



LUMENS AS A SERVICE

HOW TO CAPTURE THE TECHNOLOGY-ENABLED BUSINESS OPPORTUNITY FOR
ADVANCED LIGHTING IN COMMERCIAL BUILDINGS

BY KOBEN CALHOUN, IAIN CAMPBELL, AND DOUG MILLER

AUTHORS & ACKNOWLEDGMENTS

AUTHORS

Koben Calhoun, Iain Campbell, Doug Miller

** Authors listed alphabetically. All authors from Rocky Mountain Institute unless otherwise noted.*

CONTACTS

Iain Campbell, icampbell@rmi.org

Koben Calhoun, kcalhoun@rmi.org

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Editor: Laurie Guevara-Stone

Art Director: Romy Purshouse

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ABOUT US



Rocky Mountain Institute
Innovation Center

22830 Two Rivers Road



ABOUT ROCKY MOUNTAIN INSTITUTE

Rocky Mountain Institute (RMI)—an independent nonprofit founded in 1982—transforms global energy use to create a clean, prosperous, and secure low-carbon future. It engages businesses, communities, institutions, and entrepreneurs to accelerate the adoption of market-based solutions that cost-effectively shift from fossil fuels to efficiency and renewables. RMI has offices in Basalt and Boulder, Colorado; New York City; Washington, D.C.; and Beijing.



A close-up photograph of a person's hand holding a circular, glowing LED light fixture. The light fixture is composed of many small, square LEDs arranged in a grid pattern, emitting a warm, yellowish light. The hand is positioned in the foreground, with the fingers gently cupping the light fixture. The background is dark, making the light fixture stand out prominently.

The energy revolution has been fueled by business model innovations that provide services to end users, rather than selling them capital. For solar photovoltaics, the innovation was the power purchase agreement. For mobility, it's been a shift from personal car ownership to mobility services provided by the likes of Uber and Lyft. To date, buildings have largely been left behind. With LaaS, RMI has set out to change that.

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01

HIGHLIGHTS



HIGHLIGHTS

- **The convergence of technological advancements in and cost reductions of light-emitting diodes (LEDs) and smart lighting control technologies has created a major business opportunity in commercial buildings.** These developments now allow service providers to cost-effectively capture new value streams through proven advanced LED lighting retrofit solutions—with both mass deployment of LED technologies and market demonstrations of “as a service” approaches creating high confidence in their performance and financial returns as they are brought together.
- **Service providers can more effectively tap into this multibillion-dollar market and create new revenue streams by making a Lumens as a Service (LaaS) business model their go-to-market strategy.** With LaaS, service providers can deliver the latest lighting technologies to their clients, funded by the value created from the future energy savings of a lumen-optimized lighting system.
- **The LaaS business model delivers commercial building owners and property managers an immediate net operating income (NOI) and cash flow boost** that can result from service provider rental payments, which are enabled by expected future energy savings and provide the service providers the right to deploy LaaS in their buildings. In addition, owners and managers gain access to the latest advanced lighting technologies and optimized performance that service providers both monitor and manage.
- **Rocky Mountain Institute (RMI) is working to help industry better leverage a LaaS business model** to scale the delivery of cost-optimized advanced LED lighting solutions by outlining the technical opportunity and the likely accounting characterization of LaaS from the perspectives of both service providers and commercial building customers.
- **Over time, RMI expects other building energy technologies to become appropriate for “as a service” business models**—unlocking even greater energy savings, improving comfort for building occupants, and increasing market opportunities for service providers. A LaaS model might be just the beginning of additional new “as a service” offerings that can decouple energy investments in buildings from the capital constraints of building owners.



02

THE LED TECHNOLOGY-ENABLED MARKET OPPORTUNITY



THE LED TECHNOLOGY-ENABLED MARKET OPPORTUNITY

The rapid emergence of cost-effective LEDs and fixture-integrated smart controls has generated great interest among service providers and commercial building owners and property managers, but the market opportunity remains under-tapped because of the continued use of business models that limit the adoption of these transformational lighting solutions.

Given the significant constraints on building owners' balance sheets, internal competition for capital is intense. Even some of the highest-return projects are not being considered by owners due to the impact on their balance sheets. Third-party financing has the potential to overcome this market, but there is much uncertainty about the accounting treatment of loans, energy service agreements, and so-called operating leases, especially following the release of pending rule changes resulting from the alignment of the Financial Accounting Standards Board (FASB) and International Accounting Standards Board (IASB) standards.

Commercial building customers may hesitate to use LaaS if they are not offered reasonable and well-defined contractual terms, such as clear termination rights and solutions that bring appropriate benefit to the contracting parties, overcoming the often referenced challenge of split incentives.

What's more, with up to 20 percent of the private commercial building market owned by real estate investment trusts (REITs) and similarly structured organizations, customers are often unable to tap into lucrative incentives—such as the 179D tax incentives, which are awaiting extension—for lighting retrofits due to the legal structure of their entity.

