Bartenbach
research & development

IEA SHC Task 61 / EBC Annex 77

Integrated Solutions for Daylight and Electric Lighting

From component to user centered system efficiency

Bartenbach research & development

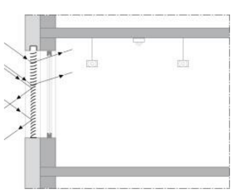
SOLAR HEATING & COOLING PROGRAMME
INTERNATIONAL ENERGY AGENCY

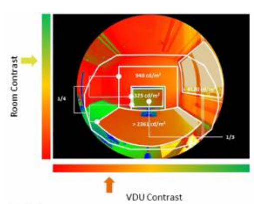
EBC
Energy in Buildings and Communities Programme

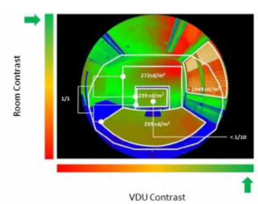
IEA FORSCHUNGSKOOPERATION

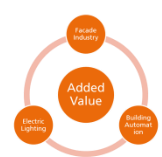
FFG Forschung wirkt.

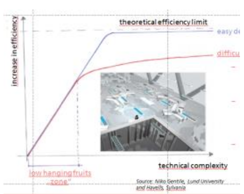
Bundesministerium Verkehr, Innovation und Technologie











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IEA SHC Task 61 / EBC Annex 77

Integrated solutions for daylight and electric lighting

From component to user centered system efficiency

Operating Agent: J. de Boer, Germany

Subtask A
B. Matusiak, Norway

User Perspective, Requirements

Subtask B
M. Fontoynont, Denmark

Integration and optimization of daylight and electric lighting

Subtask C
D. Geisler-Moroder, Austria

Design support for practioners

(Tools, Standards, Guidelines)

Subtask D
N. Gentile, Sweden

W. Osterhaus, Denmark

Lab and field study performance tracking

Joint Working Group
- Evaluation method for integrated lighting solutions
- Virtual reality (VR) based Decision Guide

Belgien, Brasilien, China, Dänemark, Deutschland, Italien, Japan, Niederlande, Norwegen, Österreich, Schweden, Schweiz, Singapur, Slowakei, USA

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Subtask A: User Perspective, Requirements

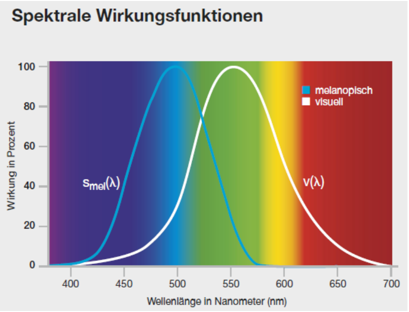
Coordination: Barbara Matusiak, NTNU, Norway

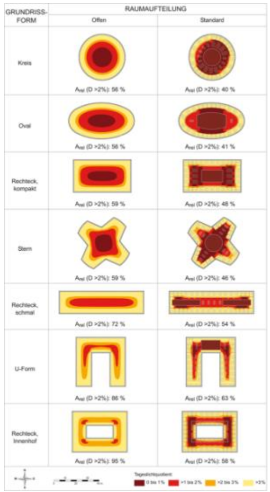
Objective: Consolidation of available knowledge on user-, activity- and time-depending visual and non-visual *requirements* including cultural and climatic dependencies. Set up *use cases* in specific applications, reflecting typical temporal changes in the usage of these interior spaces. Aggregation in so called *personas* as representations of the behaviour of a hypothesized group of users in the defined applications.

