

## Task 61

# Integrated Solutions for Daylighting and Electric Lighting



The SHC Programme finalized its work on *Integrated Solutions for Daylighting and Electric Lighting* (SHC Task 61/EBC Annex 77) in November. To learn first-hand about the Task's impact on lighting, we asked Jan de Boer, the Task Operating Agent, to share some of his thoughts on this 3.5-year project.

### Why was a project like this needed?

**Jan de Boer (Jan):** The IEA SHC Programme took on this project for a couple of reasons. First, a focus purely on LEDs for optimizing lighting efficiency is not enough. Second, the potential in the fast-moving field of improving lighting controls and daylight integration was not being adequately addressed. And third, electric lighting and daylighting are typically dealt with by two separate communities and market sectors. The opportunity, and need, we saw was a project focused on integrating these two areas at the research and the industry levels. Lighting solutions and performance depend to quite a significant extent on regional aspects, like daylight availability, cultural appreciations of light, and technological standards. So, what better means to address these topics than by tapping into the broad international IEA SHC network of member countries and experts.

### What is the current status of the technology?

**Jan:** The transition to a LED market is basically done – products are highly efficient, spectra are improved, and costs have dropped. As a result, mercury-based fluorescent lamps are starting to be banned through regulations. In terms of product development, there are now products for lighting controls and integrating non-lighting features into fixtures, for example, for indoor navigation, both of which are seeing prices drop. On the daylight and glazing side, glass parameters are very much dominated by the thermal side; nevertheless, today's 2- or 3-pane

glazing units are optimized for high visual transmission and good color rendering. As for sun shading and glare protection, satisfactory solutions are available for some but far for all relevant applications.

### Is there one result that surprised you?

**Jan:** Yes, it is how low we can now get the end energy with correctly installed installations. Down to 4 kWh/m<sup>2</sup>a end energy for lighting is possible for office situations, as demonstrated in our field studies. Nevertheless, all the bits and pieces of a lighting concept have to work together in an optimal way, which means it is still far from being the standard. But it does set a benchmark.

### Do you have a Task success story from an end-user or industry to share?

**Jan:** An actively participating sun protection manufacturer has recognized the immense relevance and added value of integration with the artificial lighting industry. Building on this, stronger collaboration with the lighting industry is being sought, and joint developments on integrated systems implemented.

### What is the future of the technology – new developments, markets, policies, etc.?

**Jan:** Lighting is not just one technology delivering one service like a radiator delivering heat. Lighting has to be designed specifically for the multi-criteria user needs, that is, for what people are doing and in which context. The importance of this is underlined by the fact that humans acquire 80-90% of their information via their eyes.

That said, knowledge on the non-visual perception of light (radiation perceived) also is critical, and this area is still growing and will need to be better integrated into design processes, standards, and lighting controls. For example, controls managing workplace light directly in the field of vision is an upcoming area. With regard to façade technology, a big disruptive step might be on the brink in the field of switchable glazing systems. Micro-optics will offer new design options that are more resource-efficient for LED luminaires and façade applications.

### What were the benefits of running this as an IEA SHC Task?

**Jan:** By going via the IEA SHC research platform, access was granted to a very well-established network of experts, each of course linked to their national research agendas but contributing to the bigger picture of the Task's work plan. Because of this, Task experts and countries benefitted from sharing knowledge – IEA SHC served as a big multiplier. The longevity of the Programme is a strong "plus," particularly for this Task as some experts go back to earlier Tasks (Tasks 21, 31, 50). That means more than 20 years of IEA SHC Task experience for some experts. This level of experience is quite unique in today's fast-changing world. And it is hard to go wrong by bringing research and practice together in a good way. The Programme offers a well-established infrastructure to support the Task's management, organization, and dissemination of results. The IEA SHC definitely is a brand that opens doors and attracts attention, for example, for workshops and other public events.

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### Will we see more work in this area in the IEA SHC Programme?

**Jan:** As is often the case, answering questions in one project inevitably brings up new questions. Lighting requirements, technology, and design constraints all have to be addressed and optimized as a whole

along the lighting value chain. And what that means is that we have to reorganize our understanding of efficient lighting in the context of the big global trends – decarbonization by means of digitalization on all levels. Therefore, I guess ‘Yes’ is the answer to this question. As a matter of fact, the Task 6I participants submitted

a proposal for a new IEA SHC Task just last month. So, if you are interested in contributing to the Task definition work or learning more, you can email me at [jan.deboer@ibp.fraunhofer.de](mailto:jan.deboer@ibp.fraunhofer.de).