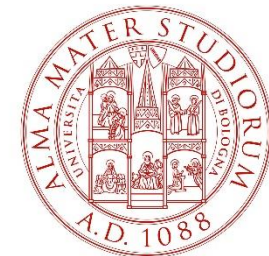




# Innovative policies for improving citizens' health and wellbeing addressing indoor and outdoor lighting

SC1-BHC-29-2020

Innovative actions for improving urban health and wellbeing - addressing environment, climate and socioeconomic factors



ALMA MATER STUDIORUM  
UNIVERSITÀ DI BOLOGNA



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# ENLIGHTENme in a Nutshell



Innovative Urban Lighting Policies for Better Health and Wellbeing



Start  
March 2021



Duration  
48 Months



Budget  
5 Mio €

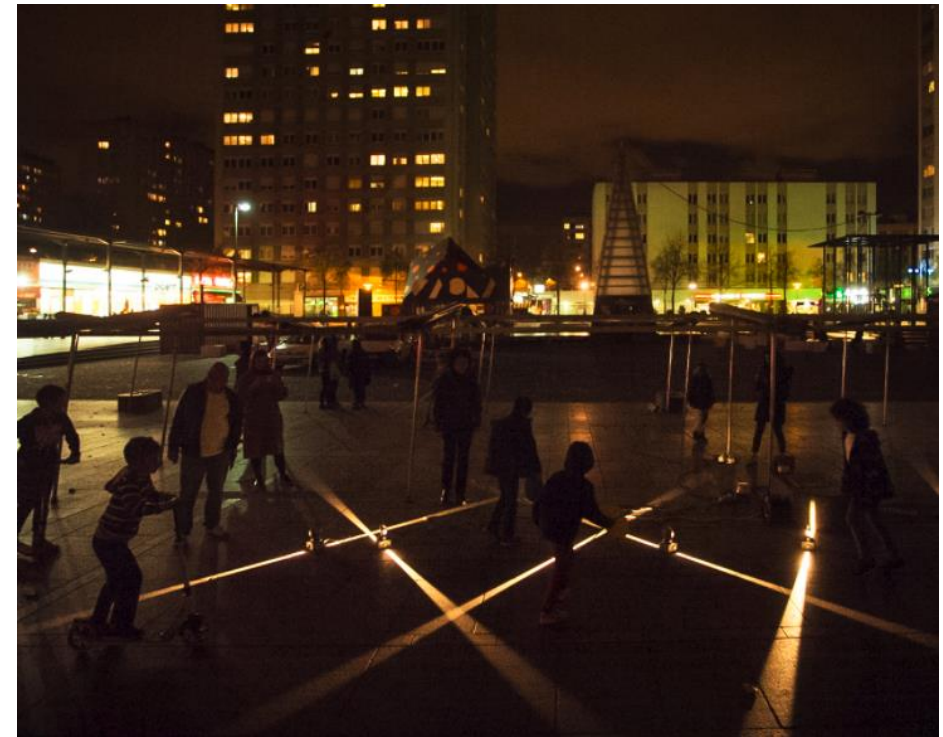


22 Partners  
10 Countries

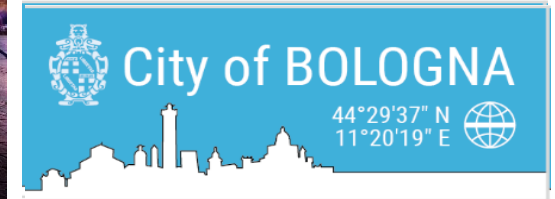
## Overall objective

to improve **older adults' health and wellbeing** by addressing public policies related to indoor and outdoor lighting.

**Target:** older adults (+65)



# ENLIGHTENme in a Nutshell



Innovative lighting interventions are ongoing in the selected district through the establishment of **Urban Lighting Labs** and the execution of the **population-based study**



### ENLIGHTENme Atlas

- Represent existing knowledge about evidence and good practices on urban lighting for health and wellbeing in a Database
- Visualize existing knowledge in a georeferenced environment
- Query/Filter the collected information according to the scale, object, target groups, etc.,
- Complete the Atlas with new knowledge / information

The screenshot displays the ENLIGHTENme Atlas interface. On the left is a world map with several green location markers. On the right is a search and results panel. The search panel includes fields for 'Author or Organization' and 'Key Words', and dropdown menus for 'Search \'geo-tagged items\'' and 'Resource type'. Below the search panel, a grid of search results is shown, each with a green checkmark icon in the top right corner.

