

Shedding Light on Adjustable Wattage Fixtures Verification

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Objectives

Adjustable wattage fixtures (AWF) are becoming more prominent in the lighting market. In adjustable wattage fixtures, installers or customers can modify the fixture's wattage from maximum specification sheet wattage. This has a direct impact on the energy usage of AWF and can affect the accuracy of energy savings calculations. Despite these implications, differences in installed and maximum setpoint fixture wattages of AWFs are not commonly verified or reported. Further, there is insufficient guidance on how to verify the installed wattage for adjustable fixtures. The objectives of this research are to: 1) quantify discrepancies between maximum and installed fixture wattages post-installation; 2) assess whether customers modify fixture wattage after installation or project closeout, and identify trends related to this behavior; and 3) provide actionable recommendations to improve the accuracy energy savings estimates.

Methodology

The study examines a sample of 130 commercial and industrial downstream and midstream lighting projects, implemented by Energy Trust of Oregon's Business Lighting program. In downstream projects, lighting incentives are administered to customers upon installation. We extracted installed wattages and maximum setpoint wattages from specification sheets for fixtures identified as AWFs. For midstream projects, point-of-sale incentives are paid to customers that purchase lighting from select distributors. Fixture installation information and wattage data are generally not reported, so we contacted over 500 customers to gather information on fixture installation wattage and post-installation wattage adjustments. Our final sample includes 70 downstream lighting and 60 midstream lighting projects that installed over 152 unique measure types across five fixture categories: LED fixture or kits, exterior LED fixtures, interior fixtures with Luminaire-Level Lighting Controls (LLLC), and high and low-bay fixtures.

Findings

Adjustable wattage fixtures appear in 54% of sampled downstream projects, representing 38% of installed fixtures. Adoption of AWFs is higher by measure count in commercial projects, but industrial projects use more AWFs by fixture volume. The majority (81%) of these fixtures have three different wattage setpoints, with 60% of unique installations set below the maximum wattage. Adjustable wattages were more commonly installed within exterior LED fixtures than other fixture types. All sampled midstream projects included adjustable wattage fixtures, and most customers (83%) were aware that the fixtures purchased were adjustable. Like downstream projects, 60% of fixtures in midstream projects are set below their maximum wattage setpoint. Most midstream customers indicated they selected adjustable wattage fixtures based on installers' recommendations and seldom adjusted wattages post-installation (13%).

The observed differences between installed and maximum wattage setpoints suggest that verifying installation wattage or dimming setpoints could enhance the accuracy of ex-ante installed wattage estimates and ex-post energy savings, informing cost-effectiveness. In July 2024, the downstream lighting program introduced guidance requiring lighting installers to report installation wattage and adjustments, resulting in improved alignment between actual and reported wattage. Given that midstream projects receive incentives before installation, it may be necessary to work with installers—who know the fixtures can be adjusted and often recommend them—to collect and verify installation wattage to ensure energy savings are calculated accurately, particularly for exterior LED fixtures that more commonly use adjustable wattage.