This report highlights the business opportunity presented by the packaged delivery of smart, controllable LED fixtures in commercial buildings and

how to capture this opportunity using a LaaS business model, which provides both service providers and commercial building customers distinct advantages over traditional asset-based ownership models.

01 Advanced Lighting Technology + Digital Controls + Third-Party Control over Lighting = A Compelling Go-to-Market Strategy That Can Accelerate the Growth of the LED Market

SIGNIFICANT LED COST REDUCTIONS AND QUALITY IMPROVEMENTS: Due to technological advancements and increasing economies of scale, LED lighting now delivers reliability, enhanced lighting quality, and energy efficiency compared with early products—including the ability to tune LEDs to deliver the specific color temperature that occupants want at high-output lumen performance—along with rapidly declining costs. Thus, LEDs are now a proven and leading lighting option for commercial buildings.

PLUS ADVANCEMENTS IN DIGITAL LIGHTING CONTROLS ARE ENABLING REMOTE CONTROL AND OPTIMIZED LIGHTING OUTCOMES: Wireless technology, digital controls, and decreasing costs are enabling significant multibillion-dollar annual investments in lighting controls, which enable a high level of control over lighting systems whereby every diode can be digitally controlled to deliver optimized lighting performance. The wireless nature of digital controls also means that they can easily be installed without needing new wiring or disrupting existing building infrastructure. These enhanced technological capabilities can deliver additional benefits that, in turn, further enable lighting-performance optimization and position the digital lighting controls market for continued growth, including:

- **Daylight harvesting:** the use of natural light to offset electric lighting in perimeter areas through continuous dimming, which is less disruptive to occupants than other approaches
- **Occupancy tracking:** the use of data analytics and sensing networks to better align occupancy patterns with lighting schedules
- **Demand-response and peak load shaving/shifting:** the ability to dim lights, sometimes imperceptibly, to generate revenue or savings through utility demand-response programs
- **Distributed supervisory control over lighting:** the ability for service providers to remotely monitor and manage the lighting system to ensure compliance with contracted performance requirements
- **Individual local control over lighting:** the ability for fixtures to be tuned and controlled separately within fixed parameters, which allows individual occupants to dictate how lights are operated in their space

EQUALS A MULTIBILLION-DOLLAR, TECHNOLOGY-ENABLED MARKET OPPORTUNITY: The LED lighting market alone is anticipated to reach 45 percent growth per year through 2020 and ultimately a \$63 billion market size. However, this market opportunity is based on traditional business models for delivering new LED lighting technologies. New business models, such as Lumens as a Service, can both accelerate adoption of LED lighting and expand the overall market opportunity. Service providers offering financing or serving as a key channel for finance providers enable the LaaS business model.

COMBINING LEDS WITH SMART CONTROLS ENABLES A THIRD-PARTY SERVICE MODEL FOR COMMERCIAL LIGHTING. The combined maturation and advancement of LED and smart lighting control technologies enable third-party monitoring, control, and ownership of lighting assets. This in turn allows for

a service agreement structure that delivers optimized and stipulated lighting performance in workplace environments in the form of LaaS. The enhanced capabilities these technologies provide—available at a highly accessible cost—make third-party control of lighting a possibility and a compelling business pursuit for both service providers and commercial building customers. With this approach, service providers remotely monitor, manage, and optimize lighting performance for customers according to agreed-upon performance levels for a particular space. It is therefore the convergence of new cost-effective technologies and their capabilities that makes LaaS possible and an increasingly attractive service provider offering.

LAAS HAS ENORMOUS POTENTIAL AS A GO-TO-MARKET STRATEGY. The LaaS market—when considered alongside loans, capital leases, and operating leases—is expected to grow from \$35.2 million in revenues globally in 2016 to \$1.6 billion by 2025. However, the potential market is likely significantly larger than forecasted if service providers make LaaS their go-to-market strategy.

LAAS CAN DEMONSTRATE HOW BROADER “ENERGY AS A SERVICE” STRATEGIES MIGHT WORK. Over time, we expect other assets to benefit from this approach—implying that LaaS might be just the beginning of “as a service” approaches to other building energy and operations categories.



02 Installation of LED Retrofit Kits over Existing Troffer Housing as Today's Leading Commercial Lighting Retrofit Solution

LED RETROFIT OPTIONS CAN ACCOUNT FOR CUSTOMER REQUIREMENTS. The market currently offers three distinct options for retrofitting existing fluorescent troffers—the [most commonly found fixture type in commercial offices](#)—with smart LED fixtures that vary in their up-front costs, cost savings, and performance improvements:

1. Install partial retrofit kits that reuse the existing troffer housing
2. Install complete retrofit kits that include a high-efficiency reflector installed over the existing troffer housing
3. Remove and replace existing fluorescent fixtures with new LED-dedicated luminaires

COMPLETE LED RETROFIT KITS ARE GENERALLY THE BEST OPTION FOR COMMERCIAL OFFICE RETROFITS. Retrofit kits installed over the existing fixture housing currently offer the best combination of initial cost, (minimal) installation time, and ongoing performance for most commercial building customers. Unlike LED tube replacements and partial retrofit kits, complete LED retrofit kits take advantage of efficiency gains in both the light source and the fixture housing itself because they are installed over the existing fixture housing and lens.

