

# Energy & Green Building Codes Update



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# Energy & Green Building Codes Update

Our mantra: **Defend and Promote**

- *Defend* against changes harmful to the industry
- *Promote* the positive attributes of glazing in the B&C sector

## Energy and Green Codes & Standards:

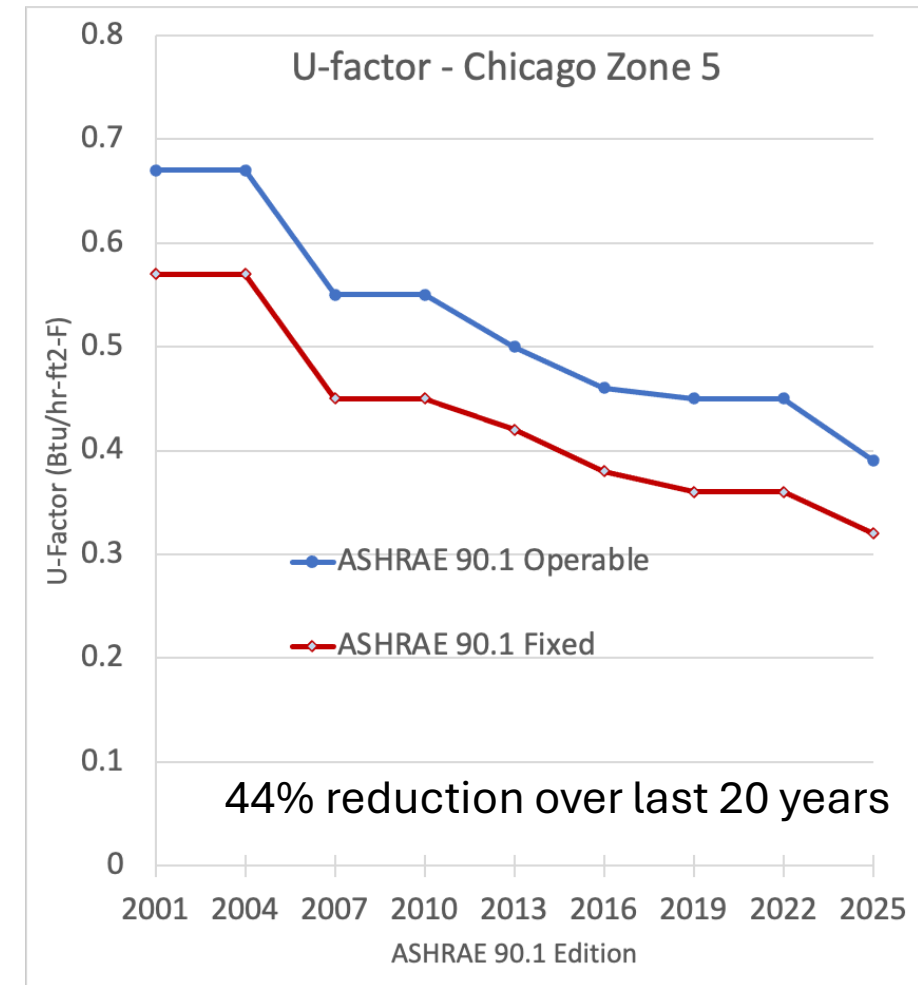