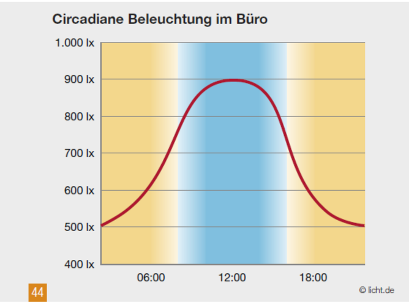
A.1 User requirements

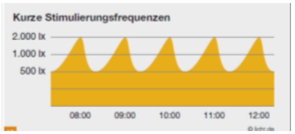
A.2 Use Cases

A.3 Representation of user behaviour - personas









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Subtask B: Integration and optimization of day- and electric lighting

Coordination: Marc Fontoynont, SBI, Denmark

Objective: Identify the promising technical solutions to offer optimal control of lighting and daylighting components, with respect to minimum use of lighting electricity, maximum satisfaction of users, most attractive user interface (users and facility managers)

B.1 Interview of professionals: opportunities and barriers

B.2 Critical review of existing control systems and their functionalities

B.3 Critical review of new approaches under development

B.4 Review of other important aspects affecting performance of controls

B.5 Critical analysis of interfaces

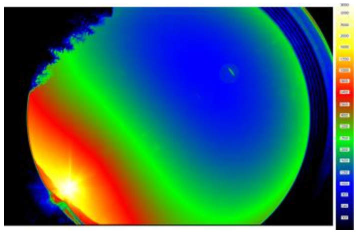
B.6 Link with standardization activities

New technology	Benefits / interest
Miniaturisation of sensors, integrated sensors	Ability to read more relevant information locally, to offer a better fit with the demand of the users and facility managers
Use of LED in DC power supply	Ability to control each luminaire individually, and dim power progressively Ability to vary spectrum of light according to time of day and specific requirement of users (for example elderly, of people with specific visual handicap)
Wireless controls	Reduction of costs of installations Possibility to keep installation future proof (allowing modification of indoor space management)
Internet of Things	Link to internet can facilitate management of lighting sources with data flow upstream and downstream Management can also integrate external information (climatic conditions, variable cost of electricity, etc.) (Security issues have to be addressed)
Interface on tablets and smart phones	User friendly, mobile interface which could be used anywhere High quality graphics and possibility to ease operation: make the system fully understood.
Electrochromic glazing	Possibility to control freely daylight penetration, glare control, under various sections of the facade glazing.
Silent electric motors	Can operate blinds systems and any active daylighting systems more continuously and silently, to increase satisfaction by users
PoE (Power over Ethernet), DC-nets, driver-less/central hub solutions etc	New power technologies may call for new definitions of system components etc.
Built-in light sources	LED light sources can be integrated in other building components such as ceiling or wall modules.

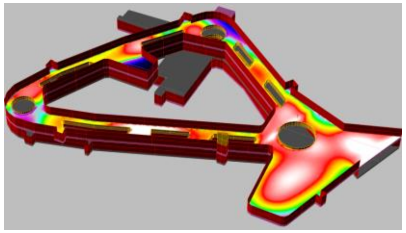
Subtask C: Design Support for practitioners

Coordination: David Geisler-Moroder, Bartenbach, Austria

Objective: Focus on the application of technical innovations in the field of integrated lighting solutions in practitioners' workflows. Bring findings onto the desktops of designers by integration into widely used software tools, standards and codes, and design guidelines.

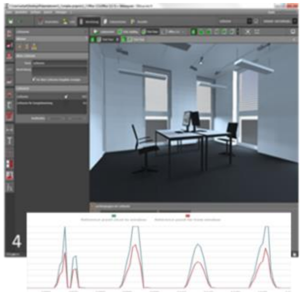


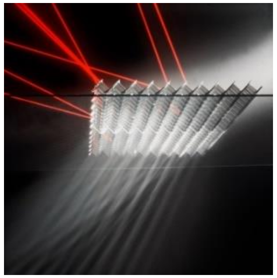
C.1 Review of state of the art design workflows



C.2 Standardization of BSDF daylight system characterization

C.3 Spectral sky models for advanced daylight simulations





C.4 Hourly rating method for integrated solutions

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Subtask D: Lab and Field Study Performance Tracking

Coordination: Niko Gentile, Lund University, Sweden; Werner Osterhaus, Aarhus University, Denmark

Objective: Demonstrate and assess typically applied concepts for integrated daylighting and electric lighting design by medium-term experiments in live-labs, supplemented by short-term investigations in controlled research laboratory environments, as well as performance tracking in “real” field studies.