INSTALLING LED RETROFIT KITS OVER EXISTING TROFFER HOUSING HELPS SUSTAIN LAAS AS A SIMPLE SERVICE AGREEMENT. The use of existing troffer housing provides several advantages. Service providers can easily switch out equipment as technologies improve to further optimize performance and reduce the cost of delivering LaaS—or if a customer decides to terminate the service agreement. In addition, the use of existing troffer housing can help establish and sustain LaaS as a simple service agreement, in part because the service provider's equipment does not fundamentally change core building infrastructure (e.g., the installation of wireless controls does not require new wiring) and can easily be replaced. Retaining the existing troffer housing also has the potential to avoid any asbestos abatement issues and to reduce occupant disruption.

FIXTURE-INTEGRATED SMART CONTROLS HELP LED RETROFIT KITS MAXIMIZE VALUE AND PERFORMANCE. LED retrofit kits should include lighting sensors and controls capable of helping fixtures deliver their full potential: [dynamic, smart, and ultra-efficient systems that provide more evenly illuminated workspaces](#) with reduced operation and maintenance (O&M) costs. An effective fixture-integrated smart controls system requires three key components—occupancy sensors, photo sensors, and a central building automation system (BAS) link—as indicated in Table 1.

TABLE 1
CRITICAL COMPONENTS OF FIXTURE-INTEGRATED SMART CONTROLS

Fixture-Integrated Smart Control Key Components	Main Purpose	Additional Capabilities
Occupancy sensors	Ensuring that lights are turned off during unoccupied hours	Informing high-efficiency space scheduling; dimming capabilities at the LED fixture to maximize energy savings; supply-side HVAC optimization
Photo sensors	Employing daylight harvesting in perimeter zones	Dimming lights to adjust for other light sources (e.g., task lighting), where dimming capabilities at the LED fixture maximize energy savings
A central building automation system (BAS) link	Simplifying lighting measurement and verification (M&V)	Allowing for demand response, peak load shaving, and other control strategies employed from a central control room

03 What is an “as a service” business model?

An “as a service” business model creates a relationship in which the customer purchases a service (or subscription) from a service provider that then delivers the service through assets it owns, maintains, and improves. By comparison, a traditional ownership model involves the customer purchasing an asset from a vendor for the customer’s own use. Innovative “as a service” business models are becoming increasingly common for capturing market opportunities using scalable approaches, often enabled by wireless Internet-based technologies. A service agreement is simply the contract that governs the “as a service” relationship between the customer and the service provider.

When a service agreement is being structured, it is critical to understand the difference between a service agreement and a lease. While service

agreements can resemble leases in some ways, when well designed they may not need to be treated as leases under guidance issued by the Financial Accounting Standards Board (FASB). Under the guidance of FASB’s February 2016 [No. 2016-02—Leases \(Topic 842\) Accounting Standard Update](#), service agreements can be distinguished from a lease—and fall outside the new FASB requirements for leased assets—in that service agreements do not provide the customer “the right to control the use of identified property, plant, or equipment (an identified asset) for a period of time in exchange for consideration.” In Table 2, RMI highlights both this and other key characteristics outlined by the FASB Accounting Standard Update No. 2016-02—Leases that help distinguish the difference between service agreements and leases (customer’s auditors will need to assess accounting treatment for individual projects).

TABLE 2

LEASE CONDITIONS COMPARED WITH SERVICE AGREEMENT CHARACTERISTICS

If any of the following conditions are false, the arrangement likely does not contain a lease:	Characteristics of service agreements that distinguish them from leases:
There is an identified asset	There is an identified outcome
The customer has the right to obtain substantially all of the economic benefits from use of the asset throughout the period of use	Service agreements can be structured to provide little to no direct economic benefit from delivered energy savings to the customer, although they will typically provide many indirect benefits—making this characteristic the least clear due to the many interpretations of “economic benefits”
The customer (rather than the service provider) has the right to direct how and for what purpose the identified asset is used throughout the period of use	Service agreements specify performance-based outputs rather than specific assets in that service providers design the system to meet these outputs without material customer input and control the system to direct its use
The customer has the right to operate the asset throughout the period of use without the supplier having the right to change those operating instructions AND the customer (rather than the service provider) designs the asset or specific aspects of the asset in a way that predetermines how and for what purpose the asset will be used throughout the period of use	Service agreements demonstrate third-party control of a system, where service providers control both the design and subsequent operation of the lighting system to meet contracted performance outcomes for customers

Two examples of familiar service agreements are Software as a Service (SaaS), in which clients purchase a subscription from a central software host for licensed use of the software, and solar power purchase agreements (solar PPAs), in which clients purchase solar power at a set price from a solar power provider. In both cases, clients pay for the use of a service from a service provider that owns and maintains the mechanisms of service delivery. Service agreements like these are becoming increasingly popular across different industries because they provide high-value business solutions that are enabled by advanced technology.

