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MARK THROWER MANAGING EDITOR



SERIES 18 | MODULE 04 | LIGHTING TECHNOLOGY

# Lighting as a service

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CPD module sponsored by TamLite Ltd



LUX Manufacturer of the Year 2018

It is not new for lighting to be provided as a service. It has become more prevalent for many suppliers to offer this as an option for customers. We are going to explain what we mean by Lighting As A Service (LaaS), what are the key features and benefits to it and considerations energy managers should take when considering this approach to lighting. This is not meant to be read as an endorsement for LaaS as the single route to take but instead to provide some insight into seeing it as an option for an organisation when exploring project finance or a route to enable a lighting project to be undertaken.

So, what do we mean by Lighting as a Service? Most lighting installations are traditionally procured as a capital project, payable upfront or on completion of the project to a supplier. LaaS is fundamentally different from that, as payment is through an agreed subscription cost paid periodically. The supplier is being paid periodically for a comprehensive provision of lighting, say monthly for five years. It is a way of avoiding a large capital expenditure by paying a flat fee over an agreed period.

It is not the same as hire purchase though, as it generally has a performance mechanism (the service) included with it. It would be closer to leasing or performance contracting than hire purchase or asset financing. For example, the supplier has to guarantee a performance like a minimal lighting level, as well as other characteristics of the lighting like colour rendering, colour temperature, for the duration of the service contract. Not just pay the cost back over time with an interest rate attached to the loan.

It would be the responsibility of the supplier for maintaining the system and any costs to do so, during the service agreement period, to ensure meeting the performance



requirements. For example, if there is a failure it would be at the cost of the supplier to replace it. In the agreement there is likely to be a service level expectation too. For example, failures have to be fixed within five working days.

So, instead of putting up capital investment for a lighting upgrade at the beginning of your project, you can turn the investment into an operating expense for the company, and ensure the desired performance requirements. With only a portion of the money you save on reduced energy bills being outlaid, you budget a monthly expense payment for your lighting. It's a way to take advantage of the lighting upgrade and potentially making it cash flow positive from day one.

By not buying the lighting system yourself, however, it means the organisation does not retain ownership. The organisation is bound to the supplier for the length of the service agreement. This may be considered too long a duration to some. It is also likely to mean that overall, the system will cost more as

interest and fees are incurred in the subscription costs.

### Responsibility of the supplier

The key features and benefits to LaaS are:

- lighting requirements are the focus of the agreement, so the organisation knows these shall always be met. It is performance driven;
- the maintenance is the responsibility of the supplier, including compliance.
- subscription costs are known and easier to budget for;
- any costs risks sit with the supplier for the duration;
- most of the risks are transferred to the supplier;
- the organisation may not have a capital budget to pay outright but still wants to reduce operating costs;
- the organisation can use the savings to pay for the subscription cost as the savings are being realised;
- capital can be deployed to other projects;
- the service can then be thought as



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cost neutral for the organisation with savings coming in and then paying the subscription cost (although you would expect it to be a benefit overall). It is, therefore, cash flow positive from the outset;

- a reduction in own staff time by outsourcing it to the supplier;
- it would be considered off balance sheet so positively impact operating income;
- increased monitoring of the lighting system performance; and
- no asset depreciation write-offs.

Another aspect to consider is that the suppliers/manufacturers are motivated to make better-quality, longer-lasting and easier-to-reuse products, by virtue of retaining ownership. We have seen this with some manufacturers already in the LaaS model. For example, Philips has a policy of reusing as many lighting components which LaaS lends itself to. The company can maximise recycling and improve its own circular economy agenda by offering this as an option. Other manufacturers are also doing similar things.

