IEA SHC Task 50:
Advanced lighting solutions for retrofitting buildings

Daylighting
Electric Lighting
Lighting Controls

January 2013 – December 2015
Lighting and Energy: **Potentials in Retrofitting**

**Only small volume of new building constructions**

40-50% of turnover of facade and lighting industry in retrofitting

~3% retrofit rate
(estimation facade and lighting industry)

75% of appliances outdated (older than 25 a)

“Lighting retrofits can save significant amounts of energy costeffectively”

LIGHT'SLABOUR'S LOST, Policies for Energy-efficient Lighting, IEA, 2006
Task Structure

The objective is to accelerate retrofitting of daylighting and electric lighting solutions in the non-domestic sector using cost-effective, best practice – approaches, which can be used on a wide range of typical existing buildings.

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Operating Agent: J. de Boer, DE

Subtask A
M. Fontoynont, DK
Market and Policies

Subtask B
M. Knoop, DE
Daylighting and Electric Lighting Solutions

Subtask C
J. Kaempf & B. Paule, CH
Methods and Tools

Subtask D
M.-C. Dubois, SE
Case Studies

Joint Working Group: “Lighting Retrofit Adviser”
Subtask A: Market and Policies
[Coordination: M. Fontoynont, SBI, Denmark]

Objective: To understand and model the financial and energy impact associated to retrofiting daylighting and electric lighting of buildings.

A.1 Global economical models
A.2 Barriers and benefits
A.3 Building Energy regulation and certification
A.4 Proposal of action concerning value chain

<table>
<thead>
<tr>
<th>Typology / best solutions</th>
<th>TCO of lighting</th>
<th>Value benefit</th>
<th>Energy benefit</th>
<th>Function benefit</th>
<th>Human benefit</th>
<th>Other benefit</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Offices</td>
<td>€/m²</td>
<td>2000 €/m² (value)</td>
<td>2 €/m².yr (lighting)</td>
<td>Higher productivity</td>
<td>Less stress, extra hours of work</td>
<td>€/m²</td>
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<tr>
<td>New blind system and blind control</td>
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Subtask B: **Daylighting and Electric Lighting Solutions**

*Coordination: M. Knoop, TU Berlin, Germany*

**Objective:** To assess quality of existing and new solutions in the field of façade and daylighting technology, artificial lighting and lighting controls. To identify and structure existing and develop new lighting system technologies.

B.1 Definition - system characterization

B.2 Definition of (regional) baseline conditions

B.3 Review of state of the art technology and architectural solutions

B.4 New technical developments

B.5 Measurements of selected state of the art and new technologies

B.6 Source book
Subtask C: Methods and Tools

[Coordination: Jérôme Kaempf, EPFL, Bernard Paule, Estia, Switzerland]

Objective: Provide methods and tools to make energy efficiency and economics of lighting retrofits transparent to stakeholders.

C.1 Analysis of workflow and needs
C.2 State of the art review
C.3 Development of a simple integrated rating model
C.4 Energy audit and inspection procedures
C.5 Advanced and future simulation tools
Subtask D: **Case Studies**

*Coordination: Marie-Claude Dubois, Niko Gentile, Lund University, Sweden*

**Objective:** Perform building stock analysis including generation of a building typology for lighting retrofits. Based on this deliver proven and robust evidence on achievable savings and show integrated retrofit strategies for representative Case studies.

D.1 Building stock/typology
D.2 State-of-the-art review
D.3 Assessment and monitoring procedure
D.4 Case study assessment
D.5 Overall conclusions, lessons learned
D.6 Case study book / e-documentation

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Lighting Retrofit Adviser

**design inspirations, design advice, decision and design tools for relighting**

Select your Country

![Country selection](image)

You are Investor / Owner

START

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- Identify demands by simple question, who the user is
- Configure the contained information (components) into a suited workflows
- Leave access to other information (components) open
- Here a more target group oriented starting page.

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**Identify Potentials**

Discover what potentials lie in relighting and specifically in your building (portfolio), then decide how to proceed

**Financing**

Investigate on financial aspects

**Starting the relighting process**

You see it as an opportunity: See recommendations on how to get started

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IEA SHC Task 50 **Advanced lighting solutions for retrofitting buildings**
Who is behind the activity ...

30 participants
18 universities/institutes/companies
14 Countries

IEA SHC Task 50  Advanced lighting solutions for retrofitting buildings
Information & Dissemination

http://task50.iea-shc.org/

IEA SHC Task 50 Advanced lighting solutions for retrofitting buildings
„Low hanging fruits“
Advanced lighting solutions for retrofitting buildings