Author or Organization	Key Words	Search 'geo-tagged items'	Resource type
		All	All

**Search**

<p>Organization <b>International Commission on Illumination</b> lighting standards; lighting regulation; lighting professionals</p> <p>CIE   International Commission on Illumination / Commission internationale de l'Eclairage / Internationale Beleuchtungskommission</p>	<p>Project/Case Study <b>Designing for Darkness</b> Taylor Stone darkness; light pollution; design;</p> <p>Designing for darkness (tudelft.nl)</p>	<p>Organization <b>International Dark-Sky Association</b> light pollution; darkness, ethics; night</p> <p>International Dark Sky Association</p>
<p>Organization <b>The Center for Health Design</b> health design, care facilities, design research</p> <p><a href="https://www.healthdesign.org">https://www.healthdesign.org</a></p>	<p>Organization <b>Thomas Pocklington Trust</b> blind, partially sighted, indoor lighting,</p> <p><a href="https://www.pocklington-trust.org.uk/">https://www.pocklington-trust.org.uk/</a></p>	<p>Organization <b>Centre for Ageing Better</b> aging; ageing; ageing in place; work; community; health; ageism; housing</p> <p><a href="https://ageing-better.org.uk/">https://ageing-better.org.uk/</a>; <a href="https://ageing-better.org.uk/news/age-positive-image-library-launched">https://ageing-better.org.uk/news/age-positive-image-library-launched</a> <a href="https://youtu.be/Eo-SY7UXyGQ">https://youtu.be/Eo-SY7UXyGQ</a></p>
<p>Organization <b>Dementia Services Development Centre</b> University of Stirling dementia; design; healthcare;</p>	<p>Organization <b>Lighthouse Guild</b> visual impairment; healthcare</p>	

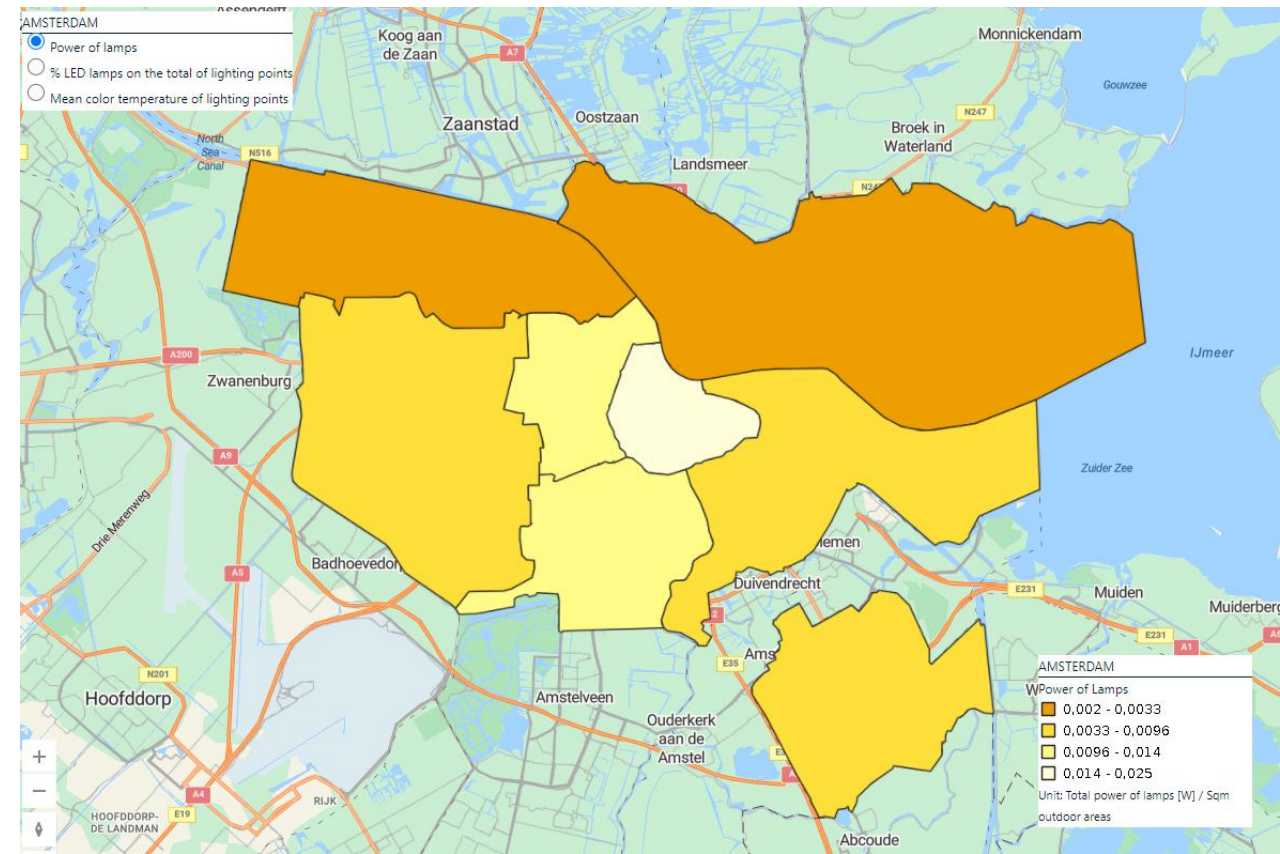
<https://appweenlightenmep01.azurewebsites.net/>