The use of service agreements in lighting, and eventually heating, cooling, and other areas of energy-intensive building services, can dramatically accelerate the adoption of energy efficiency in the built environment.

03

THE LUMENS AS A SERVICE BUSINESS MODEL



THE LUMENS AS A SERVICE BUSINESS MODEL

01 Understanding the LaaS Model

LAAS TRANSFORMS THE DELIVERY OF COMMERCIAL BUILDING LIGHTING. Under the LaaS business model, both service providers and customers are aligned and incentivized to deploy the most energy-efficient lighting system. Service providers will likely choose a highly efficient system design—consisting of LEDs with smart controls—to deliver LaaS because they can capture the majority or all of the value of any lighting-related energy savings, depending on the contract’s structure. Service providers can choose to make rental payments to commercial building customers based on a pre-retrofit assessment to have the right—but not the obligation—to deploy LaaS in customers’ spaces and capture this value. The customer benefits from the LaaS model through the potential rental income stream, the higher-quality lighting system, and the contractually defined lighting performance outcomes.

The agreement that service providers establish with each customer specifies the desired performance levels for the lighting system—namely, illumination level, obligations to repair or replace underperforming and broken systems during the agreement term, and performance standards for system availability during occupancy and non-occupancy hours—rather than specific components or technologies to be used by the system. The control that service providers have over the lighting system equipment and operations enables them to optimize lumen performance and lighting-related cost savings. For customers, the benefits come from receiving rental payments, if this option is chosen, or a share of the energy savings if not, and the utility of enhanced lighting quality.

In other words, LaaS delivers lumens to customers similarly to how photocopying service-level agreements can deliver photocopying services. Under these photocopying service-level agreements,

where service providers own and monitor the means of photocopying, a customer specifies the number of prints needed per month, the percentage of prints that need to be color versus black and white, how and when to use double-sided printing, and so on. Service providers then simply deliver photocopying services at a set price using machines they own that meet their customer’s needs with certain reliability. Because service providers have the financial incentive to reduce their cost of delivering photocopying services, they will switch out old machines with new ones as technologies improve. Similarly, under LaaS, service providers consult with customers to design a lighting system that is able to meet customers’ performance requirements. Service providers then deliver Lumens as a Service to meet those performance requirements, and over time service providers can replace lighting system equipment as technologies improve to reduce their costs of delivering the performance requirements.

Based on FASB Accounting Standards Update No. 2016-02—Leases (Topic 842), the LaaS structure may be assessed as a service agreement and therefore would not contain a lease primarily because commercial building customers do not design, control, or have the sole use of the lighting assets. Instead, LaaS should meet the [broad definition](#) of a service agreement because it is an agreement providing some type of performance in the form of a fixed price—with the fixed price based on stipulated annual energy savings—to a recipient, regardless of the assets the service provider selects to use to achieve that end. LaaS also demonstrates third-party control of lighting systems by service providers and provides limited, if any, direct economic benefit to the energy savings achieved to customers. For agreements involving a rental payment, the payment would likely be considered as an indirect economic benefit coming from the lighting system service provider’s right to install and subsequently own the deployed LED lighting system. The economic risk (as a corollary of economic benefit) of performance

clearly resides with the service provider because its compensation is tied to the performance of the updated lighting system. Moreover, the delivered service will often have multiple off-takers with current and prospective tenants that will enjoy such non-energy benefits as improved employee productivity and health as well as an enhanced ability to attain energy and sustainability goals and credentials.

For accounting purposes, LaaS should be treated in customer accounts as a simple service agreement—rather than a lease or asset purchase—thereby simplifying and enhancing the business case for LaaS among many prospective customers.

LAAS REDEFINES ROLES TO MAXIMIZE LIGHTING PERFORMANCE AND RELATED SAVINGS. The customer determines the daily schedule of the lighting system as part of the system performance requirements, whereas the service provider maintains high-level supervisory control and ownership of the system. The service provider maintains control by monitoring and managing lumen performance, actual system use (compared to scheduled system use), and actual energy savings from the established baseline to ensure that customer payments for stipulated savings do not exceed the actual energy savings realized by the customer. Customers have rights that allow them to terminate the contract for reasons other than cause, along with an appropriate breakage fee, during the term of the service agreement. Customers can also terminate or extend the contract at the end of the term of the service agreement.