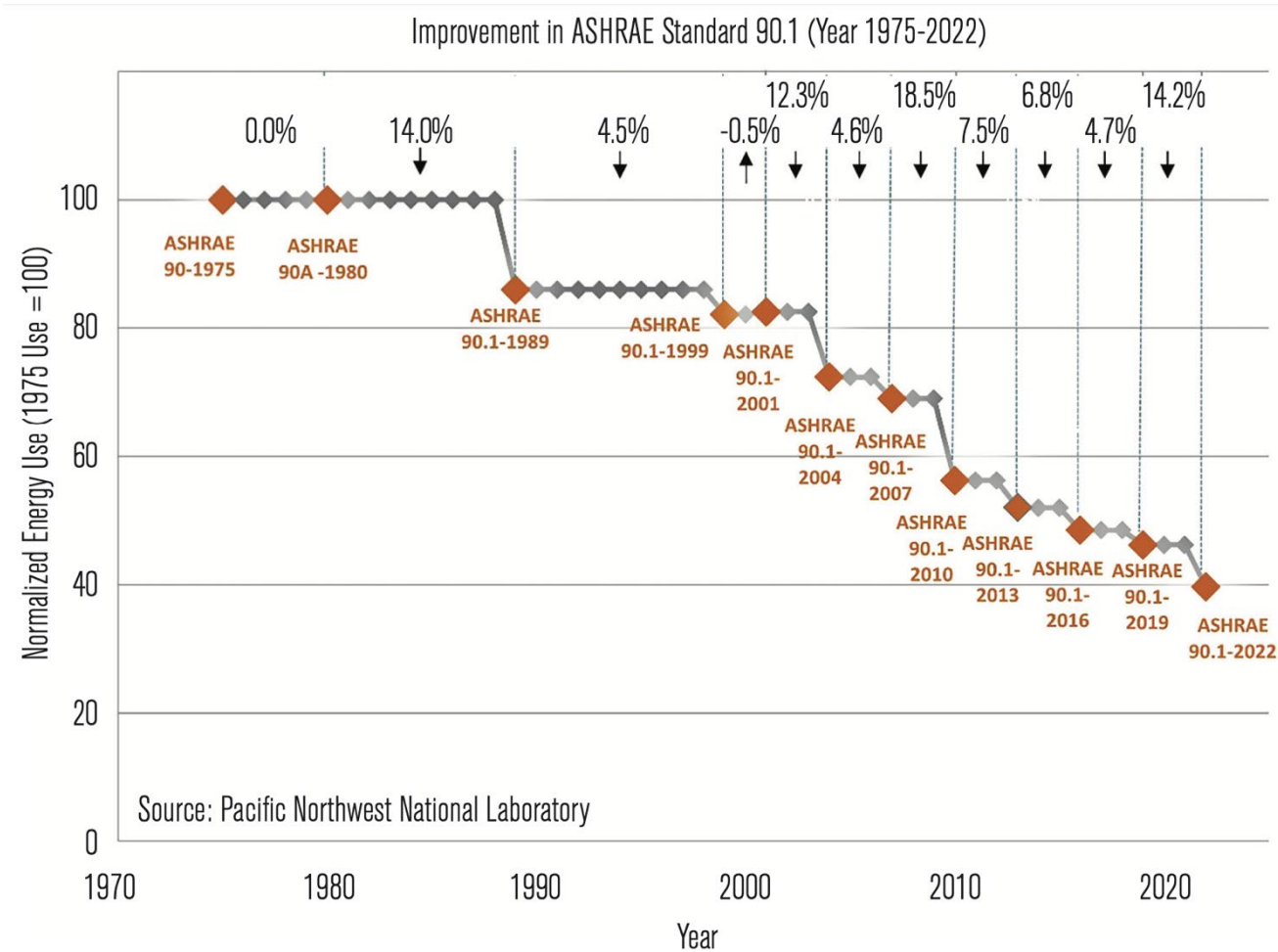
- International Energy Conservation Code (IECC), ASHRAE 90.1
- International Green Construction Code (IgCC), ASHRAE 189.1
- National Fenestration Rating Council (NFRC)
- Attachments Energy Rating Council (AERC)
- National Green Building Standard (NGBS)
- Partnership for Advanced Window Solutions (PAWS)
- ...

