



**Report**  
Analyses of the potential for  
investment in LED replacement in  
Greater Copenhagen

**By Gate 21 & Innovation Skåne**  
*Published May 24, 2018*



## Conclusion

Collecting data from Zealand and Scanian municipalities in the Greater Copenhagen metropolitan region points to a considerable potential for energy savings, in regard to an increased use of LED lighting in public buildings and in street lighting.

<b>Street Lighting</b>			
	<b>Current part of street lighting based on LED</b>	<b>Potential for saved MWh in %</b>	<b>Potential for saving, p.a.</b>
<b>Zealand Municipalities</b>	23 %	43 %	DKK 66,9 m
<b>Scanian Municipalities</b>	22 %	44 %	SEK 17,9 m

<b>Lighting in Public Building</b>		
	<b>Current part of lighting in public buildings, based on LED</b>	<b>Potential for saved MWh in %</b>
<b>Zealand Municipalities</b>	22 %	55 - 60 %
<b>Scanian Municipalities</b>	7 %	55 - 60 %

## Procedure

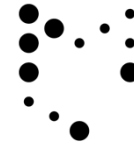
As a part of the Interreg project **Lighting Metropolis**, it was decided to make a data collection among the municipalities in the Greater Copenhagen metropolitan region. The purpose was to establish a baseline for the composition of different type of light in public areas, whether they are in municipal buildings or street lighting, and then investigate the potential for a replacement to LED based lighting.

The Zealand and Scanian municipalities in the Greater Copenhagen metropolitan region were each sent a questionnaire with questions about lighting in municipal buildings. This was done to establish

- The total floor area maintained by the municipality concerned, the amount of electricity consumption, the amount of lighting used, and the proportion of LED.
- The size of planned investments aimed at replacing or establishing LED lighting in the fiscal years 2018 - 2021, the affected building area in m<sup>2</sup>, expenditure in DKK or SEK, and the expected savings in MWh / year.
- The scale of agreed energy service contracts based on ESCO agreements and the like.

In parallel, the same Scanian municipalities received several questions regarding their street lighting:

- The status of the use of LED for street lighting and current ownership of the utilities both for private and municipal roads.
- The use of various forms of automatic control, such as night-time dimming mechanisms.
- Planned investments in LED based street lighting and automation in the fiscal year 2018 - 2021, calculated in expenses in SEK as well as expected savings in MWh / year.



- The average energy consumption per light source, both LED based and traditional.

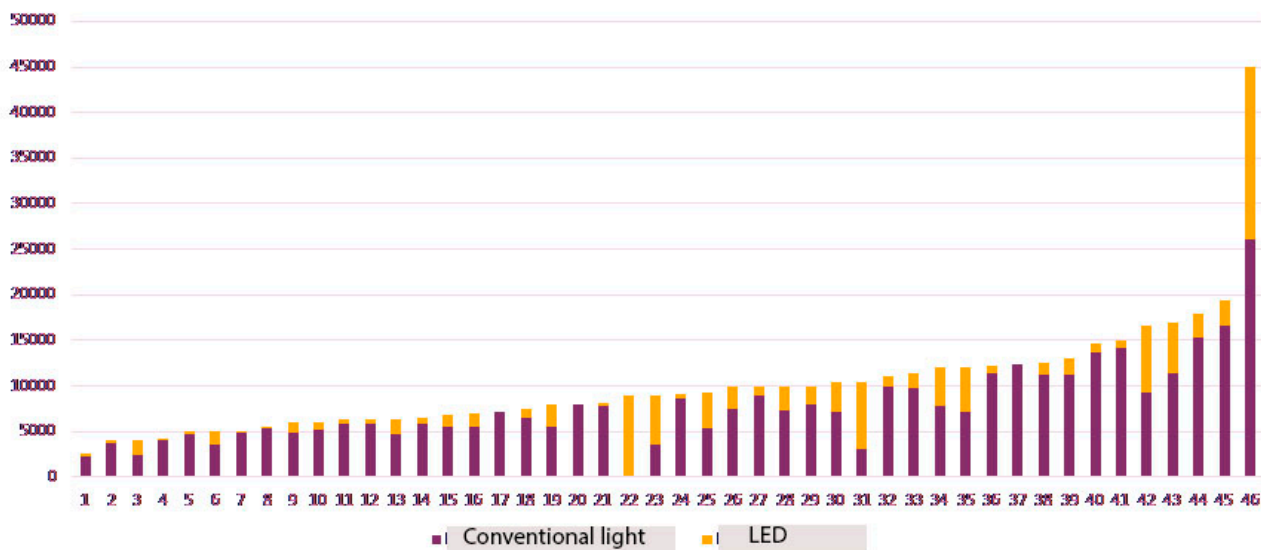
There was no need for a corresponding questionnaire for Zealand municipalities, as the information had already been collected for Zealand street lighting in the areas.