LAAS SHIFTS AND REDUCES THE RISK OF OWNERSHIP. Because service providers own, monitor, and control lighting equipment under LaaS to deliver optimized performance, the overarching risks of owning lighting shift from commercial building customers to service providers. In addition, LaaS reduces the risk of ownership for customers from a performance perspective by allowing them to seek contractual recourse, or ultimately terminate the

services, if the service provider does not meet the stipulated performance requirements. For service providers, LaaS enables the [option to reuse LED equipment](#) that is removed from one workplace in another to the extent it helps the service provider optimize its fulfillment of LaaS agreements for different customers.

LAAS CREATES PAYMENT AND INCENTIVE CAPTURE, AND MAXIMIZES VALUE FOR BOTH CUSTOMERS AND SERVICE PROVIDERS. For a term coincident to the LaaS service agreement, the service provider can choose to pay “rent” to the customer building owner or property manager to have the right to install an advanced lighting system in the customer’s space. This rental payment, which is determined based on a pre-retrofit assessment of the economic opportunity in a particular building space, crystallizes the customer benefit in a way that removes uncertainty and boosts building investment returns. If the rental feature is not part of the agreement, the service provider can simply offer the customer a share of the stipulated savings, although this form of benefit is likely to be valued less by real estate investors than the option of increased rental income.

In exchange, the customer pays 100 percent of the stipulated lighting-related energy cost savings to the service provider, subject to actual calculated savings being equal to or greater than the stipulated savings. Under this agreement, the customer and service provider agree to a baseline for pre-retrofit lighting consumption based on a predetermined schedule of use and energy price. Service providers can capture the value of the difference between the baseline and the stipulated performance of the replacement lighting system. The service provider also has the right to capture any additional revenue streams enabled by the system’s implementation, such as revenue from utility demand-response programs (where available). Furthermore, LaaS enables service providers or finance providers that have sufficient tax capacity to benefit from the tax deduction to monetize the

lucrative [179D tax deduction](#) for energy efficiency improvements in commercial buildings and capture the value of this incentive at \$0.20 per square foot—provided this currently expired incentive is extended.

LAAS LIKELY APPEALS MORE TO COMMERCIAL BUILDING CUSTOMERS THAN DO ENERGY SAVINGS PERFORMANCE CONTRACTS (ESPCs).

Energy service companies (ESCOs) apply their ESPCs [mostly to federal, state, and local government public buildings](#), and have had [less success in commercial building markets](#). ESPCs—an arrangement whereby energy performance improvements are made with guaranteed energy cost savings that are used to pay for these improvements over time—were developed for public infrastructure renewal. ESPCs generally don't appeal to commercial customers for a number of reasons, including a long [average term length of 17 years and their characterization as a capital lease](#). In contrast to ESPCs, LaaS provides immediate advantages to customers' net operating income (NOI) and cash flows without the capital characterization because the rental payment has no direct relationship to the actual (lighting-related) energy cost savings delivered by service providers. With LaaS, customers are more likely to be satisfied with the services because they can adjust their relationship with service providers, and even terminate the service agreement, based on whether the specified services are fully delivered.

02 LaaS Has Advantages over Asset-based Models

CUSTOMERS IMMEDIATELY INCREASE THEIR NOI AND CASH FLOW.

Customers can increase their NOI and cash flow immediately after becoming a LaaS customer because of the rent that service providers can offer for the right to own and control building lighting systems, if this option is selected. The immediacy of high-value financial benefits and the option to treat LaaS as a simple service agreement make LaaS an attractive option for customers.

SERVICE PROVIDERS CAN EXPAND REVENUE STREAMS.

Service providers have a greater opportunity to scale LaaS and grow their business compared with other business models based on customer purchases of lighting equipment. This is because LaaS contains service-based contract terms that are appealing to customers, that streamline service delivery, and that help customers reduce their equipment-ownership risks.

SERVICE PROVIDERS AND FINANCE PROVIDERS WITH TAX CAPACITY CAN CAPTURE THE (CURRENTLY EXPIRED) 179D TAX DEDUCTION.

If extended, the 179D tax deduction of \$0.20 per square foot would enhance the economics of LaaS when compared with traditional asset-based ownership models because service providers and finance providers with tax capacity could monetize this deduction if they can demonstrate asset ownership—bolstering the case for LaaS. Building owners and property managers, by contrast, typically could not monetize the 179D tax deduction when making investments to improve energy performance in their buildings because either they do not have tax capacity due to their legal structure or they have insufficient profits.

CUSTOMERS GAIN ACCESS TO ADVANCED TECHNOLOGIES THAT OPTIMIZE PERFORMANCE.

