the rest, contributing roughly 28% of total global carbon emissions. To get that down to zero, we must end buildings' dependence on fossil fuels.

To that end, in 2009 the AIA established the 2030 Commitment to help architectural firms utilize data-driven, project-specific tools to improve building performance and achieve carbon-neutral buildings by 2030. The 549 member-firm signatories of the AIA 2030 Commitment support the 2030 Challenge,¹ which outlines these specific metrics to meet that goal:

- "All new buildings, developments and major renovations shall be designed to meet a fossil fuel, GHG-emitting, energy consumption performance standard of 70% below the regional (or country) average/median for that building type."
- "At a minimum, an equal amount of existing building area shall be renovated annually to meet a fossil fuel, GHG-emitting, energy consumption performance standard of 70% of the regional (or country) average/median for that building type."
- The fossil fuel reduction standard for all new buildings and major renovations shall be increased to: 80% in 2020; 90% in 2025; 100% in 2030.

¹ http://content.aia.org/sites/default/files/2019-08/AIA_2030_BytheNumbers_2018.pdf

- The outcomes must be achieved mainly through the design of energy efficient and clean-energy generating buildings. It sets a maximum allowance of 20% off-site energy purchasing.²

These goals align with the policy put forth in the Energy Independence and Security Act (EISA) of 2007 which set targets for federal buildings to decrease overall energy use and to phase out the use of fossil fuels.³ The AIA was a firm supporter of that bipartisan policy, signed into law by President George W. Bush.

I appreciate the work of the members of the committee who put forward the energy efficiency bills we are discussing today. In particular, I would like to provide feedback on H.R. 3962, the Energy Savings and Industrial Competitiveness Act.

I want to thank the lead cosponsors, Congressmen Peter Welch (D-VT) and David McKinley (R-WV), for their work to promote the use of energy efficiency technology in residential, commercial, and industrial sectors. By establishing Building Training and Assessment Centers, the bill provides beneficial support for architects and other professions in the building industry to learn new energy efficient design and technological best practices.⁴ It amends Section 304 of the Energy Conservation and Production Act (ECPA) to require the Secretary of Energy to encourage and support the adoption of building codes by states and municipalities, and again provides training and technical assistance support for impacted building industry professions. AIA is very supportive of this goal and also works to support building code adoption at the state and local level, and the development of stretch codes.⁵ Most importantly, the bill reestablishes the energy efficiency targets of the ECPA with an updated baseline year.

Despite these positive provisions, the AIA is deeply concerned that the bill also includes the repeal of Section 433, the short-hand designation for the current policy that requires the phase out of the use of fossil fuels in federal buildings. As we have in the past, the AIA strongly opposes this repeal and cannot support the bill with the inclusion of that provision.⁶ We urge the committee to strike that provision and move forward with the other important updates that this bill could rightly provide.

² Architecture 2030, The 2030 Challenge, https://architecture2030.org/2030_challenges/2030-challenge/

³ PUBLIC LAW 110–140—DEC. 19, 2007 <https://www.govinfo.gov/content/pkg/PLAW-110publ140/pdf/PLAW-110publ140.pdf>

⁴ GPRO (created by the NYC chapter of the USGBC- Urban Green Council) is an excellent example of workforce training to energy efficiency and environmentally responsible construction. <https://www.urbangreencouncil.org/education/GPRO>

⁵ The AIA actively supports state and local building code adoption. At the end of 2019, we were pleased that the outreach of AIA's members to the International Codes Council and its voting members helped support the inclusion of the Zero Code Renewable Energy Appendix in the next edition of our national model construction codes, the I-Codes, that will be published in summer 2020. This voluntary appendix will offer local jurisdictions the option to adopt a zero energy standard as their community's minimum energy code for all new commercial, institutional, mid- and high-rise residential buildings. For more information, see here <https://www.aia.org/pages/3426-top-issue-building-codes>

⁶ AIA Statement, April 2016 <https://www.aia.org/press-releases/2306-architects-denounce-senate-vote-killing-energ>

Energy efficiency and energy sourcing are not a replacement for one another. We must address both. It is of paramount importance that buildings be built and renovated to consume less energy, and wherever possible, buildings should produce clean energy to put back into the energy grid. For those buildings who cannot (yet) generate enough power to cover their needs, the remainder must come from purchased renewable sources.