**Result of the potential analysis**

The collected data shows a significant potential for energy savings in the public sector.

**Street Lighting in the Zealand Municipalities**

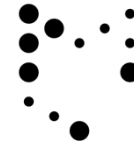
Currently, 23% of the total public lighting in the 46 Zealand municipalities are based on LED.



Total amount of light sources, including the share of LEDs, in 46 municipalities in Zealand.

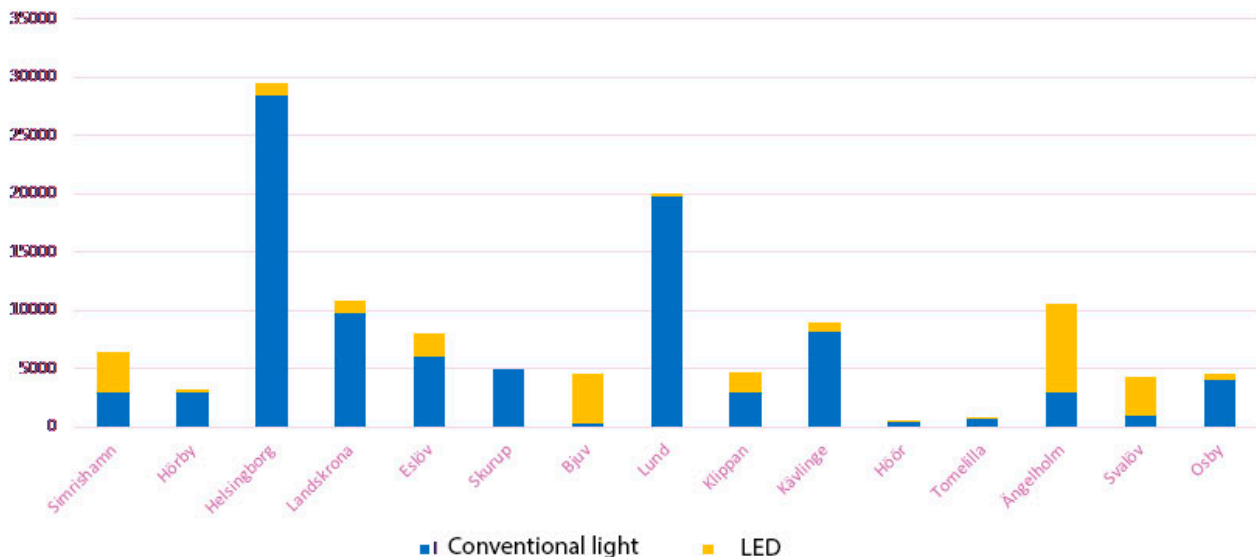
As shown by the figure above, the share varies considerably from municipality to municipality. But in total, the estimate indicates a saving potential of 43% of the total energy consumption, corresponding to DKK 66,9 m.