# As I spoken about before, my prediction for the coming years ...

## **Local vs. National Action:**

- At the national level, slower but continued small incremental changes will continue in the national model energy codes
- +
- Increase in regional activity, with political split
  - Less in red states
  - More in blue states and cities (including blue cities in red states)
- Creates both threats and opportunities at the regional level
  - Have to watch for attacks on window area like before, but we are ready.
  - Creates opportunity for high performance products (VIG, triple glazing, 4<sup>th</sup> surface low-e, advanced spacers, advanced frames).
  - Creates opportunities for retrofit and replacement products in existing buildings.

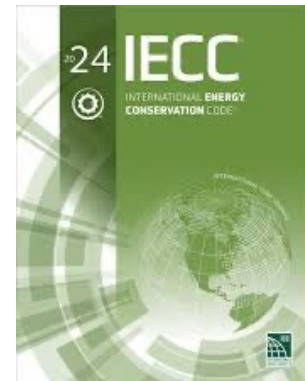
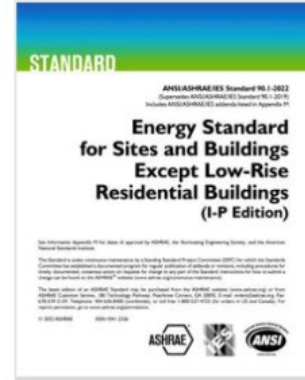
# Energy Code Progression – ASHRAE 90.1



**Steady progression over last 20 years, regardless of politics**

# This steady progression is continuing: ASHRAE 90.1-2025 and 2027 IECC Fenestration Criteria essentially complete.

- Comprehensive changes in fixed windows, operable windows, skylights/sloped glazing. No changes to glazed entrance doors.
  - We worked with the committees over the last 3 years to ensure it is cost effective, practical.
- 
- **No reduction in window area**
  - ~ 3-13% changes in U-factor
  - SHGC already mostly optimized, so main change is extending 0.23 SHGC up to Zone 2 in non-residential spaces.
  - Increased use of thermally broken frames, warm edge spacers, gas-fill *in all zones*
  - 4<sup>th</sup> surface low-e and higher performance thermal breaks *in northern zones*
  - Triple glazing in far north zones (Zones 7-8)



# Steady progression continued ...

- Also, despite some of the rhetoric about **renewable energy**, the national model codes have maintained or increased their requirements related to renewable energy serving buildings.
  - The 2027 IECC committee rejected proposals to reduce or eliminate the renewable energy requirements.
  - ASHRAE 90.1-2025 will increase the amount of renewable energy used on new building projects by 50% to align with what the IECC requires.

Also includes options for more proactive designers:

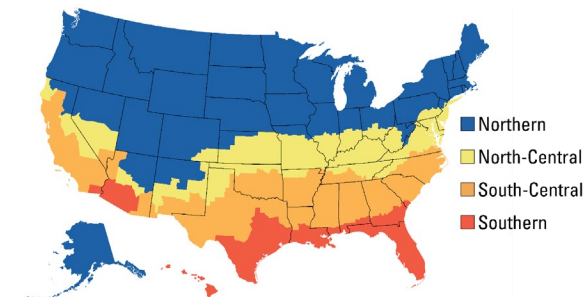
- Credits for higher performance envelopes, extra renewable energy, tighter air leakage.
- Expanded ability to take credit for **automated shading** and **dynamic glazing** in ASHRAE 90.1 (although less so in IECC).



# What about Energy Star?

- Energy Star program version 7 for residential windows, doors, and skylights has been in effect since Oct 2023.
- Current administration has proposed ending or privatizing the Energy Star program – not just windows, everything.
- However, big pushback from building owners, builders, manufacturers.
  - Energy Star has helped with marketing of many consumer products.
  - Homebuilders market Energy Star homes.
  - Energy Star buildings program used for tax credits and local benchmarking ordinances.
  - Logistics for privatizing more difficult than first expected.

Climate Zone	U-Factor <sup>1</sup>	SHGC <sup>2</sup>	
Northern	≤ 0.22	≥ 0.17	Prescriptive
	= 0.23	≥ 0.35	Equivalent Energy Performance
	= 0.24	≥ 0.35	
	= 0.25	≥ 0.40	
	= 0.26	≥ 0.40	
North-Central	≤ 0.25	≤ 0.40	
South-Central	≤ 0.28	≤ 0.23	
Southern	≤ 0.32	≤ 0.23	





# What about Energy Star?

- Because of pushback, both the House and Senate appropriations committees have included a specific line item to fully fund Energy Star for FY25 (bipartisan, unanimous).
- However, if no budget is approved or only do a continuing resolution, the program is still at risk of impoundment.

