NSG

GROUP

International Year of Glass 2022

The Role of glass in the age of sustainable development

INTERNATIONAL YEAR OF GLASS 2022

https://www.iyog2022.org/

https://www.nsg.com/en/iyog-2022

Milestones to be celebrated in 2022:

- 670th anniversary of first depiction of eyeglasses in a painting;
- 200 years of Fresnel Lenses in coastal lighthouses;
- 100 years since glass discovered in King Tutankhamun's Tomb;
- 100 years of the German Society of Glass Technology (DGG);
- 70th anniversary of the Pilkington patent for *Float Glass*;
- 60 years of the Studio Glass Movement;
- 45th anniversary of Anderson, Mott & Van Vleck's Nobel prize (glassy materials).

Why glass?

- Good health and well-being
- Affordable and clean energy
- Sustainable cities
- Responsible consumption/production
- Climate action

- Transformative product
- Infinitely recyclable
- Chemically resistant and inert
- Key component for transportation
- Element of all renewable energy
- Technology and electronics
- Architectural design/performance

- Tempered
- Laminated
- IGU
- Hurricane-rated
- Turtle code
- Fire-rated
- Dynamic glass
- Light emitting
- Heated glazing

- Bird-friendly
- Power generating
- BIPV
- Privacy glass
- Switchable glass
- Sound-reducing
- Structural interlayer
- Blast-resistant
- Bullet resistant

- Anti-reflective
- Anti-glare
- EMI shielding
- Transparent conductive
- Anti-microbial
- Self-cleaning
- Annealed

How do we drive the future?

What makes a building sustainable?

Sustainability ⟷ Resiliency

"Meeting the needs
without compromisi
future generations t
needs."

- United N
Brundtlan
1987

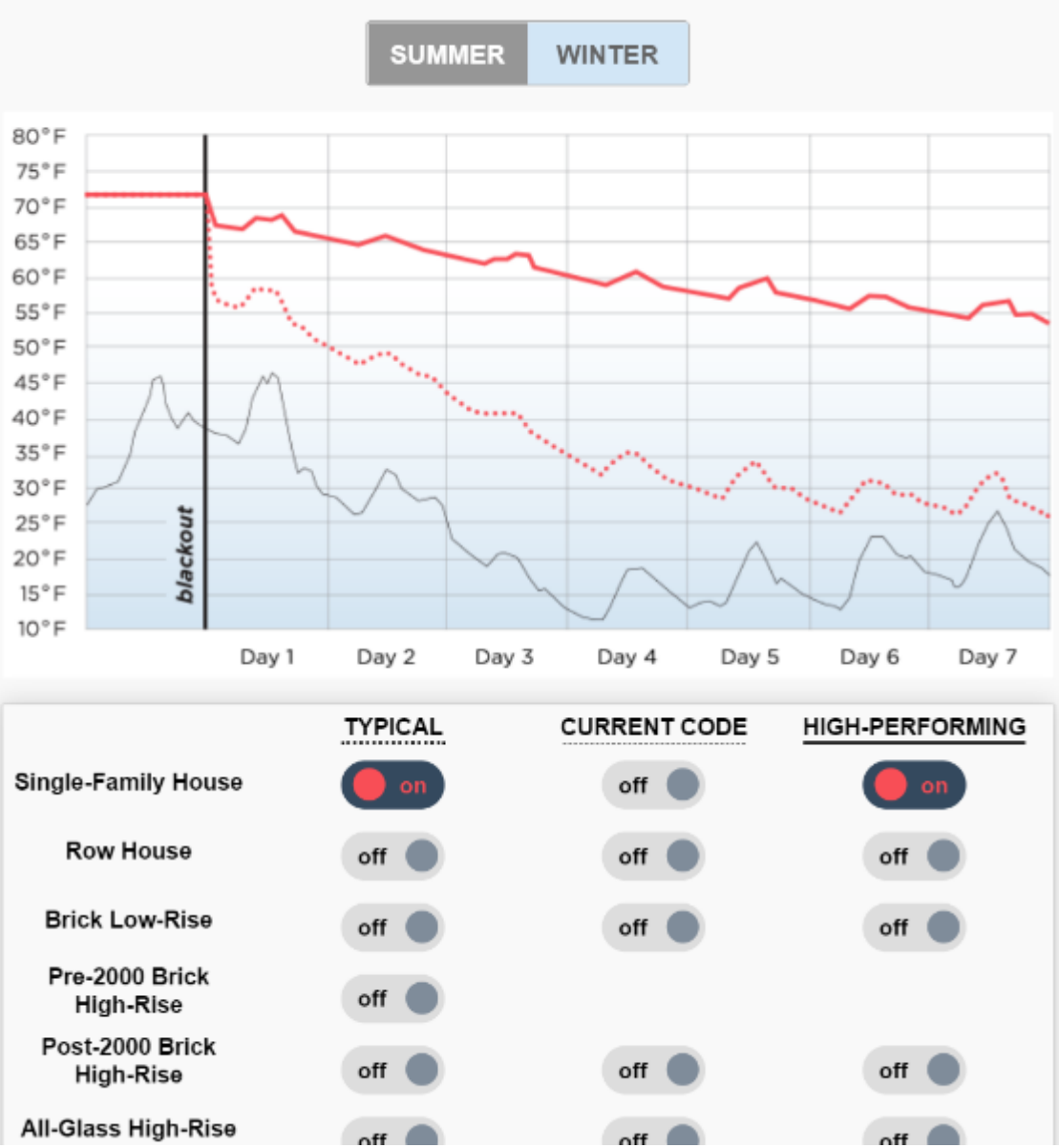
of a system, community
posed to hazards to
, accommodate to and
the effects in a timely
manner, including
preservation and
f its essential basic
d functions."