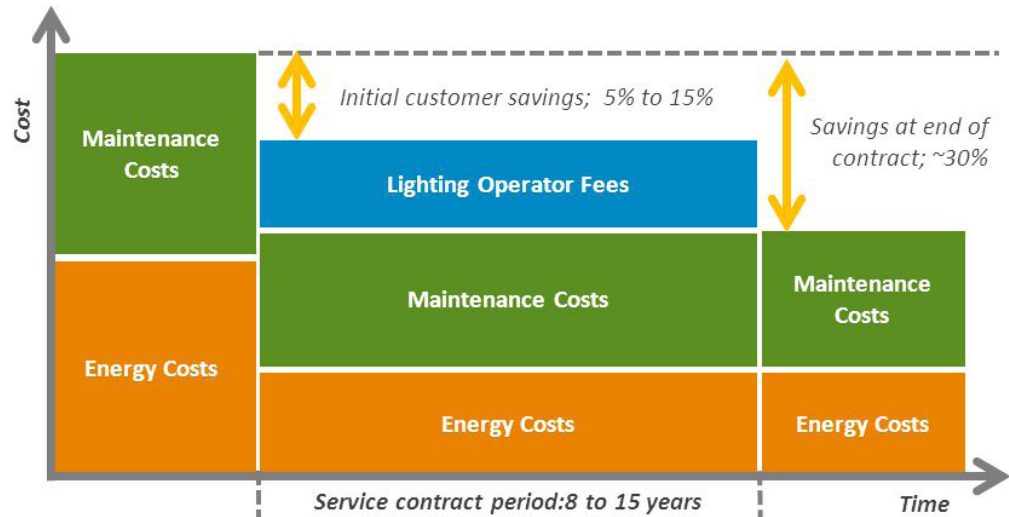
**Scope out the service**

Let's look at some of considerations and the process for LaaS. The starting point would be to scope out the service required by the organisation. This would be a process of turning performance requirements into design criteria. For example, an assembly hall may

