

EPC Quick Checks – Lighting in Buildings



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Carlow Kilkenny Energy Agency
driving sustainability



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EPC Quick check – Lighting in Buildings

Quick-check lighting refurbishment: Lighting in buildings

In the public and business sectors, there is a large number of buildings with old and inefficient lighting systems, these are usually left on during business hours, have short lifecycles and therefore have a high maintenance cost.

The costs for LED lighting for buildings have significantly decreased in recent years, making a refurbishment project economically viable in many cases.

The following quick-check allows a first assessment of whether lighting refurbishment could be carried out economically and whether "energy performance contracting" might be a suitable option.

How can public sector/companies/communities use this quick-check?

1. Complete the "OK and KO criteria" on page 3 of this folder
2. If most of the answers are positive (OK), complete the "Streetlight Data Collection Sheet" inserted in this folder
3. Send the completed data sheet to the following address:
"EPC Quick Checks"
Carlow Kilkenny Energy Agency,
Kilkenny Research & Innovation Centre,
Burrells Hall,
St Kieran's College
Kilkenny
4. The Carlow Kilkenny Energy Agency will contact you and provide further information.

Why lighting refurbishment now?

In Ireland the most commonly used light source for buildings are fluorescent tubes (T5, T8 and T12) and compact fluorescents (CFL's) for the illumination of workstations and circulation areas in buildings. Due to the short lifetimes of fluorescent tubes (T8 and T12 especially), costs for lamp replacement can be quite high. Also many buildings have high operation hours, resulting in high electricity costs if inefficient lighting is used.

LEDs have very long lifetimes (thereby significantly reducing maintenance costs) and also a much lower electricity consumption. However, until recently, LED lighting was often technically and economically not feasible due to high lumen requirements.

Especially in the last three years, LED technologies have developed very rapidly. Already today, LED lighting is an economically very interesting option in many cases, with cost



reduction potentials of over 50%. Especially in buildings with long operating hours, LEDs are an economic solution when taking the whole life cycle costs into account.

The table below shows an example of the savings over the life time:

Costs in 5 years (Euro/lamp)						
Lamp type	Investment Costs (€)	Wattage (W)	Hours of Operation	Electricity Cost (€)	Maintenance Cost (€)*	Total costs
T8	€20	128	2500	€240	€150	€410
LED	€140	43	2500	€81	€50	€271
Costs in 15 years (Euro/lamp)						
T8	€60	128	2500	€720	€450	€1,230
LED	€140	43	2500	€243	€150	€533

LED= Light Emitting Diode, T8= 2 * 58W T8 fluorescent tube. Example show is replacing a 58W double fluorescent tube with 43W LED

*additional savings will be achieved through reduced maintenance costs

When planning a lighting refurbishment, it is very important to make a thorough analysis of the requirements for illumination density and colour rendering. EN 12464-1 gives recommendations for the different applications (e.g. 100 lux for storage areas, 300 lux for sports halls).

What is EPC?

Energy Performance Contracting is a contractual arrangement between a beneficiary (e.g. a municipality) and a provider of an energy efficiency improvement measure, a so-called "Energy Service Company" (ESCO). The ESCO finances and implements energy efficiency investments - for example the refurbishment of a street lighting to LED technologies or the refurbishment of indoor lighting systems. The annual energy savings are used to cover the investment and capital costs. After the end of the contract, the client benefits from the energy and cost savings.