nited Nations Office
Disaster Risk Reduction

Protecting the en
human impacts t
conditions for fu
generations.

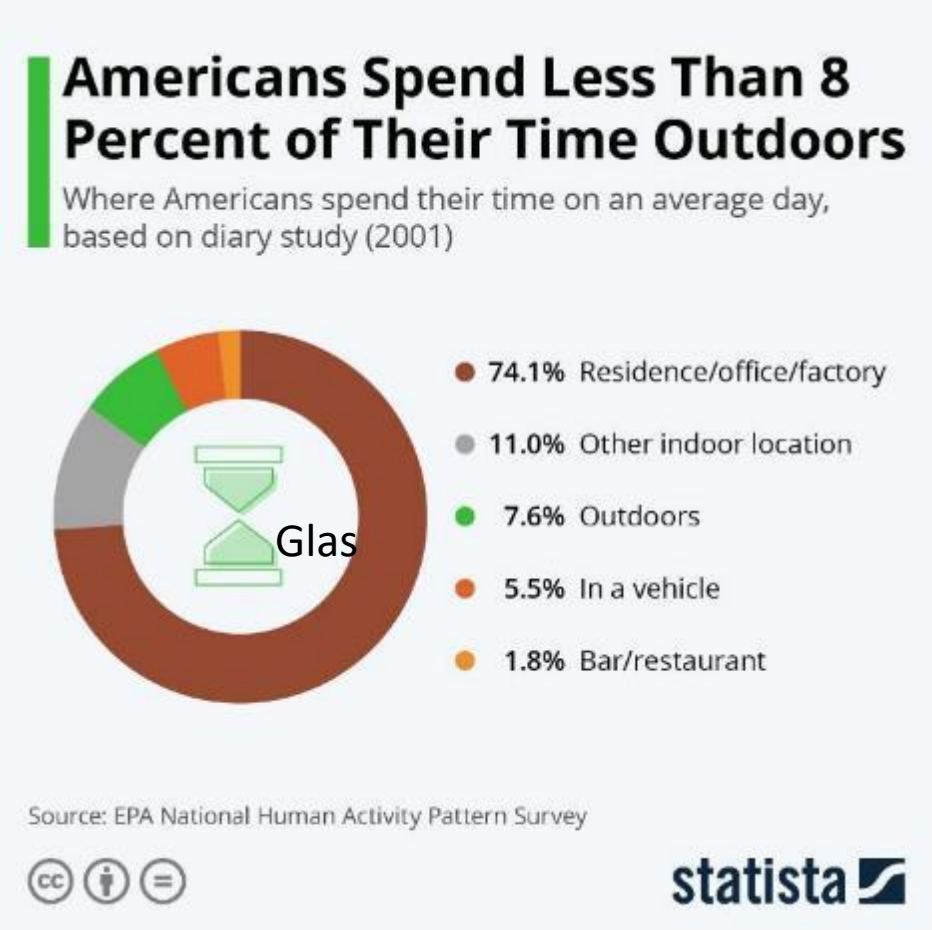
humans from
ntal impacts to sustain
ditions for future
generations.

