

High-Performance Windows Can Help Save The World

The request:

- Continue to support Infrastructure Investment and Jobs Act funding for DOE's Resilient and Efficient Codes Implementation (RECI) program. Implement energy-efficient model building codes at the state level.
- Ensure the GSA rules that apply IRA funds for embodied carbon legislation also consider operational carbon, energy cost savings and building resiliency associated with high-performance glazing in windows.

Window retrofit is key to decarbonization.

- Residential and commercial buildings are responsible for almost 40% of carbon dioxide emissions¹ and energy usage in North America.
- For example, existing buildings with inefficient windows account for ~70% of New York City emissions.
- 80% of buildings that will exist in 2050 already exist today.

High-performance windows are up to 80% more efficient than standard windows.

- New residential windows that qualify for the ENERGY STAR Most Efficient designation are up to 40% more efficient than new standard windows. Just imagine the energy savings if the existing windows are decades old!²
- Upgrades in window technology in the last 20 years have significantly improved heat-loss performance for residential and commercial structures.
- High-performance windows lower building operational costs, reduce carbon emissions, create skilled-labor positions through urban renewal projects and improve occupant comfort and building resiliency.

New windows can pay back embodied carbon in less than a year.

- Glass is typically 2-5% of a building project's embodied carbon. Upgrading to a more efficient glazing system will initially add some additional embodied carbon.
- However, in both commercial and residential installations, operational energy/carbon savings from the more efficient windows will offset that initial increase in 6 - 20 months in a cold climate and thereafter provide additional annual carbon savings.⁴

Decarbonization efforts should include both embodied and operational carbon.

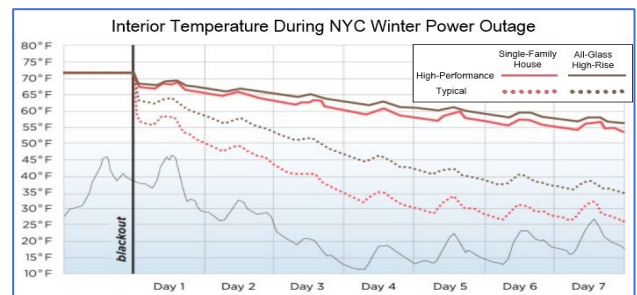
- Existing legislation targeting embodied carbon does not take into consideration the long-term benefits glazing materials provide by mitigating annual carbon impacts through ongoing operational cost savings.
- Upgrading installed windows improves total building energy performance by up to 20%,³ improves comfort and health for occupants, and reduces operational costs and carbon emissions.

High-performance glass is used in on-site renewable energy products.

- High-performance glass is a key component in the domestic supply of solar panels and building integrated photovoltaics (BIPV).
- Increased use of on-site renewable energy is critical to achieving net-zero energy and carbon targets and will also help improve grid resiliency and U.S. energy independence.

High-Performance windows improve building resiliency.

- In the event of extended power disruption, high-performance windows enhance building resiliency and maintain habitable interior temperatures for longer periods of time.⁵



Over a 7-day cold spell following a winter blackout when the temperature outdoors drops to 10°F, the house or office with high-performance windows cools from 70°F to about 55°F whereas the buildings with conventional windows can drop below freezing (25°F-35°F).