D.1 Literature Survey: Quantifying Potential Energy Savings

D.2 Monitoring protocol

D.3 Case Studies: Living Laboratories and Real Buildings

D.4 Lessons Learned – Guidance to Decision Makers

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Joint Working Group: Evaluation tool & VR Decision Guide

Coordination:
Marc Fontoynont, Aalborg University, Denmark; Jan de Boer, Fraunhofer Institute of Building Physics, Germany

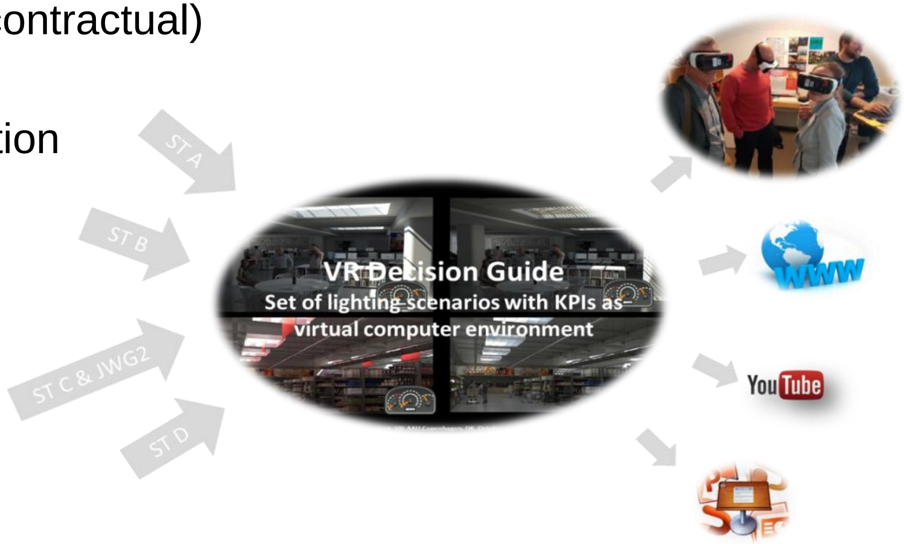
Objective:

The joint working group shall integrate and focus main results of the subtasks and look for an appropriate implementation

1. Evaluation / rating tool (hourly based) for integrated lighting solutions for implementation in standards and tools.

2. VR Decision guide (technical, architectural, contractual)

Management aspect: common goal, dissemination



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Projektpartner




35 participants · 27 universities / institutes / companies · 16 countries

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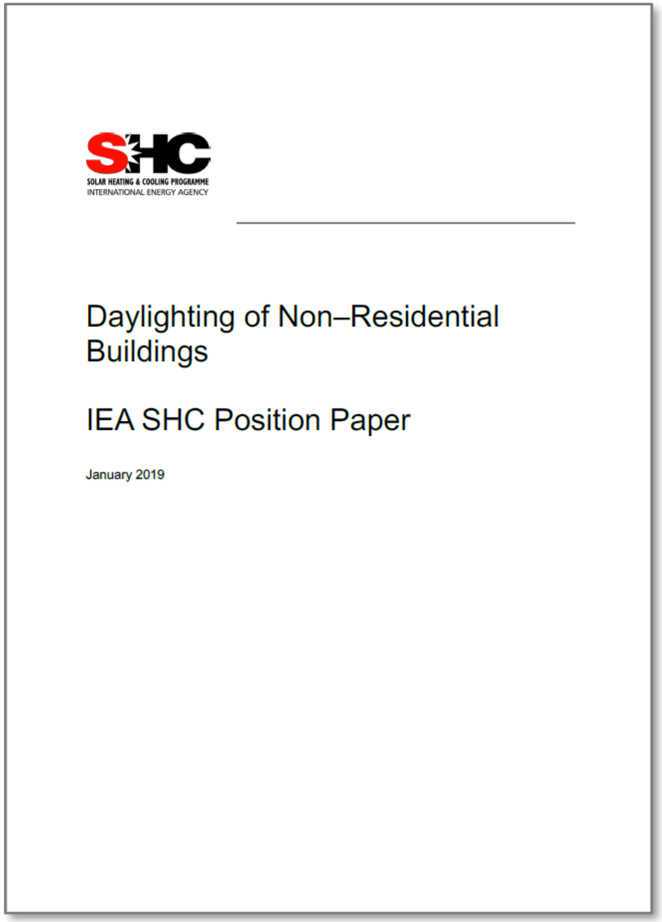
Erste Outputs



