

Five Specification Missteps, Codes Challenges, and Opportunities



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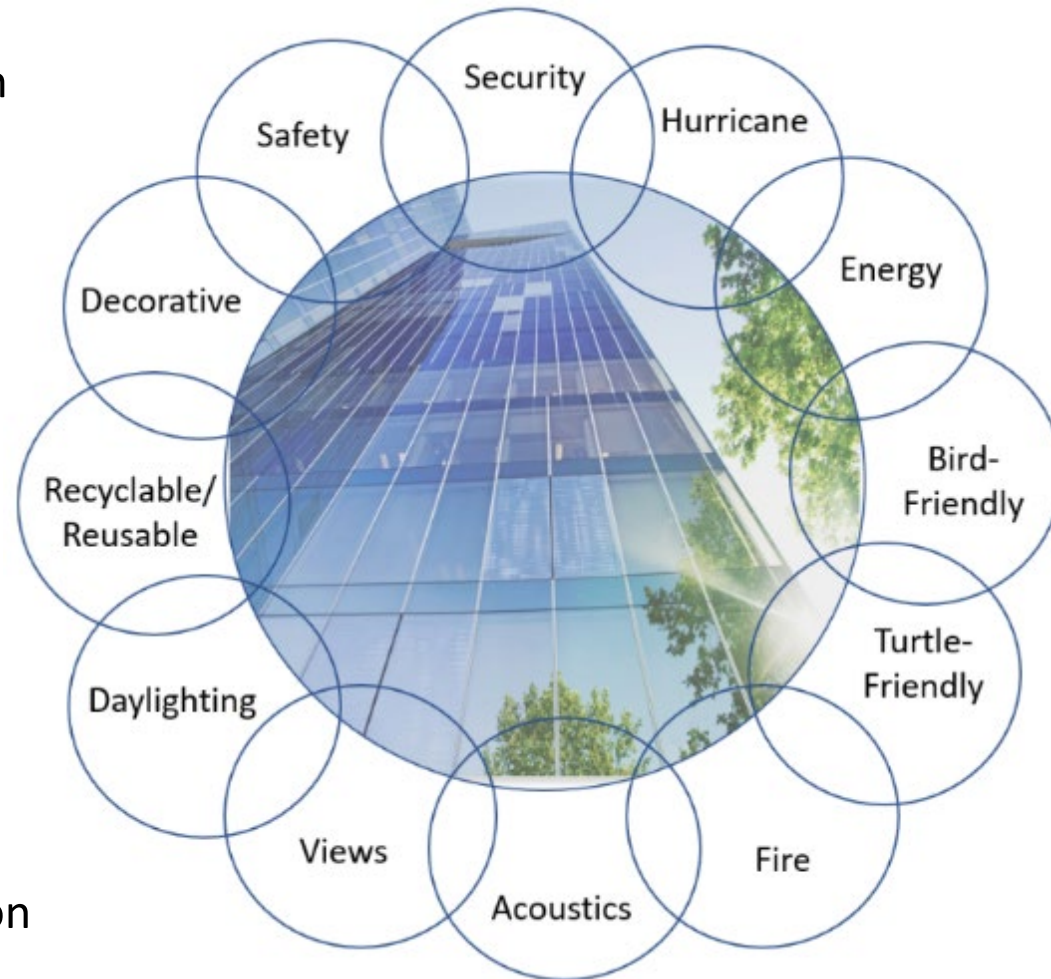
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National Glass Association

Balancing the Many Functions of Glazing

Controlled Environment

- Weather protection
- Ventilation
- View
- Daylighting
- Fade resistance
- Energy efficiency
- Thermal comfort
- Solar gain
- Acoustics
- Privacy
- Human health
- Safety
- Structural protection
- Security
- Fire
- Egress



Many Types

- Clear, low-iron, tint
- Low-e
- Heat treated
- Laminated
- Insulated
- Vacuum Insulated Glazing
- Thin glass
- Electrochromic, thermochromic
- Photovoltaic
- Decorative
- Patterned, fritted, etched
- Applied films

#1 What is a Code versus a Standard?