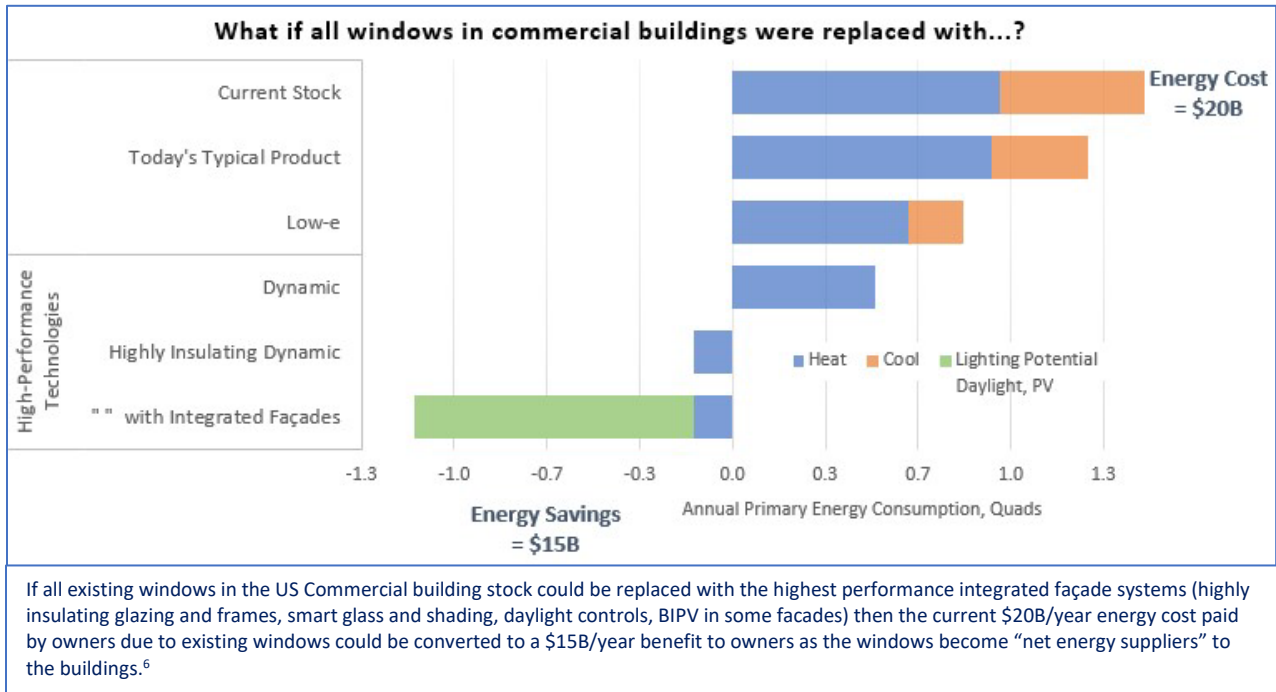
- Upgrades to the building envelope increase long-term energy efficiency.
- Improvements allow for downsizing of replacement mechanical systems and more effective use of funding, while increasing building resiliency in the event of extreme weather and blackouts.

Retrofitting buildings with high-performance windows creates job opportunities for skilled workforce.

- Installation of high-performance window products supports skilled-worker job creation along with urban renewal.
- At the local level, changes in building performance standards requiring improvements in existing buildings are taking off, but adoption among cities is scattered.
- Federal level initiatives encouraging window and building envelope upgrades, as well as lighting and mechanical system updates, would create additional manufacturing demand and related jobs.

High-Performance Windows Can Help Save The World

Retrofitting All Commercial Windows: Converting a \$20B/year Energy Cost to a \$15B/year Net Energy Surplus



References:

- <https://www.eesi.org/topics/built-infrastructure/description>
- <https://eurocladsystems.com/heres-how-much-energy-youll-save-with-new-windows-and-doors/>
- <https://www.cardinalcorp.com/technology/case-studies/>
- <https://www.glass.org/triple-glazing-and-embodied-energy-yes-juice-worth-squeeze>
- Atelier 10 study for Urban Green "Baby its cold inside"
- Zero Energy Windows, Arasteh, D; Selkowitz, S; Apte, J; LaFrance, M, Proceedings of the 2006 ACEEE Summer Study on Energy Efficiency in Buildings, August 13-18, 2006, Pacific Grove, CA.



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-nga/advocacy. For further information on glass industry sustainability efforts and high performance windows please feel free to contact NGA Technical Staff at <mailto:technicalsvcs@glass.org>.