**Figure 1: LaaS overview model (Source: Signify (formerly Philips Lighting))**

**Lighting Service Business Model**

*Net-present value of efficiency improvement to fund upgrades*

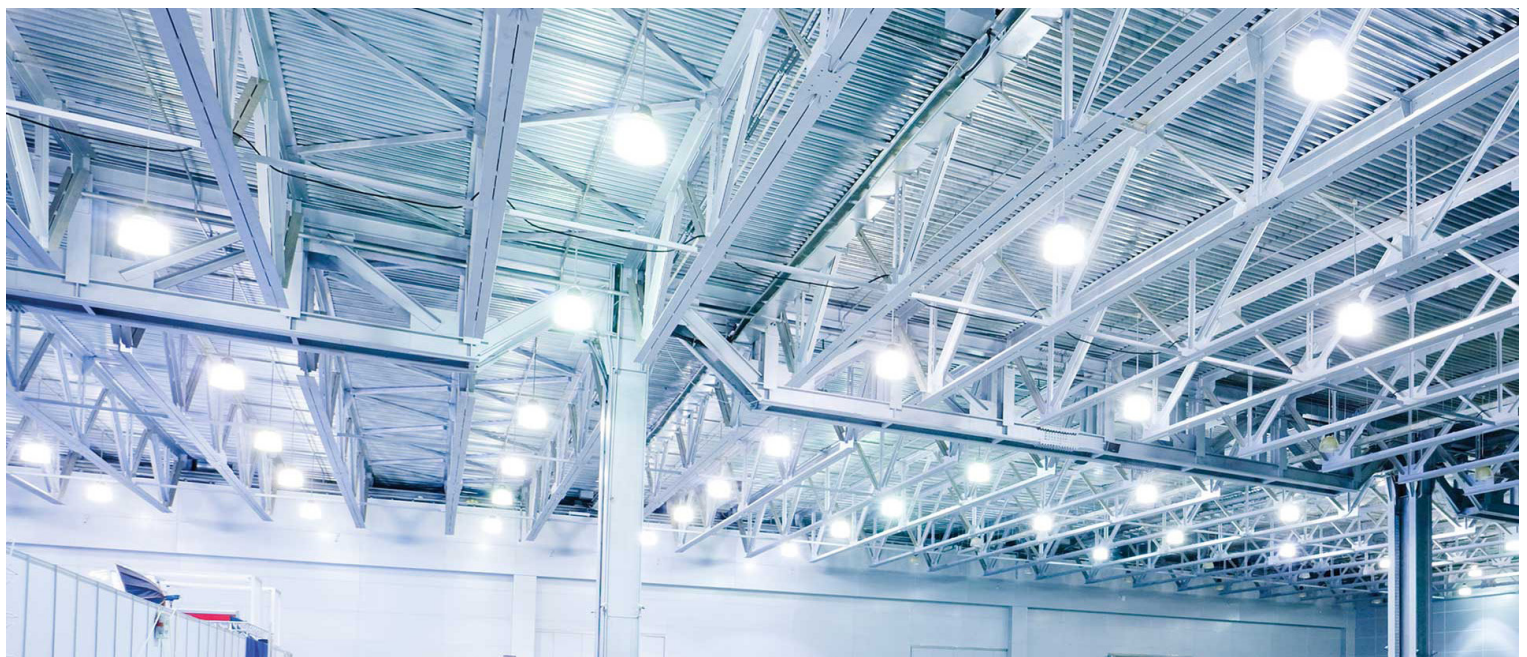


require lighting levels of >500lux and a uniformity of 70 per cent. They required a colour rendering of >80Ra with a colour appearance throughout of 4,000k.

A supplier would then design a lighting system to meet these requirements, taking a maintenance factor into consideration. Knowing

what the hours run are likely to be, they can work out the useful life of the lighting system. They can then model different rated hours of the fittings with light output degradation and lamp performance expectation. This allows them to budget both costs and maintenance provisions over the lifetime of the agreement.

Light output degradation is stated as the light output as a percentage of the initial light level, so L70 would be 70 per cent of its initial light output at a rated life (say 80,000 hours). Similarly, lamp performance expectation is a percentage of failed fittings/LEDs not able to meet operational expectations. So, B10







would mean 10 per cent expected to be failed at the rated life. In some cases it may not be the entire fitting that would fail but may only be one or some parts like the driver or LED chips.

In practice, they are likely to look at the installation cost of installing the lighting to L90 rather than L70 and B10 rather than B50. Then while not taking away from the performance requirements, decide if the higher upfront cost for the better L and B rating schemes are more beneficial in their financial model (a whole life costing if you like) than at a later date in the service contract period. This will also filter into how the subscription costs are too.

The longer the agreement the more likely the suppliers would install better L and B rating schemes. Similarly, the longer the operation hours the more likely for better L and B rating schemes to be installed. An organisation may make the rated performance a requirement but are likely to wait until the modelling is done.

If the useful life of the lighting scheme is greater than the contract length at the lower L and B rate schemes there is likely to be little benefit financially to install better

L and B rated schemes for either party. The organisation will want to balance the subscription cost with the energy savings and the L and B ratings will all have an effect on this and so their decision.

Figure 1 shows a typical LaaS model over a period of time. The operating cost positive position can be seen against the previous/existing operating costs in the first column of the chart. The final column on the right shows the position if/when asset transfers back to the organisation.

#### Service level agreement

On selection of the scheme, a service level agreement would be formed. This would include items such as:

- the duration;
- the subscription cost and frequency;
- any adjustments for inflation (more so in longer agreements);
- minimum performance requirements that the supplier has to guarantee;
- responsibility of the supplier and of the organisation;
- reference to the reviewable design data;
- how performance is monitored or checked;
- agreed reactive service levels (if

something fails or is not meeting requirements);

- provisions of how the transfer of the asset's ownership to organisation;
- early exit cost or mechanism for calculating early exit;
- penalties for not meeting service requirements; and
- exclusions, for example if there was damage caused by organisation.

