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JUN 14-17, 2026

CHICAGO

ENERGY & GREEN CODES UPDATE

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June 16-17, 2026

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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:

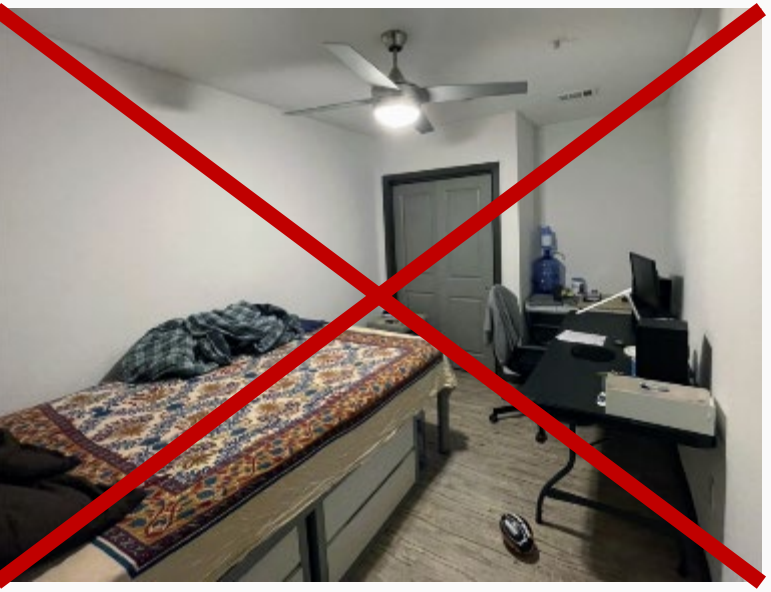
- International Energy Conservation Code (IECC), ASHRAE 90.1
- International Green Construction Code (IgCC), ASHRAE 189.1
- National Fenestration Rating Council (NFRC)
- Attachments Energy Rating Council (AERC)
- National Green Building Standard (NGBS)
- Partnership for Advanced Window Solutions (PAWS)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

We'll start off with a big win on the Promote side, which overlaps both the building code and green building parts of NGA's Advocacy Team …

Natural Light Code Requirements

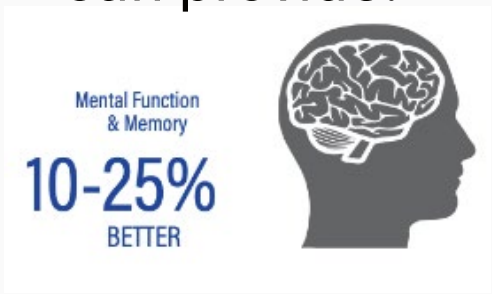
- As part of 2027 IBC cycle, NGA, GICC, AEC introduced a joint code proposal to require **minimum natural lighting in classrooms** to provide the basic "right to light" and a better learning environment based on the extensive work of Lisa Heschong and others.
- Also coordinated with AIA and Prof. Miro from UT Austin on related proposals in **dormitories and apartments**.
- Close a loophole that some were exploiting to build windowless dorms in MI, TX, CA.

NATURAL LIGHT CODE REQUIREMENTS



This is real.
"The loneliness and claustrophobia caused by the four solid walls is unbearable."
– Karim, UT Austin student

But light and view can provide:



Big Win for Healthy Buildings and Students!

- Previously reported that NGA, AEC, AIA, and Prof. Miro worked together to get these joint proposals passed through earlier committee and public comment hearings.
- Now we can report that they have successfully been approved in the final online governmental vote of building officials across the country!

ENERGY CODE DIRECTIONS:

- We have previously predicted the changes in Washington could lead to a split in **National vs. Local** activity:

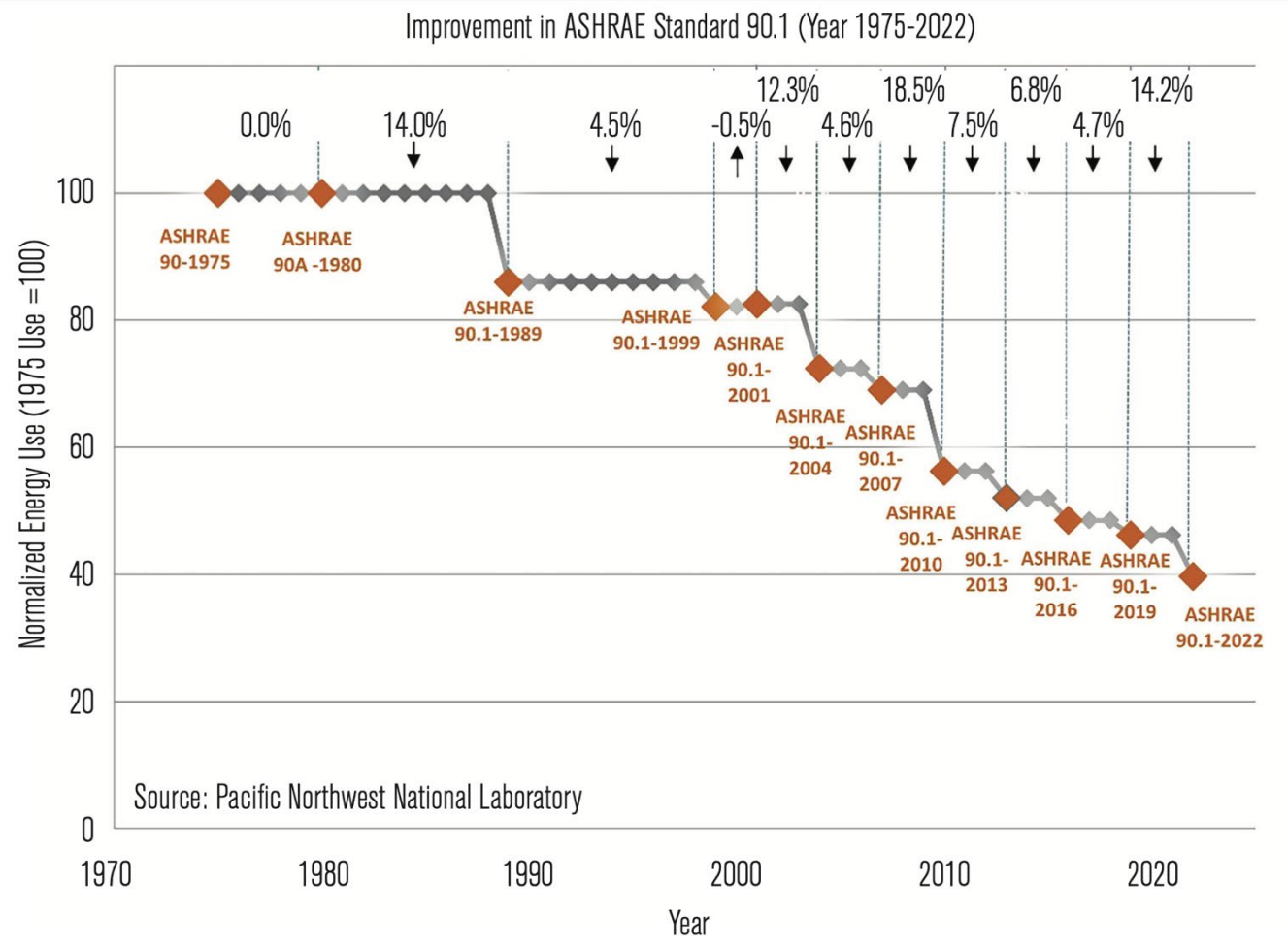
- *At the national level,* continued small incremental advancements in the national model energy codes, similar to the last 20+ years,