CODE OR
STANDARD?

Code is mandatory

Standard is voluntary*

* Can be referenced by a code

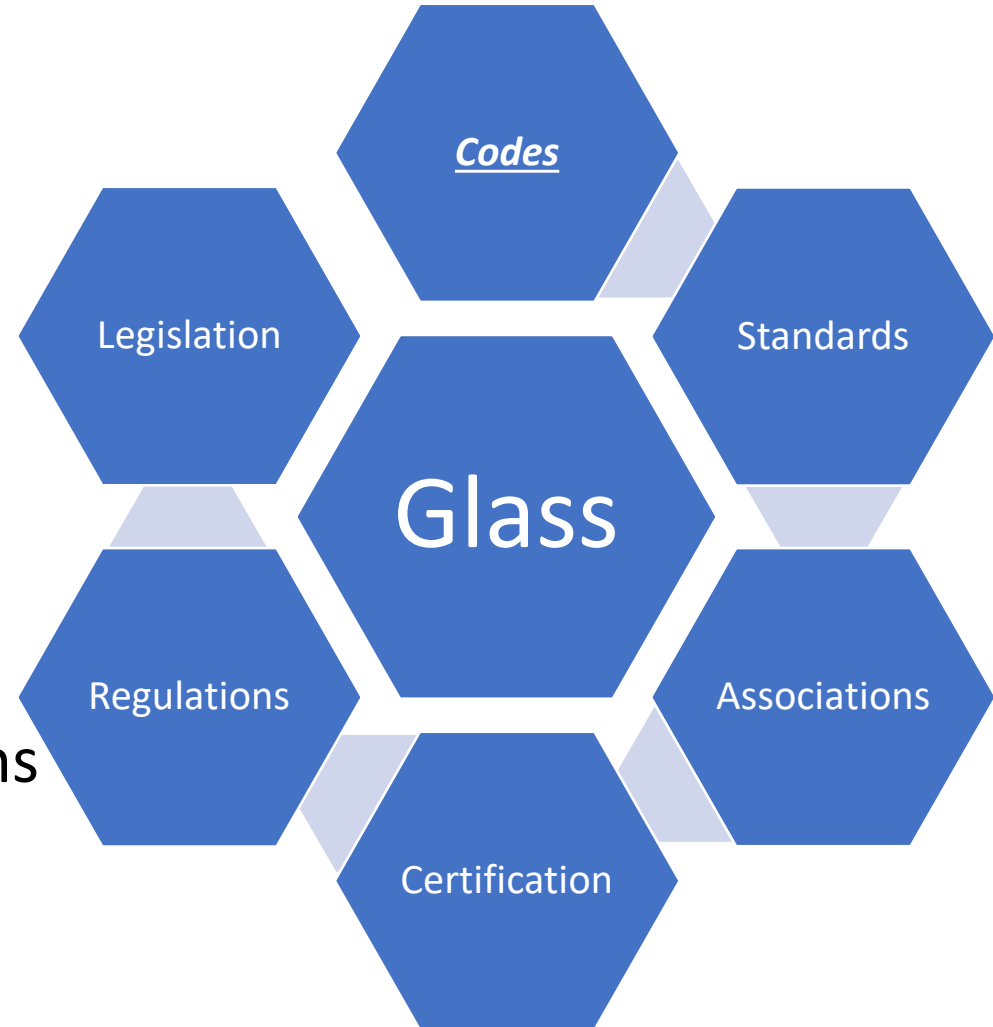
What are codes?

- **Minimum** guidelines that are enforced (established) at local, state, or federal level
 - Safety (fire, hazard, structural)
 - Conservation (energy, sustainability)



Code drivers

- Public Sector
- Laws/Regulations
 - Federal
 - State
 - International
- Private Sector
- Suppliers
- Customer
- Standards Development Organizations
- **Trade Associations**
- Insurance



What are standards?