Building resiliency



Baby It's Cold Inside | Urban Green Council

Building for people

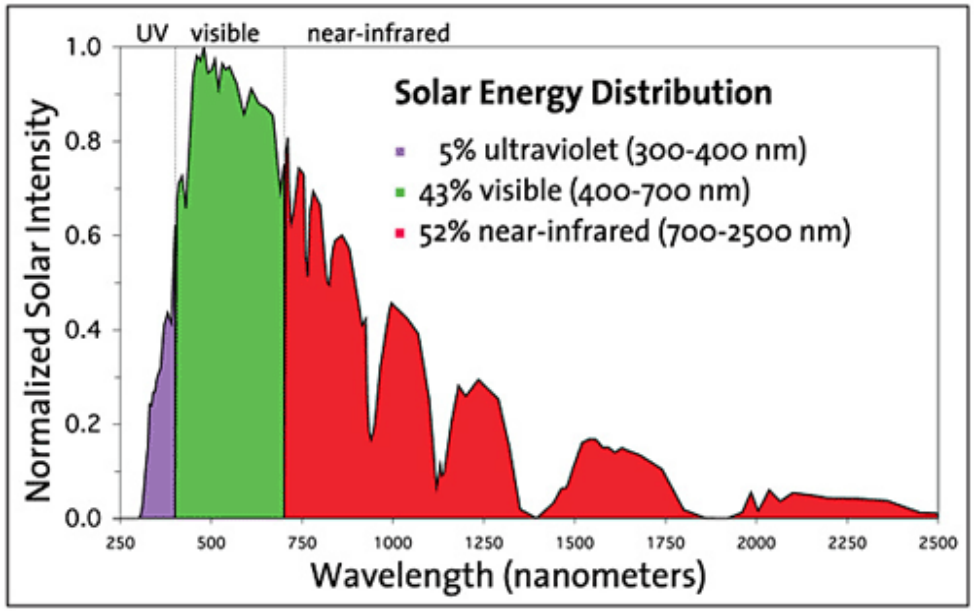


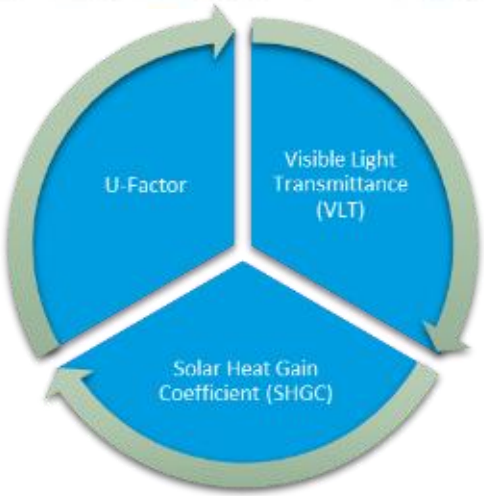
Designing a rich, interactive, and lively space that has a positive effect on the human experience is the goal of every architect.

