

# NGA GLASS CONFERENCE™ MILWAUKEE

AUGUST 6-8, 2024

**NGA**

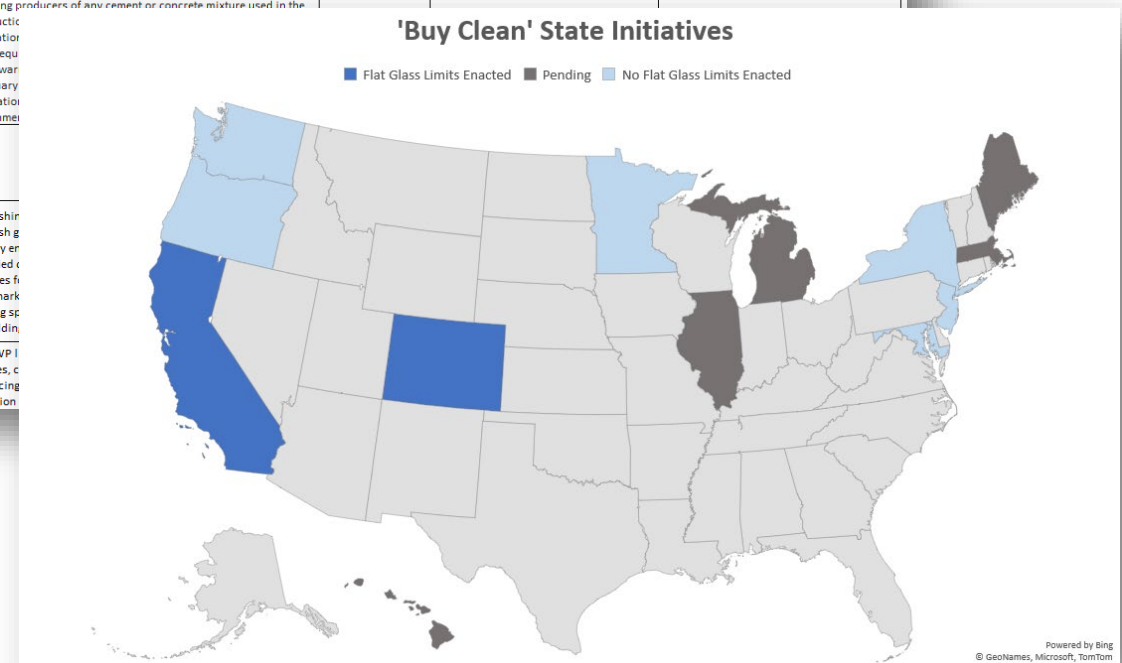
NATIONAL GLASS ASSOCIATION with GANA



# State Buy Clean Initiatives

- State Buy Clean legislative tracking spreadsheet
- Members-only resource to be made available
- State, materials covered, description, bill number, etc.

State	Materials Covered	Flat Glass? (Y/N)	GWP Limit for FG (kg CO2eq)	Description	Bill No.	Reference	Notes
CA	Steel, glass, mineral wool, concrete, gypsum board, insulation, carpet ceiling tiles, future expansion	Y	1430	For eligible projects with contracts signed on or after July 1, 2022, contractors must submit facility-specific material or product EPDs before the material will be accepted for installation. The Environmental Product Declaration must show that the facility-specific global-warming potential of the material or product does not exceed maximum global-warming potential (GWP) value as published by the Department of General Services Procurement	Public Contract Code Sections 3500-3505	<a href="https://www.dgs.ca.gov/PD/Resources/Pages/Content/Procurement/Division/Resources/List-Folder/Buy-Clean-California-Act">https://www.dgs.ca.gov/PD/Resources/Pages/Content/Procurement/Division/Resources/List-Folder/Buy-Clean-California-Act</a>	
CO	Asphalt, cement, concrete, glass, steel, wood	Y	1510	Applies to State public projects for which the project cost exceeds \$500k, and for which an agency of government issues a solicitation on or after Jan 1, 2024. Includes any construction, alteration, repair, demolition, or improvement of any land, building, structure, facility, road, or bridge that is intended to promote public upkeep. Requires the Office of the State Architect to establish a maximum acceptable GWP limit for each category of eligible materials.	C.R.S. 24-92-117	<a href="https://osa.colorado.gov/energy-environment/buy-clean-colorado-act">https://osa.colorado.gov/energy-environment/buy-clean-colorado-act</a>	
HI							
IL							
ME							
MD	cement / concrete mix	N	-	Requiring producers of any cement or concrete mixture used in the construction declarator 2024; requ global war by January Declaration environme			
MA	Concrete	N	-				
MA				Establishir establish g industry er embodied c practices fi benchmark building sp for buildin			
				Sets GWP l mixtures, c reinforcing insulation			




## Resources available at glass.org

### NGA Resources at [glass.org/ondemand-webinars](https://glass.org/ondemand-webinars)

- Watch “Impacts and Opportunities of the Inflation Reduction Act”
- Download presentation handouts

### NGA Resources at [glass.org/legislation](https://glass.org/legislation)

- One-Pager on Global Warming Potential (GWP)
- Building Compliance FAQs
- Links to on-demand webinars about EPDs

 NATIONAL GLASS ASSOCIATION with GANA | **ADVOCACY**

Flat Glass Global Warming Potential

**The request:**


When states or jurisdictions compile global warming potential for flat glass, we request setting the Global Warming Potential (GWP) limit for flat glass to:

**1716 kg CO<sub>2</sub> eq.**

The request of 20% above the industry-average referenced in Declaration Number ASTM-EPD121 is due to the inherent uncertainty of the life cycle assessment process and the inclusion of estimated variables and assumptions including, but not limited to, weighted averages, upstream/ downstream transportation and building/service life.