Separate update item:

- Within Energy Star Plants program, EPA is updating their model for benchmarking and certifying flat glass plants.
- They have reached out to all the primaries (or let me know if you need a contact).



# Examples of Regional Actions - Colorado

- Colorado passed a law requiring all residential windows, doors, and skylights sold in the state to meet **Energy Star v7** criteria starting Jan 2026.
- However, following review of market availability and cost, uncertainty about Energy Star, and some background negotiating, CO revised the requirement at the end of June to match the **2024 IECC** instead of Energy Star.
  - U-0.30 for windows and glazed doors, U-0.50 for skylights, no SHGC requirement, opaque doors exempted.
  - Compromise that gets more parties on board and still advances the market for the entire state (regardless of local code adoption).
  - Intent is to update it every 3 years to follow the model code.
- They did not include proposals to limit the argon exemption (from U-0.28 to U-0.30) to only above 6500-7000 ft, but more manufacturers starting to do high altitude argon via pre-equalization.
- Also, new “**Colorado Model Low Energy and Carbon Code**”
  - Started July 1, 2026
  - Based on 2024 IECC but with extra solar, EV, electrification.
  - Local jurisdictions updating their code required to use this.



# Examples of Regional Actions - Illinois

- Updated **Illinois Stretch Energy Code**
  - Used for state-funded buildings, and can be adopted by local cities wanting to go beyond base code.
  - Based upon 2024 IECC plus some.
  - Final approval expected Sep 30.
- For commercial windows,
  - U-0.28 fixed, U-0.32 operable in IL stretch code
  - U-0.32 fixed, U-0.39 operable in ASHRAE 90.1-2025So more advanced, but still achievable and practical.
- For residential windows, accepted PAWS proposal to align with expected 2027 IECC values.
  - U-0.27 zone 5, U-0.30 zone 4



# Examples of Regional Actions

- **Boston** has new “**Net Zero Carbon Zoning policy**”
  - Started this last July 1, 2025, new building projects must demonstrate net zero carbon emissions during permitting.
  - Aggressive MA stretch energy code + renewable energy
  - Report embodied carbon (EPDs). Large projects must do whole building life cycle assessment.
  - New buildings > 20,000 ft<sup>2</sup>, multifamily with 15 units or more.
  - Additions, renovations > 50,000 ft<sup>2</sup>
- Enabling other regional action, ASHRAE 90.1-2025 has new *voluntary* addenda for **net-zero energy buildings** (performance and prescriptive) that can be adopted by local jurisdictions.
  - Notch above main energy code + increased on-site renewable energy.
  - High performance target, but no direct limit or attack on window area.



# Examples of Regional Actions – CA, MO

Local action can also work the other way ...