The investments needed for a realization of the savings potential, i.e. a total replacement for LED lighting in the 46 Zealand municipalities, is estimated at DKK 651,3 m.



## Street Lighting in the Scanian Municipalities

The response rate for the Scanian municipalities were lower and the survey is based on the 15 municipalities out of 33 who chose to respond to the survey. This shows a current LED share of 22% of the total public street lighting.



### Total amount of light sources, including the share of LEDs, in 15 Scanian municipalities

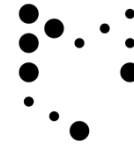
Here too, it appears that the proportion of LEDs varies from municipality to municipality. The estimate indicates a saving potential of 44% of total energy consumption or SEK 17,9 m. The investment need for a realization of the savings potential, i.e. a total replacement for LED lighting, in the 15 Scanian municipalities is estimated at SEK 209,9 m.

### Recap

The figures in the survey indicate that the current proportion of LED-based street lighting on average represents less than a quarter of the total, 23% in Zealand municipalities and 22% in Scania.

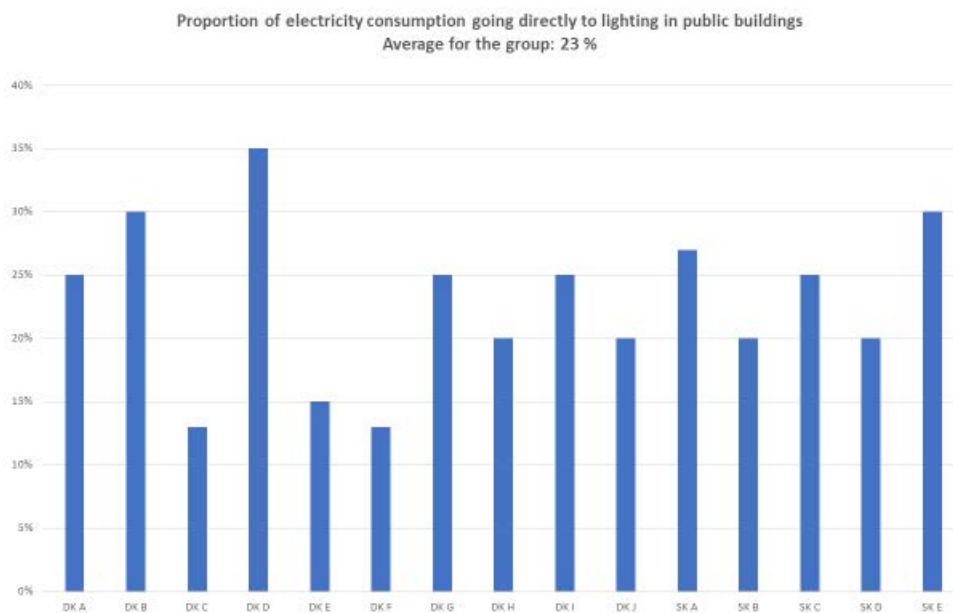
At the same time, the survey shows a significant potential for savings in both megawatts and money by a complete transition to LEDs in both Zealand and Scanian municipalities: an annual saving of the number of MWh at

- 43% in Zealand municipalities, corresponding to DKK 66.9 m
- 44% in Scanian municipalities, corresponding to SEK 17.9 m

