SOLAR HEATING & COOLING PROGRAMME
INTERNATIONAL ENERGY AGENCY

2023 HIGHLIGHTS

SHC Task 70 / EBC Annex 90 – Low Carbon, High Comfort Integrated Lighting

THE ISSUE

Lighting accounts for 5% of the global CO2 emissions and its carbon footprint has a significant impact on global warming. In the transition to mainly electricity-based energy systems, lighting, with 15% of the electrical energy consumption, is in strong competition with other existing and new consumers, e.g., e-mobility or heat pumps. With rising electricity prices and steadily higher directly taxed CO2 emissions, lighting costs also will increase significantly.

To make today's high comfort lighting installations more efficient, the consumption of electric lighting systems must be cut further, and daylighting used better. Embodied energy for electricity and daylighting—façade technology—must be taken into account. And the rating perspective of lighting solutions widened to a more holistic view of its CO2 emissions impact, encompassing the whole life cycle (the “lighting value chain”) and in the context of regional energy markets and interaction with other building trades, etc., is urgently needed. This goes far beyond pure LED lamp-driven efficiency gains and has significant potential.

OUR WORK

SHC Task 70/EBC Annex 90 is working to identify and support implementing the potentials of lighting (electric, façade: daylighting & passive solar) in the decarbonization on a global perspective while aligning the new integrative understanding of humans’ light needs with digitized lighting on a building and a building related urban scale:

- Supporting a broader view of lighting solutions in decarbonization. Bridging the gap between a component view and design-oriented system approaches. Supporting the transition from an energy-focus to an LCA perspective. Identifying key impact factors and developing effective strategies and roadmaps while including regional specifics.
- Contextualizing with the fast-developing digitization of buildings/lighting installations on the technology, design, and operational side.
- Aligning with the growing understanding of user needs and building upon past SHC Task results. Integrating different players (electric lighting, façade, industry, controls) in workshops and projects.
- Creating added value by transferring into standards, regulations, and building certificates.

Participating Countries

Australia
Austria
Belgium
Brazil
China
Denmark
Germany
Italy
Japan
Norway
SACREEE
South Africa
Spain
Sweden
Netherlands
Türkiye
United States
United Kingdom

Task Period	2023 – 2026
Task Leader	Jan de Boer, Fraunhofer IBP, Germany
Email	jan.deBoer@ibp.fraunhofer.de
Website	task70.iea-shc.org

KEY RESULTS IN 2023

Task kick-off

SHC Task 70 / EBC Annex 90 started with two well-attended industry workshops in conjunction with the expert meetings in Aversa, Italy, in the spring and London, UK, in the fall of 2023. Contributions from lighting, façade and control system manufacturers, lighting and building designers, and authorities were combined with presentations from several Task experts. Deep insights into how stakeholders tackle sustainable integrated lighting solutions were given and discussed from different perspectives.



Making the right decisions now! A new guideline on lighting retrofits

The new IEA SHC *LED Guideline for the Promotion of Lighting Retrofitting* provides suggestions for accelerating the replacement of old lighting systems, harvesting the "low hanging fruits," and managing daylight. Lighting is responsible for about 15% of electricity consumption and about 5% of global CO2 emissions, so it needs to be brought up to date with climate protection, energy sovereignty, and economic efficiency while ensuring user comfort.



In new buildings, almost only LED systems are being designed. However, in existing buildings, many have not yet been converted to LED technology despite offering great and often easy-to-develop climate protection potential — so-called "low hanging fruits." With the conversion forced by the phasing out of fluorescent lamps (e.g., by 2023 in the EU), the main question is whether "transitional solutions" in the form of LED replacement lamps make sense or whether it would be better to switch to more powerful LED lights right away. When answering this question, the focus should not be solely on the high efficiency of the LEDs but also on new control options and the most sustainable light source, daylight. Download the LED Guideline for the Promotion of Lighting Retrofitting and other Task reports when published for free at https://task70.iea-shc.org/publications.