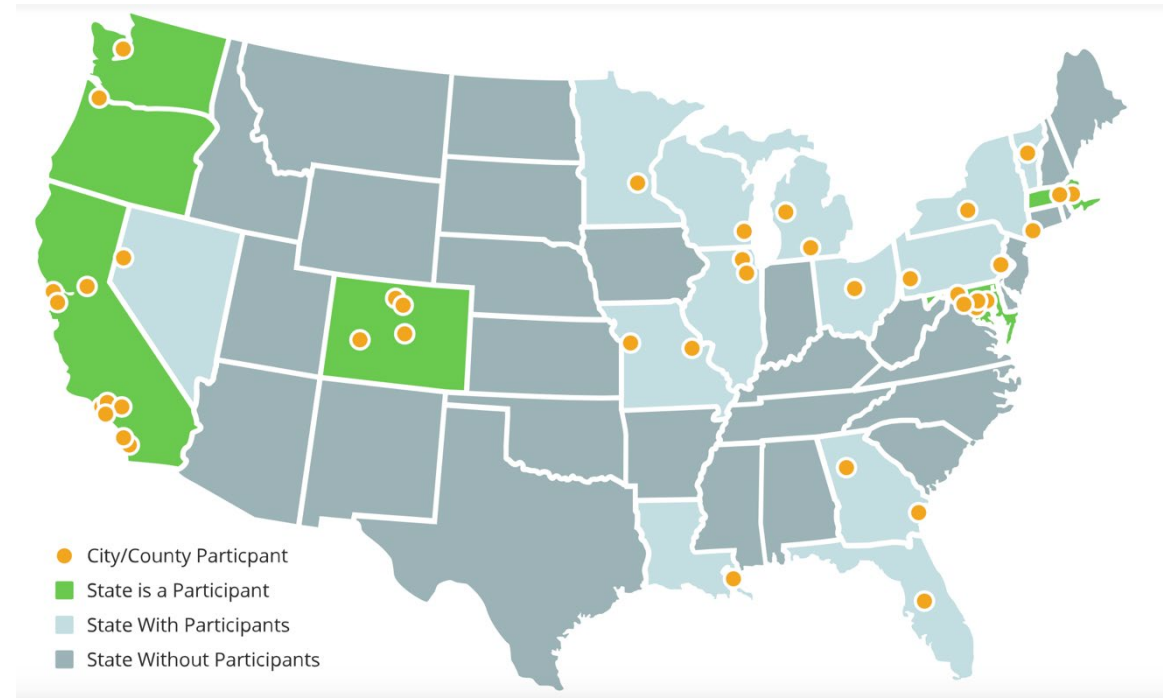
- California only considering small changes this cycle to the nonresidential window requirements in two zones to align with 2027 IECC.
- California AB130 puts a pause on local communities adopting residential reach codes more stringent than state code for next 6 years, with some exceptions. Residential only.
- Missouri introduced bill to roll state energy code *backwards* from 2018 IECC to 2009 IECC. Bill died, but shows some of the sentiment out there.



# Regional Action - Building Performance Standards

- This local vs. national action trend also led to significant increase in adoption of ***building performance standards***, which push retrofits in existing buildings.
- Again, most activity at city level.

National BPS Coalition



# *What about on the carbon side?*

## EPD Demand and Trends

- Similar thing – federal level stepping back, but continuing elsewhere.
- The One Big Beautiful Bill Act officially canceled any unobligated funds for the low embodied carbon construction materials programs in EPA and GSA – including our \$2.1M EPA EPD assistance grant.
- Nonetheless, despite backtracking by EPA and GSA, we do not see the demand for EPDs or product carbon footprint data stopping in B&C ...

# Continued Demand for EPDs

- Architects / GCs continuing to add to specifications or make a last-minute request.
- “Buy Clean” policies remain at state and local level. Mostly concrete, steel, flat glass, and asphalt for now. Whole building life cycle assessment will require product carbon footprint info on all materials, including glass and aluminum.
  - **Buy Clean California and CALGreen** for state-funded projects, large offices, schools – will need PCF data.
  - **IgCC / ASHRAE 189.1** – will need product-specific EPDs
  - **Boston new “Net Zero Carbon Zoning policy”** for new buildings > 20,000 ft<sup>2</sup> and additions, renovations > 50,000 ft<sup>2</sup>. Will need product specific EPDs.
  - **Buy Clean Colorado** for state-funded projects, tax credits for private projects. Will need PCF data.
  - **New York State** looking at new requirements
  - **LEED v5** now finalized ...





# LEED v5

- LEED v5 has now been finalized.
  - LEED v4.1 sunsets Mar 31, 2026 although projects registered prior to then have 6 years to complete certification.
- Two main items related to embodied carbon:
  - “Quantify and Assess Embodied Carbon” reporting prerequisite requires EPDs.
  - “Reduce Embodied Carbon” credit awards different point levels.
    - Level 1 points are for providing company and product-specific EPDs.
    - Higher Level 2 points are awarded for products showing a 20% reduction in embodied carbon compared to a baseline.
    - Baseline can be prior industry-wide EPD, Carbon Leadership Forum published number (which matches industry-wide EPD), or a previous EPD for the same product.