## Urban lighting and health maps with data provided by the municipalities

- Electrical power of the light sources [W/Sqm of outdoor areas]
- % LED lamps on the total [%]
- Average Controlled Color Temperature [K]

Contribution to the general index through the definition of two scenarios:

- Wellbeing scenario (+ + -)
- Sleep scenario (- - -)

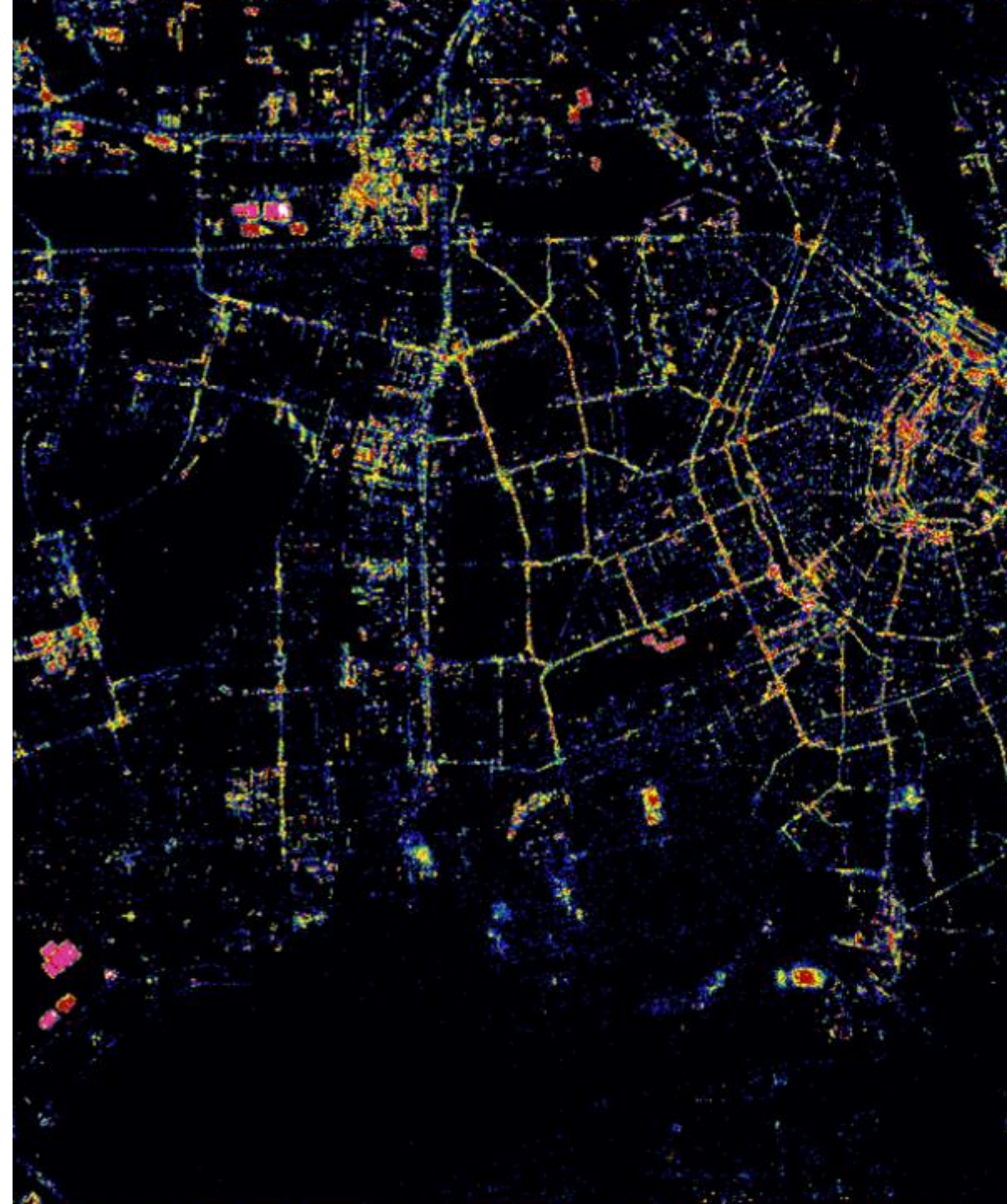


# Knowledge building phase

## Use of satellite data

### Lessons learnt @Mount Sinai

- The **quality and quantity of data** available from satellite imagery has exploded recently with the possibility of having RGB channel at 1m x 1m of spatial resolution
- **Satellite data alone cannot tell the entire story** of what light exposures people will have in the night-time urban environment.
- At **small scale** there are some cases like pedestrian arcades or squares covered with trees that are not detected by satellite but quite brightly lighted
- Still important to have **lighting measurements taken at ground/human level**



## Knowledge building phase

### Use of satellite data

#### Lessons learnt from Bologna case study @Mount Sinai

- Both photometric values from the satellite data and the ground-level measurements suggest that the overall light levels in the specific areas of Bologna were **hardly ever high enough to exceed recommendations for human nighttime light exposure** based on melanopic equivalent daylight illuminance (mEDI) or circadian stimulus (CS).
- Even if light levels are low at night, this suggests that it is also important to understand light exposures throughout the **entire 24-hour day** – people need high light levels during the daytime, and a strong contrast between day and night.
- While light going up into the sky is not the ideal way to characterize human light exposures, it could be very useful to understand exposures to **insects, birds or bats** who can experience outdoor lighting from “above.”