- **Voluntary** guidelines, best practices, test methods and specifications



Standard/specification drivers

- Public Sector
- Laws/Regulations
 - Federal
 - State
 - International
- Private Sector
- Suppliers
- Customers
- Trade Associations



STANDARDS IN CODES

ANSI Z97.1

ASCE 7

ASTM International

ASHRAE 90.1

NFRC

AAMA/WDMA/CSA

Etc.

#2 EPDs – what to do?

- Increasing requests to provide **Environmental Product Declarations (EPDs)**
 - Being added to specifications, or last-minute requests from Architect / GC.
- Driven by “Buy Clean” policies setting *embodied carbon* (CO2eq) / GWP limits for construction materials, requiring EPDs.
 - GSA / Federal Buy Clean Initiative for certain Federal projects
 - Buy Clean California and CALGreen for state-funded projects, large offices, schools
 - Buy Clean Colorado – stick for state-funded project, tax carrot for private projects
 - International Green Construction Code / ASHRAE 189.1; USGBC and LEED
- Most are prioritizing concrete, steel, **flat glass**, and asphalt.



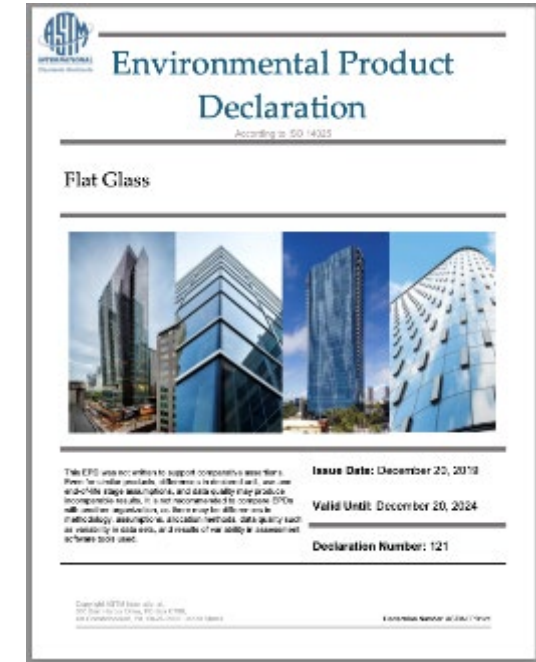
EPDs: Bottom line ... what do you need to do?

What do you need to do? What is NGA doing to help?

- The CO₂eq number is not the issue – it's the question of EPD availability.
- As a result of our advocacy, all programs either:
 - Only require EPD for *primary flat glass*,
 - Or for construction assemblies such as a window or curtain wall, allow EPDs covering 80% of the assembly cost or weight to be submitted.
 - Minor parts (sealants, hardware, fasteners, spacers, etc) can be ignored as the bulk of the carbon impact is in the primary glass and framing.
- In other words ...

EPDs: Bottom line ... what do you need to do?

- When asked about embodied carbon or EPD, simply hand in the NGA industry-wide EPD for flat glass.
- If need a product-specific EPD (e.g. GSA, CO, CA), simply hand in the EPD from your primary glass supplier.
- If need one for framing, the Aluminum Extruders Council also has an industry-wide EPD for aluminum extrusions with thermal breaks and different finishes.



But ...

EPDs: Next Steps

- There is increased demand for more granular EPDs: company & product specific EPDs, facility-specific EPDs, and processed glass EPDs (heat treated, laminated, coated, IG, etc.)
- To support the glazing industry across the entire supply chain, NGA submitted a \$2.1M grant application to EPA / IRA funding to support EPD development:
 - Improved Primary Flat Glass LCI Data
 - EPD Generator Tool for Processed Glass
 - EPD Development Assistance for Glass Fabricators
 - End-of-life LCA data collection on architectural glass recycling

#3 Specification Missteps



Glass Technical Paper

FB11-06 (2022)

Marking and Labeling of Architectural Glass

Modern architectural designs require installation of glazing materials that are capable of mitigating multi-threat situations. These applications typically require levels of protection well beyond those of basic safety glazing. As such, there has been unprecedented advancement in the types, configurations and complexities of glazing materials currently utilized in architectural applications.