This is a mathematical necessity if this Committee is going to achieve its announced goal of a zero-carbon economy by 2050. It is also more possible than ever before. We should not shy away from this target now.

Continuing to build on the advancements the industry has made in energy efficiency and onsite renewable energy generation is of critical importance to the environment, but it also has significant value to building occupants. We tell our clients that it's not just about using less, it's about expecting more from their buildings; not "less bad" but doing good. When discussing the issue with clients, we try to demystify the steps necessary to achieve these energy use goals.

We start with **reducing** energy demand. This can be achieved through the application of fundamental design principals that can often be seen in indigenous or "low tech" structures before the advent of elevators and air conditioning: building orientation (for new buildings), massing, percentage of glazing used, type and the amount of insulation, daylight autonomy, low infiltration and other passive strategies. To put it more plainly, the ability to rely on natural daylight instead of artificial lighting. Artificial lighting not only requires energy, but also adds heat to an interior environment, which may then need to be offset with more energy in cooling. There is also plenty of anecdotal client evidence to support what we know from daylighting studies: people like environments that provide them natural light.⁷

Second, we focus on energy **absorption** strategies that repurpose, store, or move around energy already onsite. We consider thermal mass, solar thermal heating, heat exchange, reusing waste heat, and peak-load offsetting with phase change materials like ice storage. Anyone who has sat in a drafty building understands the client-comfort angle of this conversation. We figure out ways to minimize leaks and maximize heating efficiency.

Third, we evaluate **conservation** strategies, which includes working directly with the client on occupant behavior and preferences, like thermostat set points, "right-sizing" systems for optimal efficiency, habits like turning off the lights, or more technology-based solutions like motion, occupancy, daylight, or vacancy sensors.

Finally, the **generation** of renewable energy is the last piece to offset the nominal remaining energy demand. With technological advancements in onsite photovoltaics (PV), wind turbines, and microturbines, cost is not the barrier that it once was. With advancements in battery technology, energy storage is also becoming less of a restraint as well.

Strategies one, two, and three are based on **good design, smart planning, and education around best practices**. They don't necessarily increase the capital costs of construction when implemented at the right time. Further, this design thinking is rooted in the communities in

⁷ <https://www.aia.org/articles/6079570-keeping-natural-light-integral-in-design>

which the buildings are designed and constructed. H.R. 3962 helps develop the knowledge and expertise of both professional services and trades for work that is less likely to be outsourced to other economies. Technological solutions are an important component, but they are not the only answer. AIA supports holistic design-thinking to incorporate the best practices and the latest technological advancements that provide the best performing buildings for our clients and our country.

In our profession, the **reduction of energy use and the decision of where energy should come from are two parts of the same conversation**. We call on Congress not to divorce these two interrelated issues in any federal legislation on energy efficiency.

Keeping these two issues linked also makes strong business sense. I have had the distinct pleasure of living in different regions of the country. I was born and went to college in Georgia. A graduate degree took me to New York City where I worked for over a decade. Now I live in Dallas. **In every region, clients need reliable energy and high performing, beautiful buildings**. Client conversations around energy use may look different, and this often depends on which of the converging benefits means the most to them.

Some clients (and their customers) expressly want to know that their building is responsibly designed and generating energy to help mitigate the effects of climate change. For others, they want to know how the improved building performance and energy independence will limit their risk resulting from things beyond their control. Whether from fluctuating fossil fuel costs based on geopolitics or increasing their building's resilience in the wake of a natural disaster, these have real financial costs on businesses. Still others want to know how the building performance may be marketed as a recruitment tool for top young talent, who are prioritizing decision making for health and wellbeing, lifestyle, and social responsibility. For all clients, the reduced average cost of their utility bills over the lifetime of the building is an important consideration. These reductions can be generated by reduced energy demand but also in many cases from the onsite energy production; **I have yet to meet a client uninterested in their own potential savings**.