## Co-created urban lighting interventions in the three ENLIGHTENme cities

**Urban Lighting Labs** have been established in each ENLIGHTENme cities, after district selection, aiming at:

- Engage communities and cities to generate qualitative data and provide laboratory to test lighting interventions,
- Conduct qualitative research and technical lighting measurement in districts before, during and after outdoor and indoor lighting interventions
- **Co-design and implement** outdoor lighting installations and indoor lighting interventions



# Evidence building phase

## Bologna case study



13 May 2022  
Public meeting

Presentation of ENLIGHTENme aims and activities

12 May 2022  
Workshop and virtual nightwalk through Piazza Lambrakis

Workshop to illustrate the different qualities of light

19 May 2022  
Workshop

Co-designing lighting installation

Throughout daily/weekly  
Engagement with local social networks

Contact with specific informal groups that meet regularly in the area. These provide relationships with local informants, creating longer-term contact and discussions.

08 June 2023  
New lighting installation at Piazza Lambrakis

Official introduction of the new lighting installation on the square together with the local residents who have co-created the design.



*Piazza Grigoris Lambrakis*





## Population-based lighting study on older adults

Assess the impact of outdoor and indoor lighting innovations on entrainment of **circadian rhythms**, sleep and personal light exposure, mental and physical health, and the **cost effectiveness** of the performed interventions

- recruitment of 500 participant per city is ongoing
- a baseline and a follow-up study after light therapy is performed



- A cost effectiveness analysis of the performed interventions will be carried on.