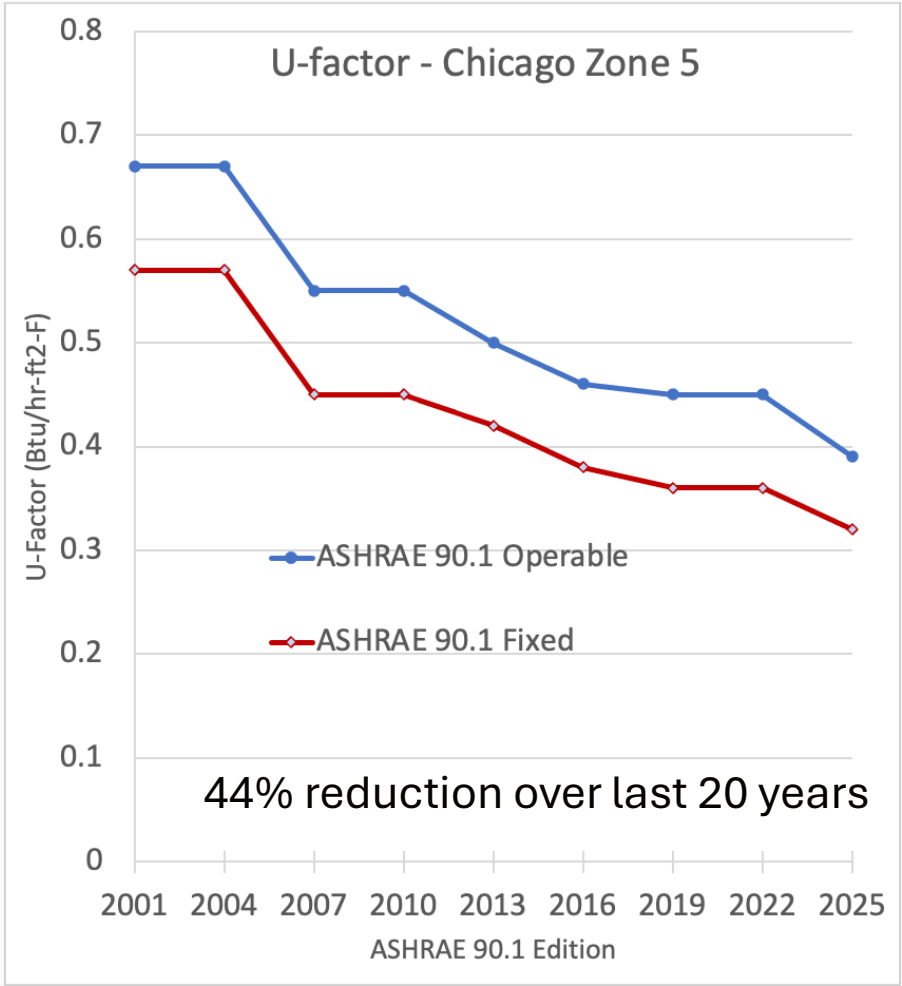
+

- *At the state or city level,* increase in local activity and variation as the federal government takes a step back.
  - Less in red states
  - More in blue states and cities (including blue cities in red states)

- And yes, we are seeing this, with a few twists …

ENERGY CODE PROGRESSION – ASHRAE 90.1

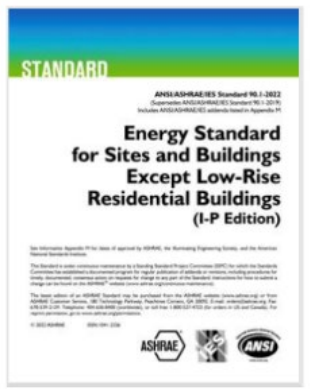


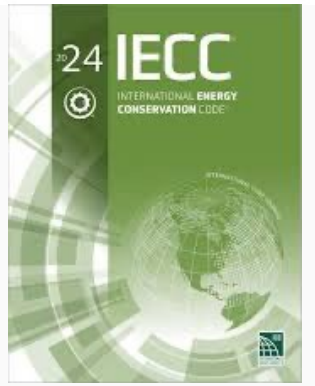


Steady progression over last 20 years, regardless of politics

AT THE NATIONAL LEVEL,

- ASHRAE 90.1-2025 published this spring, and in final voting rounds for the 2027 IECC.
- Incremental improvements that we supported – small changes in U, SHGC that are reasonable and will promote:
  - Increased use of thermally broken frames, warm edge spacers, gas fill in all zones.
  - 4th surface low-e, higher performance thermal breaks, and some triple glazing in northern zones.