Unlike traditional asset-based models for lighting, LaaS allows customers to gain access to enhanced illumination with limited effort and immediate boosts to NOI and cash flows. Enhanced lighting systems can help customers capture [building sale premiums](#)—potentially as they work to meet or maintain energy performance credentials like ENERGY STAR and LEED—and [value from other sources](#), such as increased employee productivity and reduced non-energy operations and O&M costs. They can also avoid risks associated with equipment ownership and failures with technology that they likely do not understand sufficiently to specify and procure directly.

In addition, customers gain improved access to leading technologies that enhance the illumination of their space because LaaS promotes shortened customer technology uptake cycles—a result of service providers having the financial incentive and contractual ability to install the latest technologies for customers. This contrasts with models in which building owners and property managers are more likely to keep old or current (underperforming) lighting systems until the end of their useful life, which not only costs more (compared with LEDs) but also misses opportunities for improved illumination and increased NOI and cash flow.

Because customers have several options during and at the end of a service agreement’s term—including termination, extension, upgrade, and expansion—they can adjust their relationship with the service provider depending on their satisfaction with the delivery of LaaS. The right of customers to terminate the service agreement if they are displeased with the service means that service providers have the incentive to deliver service that meets customer performance outcomes for the space—quelling potential concerns that service providers would use cheap equipment or deliver poor illumination.

BUILDING OWNERS AND PROPERTY MANAGERS CAN BETTER RETAIN AND ATTRACT TENANTS.

By agreeing to a service agreement with a LaaS service provider, building owners and property managers can enhance illumination in their buildings and in turn offer current and prospective tenants a more productive workspace. Furthermore, building owners and property managers that provide a rent pass-through to tenants (from the rental payment they may choose to receive from service providers) can make their space even more attractive—increasing their ability to retain and attract tenants. In addition, this model can help solve the common split incentive challenge by providing an economic incentive appropriate to the proportionate role of building owners and tenants.

Nevertheless, some tenants may not want the lighting equipment that service providers deliver for interior design or other reasons. Building owners and property managers would likely want the service provider’s lighting equipment to be installed in most or all common building spaces, but in tenant spaces, they could either (1) allow tenants to decline LaaS if they want different lighting equipment; or (2) recognize that requiring LaaS in all tenant spaces may be attractive to some, but not necessarily all, current and prospective tenants.



03 Specifying the Technical Treatment of LaaS

Service providers can use a LaaS business model to unlock the market for LED retrofits with fixture-integrated smart lighting controls in commercial buildings, while also delivering customers optimized performance.

In order to create a LaaS agreement that is attractive to customers, service providers should ensure that the agreement specifies the following contractual terms:

TERM 1: DEFINE CONTRACTUAL ROLES AND RESPONSIBILITIES. Service providers must specify the roles and responsibilities of involved parties in order to position the accounting treatment of LaaS as a service agreement. Key considerations include:

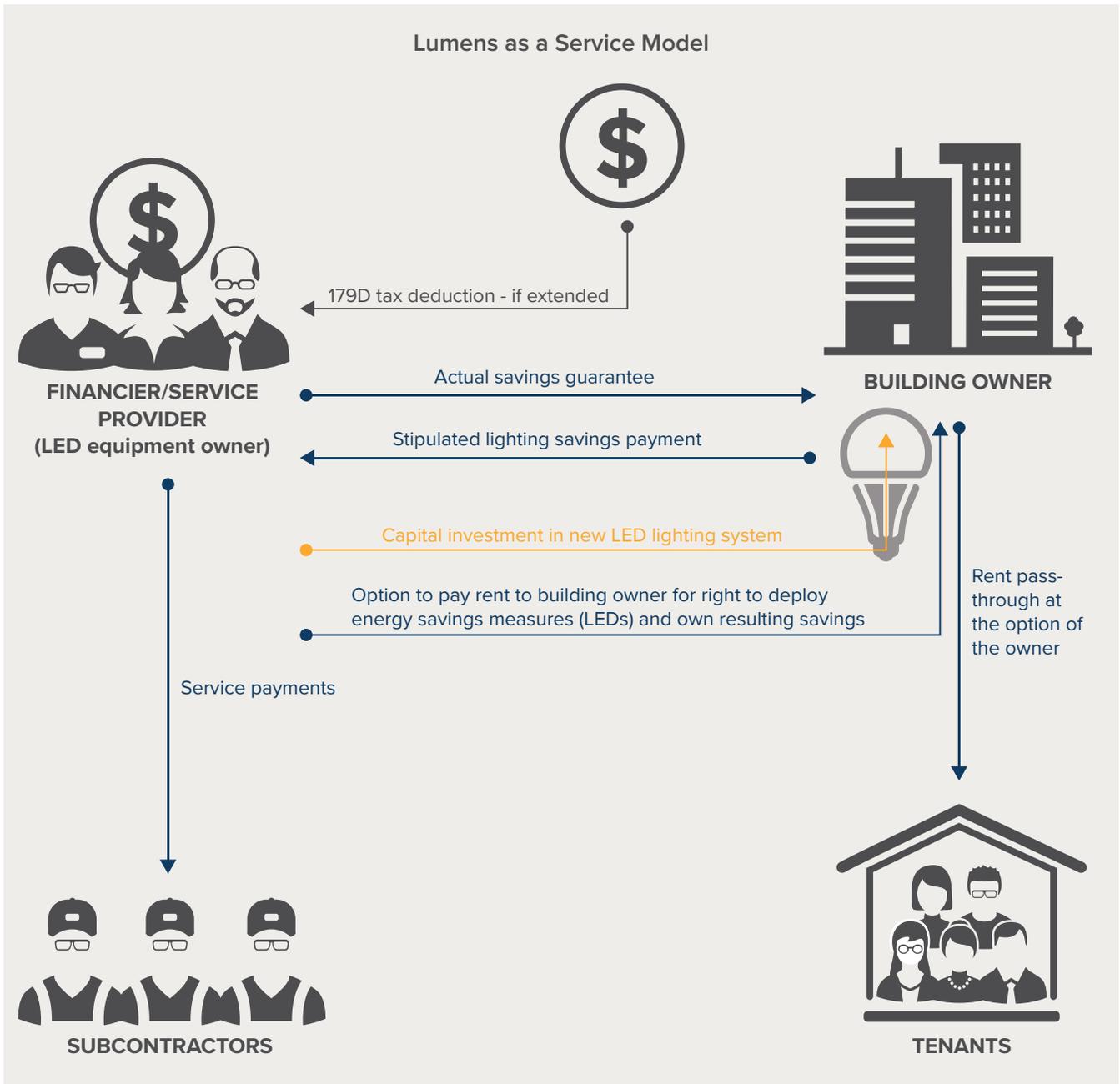
- The building owner, property manager, or tenant will inform the day-to-day scheduling of system operations that remain under the supervisory control of the service provider.
- The service provider will deliver a lighting system that meets the performance outcomes defined under the contract and maintain overall supervisory control of the system through the monitoring and active management of lumen performance, actual system use versus scheduled system use, and actual energy savings beyond baseline.

