

## OPPORTUNITY

Windows in U.S. office buildings are responsible for how much cooling energy demand?

**28%**  
**OF COOLING ENERGY DEMAND IS DUE TO HEAT GAIN IN WINDOWS<sup>1</sup>**

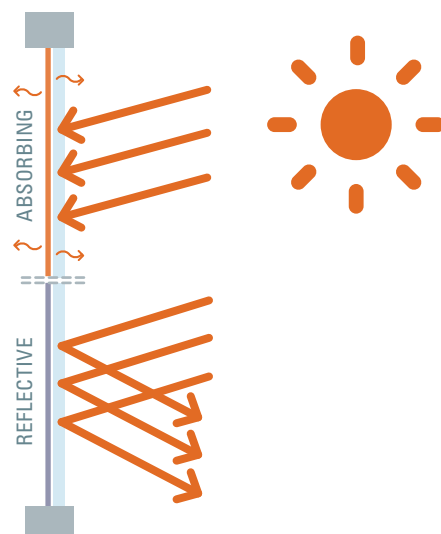
**10 MILLION HOUSEHOLDS**  
equivalent energy use<sup>2</sup>

## TECHNOLOGY

How do Applied Solar-Control Films work?

## REDUCE HEAT GAIN BY ABSORBING OR REFLECTING SOLAR ENERGY

Spectrally-selective films affect only the infrared spectrum, with little impact on the visible appearance of glass



## M&amp;V

Where did Measurement and Verification occur?

**LAWRENCE BERKELEY NATIONAL LABORATORY** assessed a liquid-applied absorbing solar-control film provided by eTime Energy at the Goodfellow Federal Center in St. Louis, Missouri. They also modeled energy performance of both spectrally-selective absorbing and reflective films in warmer climates.

## RESULTS

How did Applied Solar-Control Films perform in M&V?

## GLAZING DEPENDENT

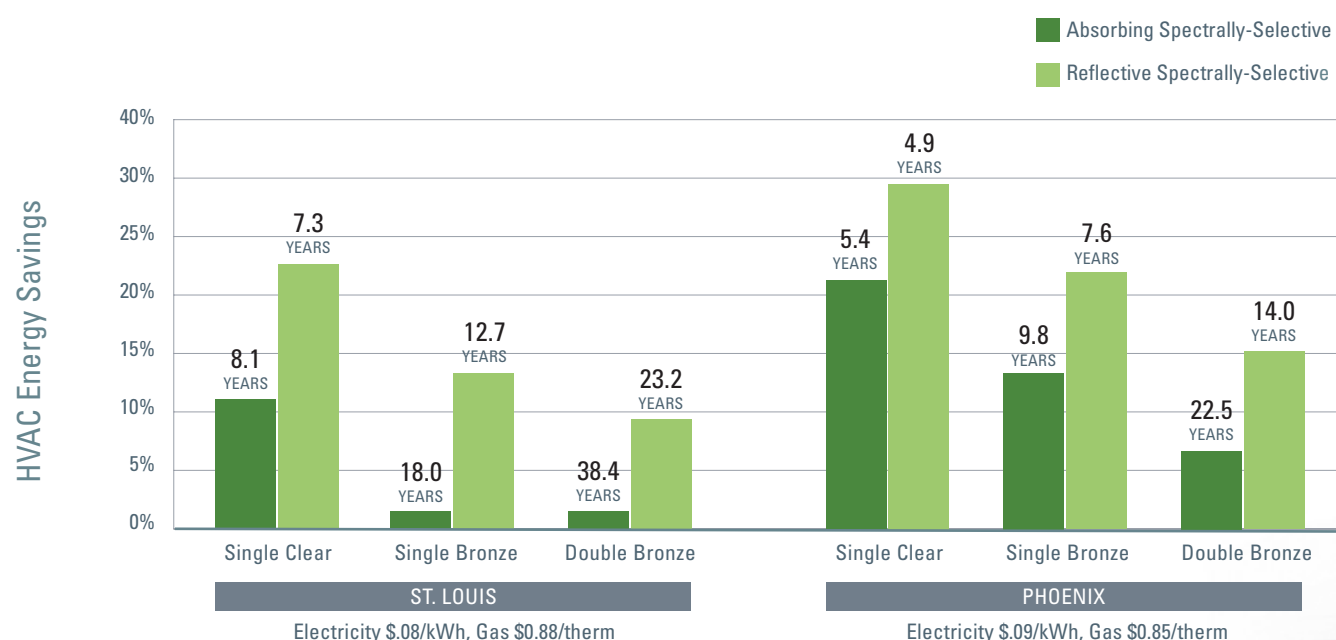
cost-effective for single-pane clear; not recommended for double-pane bronze in most climates<sup>3</sup>

## REFLECTIVE MORE EFFICIENT

up to 29% HVAC energy savings in warmer climates<sup>4</sup>

## Modeled Energy Savings For Range of Base Windows and Climates

Payback for liquid-applied absorbing @ \$8/ft<sup>2</sup> (80% of current cost) and reflective @ \$10/ft<sup>2</sup>



## DEPLOYMENT

Where does M&V recommend deploying Applied Solar-Control Films?

## SINGLE-PANE CLEAR WINDOWS

Target buildings in climates with hot summers and mild winters, exposure to direct sun without exterior shading, and south, east or west orientations.

Reflective film is currently more cost-effective and more broadly recommended. Consider absorbing films for historic buildings where reflected solar radiation might damage exterior wood trim.

<sup>1</sup>Liquid-Applied Absorbing Window Film Retrofit, Charlie Curcija, Howdy Goudey, Robin Mitchell, Leandro Manes, Stephen Selkowitz, LBNL, November 2014, p. 10 <sup>2</sup>Ibid, p.10 <sup>3</sup>Ibid, p.9 <sup>4</sup>Ibid, p.54