COMMERCIAL VERTICAL FENESTRATION U-FACTORS (2013 – 2027)

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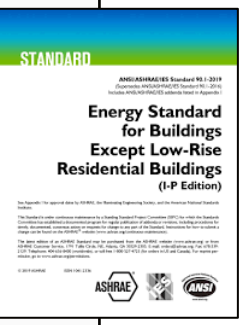
Climate Zone	0	1	2	3	4	5	6	7	8	
Fixed	0.50	0.57	0.57	0.50	0.42	0.42	0.42	0.38	0.38	90.1-2013
	0.50	0.57	0.54	0.45/0.49	0.38	0.38	0.36	0.33	0.29	90.1-2016
		0.50	0.50	0.46	0.38	0.38	0.36	0.29	0.29	2012, '15, '18 IECC
	0.50	0.50	0.45	0.42	0.36	0.36	0.34	0.29	0.26	90.1-19, 90.1-22, 2021 IECC
	0.50	0.50	0.45	0.38	0.34	0.34	0.34	0.28	0.25	2024 IECC
	0.48	**0.48**	**0.45**	**0.38**	**0.34**	**0.32**	**0.31**	**0.28**	**0.25**	**90.1-25, *2027 IECC***
Operable	0.65	0.65	0.65	0.60	0.50	0.50	0.50	0.40	0.40	
	0.65	0.65	0.65	0.60	0.46	0.46	0.45	0.40	0.35	
		0.65	0.65	0.60	0.45	0.45	0.43	0.37	0.37	2012, '15, '18 IECC
	0.62	0.62	0.60	0.54	0.45	0.45	0.42	0.36	0.32	90.1-19, 90.1-22, 2021 IECC
	0.62	0.62	0.60	0.54	0.45	0.45	0.42	0.36	0.32	2024 IECC
	0.62	**0.62**	**0.60**	**0.54**	**0.43**	**0.39**	**0.38**	**0.35**	**0.31**	**90.1-25, *2027 IECC***

Example of increasing stringency



COMMERCIAL VERTICAL FENESTRATION SHGC, 2007 - 2027

Main SHGC requirement over time:

Climate Zone	0	1	2	3	4	5	6	7	8		
SHGC		0.25	0.25	0.25	0.40	0.40	0.40	0.45	0.45	90.1-2007 90.1-2010 90.1-2013	2009 IECC 2012 IECC 2015 IECC
	0.22	0.25	0.25	0.25	0.36	0.38	0.40	0.45	0.45	90.1-2016	2018 IECC
Fixed:	**0.22**	**0.23**	0.25	0.25	0.36	0.38	0.38	0.40	0.40	90.1-2019	2021 IECC
Operable:	**0.20**	**0.21**	0.23	0.23	0.33	0.33	0.34	0.36	0.36	90.1-2022	2024 IECC
Fixed:	**0.21**	**0.23**	**0.23**	0.25	0.34	0.38	0.38	0.40	0.40	**90.1-2025**	**2027 IECC**
Operable:	**0.19**	**0.21**	**0.21**	0.23	0.31	0.33	0.34	0.36	0.36		

- Starting in 90.1-2019 and 2021 IECC, separate SHGC for fixed vs. operable products, like U.
- In reality, changes are small, as both require the *same glazing type* – it is just accounting for the higher frame-to-glass ratio in operable products.
- Only real change is zones 0-2, where 0.23/0.21 SHGC will require new lower SHGC triple silver products and/or tint with low-e (shown in **bold**).

AT THE LOCAL LEVEL,

- New energy codes in **California**, **Colorado**, **Illinois**, and **New York**
- Aggressive **Massachusetts** energy code, **Boston Net Zero Carbon Zoning policy** already in effect.
- **New Mexico** recently passed US's first rebate program for purchasing low-carbon construction materials, including glass and aluminum.

… but local activity can work both ways too …

- **Missouri** proposed to retract their residential and commercial energy code *backwards* all the way to the 2009 or 2012 IECC. Different versions did pass House and Senate, but not reconciled before end of legislative session in May, so dead for this year.
- **California** put a pause on local communities adopting residential reach codes more stringent than state code for next 6 years, with some exceptions. Residential only.