TERM 2: ESTABLISH PAYMENT AND INCENTIVE CAPTURE. In any LaaS agreement, service providers must clarify how parties will capture payments and incentives for the term of the agreement, where:

- The service provider can choose to pay “rent” to the customer in order to have the right to deploy its lighting system in the customer’s space and receive the ensuing revenue from the stipulated savings (plus any potential distributed resource-related revenues through demand-response or load-curtailement programs). This rent is based on a proportion of the estimated lighting-related energy savings from a pre-retrofit assessment of the economic opportunity that the service provider—through LaaS—has the right to capture from its deployed systems. Alternately, the rent can simply be paid in the form of an agreed share of the stipulated energy savings.
- The service provider captures the value of the stipulated energy savings from the difference between the agreed performance of the new lighting system delivered through the LaaS agreement and the original system that established the energy performance baseline—along with any performance-related malus, which would include any calculated actual savings shortfall versus the stipulated savings.



FIGURE 1
STRUCTURE OF LAAS PAYMENT AND INCENTIVE CAPTURE



TERM 3: ESTABLISH TERMINATION RIGHTS AND HOW TO DETERMINE FAIR MARKET VALUE (FMV).

Customers have several options during and at the end of a service agreement's term. These options include terminating the agreement and buying the lighting system at fair market value, extending the service agreement, and even expanding the service agreement across their real estate portfolio.

Service providers should consider specifying extension, upgrade, and expansion terms in the service agreement with each customer that—by satisfying customers with the services provided over the agreement term—will help develop ongoing revenue streams, provide expansion opportunities across other portfolio buildings, and potentially avoid having to re-compete for a customer from scratch

after the agreement term concludes. The inclusion of expansion terms may resonate strongly, particularly with customers that are considering [practical and profitable energy-performance strategies across real estate portfolios](#).

Service providers should also consider offering service agreement term lengths that are as short as possible to reduce financing cost and risk, and to increase flexibility. Advancements and cost reductions for LEDs and digital lighting controls—plus improved options for bundling these technologies in the form of LED retrofit packages—in fact enable four- to six-year contract lengths that in turn can increase the customer appeal of LaaS. This contrasts with the 17-year average term length for typical ESPCs.