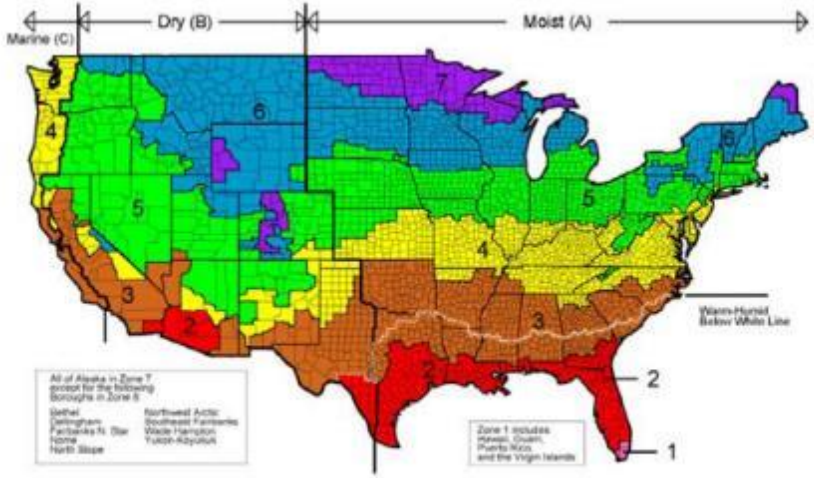
Glass buildings have been singled out as climate disasters. Can they be reformed?

Tightening building standards could mean it's curtain call for glass towers. Some innovators say otherwise.

BY JOHN LORINC
APRIL 22, 2021







Material Embodied Carbon – Reduce manufacturing impact

Included in product Environmental Product Declarations

Long Term

NSG/PILKINGTON PLANT IN UK MANUFACTURES FLOAT GLASS USING HYDROGEN POWER IN WORLD-FIRST TRIAL

August 31, 2021

NSG Group Opens New Solar Array in Rossford, Ohio

Posted on May 27, 2022 by News Editor

A 1.4 MW photovoltaic solar array is now fully operational at NSG Group's Rossford, Ohio facility. The company expects it will supply about 2.5 million kWh of renewable energy annually.

NSG Group to Increase Carbon Reduction Target by 2030 Committing to Achieve Carbon Neutrality by 2050

12 May 2022

Counting Carb (s) – 40% in buildings

Operational Carbon

- Carbon emissions from use of energy to heat and power a building

Embodied Carbon

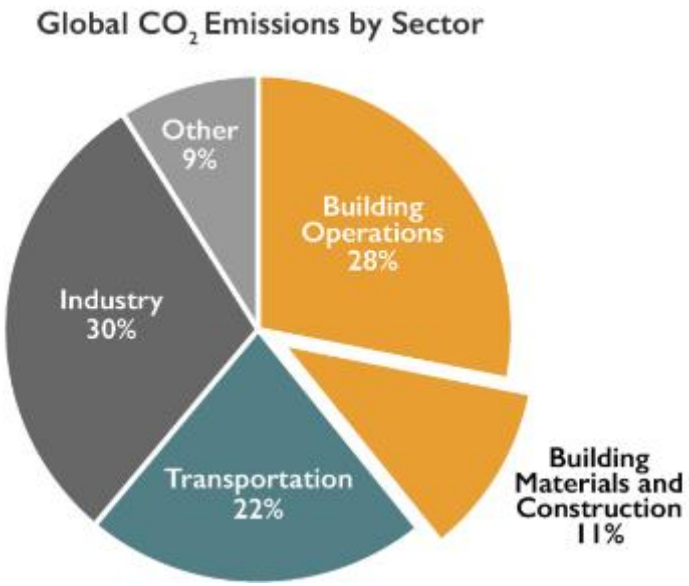
- Carbon emissions from manufacturing, production, and transportation of building materials