NEW ATTACKS ON WINDOW AREA

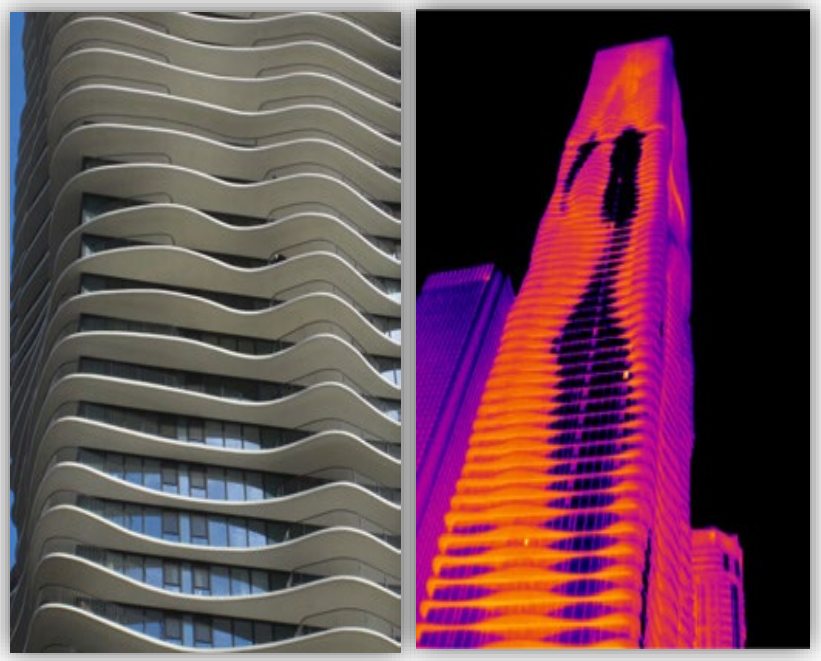
With all the activity, we can't let down our guard …

- Over the years, by being in the room, we have been able to shut down suggestions that would either directly or indirectly impact window area.
- Just last month, we stopped an attempt to revise how envelope backstops are calculated in ASHRAE 90.1 that would have indirectly limited glazing area, even in high performance buildings.
- We will continue to be on the front lines defending against these attacks that are counter to high performance buildings and occupant health and well-being.

SO WHAT'S UP NEXT?

- We are already working on ASHRAE 90.1-2028. (2030 IECC work will start early next year.)
- ASHRAE 90.1 now expanding to develop two documents:
  - Base energy standard for main adoption, and
  - An allied separate document that will focus on reduced operational emissions for optional adoption by jurisdictions who want that.
- Work items of interest for **90.1 base standard**:
  - Cost effectiveness analysis for next set of envelope requirements. Based on current economics, I expect only incremental changes.
  - Incremental change in on-site renewable energy requirements (PV, BIPV)
  - Clean-up of thermal bridging requirements

Anybody recognize this building?

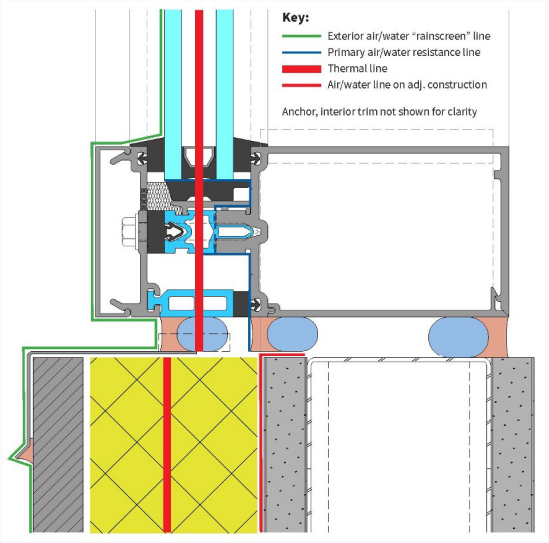


- We're <u>in</u> the building that everyone uses as the *bad* example of thermal bridging with significant energy loss from poor design bypassing insulation!

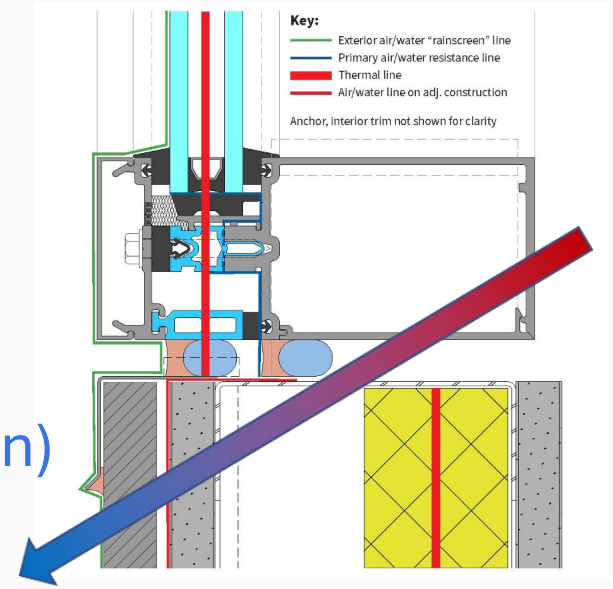
THERMAL BRIDGING AT THE WINDOW – WALL INTERSECTION

- Design issue - it's all about the alignment of the thermal line (glazing, frame thermal break, wall insulation)
- Control water, air, *and* thermal lines