NGA Specifications task group

Deltek

MasterSpec® for
Architecture and
Engineering Firms

The industry's most trusted specification content and cloud-based editing tools.



[Volunteer Here](#)

Task Group Review Complete;

Under Peer Review:

- Security Glazing
- Mirror
- Decorative
- Fire-Rated
- 088000 General Glazing

Education Ideas:

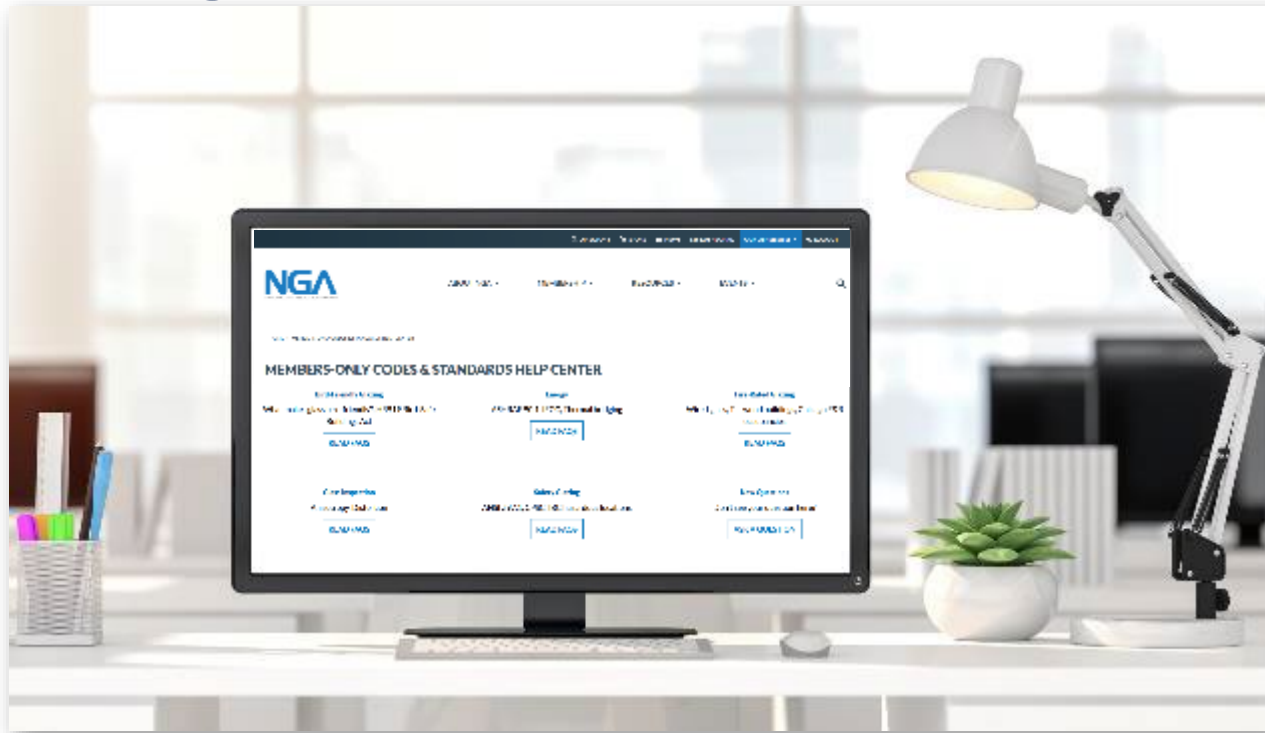
- Spec Writing for Security Glazing as an article and/or presentation for architects
- Potential spec issues for glaziers (areas of the template that may cause issues, such as disconnect between product construction and tests specified)

Up Next for Task Group Review:

- Plastic Glazing
- Curtainwall
- Storefront

Members-Only Codes & Standards Help Center

Have Questions? Get Answers.



Glass is complicated—NGA is here to help.