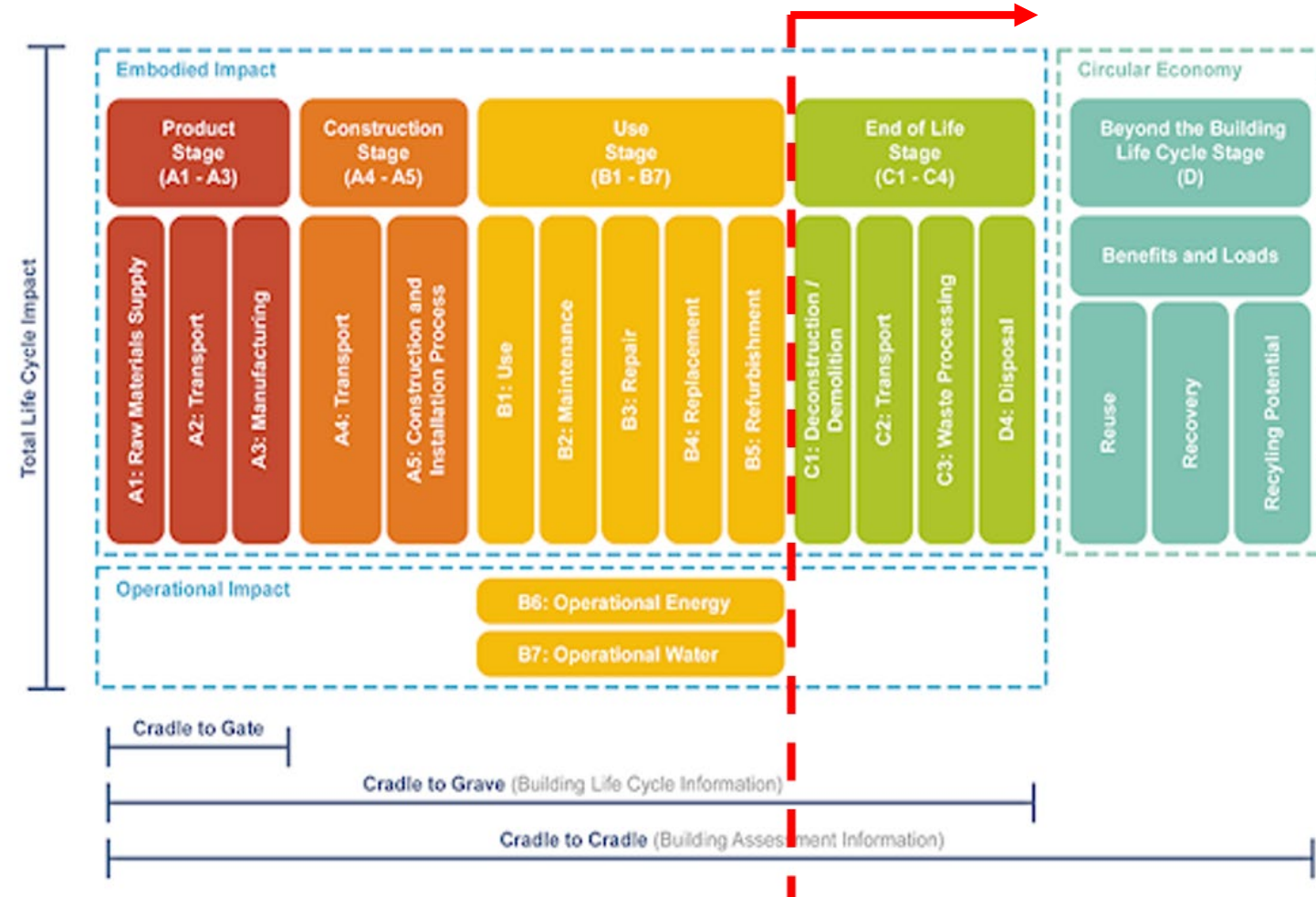
# LEED v5

- **Quality views** credit includes text about minimum 40% VLT.
  - Not necessarily difficult but starts to become an issue for some triple glazing products.
  - Also 40% vs. 25-30% VLT has no impact on quality of view (the eye adjusts) as long as it doesn't change the color dramatically.
  - Unfortunately, they ignored comments to change this.
- **Bird-friendly glass** credit is now under "Biodiverse Habitat" credit.
- Speaking of the birds, our proposal to introduce bird-friendly glazing requirements into the green code (ASHRAE 189.1 and IgCC) is currently out for public comment, and continues to have no opposition. Report under the Protective Glazing subcommittee meeting tomorrow.