TABLE 3
SPECIFICATION OF LAAS SERVICE AGREEMENT OPTIONS

Agreement Options	Service Provider	Customer
Shortening of contract length	Consider shortening the contract to make the agreement more attractive to customers	Ask about the potential to shorten the contract length
Termination of agreement and sale of lighting system	Specify the termination rights so that the customer is able to understand the financial implications of terminating or not renewing the agreement	Ensure termination rights are possible and that a clear process is in place to determine fair market value in case the customer wishes to buy the system at the end of term or at an acceleration event such as a building sale
Extension of service agreement	Specify how a customer can extend the service agreement and the benefits this would provide customers, in order for the service provider to sustain this revenue stream	Ensure the agreement provides an option for extension at end of term and explains what benefits this provides
Upgrade of service agreement	Specify how a customer can continue the service agreement at an upgraded level and the benefits this would provide customers, in order for the service provider to sustain this revenue stream and also capture additional sales (possibly through an addendum to a master service agreement)	Ensure the agreement provides an option for extension at end of term with upgraded services (if desired) and explains what benefits this provides
Expansion of service agreement across real estate portfolios	Specify how the service agreement could be expanded to a customer's real estate portfolio	Ensure the agreement provides an option for expansion to other properties (if desired)

TERM 4: DEFINE SPECIFIC ACCOUNTING

TREATMENT. LaaS is an attractive model for customers in part because it is likely to be treated as a simple service agreement rather than an asset purchase with the associated use of capital or

implied debt within a customer’s accounts. As such, LaaS would not subject to the usual competition for constrained capital—potentially improving the case for LaaS and simplifying the decision process for customers.

TABLE 4
THE TECHNICAL TREATMENT OF THE LUMENS AS A SERVICE BUSINESS MODEL

Contractual Term	Service Provider	Customer
Roles & Responsibilities	Maintains overall supervisory control of the system through the monitoring and management of lumen performance, actual system use versus scheduled system use, and actual energy savings compared with the payments related to stipulated energy savings	Manages the day-to-day scheduling of system operations within agreed-upon boundaries on behalf of the service provider
Payment & Incentive Capture	Can pay “rent” or a predetermined share of the stipulated energy savings to the customer in order to have the right to deploy its lighting system in the customer’s space and receive the ensuing net revenue from the stipulated savings—plus any potential demand-response-related revenues	Pays the stipulated savings to the service provider along with a deduction for any performance-based malus
Termination Rights	Specifies the options for customers to terminate, extend, upgrade, or expand the service agreement	Ensures that the options to terminate, extend, upgrade, or expand the service agreement are specified
Specific Accounting Treatment	Delivers customers a service rather than assets to meet the accounting criteria for service agreement treatment of the LaaS	Treats LaaS as a simple service agreement rather than an asset purchase with an associated use of capital or implied debt



04 Setting a Strategy for Customer Acquisition

Customer acquisition is a costly and time-consuming activity for a service-based business model. As service providers prepare to deploy a LaaS offering, there are three key details to consider.

LEAD WITH A LAAS MODEL. The LaaS model enables service providers to scale advanced commercial lighting solutions that bundle leading technologies to deliver customers optimized lighting performance. Service providers can reduce their costs over time to deliver lumens to customers by continuing to replace lighting equipment as better options become available. Because LaaS is attractive to customers for reasons including improved illumination and increased NOI, service providers can benefit from scaling the use of service agreements to deliver LaaS to numerous customers.

EMPHASIZE TRIGGER POINTS IN COMMERCIAL BUILDING LIFE CYCLES. Although not necessary for customer acquisition, it's generally easier to attract new LaaS customers when work is likely already under way and space disruption can be minimized, including such key trigger points as building purchases and investments, tenant fit-outs, and new lease structuring.

DISTINGUISH BETWEEN CUSTOMERS AND TENANT LEASE TYPES, IF USEFUL. Although it's preferable from a scaling perspective to design a LaaS model that is agnostic to customer type, it is also important to be mindful of the needs of different customer segments (e.g., building owners, property managers, and tenants) and the terms of different tenant lease types (e.g., triple-net, gross, and modified gross leases). In particular, contract length flexibility is likely a key consideration for service providers that want to attract different customers with varied time horizons.





CONCLUSION AND NEXT STEPS

The unique convergence of cost-effective LED technologies and fixture-integrated smart lighting controls presents a technology-enabled market ripe with opportunity. Service providers can capture increased market share and expand the overall LED market by using a Lumens as a Service model to deliver commercial building customers improved space lighting as well as increased NOI and cash flow.

RMI and a growing cadre of financing providers are industry resources for current and potential LaaS service providers and customers. We developed this report to highlight the market opportunity for advanced commercial lighting solutions, encourage service providers to use LaaS as a go-to-market strategy, and outline critical strategic considerations—such as the terms that should be specified in service agreements—for unlocking the promising LaaS market.

The widespread adoption of LaaS can dramatically accelerate the growth of the nascent LED retrofit industry toward its \$63 billion potential, while having a material impact on the decarbonization of our nation's buildings. Further, the LaaS model might be just the beginning of additional new “as a service” offerings that can finally decouple energy investments in buildings from buildings owners' capital constraints.

We welcome inquiries from service providers and customers that want to scale their use of LaaS to improve the energy performance of commercial buildings.





22830 Two Rivers Road
Basalt, CO 81621
www.rmi.org

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