DOCKETED

Docket Number:	25-BSTD-03
Project Title:	2028 Energy Code Pre-Rulemaking.
TN #:	271522
Document Title:	Thomas Culp Comments - NGA GICC AEC comments on nonresidential fenestration CASE report
Description:	N/A
Filer:	System
Organization:	Thomas Culp
Submitter Role:	Public
Submission Date:	7/17/2026 1:03:20 PM
Docketed Date:	7/17/2026

Comment Received From: Thomas Culp
Submitted On: 7/17/2026
Docket Number: 25-BSTD-03

NGA GICC AEC comments on nonresidential fenestration CASE report

Additional submitted attachment is included below.

Comments on final CASE report on Nonresidential Fenestration July 17, 2026

Thank you for the opportunity to comment on the final CASE report for potential nonresidential fenestration updates in the 2028 California energy code. I represent the National Glass Association (NGA), Glazing Industry Code Committee (GICC), and Aluminum Extruders Council (AEC) on energy code matters. Together, NGA, GICC, and AEC have over 2000 member companies manufacturing across North America. We represent the entire supply chain and broad interests across the commercial and residential glazing and fenestration industry, from primary glass manufacturers, commercial window and curtain wall frame extruders, glass and metal fabricators, insulating glass manufacturers, component suppliers, fabricators/manufacturers of completed systems, to the final retail glass businesses and installers/contract glaziers.

In short, I am supportive of the final CASE report and proposed changes considering the viewpoint of members of NGA, GICC, and AEC. However, I do offer the following comments which include potential corrections to the proposed text and tables. Please note that as these organizations have such a diverse membership, we encourage you to also review any detailed comments that have been submitted by individual members.

New Construction / Additions:

The proposed changes in U-factor from 0.36 to 0.34 for fixed windows and 0.46 to 0.43 for operable windows in certain zones are reasonable and cost justified per the cost effectiveness analysis. These are incremental changes, and achievable with well-established technologies already in use across the country.

Editorial comments on the language:

- The new TABLE 301.3-C.1 is indicated to be only for OPAQUE envelope criteria, but the direction to "include all rows from 'Roof and Ceilings—Metal Building Max U-Factor' through 'Exterior Doors—Swinging Maximum U-Factor' would still include the vertical fenestration criteria for fixed windows, curtain wall or storefront, operable windows, and glazed doors. To be clear, you may want to show the new Table 301.3-C.1 with only opaque assembly values, or be more explicit that it will not contain vertical fenestration criteria.
- If this is correct, then the text in Sections 301.3.4.2, 301.3.4.3, and 301.3.4.4 regarding U-factor, RSHGC, and VT for "vertical *windows* in *exterior walls*" should only refer to Tables 301.3-C.2 and C.3 (as well as the D,E tables as appropriate) and not Table 301.3-C.1.
- Do the current exceptions to Section 140.3(a)5B through 140.3(a)5D still exist under Sections 301.3.4.2 through 301.3.4.4? They should.

Alterations:

For the alterations / replacements less than 100%, the proposed change in U-factor from U-0.47 to U-0.43 for fixed windows and curtain wall is reasonable and cost effective using readily available technologies.

W6025 Rim of the City Road, La Crosse, WI 54601 culp@birchpointconsulting.com

I do question the operable window results, which seem to show negative life cycle savings in all zones, and therefore were not included in the proposed change. This does not seem correct, as the energy savings per square foot should generally be similar as the fixed window results. The incremental first costs will be more (as was assumed), so the benefit-to-cost ratio in each zone will be different, but it almost seems like some error in that they are all suddenly negative (see Table 45). Were they accidentally compared to a fixed window base case, or other spreadsheet error? This may be worth looking into, so that the proposed criteria update could also be applied to operable windows.

For the new requirement where replacement of 100% of any single fenestration type is pointed back to the new construction requirements, I agree with the intent, but offer a few comments:

- As previously noted, I still think the 100% trigger is too absolute and rigid, creating an easy loophole where the entire intent is bypassed if just a single transom, sidelight, or window on the back side of a building is not replaced. However, I understand the enforcement concerns about using a lower trigger such as 75%, even though ASHRAE 90.1 has used 25% for decades.
- It looks like the pointer from Section 301.5.2.2.2.1 to Sections 301.3.4.2 through 301.3.4.4 for U-factor, RSHGC, and VT is correct, and would then also include the exceptions there related to conditioned greenhouses, chromogenic glazing, etc. That is appropriate.
- However, I would also suggest that the exception to Section 301.5.2.2.2.2 for alterations less than 150 ft^2 should be applied to Section 301.5.2.2.2.1 as well. While it may be less common, if 100% of a certain type happens to be less than 150 ft^2, such as if a few operable windows happens to be the only ones on a building with mostly fixed windows, then you don't want to force a visual mismatch with the adjacent fixed windows.

Finally, I would still like to see recognition of commercial secondary windows (CSW) in the code. This need not be a requirement, but rather recognition that addition of commercial secondary windows is allowed and does not trigger the other fenestration requirements because they are improving the existing condition. That is what IECC and ASHRAE 90.1 explicitly do, exempting alterations using commercial secondary windows and storm windows as they improve the energy performance the existing window and building, although ASHRAE 90.1 does require a low-e coating to be included. It is also possible to include a reference to AERC certification for CSW products. This could be a simple exception under 301.5.2.2.1 and 301.5.2.2.2. I'm happy to help with language.

Thank you again for the opportunity to comment, and please contact me with any questions.

Best regards,

Thomas D. Culp, Ph.D.
Birch Point Consulting LLC
culp@birchpointconsulting.com