Exclusively for NGA members, we have compiled answers to nearly 50 tough technical codes and standards questions in an easy-to-use, online help center.

Available now (member login required).

Get started: glass.org/members-only-resources

HELP CENTER TOPICS

Bird-Friendly Glazing

What makes glass bird-friendly?, HR919
Bird-Safe Buildings Act

[READ FAQs](#)

Energy

ASHRAE 90.1, IECC, Thermal bridging

[READ FAQs](#)

Fire-Rated Glazing

Wired glass, Tall wood buildings,
Chicago E&R occupancies

[READ FAQs](#)

Glass Inspection

Anisotropy, Distortion

[READ FAQs](#)

Safety Glazing

Laminated; NEW: Mirror; Repairs,
Remodeling & Alterations; Tempered;
other

[READ FAQs](#)

NEW: Sustainability

All new questions, including PCR, LCA,
EPD, GWP, recycling

[READ FAQs](#)

SUBMIT QUESTIONS

Don't see your question here? [Ask a new question](#)

#4 Window Area and Glaziers as Ambassadors

For years, we have fought the ‘battle for the wall’ defending not only our industry, but also fighting for **healthy buildings where people live, play, learn, work, and heal.**

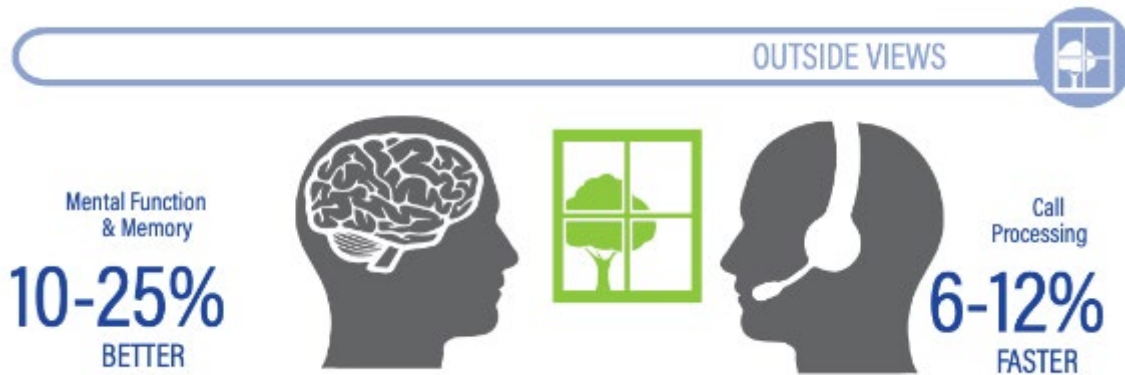
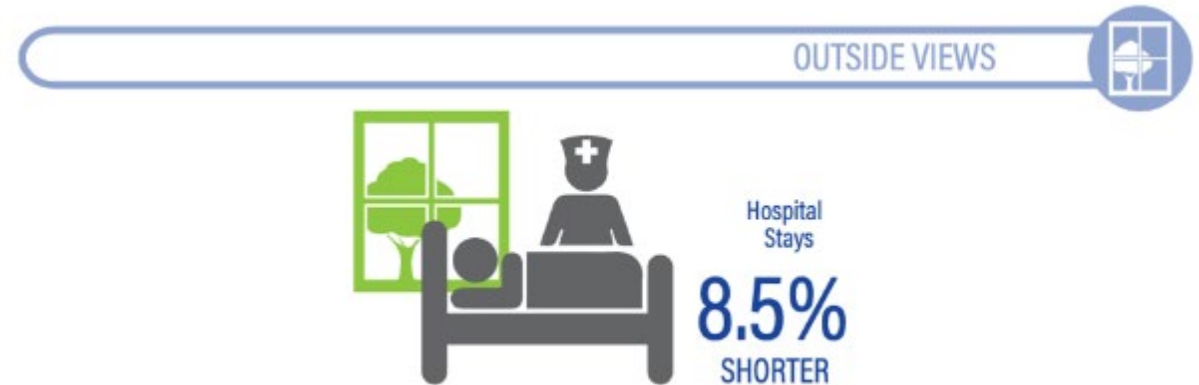
You have a role in this fight too.
Glaziers are one of our front-line ambassadors.



