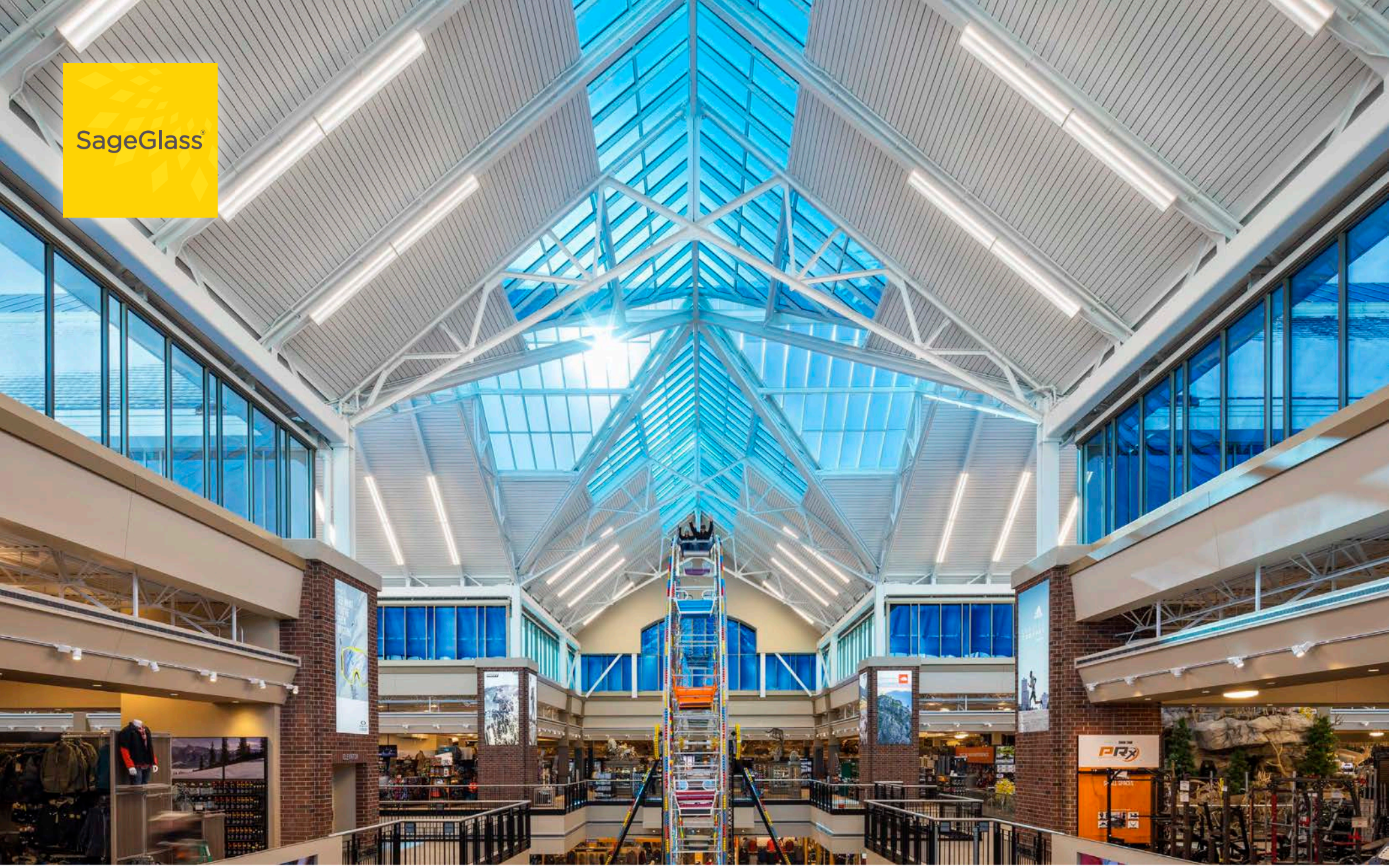


ENERGY SAVINGS STUDY

SCHEELS®

INTRODUCTION

A focus on providing the best retail experience for customers drove Scheels to incorporate smart glass in their new store in Johnstown, Colorado. Scheels is an employee owned and operated sporting goods and entertainment chain with 27 stores in 12 states. Their signature building style features large roof skylights, inviting glazed entrances, and punched openings designed to offer plenty of daylight and views for customers and staff.

Unfortunately, traditional glazing solutions used in previous Scheels locations created interior spaces that were too bright at certain times of day. Scheels considered installing mechanized shades, a traditional solution to glare issues, but decided against using them because they would obstruct the view and wouldn't solve the problem of unwanted heat gain.

Scheels turned to a smart glazing system to solve their heat and glare issues. Smart glass tints automatically in response to the sun and outdoor conditions to prevent heat gain and glare and maintain unobstructed views to the outdoors. Smart glass includes sensors and intelligent controls and can be used in facades, curtain walls, and skylights.

While occupant comfort was the key factor driving the use of smart glass in the Johnstown, Colorado location, increasing the energy performance of the building was also important. Better insulation, LED lighting, enhanced building automation HVAC controls and smart glass were used in combination to increase building performance and energy savings. In their first year of operation, Johnstown Scheels benefited from a **73% decrease in electricity consumption** when compared to a comparable Scheels location in Overland Park, Kansas.