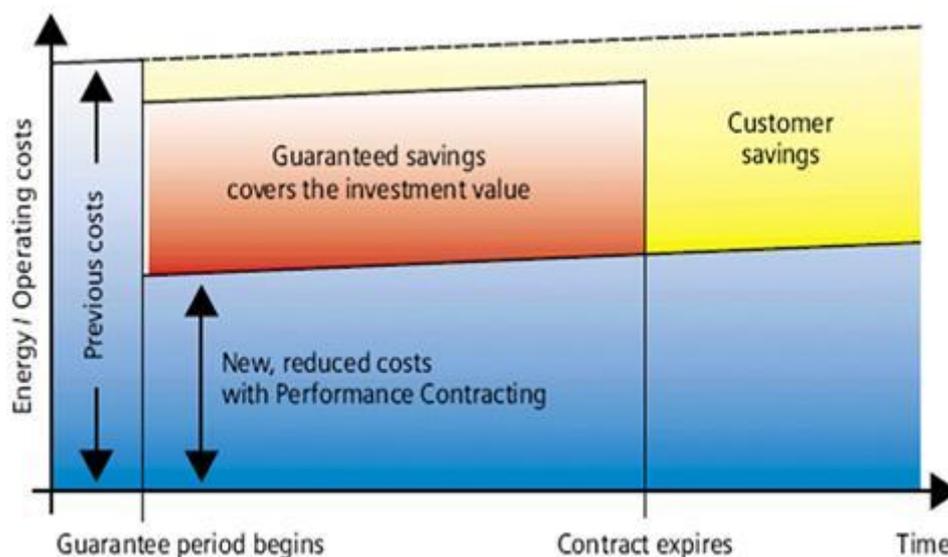


Figure 1: Sample Energy Performance Contract



Step 1 OK & KO criteria for lighting refurbishment with EPC: Buildings

Positive / negative factors	YES (OK criteria)	NO (KO criteria)	don't know
Lamps/installations are operational, but in bad condition			
Lux levels not achieved or poor lumen output			
Lamps/installations are older than 10 years			
"Phasing out" lamps installed (High Pressure Sodium, High Pressure Mercury lamps)			
The average total electricity price is above 0.15Euro/kWh			
Operating time is above 2200 hours/a or: Operating time is on average at least 8 hours/day			
Investment costs present a problem or external funding for the investment is preferred.			

Quick-check Lighting Refurbishment: Buildings

This quick-check aims to support companies and institutions in taking the first steps towards refurbishing lighting systems in their buildings. It helps them to assess whether lighting refurbishment could be carried out economically and whether "energy performance contracting" might be a suitable option. The quick-check was developed in the context of the European "Streetlight-EPC" project.

Support for municipalities and companies in lighting refurbishment

As an important activity of the "Streetlight-EPC service", the Carlow Kilkenny Energy Agency supports municipalities, companies and ESCOs in implementing lighting refurbishment and EPC projects. The information and advisory service includes the following activities:

- a dedicated website on EPC at <http://ckea.ie/streetlightepcfacilitationservice/> with an overview of existing ESCOs, project examples, FAQs, funding and contractual information
- publications and events
- advice on specific projects, pre-check of projects/contracts

The support also includes information on available financial support from regional, national and European programmes. Currently, there is financial support available from the Sustainable Energy Authority of Ireland through the Better Energy Communities grant programme and there is also funding available through the obligated parties under the Energy Efficiency Obligation Scheme contact CKEA for more details.



The team of the Carlow Kilkenny Energy Agency welcomes your enquiries and looks forward to support you:

Carlow Kilkenny Energy Agency
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Burrells Hall,
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Kilkenny
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(056) 7790856

Contact Person: Declan Keogh, Energy Engineer



EU Project Streetlight-EPC

A project funded by the Intelligent Energy Europe Programme was launched in 2014 with the objective of triggering the market uptake of EPC through lighting refurbishment projects. The project, called "Streetlight-EPC", creates demand and supply for EPC projects in 9 regions through regional EPC facilitation services. These services provide comprehensive support to both lighting operators, such as municipalities or companies, and ESCOs. The project team includes 9 regional agencies/organisations, which provide the EPC facilitation services, 9 municipalities and a European network.

Further information: www.streetlight-epc.eu



EPC Quick Checks – Lighting in Buildings

LIGHTING REFURBISHMENT IN BUILDINGS – EPC DATA COLLECTION SHEET

To allow a first assessment of whether EPC is a suitable option in your case, the following data needs to be collected.

Public Authority/Company Name		
Type of project (e.g. Full retrofit, part retrofit, lamp replacement)		
What type of use is the building (e.g. admin, public, sports, retail)		
	Unit	Your lighting system
Age of lighting installation	Years	
Year of last comprehensive refurbishment	Year	
Total Number of lighting points	Number	
Most frequent lamp type and Wattage*	Type/Watts	
Estimate number of lamps of this type	Number	
Second most frequent lamp type and Wattage*	Type/Watts	
Estimate number of lamps of this type	Number	
Third most frequent lamp type and Wattage*	Type/Watts	
Estimate number of lamps of this type	Number	
Condition of the lighting system (optional)	good/bad	
What type of ballasts are used? (magnetic/electronic)		
Is daylight used in the building? To which extent?	(Yes/No)	
Total installed capacity of the project	kW	
Total annual electricity consumption of the project and building	kWh/year	
Total annual electricity costs (including or excluding VAT)	Euro	
Total annual maintenance costs or the lighting system	Euro/year	
Typical operation time (total operating hours/year)	hours/year	
Periods of dimming/switch-off		
Any problems with present lighting system?		
Special requirements for the lighting system? (e.g. concerning brightness, colour rendering, health & safety)		
Name of contact person		
E-mail		
Telephone		

*HPM: High Pressure Mercury lamps; HPS: High Pressure Sodium lamps; LPS: Low Pressure Sodium lamps; MHL: Metal Halide Discharge lamps; CFL: Compact Fluorescent lamps; FL: Fluorescent lamps; LED: Light-Emitting-Diodes

Please include: pictures of luminaires and electricity bills (at least 12 months)



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