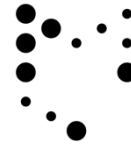


### Lighting in public buildings

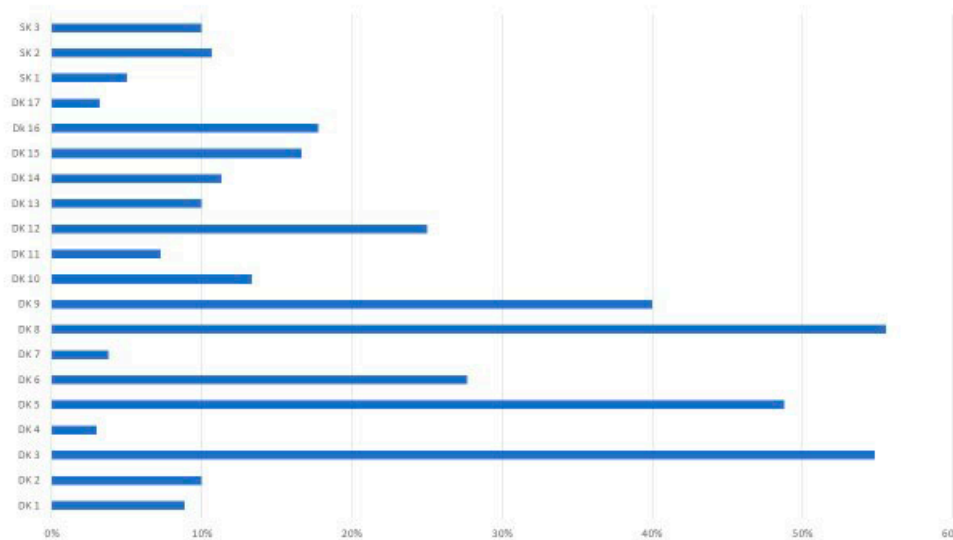
It is harder to get specific information on lighting in public buildings. Often the lighting part is difficult to isolate from the other energy-consuming parts of the buildings. However, as shown in the table below, based on the questionnaire, the proportion of electricity consumption going directly to lighting in public buildings is estimated to an average of 23 %:



Proportion of electricity consumption going directly to lighting in public buildings

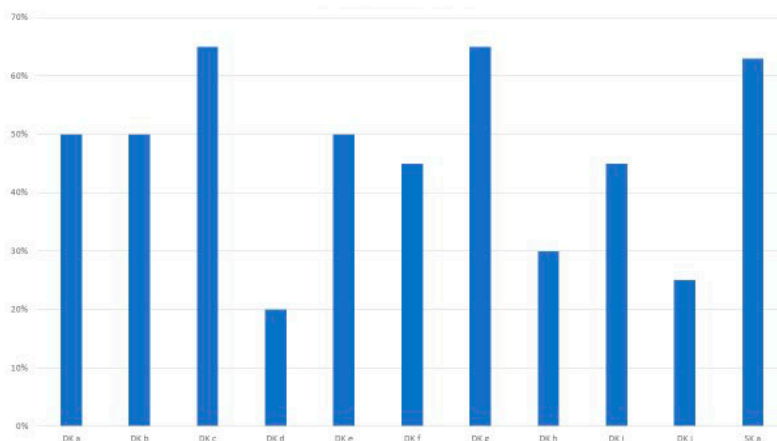


Of the total amount of lighting, the information from the surveyed questionnaires indicates that on average 22% of the lighting in public buildings is changed to LED in Denmark and 7% in Sweden on average:

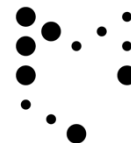


Share of LED lit floor area in public buildings: 7 % in Scania, 22 % in Denmark

When viewing the information from the municipalities on estimated energy savings by changing to LED in relation to the size of the municipality's floor area, the figures leans towards a weighted average of 57%.



Estimated energy savings by changing to LED in a status quo situation: weighted average 57 %



## Summary

Just like with road lighting, the study shows a relevance in working to scale the spread of LED-based lighting in public buildings. The current proportion of LED-based lighting in public buildings accounts for 22% in Zealand municipalities and 7% in Scanian municipalities.

Lighting accounts for just under one quarter of total electricity consumption in public buildings, 23% in Zealand municipalities and 22% in Scania respectively. And once again the survey shows a significant potential for saving megawatts by a complete transition to LEDs in Zealand and Scanian municipalities: The annual electricity saving of a lighting replacement is estimated to be 55-60 % of the total electricity consumption for lighting in both Zealand and Scanian municipalities.