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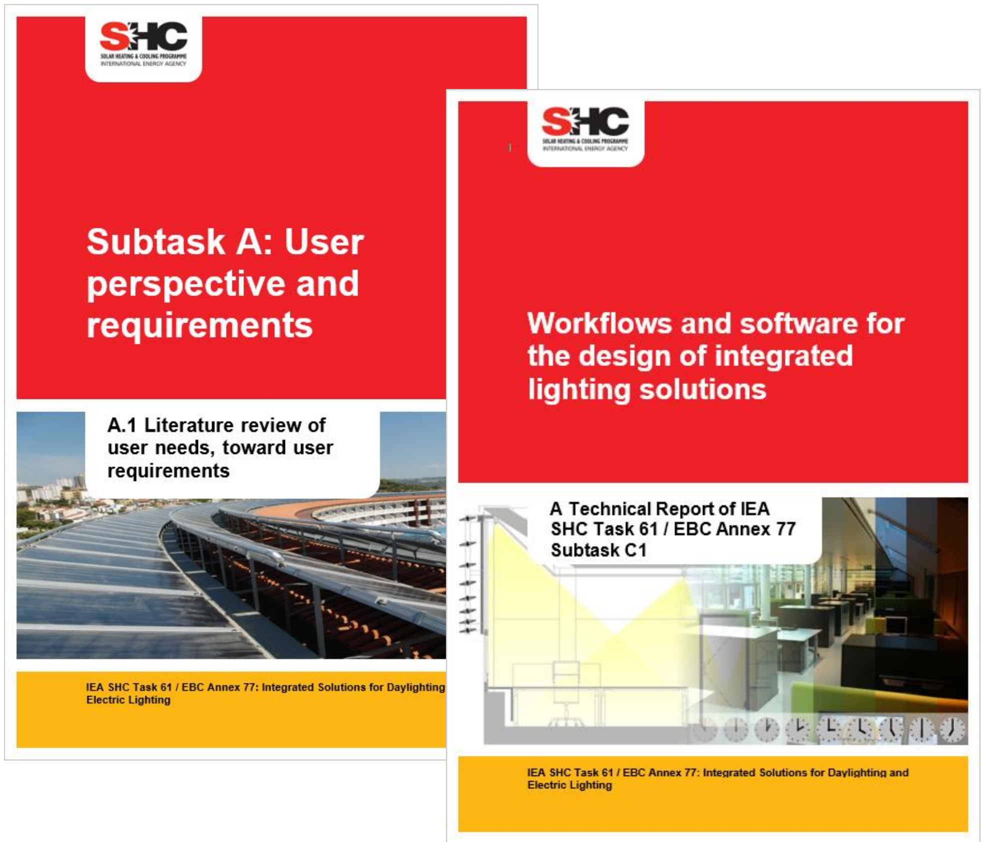
Erste Outputs (coming soon)



ISO

ISO/TC 274/JWG 1 **N 223**

ISO/TC 274/JWG 1
Energy performance of lighting in buildings (joint working group with CIE-JTC 6)
E-mail of Secretary: janine.winkler@din.de
Secretariat: DIN

Call for experts for ISO/TC 274/JWG 1 task force "Revision of ISO 10916"

Date of document 2019-08-09

Vielen Dank für Ihre Aufmerksamkeit!

Fragen?