For my firm HKS, the Texas portfolio includes the following enhancements from 2017-2018:

- 9% increase in projects reporting in the 50% or greater pEUI⁸ reduction.
- 1.5% increase in the over 60% pEUI.
- In 2018, we have our first Texas project in compliance with the 70% reduction target.⁹

Some have argued that the move to entirely renewable energy sources is not yet possible in all places, and therefore the government should back away from this previous policy commitment. But this misunderstands the way industry responds to market challenges. The adage "necessity is the mother of invention" is never truer than in America, where the unimaginable becomes commonplace less than a generation later. There are now three times more Americans

⁸ Predicted energy use intensity.

⁹ AIA will follow up with more state-specific examples of progress already underway.

employed by the clean energy industry than directly employed by the fossil fuel industry, and that delta is expected to grow.¹⁰

Here's a **market-transformation example** from one of the projects I worked on. When reconstructing the World Trade Center in New York, a collaboration (between the Port Authority landowner, private developer, building operator, design and construction teams, the states of New York and New Jersey, the Lower Manhattan Development Council, and the New York State Energy Research and Development Authority) set forward ambitious Sustainable Design Guidelines for the project.¹¹ As part of these standards, only ultra-low sulfur (less than 15 ppm) diesel fuel construction vehicles were permitted onsite to reduce GHG emissions and protect air quality downtown.¹² At the time, this technology was not readily available in the market, but since that significant and sizable project put a stake in the ground, industry responded and the criteria were met as a result of the demand. Working on that project, I had a front row seat to seeing how industry responded with technological solutions when the client demanded it.

We all have an important role to play in climate action. **To accelerate the change we need at the pace required, large volume and iconic projects must lead the way.** The general awareness and publicity these types of projects generate in “firsts” or pushing the envelope, among other building owners, other designers, and the broader public, provides a platform for more actionable energy efficient design innovation. The federal government building portfolio under the GSA is both large and iconic. As the client, the US Federal Government should demand that it meets its own goal.

The GSA has done impressive work, to date, in achieving the targets set out in energy use reduction and energy sourcing. Their building portfolio includes incredibly energy-intensive buildings and achieving the final energy use and energy sourcing requirements will take continued innovation and dedication. Their hard work should be supported by this Congress, not undermined by repealing Sec. 433 that helped to propel much of the progress that has already been made, including job creation and economic benefits at virtually no cost to taxpayers. Please refer to fellow COTE Advisory Group member and Principal at the Rocky Mountain Institute Victor Olgyay's May 2012 testimony for several specific examples.

Finally, I urge the Committee to consider the example the United States must set to reduce operational emissions globally. Projections are clear that if we continue on the current trajectory, global building stock will double by the year 2060.¹³ If those buildings are powered by fossil fuels, our emissions crisis will only worsen. Other countries must also step up to confront this challenge. If the United States turns away from its commitment to making its own

¹⁰ <https://www.forbes.com/sites/energyinnovation/2019/04/22/renewable-energy-job-boom-creating-economic-opportunity-as-coal-industry-slumps/#428500be3665>

¹¹ <https://www.wtc.com/media/news/sustainable-design-a-priority-at-wtc>

¹² <http://renewnyc.com/content/pdfs/RODAddendum.pdf>
http://www.renewnyc.com/content/pdfs/rod/01_Rec_of_Decision.pdf

Since 2004, NYC LL 77 required ULSF for road vehicles and the “best available” for non-road construction vehicles.
<http://www.klgates.com/files/tempFiles/1cc3338a-8ebd-4f81-8ac6-9349c80c77a8/NYLJ.pdf>

¹³ https://architecture2030.org/buildings_problem_why/

federal buildings fossil fuel free, it will be harder to convince emerging markets around the globe to do the same. Instead of rolling back requirements already in place, more should be done. That is what the climate crisis demands.

Thank you for the opportunity to testify. I look forward to your questions.