- **Goal** – reduce overall carbon impact / usage

Goal = Lose weight

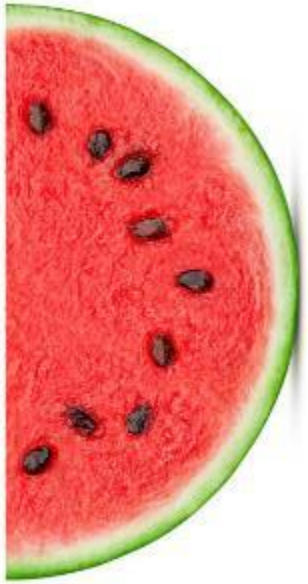
1 lb / week

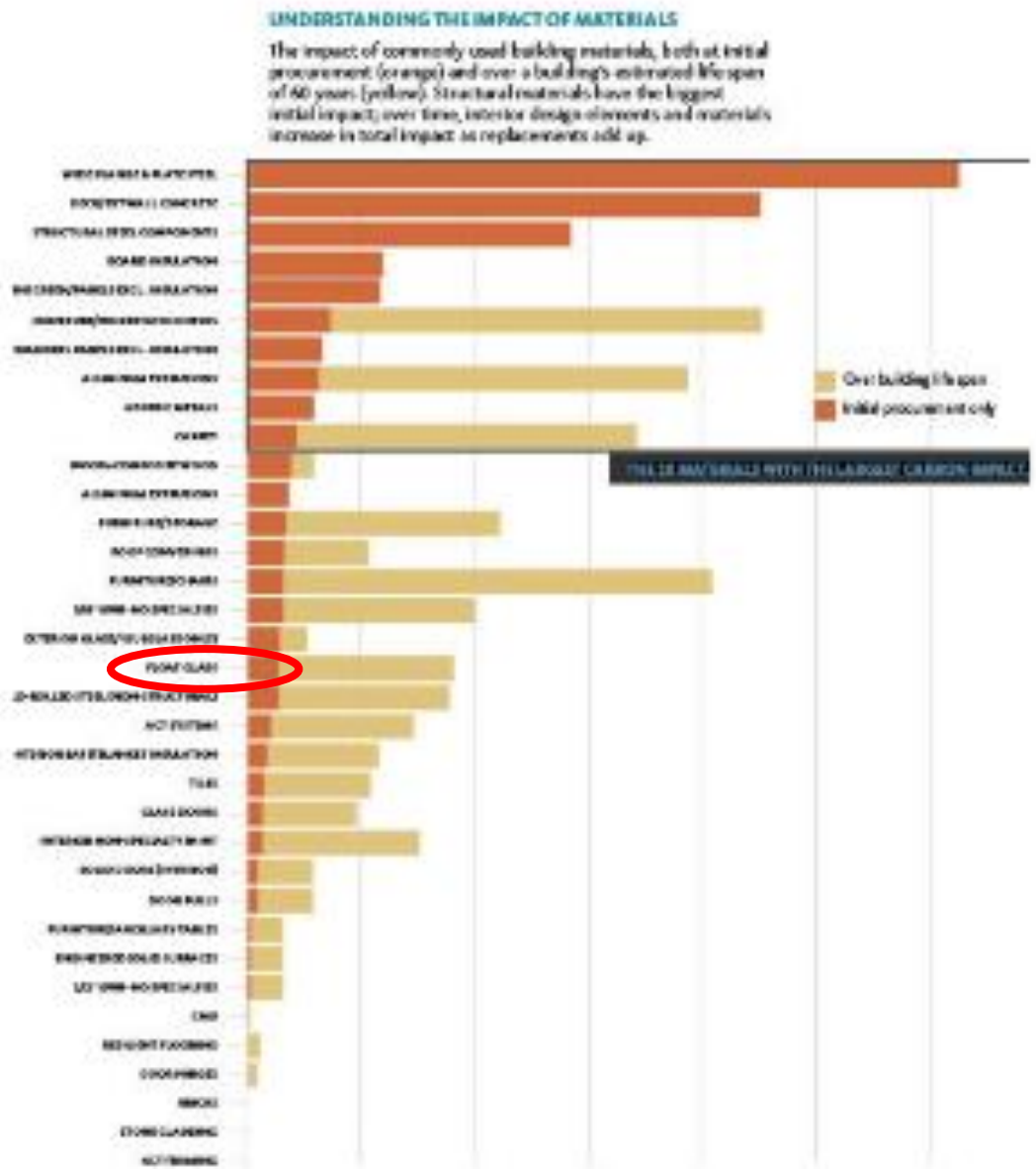
2 lb / week
1st add 50 lbs



Embodied - Glass and window impact

- Glass – skin of building
  - Structural elements - majority



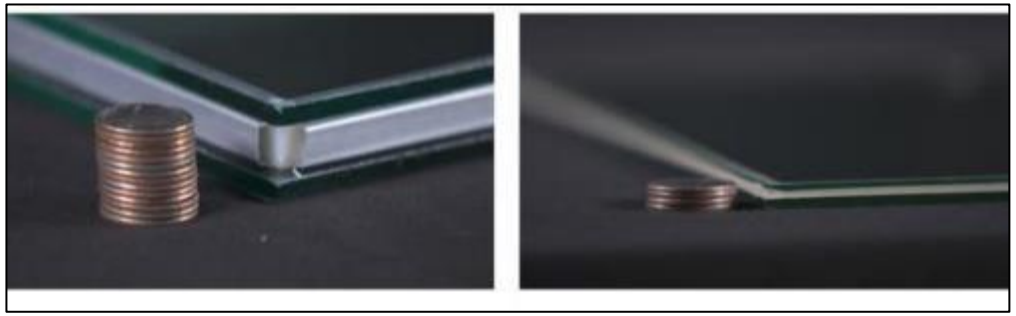


Carbon reduction & reuse

The Kahn

Current operating carbon (metric tons CO2 eq)	1273

	Reglazing with VIG	Storm window (1/4")	Al storm windows (1/4")	Al replacement windows
Embodied carbon total (metric tons CO2 eq)	25	41	59	99
Operating carbon annual savings (metric tons CO2 eq)	-226	-161	-161	-233