<p><b>The issue:</b></p> <p>Stakeholders and sustainability programs want to better understand the environmental performance of glass products manufactured for buildings.</p> <p>IANA Product Category Rule (PCR) for Flat Glass was published by NSF in 2014 describing the requirements for life cycle assessments (LCAs) and environmental product declaration (EPD) of flat glass.</p> <p>NGA flat glass* member companies published an industry-average EPD for flat glass sold in the US in December 2019 (ref: ASTM-EPD121).</p> <p>The EPD scope includes raw material production, transport of materials, manufacturing processes, product packaging, onsite storage and manufacturing waste (cradle to gate).</p> <p><small>*members of the Forming Committee</small></p>	<p><b>The strategy:</b></p> <p>Results of the Flat Glass Industry-Average EPD:</p> <ul style="list-style-type: none"> <li>• The industry-average Global Warming Potential for flat glass is 1430 kg CO<sub>2</sub> eq.</li> <li>• Raw materials and direct emissions are the largest drivers of potential environmental impact of flat glass products.</li> <li>• Many North American flat glass plants have taken measures to more efficiently control emissions using environmental emission control systems.</li> </ul> <p>The declared unit evaluated is one metric tonne (1000 kg) of flat glass, maintained for 30 years.</p>
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**Relative contribution of manufacturing inputs and outputs to Global Warming Potential**



- Natural Gas (28%)
- Batch Materials (27%)
- Direct Emissions (21%)
- Electricity (9%)
- Process materials (2%)
- Inbound transport (2%)
- Miscellaneous (1%)

National Glass Association (NGA) combined with the Glass Association of North America (GANA) in 2018 to create the largest trade association serving our industry. We develop standards, create technical resources, and promote and advocate for glass in the built environment. Learn more at [glass.org/about-us/advocacy](https://glass.org/about-us/advocacy). For further information on glass industry sustainability efforts and CO<sub>2</sub> eq. please feel free to contact NGA Technical Staff at <mailto:technicalsvcs@glass.org>.

# Flat Glass Industry Standard Definitions

- Low-E
- Solar control
- Jumbo glass
- Low iron
- Thin glass

# US DOE Decarbonization

- DOE Glass Decarbonization Workshop in Pittsburgh, PA in May 2024
  - Hosted by the US DOE's Industrial Efficiency & Decarbonization Office (IEDO)
- NGA was represented
- Discussion on energy efficiency, carbon footprint of the industry – container, architectural, fiberglass, etc.
- IEDO estimates that 60% of heavy industry emissions reductions by 2050 will come from technology that is not yet market ready

# Flat Glass Sustainability Drivers

- Embodied vs Operational Carbon
- Social cost of carbon
- Circularity
- Global Warming Potential (GWP)
- GWP vs CO2 Emissions
- ESG, ESGCC

# Embodied vs Operational Carbon

- Embodied Carbon
  - Refers to the greenhouse gas emissions (measured in CO<sub>2</sub>eq) from the manufacturing, transportation, installation, maintenance, and disposal of building materials.
- Operational Carbon
  - Refers to the greenhouse gas emissions (measured in CO<sub>2</sub>eq) from the building energy consumption.

Reference: Carbon Leadership Forum (CLF)  
<https://carbonleadershipforum.org/embodied-carbon-101>

# Social Cost of Carbon

- SC CO<sub>2</sub> is a dollar value that measures the long-term damage done by one ton of CO<sub>2</sub> emissions in a given year.
- Also represents the value of damages avoided for a small emission reduction (benefit of a CO<sub>2</sub> reduction).
- Designed to be a comprehensive estimate of damages from climate change, including changes in the following:
  - Net agricultural productivity
  - Human health
  - Property damage from increased flood risk
  - Changes in energy system costs (cost of heating/air conditioning)



# Circularity

- Designing products with their end-of-life in mind
- A step towards overall sustainability
- *Circular Economy*: A circular economy reduces material use, redesigns materials and products to be less resource intensive, and recaptures “waste” as a resource to manufacture new materials and products.

# Global Warming Potential (GWP)

- *GWP*: Measure of how much energy the emissions of 1 ton of gas will absorb over a given period of time, relative to the emissions of 1 ton of CO<sub>2</sub>.
- Developed to allow comparison of global warming impacts of different greenhouse gases.

The general equation for calculating the GWP of a greenhouse gas  $i$  is:

$$\text{GWP}_i = \frac{\int_0^T a_i \cdot [C_i(t)] dt}{\int_0^T a_{\text{CO}_2} \cdot [C_{\text{CO}_2}(t)] dt}$$

where:

- $\text{GWP}_i$  is the Global Warming Potential of the gas  $i$ .
- $T$  is the time horizon over which the GWP is calculated (typically 20, 100, or 500 years).
- $a_i$  is the radiative efficiency of the gas  $i$  (i.e., the energy per unit mass per unit time absorbed by the gas).
- $[C_i(t)]$  is the time-dependent concentration of the gas  $i$  in the atmosphere after a pulse emission.
- $a_{\text{CO}_2}$  is the radiative efficiency of carbon dioxide (CO<sub>2</sub>).
- $[C_{\text{CO}_2}(t)]$  is the time-dependent concentration of CO<sub>2</sub> in the atmosphere after a pulse emission.

# ESG

## Environmental

- Energy efficiency
- Climate change and carbon emissions
- Waste management
- Air & water quality
- Biodiversity
- Deforestation

## Social

- Diversity
- Employee engagement
- Community relations
- Customer satisfaction
- Data protection & privacy
- Human rights
- Labor standards

## Governance

- Board composition
- Executive compensation
- Audit committee structure
- Bribery & corruption
- Lobbying
- Political contributions
- Whistle-blower schemes