Good thermal alignment

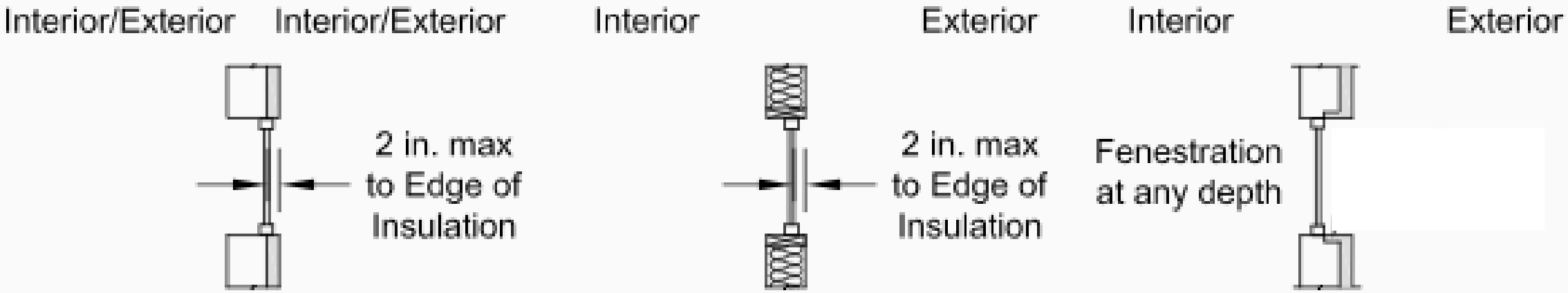


Poor thermal alignment. Energy bypass (and cold points, potential condensation)



(thermal line illustrated in red)

- **2024 IECC and ASHRAE 90.1-2022 / 2025 Requirements**
  - Simple approach: align the glazing layer and frame thermal break within 2” of the wall insulation, *OR*
  - Wrap the exposed area between the window frame and the opaque wall insulation with R3 insulation or wood framing member.



  - Or can do detailed analysis accounting for the thermal bridging using a calculated psi-factor for the construction detail.

- Language is confusing, so subcommittee cleaning up language for 90.1-2028

SO WHAT'S UP NEXT?

- Work items of interest for **90.1 annex document**:
  - Purpose is operational emissions reduction, but ultimately still just sets requirements for energy efficiency, load management, and renewable energy.
  - Will also undergo cost effectiveness analysis but use higher utility costs including social-cost-of-carbon.
  - Expect envelope requirements to be a "notch" beyond the base standard (but nothing dramatic) paired with more renewable energy, energy storage, and dynamic technologies.
  - We will be present to head off any direct attacks on window area.
- 2030 IECC is also doing something similar and splitting into two standards, with any emissions, electrification, renewable energy aspects put into the "IECCX" standard.

Other Energy Code Activity: California 2028 Title 24

- Not planning any residential window updates.
- Small changes to commercial fenestration requirements.
  - Nonresidential Fenestration CASE report now published; stakeholder webinar on Jun 24.
  - *New construction:* in a few zones, tweaks to fixed windows from U-0.36 to 0.34, and operable windows from U-0.46 to U-0.43.
    No changes to SHGC.
    No changes to U-factor for curtain wall / storefront, skylights, doors.
  - *Alterations:* If replace 100% of a fenestration type is replaced, meet same as new construction. For less than 100% replacement, lower the criteria for fixed windows and curtain wall from U-0.47 to U-0.43, and lower the SHGC requirement for curtain wall to match new construction.
- Nothing hard, but some language issues I've commented on.