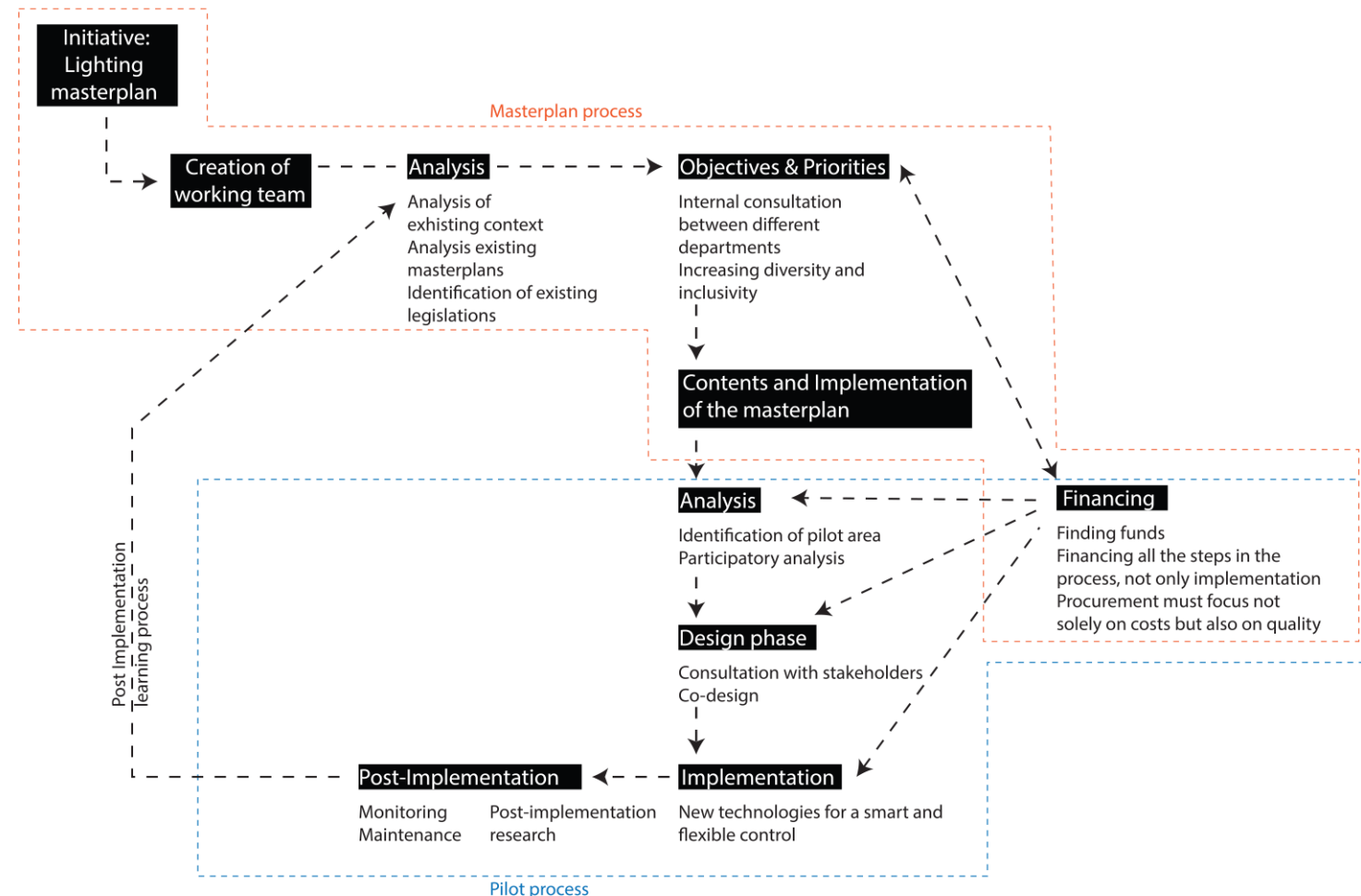




## Lighting policies and guidelines definition – initial phase

**Guidelines** will serve to bring both public policies and the market to systematically **take into account the health implications of decisions on urban lighting**, to seek synergies, and avoid harmful health impacts, thus improving urban health and reduce health disparities in cities.

Co-creation with Board of Lighting companies, Health and Urban Lighting Advisory Board, Scientific Advisory Board





### Health City Manager training – initial phase

- The training is developed by Health City Institute and key experts
- Aim: establishing into public administration this multidisciplinary role to place health high on the agenda of policy-makers, facilitating the implementation of inter-sectorial health promotion strategy
- Two editions per each of the three ENLIGHTENme city, participants in presence
- Topics related to ENLIGHTENme project (e.g. the impact of light on health and wellbeing)

### «Lighting up city life» awareness raising campaign – initial phase

- Target: citizens and general public
- Materials: informative video about the project as first step, and infographics, posters and leaflet with project results in a second stage, once results will be available
- Objective: offering tips to reorganise light in homes and behaviour recommendations to reduce adverse health and wellbeing effects



**Thank you for your attention!**

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