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Title: Made in the Shade - Advocating for Automation of Shading in Existing Buildings

Abstract: Glass is a static solution to a dynamic situation. We set thermostats that automate the heating and cooling of indoor spaces, and electric light can automatically respond to occupancy and daylight variables, but the automation of natural light remains largely untouched. Yet windows are one of the most critical building design components in relation to occupant comfort and satisfaction. Windows can provide connectivity with nature - both light and views - and they also affect our comfort and work performance based on glare and heat gain or loss. Shading has been used for thousands of years as a method to alter building apertures primarily modified by the behavior of the occupant. In modern U.S. buildings the presence of shading is either structural, such as exterior window overhangs or the interior use of manual shades or blinds. But a 2017 study by University of Oregon found that 51% of occupants did not change their window shades position even once, 20% adjust the shades about once annually, and 24% were seasonal users - leaving only 6% as actively adjusting shades daily. The dynamic nature of the sun's daily and seasonal migration intersecting with the building design, window properties and the space occupant space configuration create a complicated intersection of temperature, light and comfort.

Automated shading can provide benefits to the occupant if designed with the ability for occupant preferences and modifications or overrides to default settings. In addition, the control of electric lighting and heat gain/loss through automated shading can have significant energy savings that support energy and carbon targets as well as benefiting the owner's operational costs. This presentation will introduce these topics and then share fascinating findings from a CEC EPIC research project with lab and field study of a new shading device that solves three key industry issues through its design. This innovative design provides 1) separation of the top section for daylight provision into the space and interaction with the electric lighting sensors, 2) the bottom 'view' portion of the window allows occupant and operator preferences in response to glare and heat, and 3) wireless communication significantly reduces cost. Creating existing building retrofit solutions that are low-occupant disruption and solve energy, occupant and owner issues is a critical piece for Scaling Up climate solutions.