

# Now is the Time for Advanced Window Solutions

## Why now?

While windows brighten our days and constitute only 10% of the surface area of a typical home, traditional windows are poor energy performers. As the U.S. prioritizes net zero energy buildings, addresses carbon emissions, and confronts the challenges of decarbonizing the grid, there is a pressing need to dramatically increase the availability and use of highly efficient window products.

- ◆ Buildings are responsible for ~40% of U.S. energy use/emissions. Windows are responsible for about 4% of total societal energy use and greenhouse gas (GHG) emissions, or ~4Q of energy. This costs building owners and consumers ~\$50 billion/year.

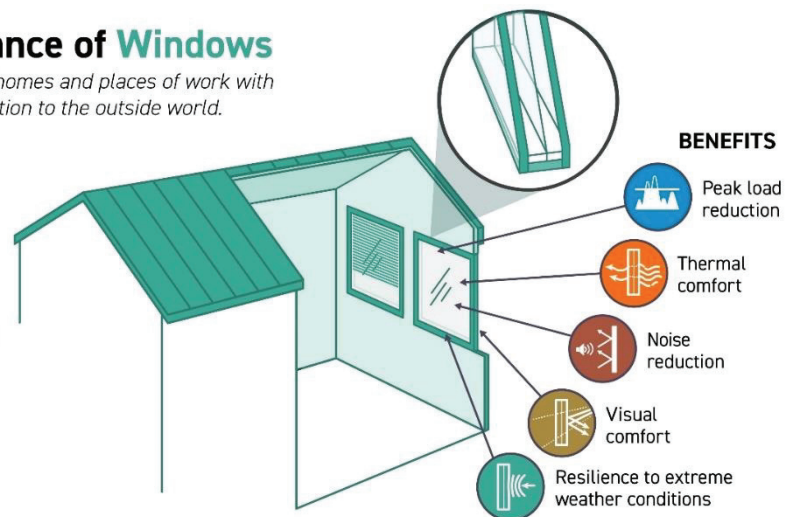
- ◆ Windows usually account for 30-40% of the heat loss in winter, and often add to cooling peaks and discomfort in summer. Switching from today's code-compliant window in a new home to new advanced solutions—a window with R5 insulating power—can save between 7-16% of a home's energy use, and even more in older homes.

### The Importance of Windows

*Windows provide our homes and places of work with light, view, and connection to the outside world.*

**ENERGY USE**

- 25%** of heating and cooling energy use
- 10%** of total building energy use
- 8%** of envelope area, but
- 45%** of envelope heat transfer



- ◆ An updated version of ENERGY STAR® certification for higher performing windows also means that more advanced window specifications will soon be built into building codes and standards.

## The Benefits of Advanced Window Solutions

### Carbon and Energy Reduction

Within buildings, energy use is typically split between HVAC, lighting, hot water, and appliances; however, HVAC is the largest consumer in virtually all building types and climates. HVAC energy use is primarily driven by the thermal properties of the building envelope, where windows are historically the poorest performing elements. Replacing HVAC in buildings without upgrading or replacing window stock requires larger, more expensive heat pumps and more renewables generation, transmission, and storage to power them, and limits the opportunities for decarbonizing heating.

## Cost Reduction

Energy-efficient upgrades to lighting- and cooling-systems, combined with advanced window solutions can yield substantial reductions in peak electricity demand, and offer opportunities for additional cost savings by enabling the downsizing of HVAC systems. Realizing this benefit requires a wholistic, system-level approach that can be pursued during design for new construction or building renovations. The savings from installing smaller HVAC systems can also help offset window upgrade costs.

## Comfort & Health

Noise reduction, increased comfort, and condensation concerns are all important selling points for high-performance windows. To date, there have been more than 50 studies linking various health aspects to daylight, and there is growing scientific evidence of the importance of light on human health and wellbeing.

## The Challenge

Despite significant research and development, window-product technical innovations, market-infrastructure advances, and customer desire for quality windows, the market for higher performing windows solutions has been slow to grow. **The problem appears to be a very fragmented market, despite pockets of innovation and activity.** The fragmentation stems from many issues, including:

- ◆ Manufacturers require higher demand before they invest in scaled production that will lead to subsequent price reductions.
- ◆ The prices for these products remain high and difficult to source for builders and consumers that can afford them, due to limited production.
- ◆ For new construction, supply chain uncertainty has many builders reluctant to broadly shift to high-performance windows even as they acknowledge that buyers appreciate the benefits.
- ◆ Many utilities can't run programs until prices decline because of cost-effectiveness requirements.

## The Solution

The national **Partnership for Advanced Window Solutions (PAWS)** collaborative includes national labs, window and glass manufacturers, trade groups, energy advocates, utilities, and market transformation organizations working together to accelerate the availability of advanced window solutions—including R5 windows and window attachments—and increase their adoption. PAWS creates a more streamlined and efficient channel for market adoption of these solutions by:

- ◆ Realigning and building awareness of work that already exists, finding pathways to socialize and adapt tools, resources, and programs for other regions and partners for policy implementation.
- ◆ Identifying missing components to high-performance windows market transformation efforts to inform new partner programs, and additional market barriers that have not been addressed.
- ◆ Serving as a centralized point of collaboration that builds resources across multiple organizations to help bridge the market gap.

For more information about PAWS or to join the Collaborative, please email [info@PAWS.energy](mailto:info@PAWS.energy).