Remind people: why do we have windows?

The Human Aspect – Occupant Health and Wellness

Numerous studies show having access to daylighting and quality views provides *better learning, faster healing, higher productivity, higher value.*

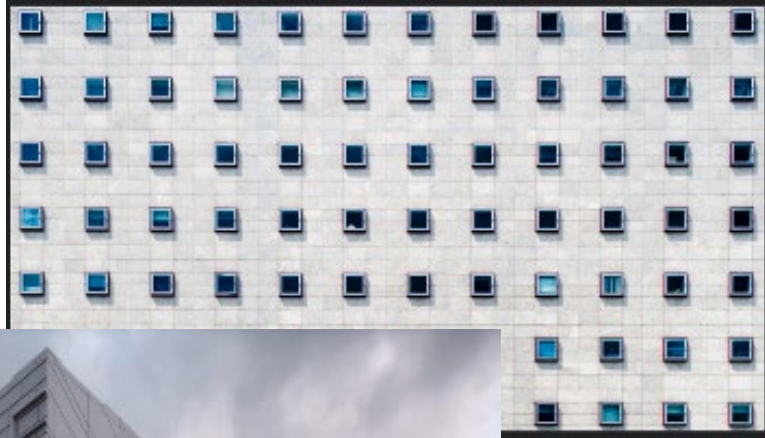


More info at:

<https://www.glass.org/resources/market-intelligence/daylighting>

As we move towards net zero buildings,
what will they look like?

New-Age Brutalism?



Fake windows!?!

- Would *you* want to work here?
Have *your* child learn here?
Have *your* mother heal here?
- No daylight, no view?
Ventilation, IAQ?
Harm to occupant health and well-being?
Increased embodied carbon / GWP?
- Buildings must serve their occupants.

Or balance?

- Energy Efficiency + Renewables
- IEQ, Ventilation, Daylighting, Views
- Healthy spaces to live, work, learn, play, heal



Denver Water Admin Facility, CO



Lick-Wilmerding High School, CA



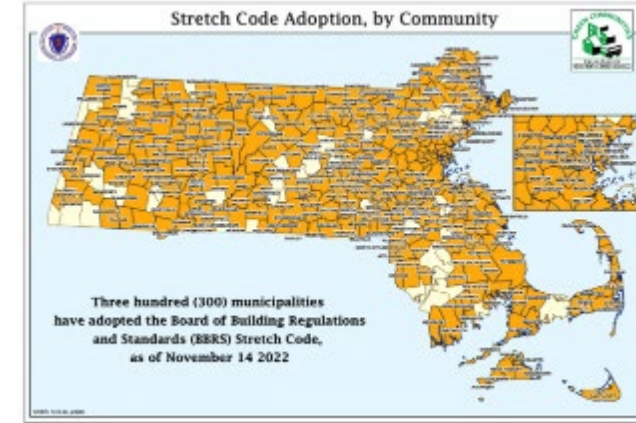
King Open School, MA

Think about it:
What is the future of net zero buildings ...
Jetsons or Flintstones?



One Example: Massachusetts


- New very aggressive Massachusetts Stretch Energy Code has now been in place since last July.
- Puts extremely aggressive requirements on curtain wall and window wall construction: Mandatory 0.25 U-factor, and aggressive overall envelope (wall + window) requirements.



- Two possible paths:



-  Will market finally transition to triple glazing and VIG? (Will building owners pay for it?)

- or -

-  Will window area be reduced in a wave of 'new age brutalism' with small punched openings?

Massachusetts Update

Two possible paths:

-  • Will market finally transition to triple glazing and VIG?
(Will building owners pay for it?)
- or -
-  • Will window area be reduced in a wave of 'new age brutalism' with small punched openings?

So what's happening so far?

