A decorative graphic on the left side of the slide. It consists of several vertical orange lines of varying thicknesses and a cluster of five orange circles of different sizes, arranged in a roughly circular pattern. The largest circle is at the top left, with four smaller circles below and to its right.

WINDOW FILM VS. SOLAR PANELS

Geoshield Window Films

www.geoshieldusa.com

HYPOTHESIS

- Window film is more efficient than solar panels per square foot.
 - i.e. through demand side management window film will provide a greater net kWh savings than the same square footage of solar panels can produce in net kWh.



EXPERIMENT- ASSUMPTIONS

- Generally speaking for solar panels, you will need ~ 1 square foot of space for every 10 watts.
- So a 3 kW solar panel system would take ~ 300 square feet; a 4 kW system would take ~ 400 square feet.
- A 3kW solar panel system will produce about 3000 kWh a year.



EXPERIMENT/ PROOF

$300 \text{ sq./ft.} \times *300 \text{ BTU/sq.ft./hr.} = 90,000 \text{ Total Load/hr}$

$90,000 \text{ Total Load/hr} \times *4\text{hr} = 360,000 \text{ Total Daily Load}$

$360,000 \times .75 \text{ SHGC} = 270,000 \text{ BTU/sq.ft., Heat Gain Before}$

$270,000 \times .40 \text{ SHGC} = 108,000 \text{ BTU/sq.ft., Heat Gain After}$

$270,000 - 108,000 = 162,000 \text{ Total Solar Energy Rejected}$

$162,000 / 10 \text{ SEER} = 16,200 \text{ wH or } 16.2 \text{ kWh}$

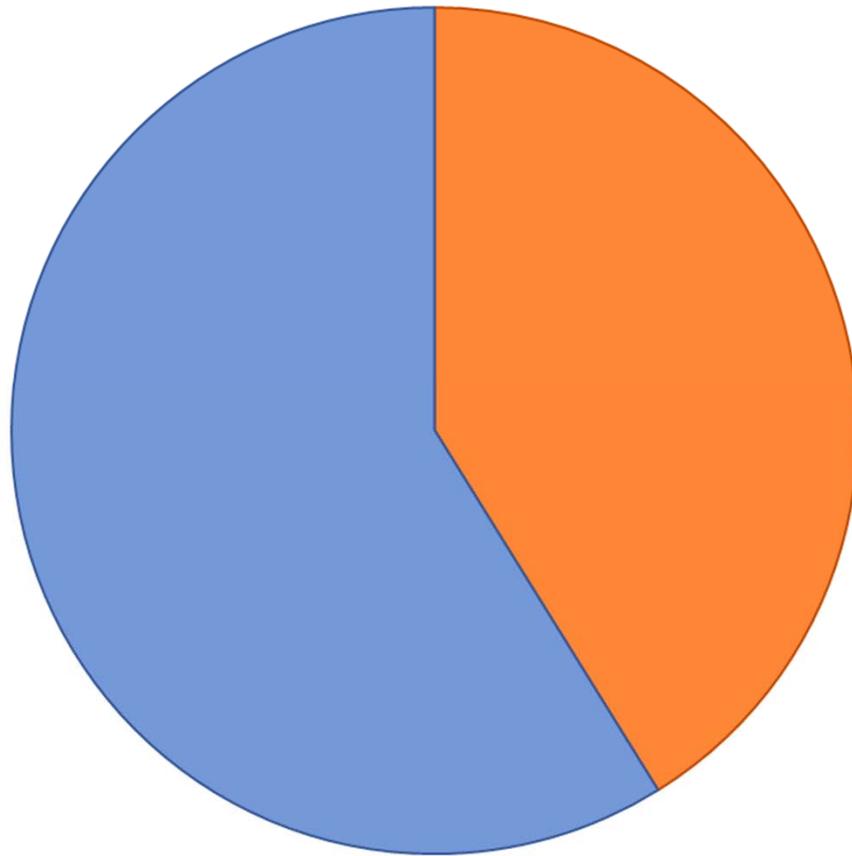
$16.2 \text{ kWh} \times *265 \text{ cooling days} = 4,293 \text{ kWh}$