The reactive service levels are likely to increase the subscription cost, the higher requirement as well as the level of penalties they may incur. The supplier manages the risk in the contract.

The installation would then be planned and implemented in a similar manner to any other lighting project. The difference would be mobilising the monitoring and checking procedure as well as the report/communication lines. The supplier has the incentive to ensure more responsibility for the quality of the installation as it is their asset, as well as commissioning properly and on time.

Modern control software can provide real-time feedback to the supplier minimising the involvement of the organisation. Sensors can provide feedback on performance requirements, like lighting levels as well as software alarms for failures

or drop in performance of the fitting or system. Some also take it a step further and can produce maintenance and compliance reports.

With the subscription being an ongoing operating cost rather than a large capital outlay the additional cost to provide more encompassing controls or more adaptive controls can be explored in depth and possibly included. This is due to the cost being spread over the duration of the contract and is more manageable. Therefore, it may seem like a small increment. An organisation is likely to go for a more sophisticated system as a result which is also in the supplier's favour.

#### Public sector potential

LaaS has great potential in the public sector. This may be an enabler for projects around increasing connectivity in smart cities and towns. Interoperable, and adaptive urban lighting systems can play a role as part of a widespread connectivity or larger application. It's a way for local authorities to commoditise street lighting, using the savings they would get from installing newer lighting, then using the additional savings over the subscription cost to reduce the cost of the connectivity part. It may be that the local authority can commoditise the interconnectivity part too. It also moves the risk of owning the assets and operating them away from the local authority.

LaaS has a place to provide organisations with another option to lowering operating costs away from traditionally capital project finance or if they need to be more flexible deploying capital. For many energy managers who don't hold large capital budgets and may have lost out to other competing capital projects or struggle to compete, yet still need to provide energy efficiency gains for the organisation, this should be a consideration.

The organisation may be thinking of it as a way of commoditising energy savings. For the supplier it is widening their route to market by being more flexible and also motivating product development, as well as a way to foster longer-term relationship with customers. This is one of the reasons why more suppliers are offering this as an option.



**LIGHTING TECHNOLOGY**

Please mark your answers below by placing a cross in the box. Don't forget that some questions might have more than one correct answer. You may find it helpful to mark the answers in pencil first before filling in the final answers in ink. Once you have completed the answer sheet, return it to the address below. Photocopies are acceptable.

**QUESTIONS**

1) LaaS is similar more to which type of finance?

- Hire purchase
- Asset finance
- Performance contracting
- Mortgage

2) True or False? LaaS is considered off balance sheet finance?

- True
- False

3) Who takes most of the risk for the lighting system within LaaS?

- Manufacturer
- Supplier
- Buying organisation
- Electricity provider

4) What is generally not included in a LaaS agreement?

- Service period
- Maintenance
- Monitoring
- Upfront capital cost

5) L70 of a fitting would indicate that it is likely to

- Have degraded to 70 per cent of its initial light output at the end of its useful life
- Have degraded to 30 per cent of its initial light output at the end of its useful life
- Have had 70 per cent expected to be failed at the rated life
- Have had 30 per cent expected to be failed at the rated life

6) LaaS motivates manufacturers to what?

- Produce lower quality products
- Produce higher quality products
- Reduce the impact on a circular economy
- Decrease the need for better controls

7) What would an organisation not need to do when entering a LaaS?

- Consider how performance is monitored
- Mobilise the service contract
- Pay a monthly subscription cost
- Include the assets on company's balance sheet

8) True or False? Are lighting systems likely to be more comprehensive with LaaS model over a traditional capital project procurement model?

- True
- False

9) LaaS as an option to organisation provides what?

- Flexibility for project finance
- A way to make a lighting installation cheaper overall to the organisation
- A way for organisations to shirk their compliance responsibilities to a third party
- Use outsourcing to make redundancies

10) Modern lighting controls are unable to offer, what?

- Real time monitoring
- Software alarms
- Performance measurement
- Eliminate compliance responsibility

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