ELECTRIC LIGHTING
PERFORMANCE
Talking Points

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Personal control of an individual's lighting system leads to higher satisfaction and typically a reduction in energy consumption

- Participants with personal control expressed significantly higher satisfaction (Newsham et. al., 2009).
- Participants with personal control expressed significantly lower distraction from changes in temperature and acoustic conditions (Newsham et. al., 2009).
- The use of personal controls reduces energy use of building services 10% (Newsham et. al., 2009).
- In Escuyer and Fontoynont's [16] study, the main reasons participants mentioned that they preferred manual over automatic lighting controls were to benefit from daylighting, reduce energy, and to relieve their eye-strain caused by a high lighting level (Gilani & O'Brien, 2018).
- As related to CCT, females' negative mood decreased in the warm and increased in the cool white light source. Males' negative mood, on the contrary, increased dramatically in the warm compared to the cool condition (Baron et. al., 1992).
- Based on the meta-analysis, the best estimates of average energy savings potential are 24% for occupancy, 28% for daylighting, 31% for personal tuning, 36% for institutional tuning, and 38% for multiple approaches (Williams et. al., 2011).
- The amount of light that is best differs from one person to another as well as the tasks they want to get done. That's why the best solution is to opt for variable or flexible lighting, which allows one to dim overhead lights as well as provide individual light and lamps that can be turned on or off based on a person's preference or task (Luenendonk, 2019).

A comfortable and high-quality visual and luminous environment increases building occupant productivity and leads to increased organizational financial performance

- Seeing lighting change as a change process can give us a more realistic picture than just comparing different lighting conditions. We recommend that this viewpoint be used more often when lighting in general is discussed. It also provides non-lighting professionals with some possibilities for estimating the meaning of lighting and lighting change (e.g. investors). Seeing lighting change as a process with several mechanisms, which are partly "light related mechanisms" and partly general change mechanisms, will help them to estimate whether a lighting change is worth the investment (Juslén & Tenner, 2005).
- A lighting change that improves visual comfort, such as a decrease of discomfort glare, yields a higher performance by reducing a disturbing factor present in the environment (Juslén & Tenner, 2005).
- Harsh overhead office lighting is usually one of the causes of migraines and headaches. If any employee experiences headaches or migraines during their work, it could cause them discomfort, which prevents them from feeling productive or motivated (Luenendonk, 2019).

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Improved lighting design within a workplace can boost alertness and increase productivity

- Utilizing a fully autonomous lighting system can reduce user error and provide lighting in a more natural way (Cupkova et. al., 2019).
- Utilizing blue-enriched bright white light during the day promotes nonvisual effects such as alertness, performance, and reduces fatigue (Viola et. al., 2008).
- The data show that blue-enriched white lighting in offices, when compared with white office lighting, has beneficial effects on daytime alertness, performance, mood, and eye strain, as well as on nighttime sleep quality and duration (Viola et. al., 2008).
- A lighting intervention in a classroom lead to increased Oral Reading Fluency scores (Mott et. al., 2014)
- Increasing the illuminance levels can boost office productivity, especially during the winter months. At 1200 lux, the speed of manual assembly was higher than at 800 lux. The effect was a 2.9% increase of production speed in the summer and a 3.1% increase in the winter (Juslén et. al., 2007).
- Furthermore, recent fMRI studies have shown that daytime exposure to blue light, when compared with green (20) or violet (21) light, is more effective in enhancing responses to a memory task in several cortical, thalamic, and brain stem areas (Keis et. al., 2014).

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