** Empirical Data Based on ASHRAE Solar Heat Gain Factors*



CONCLUSION

300 sq./ft. net kWh



CONCLUSION

Return On Investment (ROI)=

300 sq./ft. window film cost ~ *\$2,100

4,293 kWh x \$.13= \$558.09 Yearly Savings

\$2,100 / \$558.09= 3.76 Years ROI

3kW or 300 sq./ft. solar panel cost ~ *\$25,000

3,000 kWh x \$.13= \$390.00 Yearly Savings

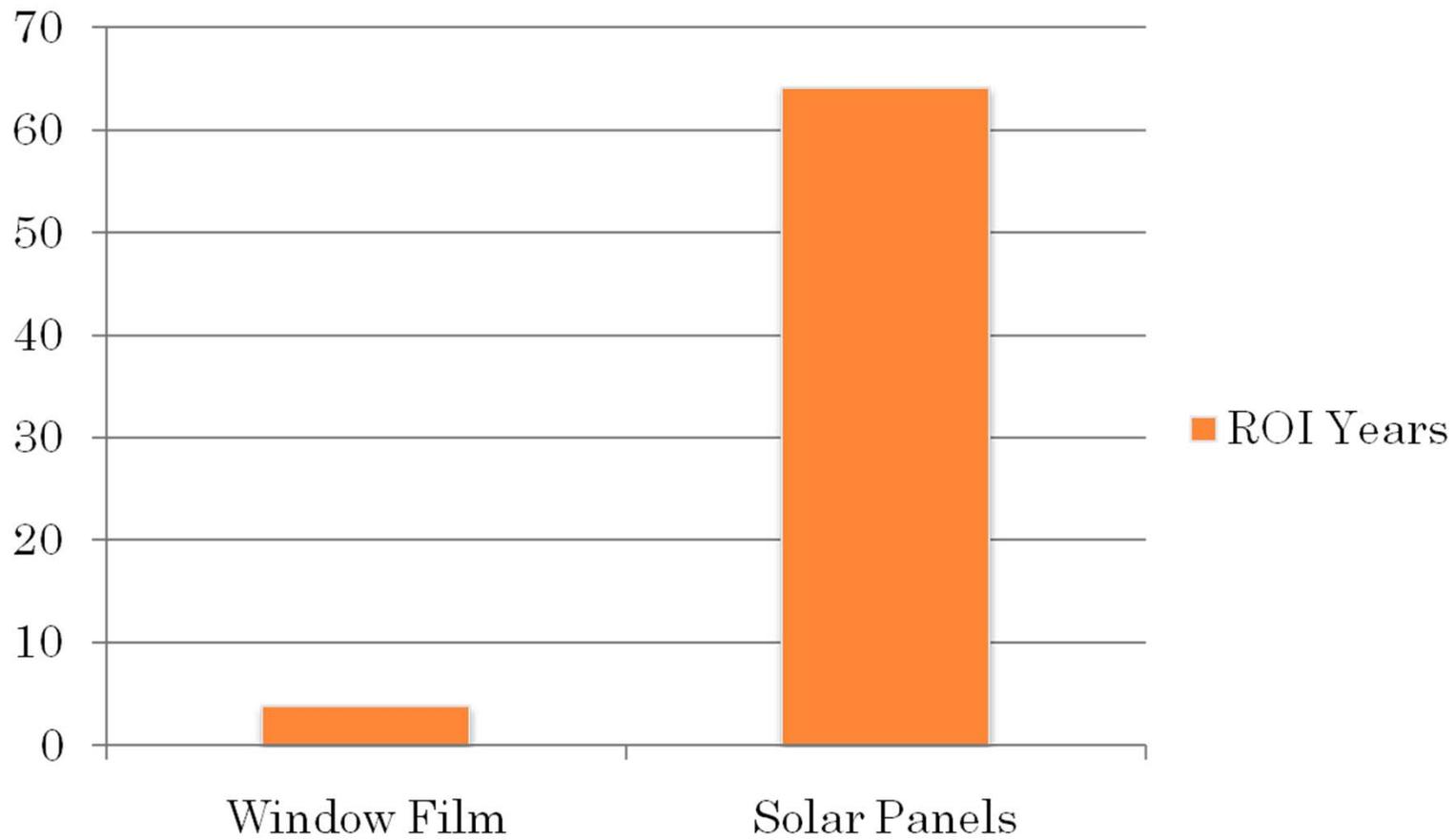
\$25,000 / \$390.00= 64 Years ROI

**Estimated Installed Cost*



CONCLUSION

Return on Investment- Years



THEORY

- Window film is more efficient than solar panels per square foot.
- Window film is 8% the cost of solar panels.
- Window film saves 1.43% more net kWh
- Window film ROI is 17 times greater than solar panels.