Total Y1 carbon impact (metric tons CO2 eq)	-201	-120	-102	-134
Embodied carbon debt payback (months)	1	3	3	5
Breakeven point - Years payback for embodied carbon				11

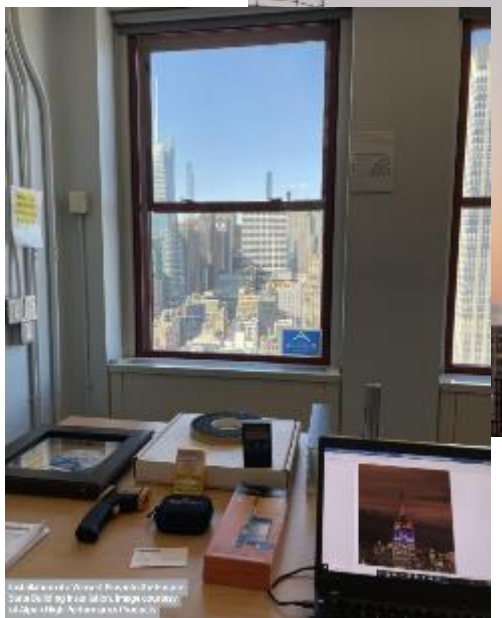


- 1931
- 11 story
- 320,000 ft^2 building, 17,500 ft^2 glazing area
- 700 bronze, double-hung windows, monolithic ¼” glass

Carbon Reduction – Reuse

Secondary Window System

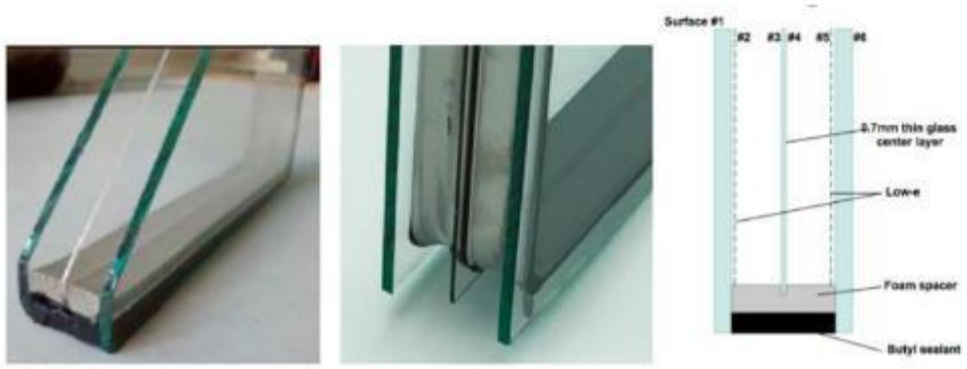
- Addition to existing glazing
  - Reduce operational carbon by improving U-factor and SHGC
- Interior and Exterior Solutions
- Drawback
  - Lose operability