- Tentatively optimistic that the first path is winning.
- Anecdotal feedback is that vision area is not being reduced.
 - Engineering firms and architects are working with building owners to keep window area up, using very high performance systems. *(Our messaging getting through about importance of occupant health and well-being? 🙌 😄)*
- *But*, also hearing that spandrel area is being reduced in some cases. 😡

#5 The Next Opportunity - Existing Buildings

We've already been waving the flag for several years, but it's really happening ... existing building retrofits.

   Work for glaziers that could surpass new construction.   

- DOE estimates that in the U.S. there is still:
 - 2 billion ft² of single pane glazing in commercial buildings
 - 47 million homes with single glazing
 - 46 million homes with less efficient double pane clear (no low-e)
- DOE backing this up with \$2M in prize funding for development advanced commercial secondary glazing systems.
- And being pushed by Building Performance Standards ...

Building Performance Standards *expanding rapidly!*

Local requirements setting **energy use limits on EXISTING BUILDINGS.**

- Building Performance Standards have been enacted in:
 - [New York City](#) (carbon limits starting 2024)
 - [St. Louis](#) (energy use limits starting 2025)
 - [Boston](#) (carbon limits starting 2025)
 - [Washington State](#) (energy use limits starting 2026)
 - [District of Columbia](#) (energy use limits starting 2026)
 - [Colorado](#) (limits being finalized, targeting 2025)

Replacement glazing
Replacement windows
Secondary glazing
Low-e storm windows

Fines start 2025-2026 ... but building owners have already started planning

Large incentive to upgrade existing buildings; improves economics of envelope retrofits.

National Building Performance Standards Coalition

As of Dec 2023:

Look to these locations for rapid growth in the retrofit market.



Existing Building Projects – what are we seeing for Glaziers?

- In addition to ‘straight-forward’ window retrofit projects, building owners are starting to look at the whole picture.
- Addressing windows, walls, roofs, HVAC, heat pumps, etc. each separately is better than nothing, but not smart. Each has separate limited payback.
- Much better payback looking at them together. For example, improving window performance (U, SHGC, air leakage) and moving to electrification at the same time allows heat pumps to be downsized ... saving the building owner significant \$\$\$ and improving comfort / tenant satisfaction.
- *Glaziers will start to see more of those types of integrated projects.* Improves the upsell value of improving the windows as part of a building retrofit, but also affects scheduling and involves more trades.

We covered a lot quickly.

Questions / Comments?

What are you seeing in real life?

How to Stay Informed

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Opt-in for the monthly AT Eblast

NGA NATIONAL GLASS ASSOCIATION with CANA
ADVOCACY & TECHNICAL SERVICES
AN UPDATE ON IMPORTANT TECHNICAL AND CODES WORK BY NGA'S ADVOCACY AND TECHNICAL SERVICES TEAM
October 2023

Current Activities

ASHRAE 90.1 Second Advisory Public Review of Appendix for Zero-Emission Buildings
ASHRAE 90.1-2022 *Energy Standard for Sites and Buildings Except Low-Rise Residential Buildings* is seeking public feedback on a proposed appendix that jurisdictions could adopt to achieve a zero-emission building. The appendix demonstrates the necessary modifications to the standard to achieve zero emission requirements. The new appendix is based on the Performance Rating Method as modified with new targets for the Performance Energy Index Site and Performance Emissions Index Greenhouse Gas metrics. Jurisdictions have flexibility to determine their timeline for reaching the zero-emission target. [Review and comment online by November 5.](#)



Canadian National Model Codes Third Public Review
The Canadian Board for Harmonized Construction Codes (CBHCC) is inviting the public to take part in the third public review of proposed changes to the 2020 editions of the National Model Codes. Public comments are due **December 18**. Access the proposed changes on the [CBHCC's website](#). NGA's code consultants will review proposed changes with the Glazing Industry Code Committee (GICC) and provide comments.

GICC works directly with NGA's code consultants to build greater knowledge and acceptance of architectural glass, glazing materials, and glazing systems as safe, efficient,



Reach Out Here