Other Energy Code Activity: Canada

- Canada taking public comments on initial proposals for 2030 code cycle. Due June 22.
- Thom covering several other proposals. Currently only 2 energy code proposals.
- No changes currently proposed for commercial fenestration.
- Proposal PCF1943 updates the whole building air leakage test method to only allow ASTM E3158. ASTM E779 no longer allowed.
- Proposal PCF2043 adds prescriptive criteria for Tier 2 compliance.
  - Canada establishes energy tiers 1 through 5. Tier 1 is minimum required everywhere, but local jurisdictions can require higher tiers.
  - Tier 1 criteria already set, and Tier 5 criteria were added in the 2025 code. Now proposing to fill in the criteria for the Tiers inbetween.

- Canada residential window tier requirements:

	Zone 4	Zone 5	Zone 6 and 7A	Zone 7B and 8	
Tier 5	U-1.05 (0.18) ER 40	U-1.05 (0.18) ER 40	U-0.94 (0.16) ER 42	U-0.82 (0.14) ER 44	Already set
Tier 4					
Tier 3					
Tier 2	**U-1.61 (0.28) ER 25**	**U-1.22 (0.21) ER 34**	**U-1.22 (0.21) ER 34**	**U-1.05 (0.18) ER 40**	Proposed
Tier 1	U-1.84 (0.32) ER 21	U-1.84 (0.32) ER 21	U-1.61 (0.28) ER 25	U-1.44 (0.25) ER 29	Already set

Not set yet

- Can see this is a big leap all in one step. FGIA proposing a more moderate and consistent steps to bridge the gaps between Tier 1 and Tier 5.

WHAT ABOUT ENERGY STAR AND TAX CREDITS?

- Energy Star program was under attack last year, proposed to be dismantled by the administration, and Energy Star staff were moved to other areas.
- However, there was strong pushback by building owners and industry who use the program for marketing, tax credits, utility incentives.
- As a result, there was bipartisan Congressional support to maintain and even increase funding for Energy Star in FY2026.
- The program is being moved from EPA to DOE but missed deadline for issuing the transition plan.
- List of products being maintained, but no promotion work being done. ‘Treading water’

WHAT ABOUT ENERGY STAR AND TAX CREDITS?

- Even if Energy Star recovers, the One Big Beautiful Bill Act terminated the 25C and 179D residential and commercial energy tax credits that were based on Energy Star.
- Some positive bits of news?
  - DOE releasing previously paused state home energy rebate funds (HOMES and HEEHR programs) with some limitations.
  - DOE “Zero Energy Ready Home” program rebranded as DOE “Efficient New Homes” program, rather than kill it, even if associated tax credits were ended.
  - Court has reinstated some DOE state clean energy grants including energy code training.
  - Legislation was also introduced by four House republicans to restore several credits / deductions including 179D and solar energy production, but uncertain future.
- Through the Partnership for Advanced Window Solutions, we are also working on a future utility incentive specifically for commercial windows in Minnesota and maybe other states.

PAWS
PARTNERSHIP FOR ADVANCED WINDOW SOLUTIONS

- Other stuff we will cover in other parts of the meeting:
  - Bird-friendly glazing updates
  - Glass and aluminum end-of-life recycling project
  - EPD demand and development

- Lots going on … just ask!

EXTRA SLIDES

RESIDENTIAL IECC

- Incremental progress in residential window requirements too.

	2021 IECC		2024 IECC		2027 IECC	
Zone	U-factor	SHGC	U-factor	SHGC	U-factor	SHGC
0,1	0.50	0.25	0.50	0.25	0.45	0.23
2	0.40	0.25	0.40	0.25	0.35	0.23
3	0.30	0.25	0.30	0.25	0.30	0.23
4	0.30*	0.40	0.30	0.40	0.30	0.40
5	0.30*	NR	0.28*	NR	0.27*	NR
6	0.30*	NR	0.28*	NR	0.27*	NR
7,8	0.30*	NR	0.27*	NR	0.27*	NR
	*0.32 for hurricane, altitude > 4000 ft		*0.30 for hurricane, altitude > 4000 ft		*0.30 for hurricane, altitude > 4000 ft	

Nothing earth-shattering, but more warm edge spacers, inert gas-fill, improved frames, 4th surface low-e. Triple silver low-e in the south.

ENERGY STAR PROGRAM FOR WINDOWS, DOORS, AND SKYLIGHTS VERSION 7

Climate Zone	U-Factor[1]	SHGC[2]	
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