# End of Life / Circularity Study

- Together with Aluminum Extruders Council, track both aluminum and glass and recovery in real façade or building deconstruction project(s).
- Quantify recovery percentage, LCA part D data, end uses, and improve the understanding about material circularity.
- Similar to prior studies done in Europe for aluminum, but for the U.S. for both aluminum and glass.



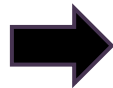
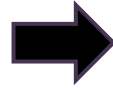
# End of Life / Circularity Study

- Starting with 1 deconstruction project at a premier Midwest institution starting this month.
- Recovery and recycling by Infinite Recycled Technologies (thank you!)
- Contracted with Digne (Sophie Pennetier) as third-party LCA expert





# End of Life / Circularity Study



- It's underway!
- Sophie will provide report in the spring.

- Thank you:

**INFINITE**<sup>TM</sup>  
RECYCLED TECHNOLOGIES

 **Digne**  
PRONOUNCES: deen-yuh

# Other items

- IBC school natural light proposal
  - Through **GIACC** and together with AEC, we submitted an IBC proposal to require minimum natural light and view in classrooms.
  - AIA and Prof. Miro from UT Austin also put in similar proposals requiring minimum natural light and view in dormitories and other spaces.
  - Committee voted down all three at first hearing in May, but encouraged us to make text refinements and bring back for next hearing in October. We are working with AIA and Prof. Miro on this.
- One Big Beautiful Bill Act (OBBA) and tax credits
  - Lots in there as you know, but besides canceling our EPA grant, it cancels the residential (25C) and commercial (179D) energy efficient tax credits and deductions.
  - Indirect, but 179D helped encourage commercial building owners to use higher efficiency products including high performance in both new buildings and existing building retrofits.





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# Spandrel Research Project

- NGA and its members have been supporting this research project to improve thermal characterization of spandrel assemblies, refining 2D and 3D models against detailed hot box thermal testing.



- Technical work led by SGH, Stantec, RDH.
- DOE contributing detailed testing at Oak Ridge National Lab, and modeling by Lawrence Berkeley National Lab.



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Building Innovation through Research



# Spandrel Research Project

- Completed testing on 3 system types (unitized curtain wall, stick-built curtain wall, US window wall). 3 more in progress.
  - Within each system, testing multiple variations including double glazing, triple glazing, hybrid VIG, metal panel ACM, different frame cover plates, different insulation, different backpans, etc.
- Team will be presenting at the Council on Tall Buildings and Urban Habitat (CTBUH) in October in Toronto.
- *Thank you* for contributions from [NGA Board & Members](#), [Permasteelisa](#), [YKK AP](#), [Tristar Glass](#), [Glass Coatings & Concepts](#), [Binswanger Glass](#), [LuxWall](#), [Quest Window Systems](#), [Mapes](#), [Owens Corning](#), [Gate Precast](#) and other financial supporters like [IIBEC](#), [AIA](#), [WJE](#), [Terracon](#), [Martin Martin](#).



# Partnership for Advanced Window Solutions

- Public / private partnership with DOE, national labs, utilities, industry, energy efficiency groups.
- <https://paws.energy> -- good info on utility incentives and more.
- Hosted workshop with energy efficient homebuilders at EEBA summit this month to promote triple glazing and other high performance options.
- Reviewing [minimum housing ordinances](#) in [Ann Arbor MI](#), Austin TX, Boulder CO, Berkeley CA, Burlington VT that potentially impact window replacement in existing residential and multifamily buildings. May serve as model for other cities.





Lots going on ... Questions?