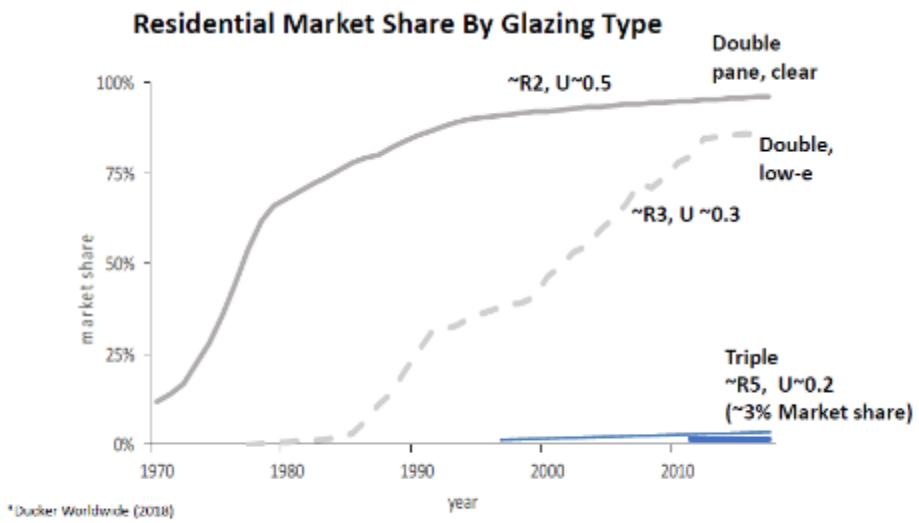
Carbon Reduction – Reduce

Thin Triple IGU

- Improve operational performance
- Thin center lite reduces embodied carbon impacts
  - Fits in standard double IGU system
- Reduce weight compared to traditional triple



Credit – Steve Selkowitz, LBNL

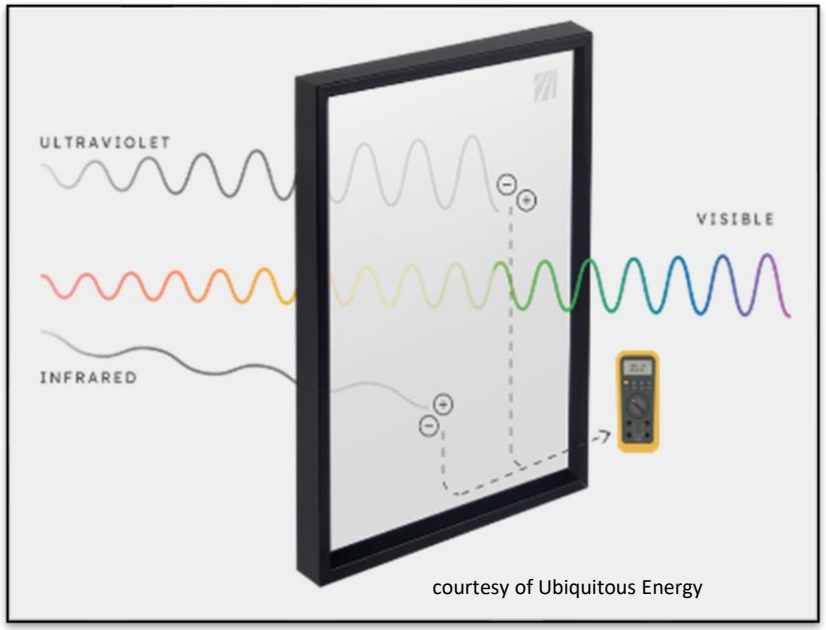


Innovation push tech development → Market Pull: Utilities, Energy Star → Codes and standards

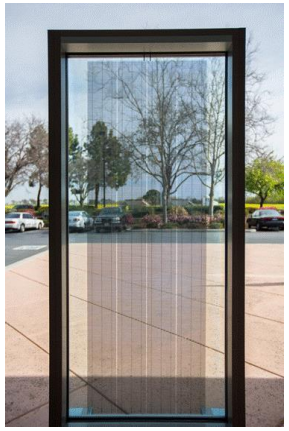
Carbon Reduction – Revitalize

Transparent Photovoltaics

- Rooftop area vs Façade area
- Passive IGU Benefits
- Dynamic Window Area
  - Embodied energy payback
  - Net zero building performance



courtesy of Ubiquitous Energy



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