COMPARISON

In order to quantify the energy savings resulting from the strategies used to increase building performance, we looked at the following factors:

	OVERLAND PARK	JOHNSTOWN
Building Size	220,000ft^2	250,000ft^2
Glazing Area	25,000 ft^2	28,000 ft^2
Glazing Type	Static glass	Smart glass
Building Orientation	North-facing	West-Facing
Climate	Similar	Similar
Solar Angles	Similar	Similar
HVAC Size	686.85 tons	707.6 tons
Hours of Operation	68 per week	65.5 per week
Lighting	Fluorescent	LED
Lighting Control	Manually Dimmed	Automatic Dimming
Building Insulation	Continuous 1"	Continuous 1.5"

SIMILARITIES INCLUDE:

- Overall building size and glazed area
- Usage patterns and hours of operation
- Climate and sky conditions
- HVAC size

DIFFERENCES INCLUDE:

- Smart glazing vs. static glazing
- Better insulation at Johnstown
- LED lights on dimmers at Johnstown vs. fluorescent "always on" at Overland Park
- Building orientation

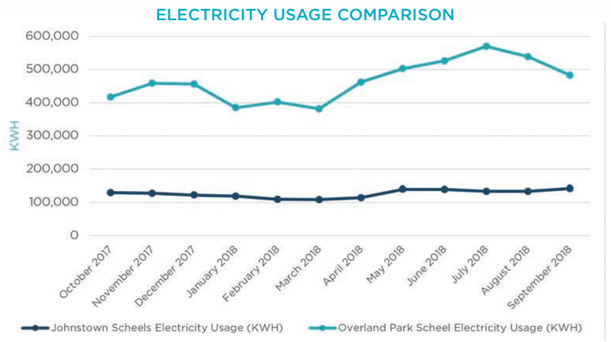
KEY FACTORS OF ENERGY-SAVINGS

- More Efficient Lighting
- Smart Glass
- 0.5" More Continuous Insulation

Building orientation, different by 90 degrees, would naturally expose the Johnstown location's extensively glazed west-facing entrance to more sun and heat than the equivalently glazed north-facing entrance at the Overland Park location. It would increase the amount of potential heat-gain and glare at Johnstown and would result in more tinting of the smart glass in the afternoon.

ENERGY SAVINGS

When comparing electricity usage between the two locations over a period of one year, the Johnstown location experienced a 73% reduction in electricity consumption. On average, Scheels reduced their electricity consumption by 338,329 KWH per month. This amounted to an average monthly savings of $40,599 (calculated by assuming a cost of $0.12 per KWH). That's $487,193 saved in their first year of operation.



73% LESS ENERGY CONSUMPTION

$487,193 ENERGY COST SAVINGS

Apportioning the total energy savings among the different measures was not possible in this instance. However, it is fair to say that smart glass is a valuable part of a comprehensive solution for managing heat-gain and glare, and contributes to the energy-efficiency of buildings like the Johnstown Scheels location. More importantly, it shows the power of a taking a holistic, system-level approach to energy saving, using synergistic measures, to deliver significant energy savings. SageGlass is now used as the basis of design for all future Scheels buildings and is a key part of a broader strategy to reduce energy consumption.

Given its ability to improve thermal and visual comfort for occupants, and offer unobstructed views of the outdoors, smart glass is an ideal glazing solution for retail environments. It is also a key driver of energy savings in buildings with large skylights or high window-to-wall ratios and can be used in concert with other energy saving measures to create more sustainable, cost-effective buildings.

APPENDIX: ENERGY USE DATA

	OVERLAND PARK ELECTRICITY USAGE (KWH)	JOHNSTOWN ELECTRICITY USAGE (KWH)	DIFFERENCE IN ELECTRICITY USAGE
October 2017	417,013	129,900	(287,113)
November 2017	458,290	128,100	(330,190)
December 2017	455,870	122,400	(333,470)
January 2018	384,707	119,400	(265,307)
February 2018	402,033	109,500	(292,533)
March 2018	381,620	108,900	(272,720)
April 2018	461,622	114,600	(347,022)
May 2018	502,493	139,800	(362,693)
June 2018	526,184	139,500	(386,684)
July 2018	569,899	133,500	(436,399)
August 2018	538,547	133,500	(405,047)
September 2018	482,967	142,200	(340,767)
TOTAL ELECTRICITY CONSUMPTION	**5,581,245**	**1,521,300**	**(4,059,945)**
TOTAL COST	**$669,749**	**$182,556**	**($487,014)**

SageGlass® is the pioneer of the world's smartest dynamic glass. Electronically tintable SageGlass tints or clears automatically to optimize daylight levels while preventing heat and glare without the need for blinds or shades. SageGlass delivers superior comfort, enhances occupant well-being and saves energy. As part of Saint-Gobain, SageGlass is backed by more than 350 years of building science expertise that only the world leader in sustainable environments can provide.

To learn more about the SageGlass installation at SCHEELS, visit:
sageglass.com/scheels

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