

Financing Innovation Drives the Deployment of Customer EaaS Solutions

By William Tokash

Commercial and industrial energy users look to capitalize on the shift from centralized power generation to renewable energy and a decentralized grid. They seek guaranteed energy use reduction and cost savings without capital expenditures. The energy as a service, or EaaS, marketplace responds to customer demand for energy solutions that are clean, distributed, intelligent, and mobile.

The electric power industry is facing a fundamental shift from centralized power generation toward more renewable energy and a decentralized grid known as the “energy cloud.” The energy cloud consists of a mix of renewables, distributed energy resources (DER) technology, and smart grid software solutions. This combination promises to disrupt traditional utility electricity procurement and power delivery models while creating new opportunities for energy users.

From a utility customer perspective, corporate commercial and industrial (C&I) energy and sustainability managers historically have had little say about the price and type of electricity they procure under traditional, regulated, and centralized grid models. These C&I energy users will increasingly seek

cost-effective, customized, and property portfolio-wide comprehensive energy management solutions that go beyond traditional energy efficiency upgrades.

The most sought-after solutions over time will provide C&I energy users with guaranteed energy use reduction and cost savings without capital expenditures (CapEx) to meet their sustainability and operational efficiency needs. These new, financed integrated energy efficiency and intelligent buildings-based DER solutions shown in Table 1 will give rise to the energy as a service (EaaS) marketplace.

Navigant Research anticipates that the emergence of the power sector and customer factors outlined in this article will give rise to demand for

innovative financing options for C&I energy users to avoid CapEx expenditures. Financing innovation will sit at the heart of the EaaS segment, to enable new business models and the delivery of new customer

options. The emerging DER financing opportunities, risks, and opportunities discussed in this article are examined in greater detail in the recent Foundation research report on which this article is based.

Table 1. New, Integrated Energy Efficiency, Intelligent Buildings-based EaaS Solutions

Portfolio advisory services	<ul style="list-style-type: none"> Strategic portfolio guidance Portfolio benchmarking DER technology feasibility, real-time EM&V DER financing models
Energy efficiency and building optimization	<ul style="list-style-type: none"> Lighting retrofits Energy savings performance contracting C&I EE retrofits & energy management Building optimization and retrocommissioning
Offsite energy supply	<ul style="list-style-type: none"> Offsite wind, solar PV procurement Retail choice energy procurement
Onsite energy supply	<ul style="list-style-type: none"> Onsite solar PV Combined heat and power Onsite diesel and natural gas gensets Microturbines, fuel cells
Load management and optimization	<ul style="list-style-type: none"> DR capacity market participation Energy storage, microgrids, EV charging Intelligent building analytics and controls

Source: Navigant Research.

Editor's note: This article is based on a Foundation research report titled The Impact of New Energy Production Technologies on Equipment Finance, published in January 2019. It is available at www.leasefoundation.org.

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ENERGY AS A SERVICE SOLUTIONS

Onsite solar photovoltaic (PV), energy storage, electric vehicle (EV) charging, and other DER technologies are being deployed on C&I energy users' properties using new financing instruments. Driving the emergence of EaaS solutions are financing instruments including equipment leases, power purchasing agreements (PPAs), and software and equipment subscriptions. These new EaaS solutions, which transcend traditional project-based energy efficiency EaaS solutions, include:

- **Portfolio advisory services:** Comprehensive strategic guidance to navigate the unique procurement, energy

management, sustainability, financing, business model, and technology opportunities, often provided as a separate fee for service, but increasingly provided as part of a bundled, financed solution alongside other solutions below.

- **Onsite energy supply:** Onsite distributed generation solutions like solar PV, combined heat and power (CHP), diesel and natural gas gensets, microturbines, and fuel cells.
- **Offsite energy supply:** Electricity procurement options from offsite sources in competitive electricity and gas supply markets and from new emerging large-scale, offsite renewable energy procurement business models.
- **Energy efficiency and building optimization:** Comprehensive energy efficiency assessment, business case analysis, financing, implementation, monitoring and verification, and building commissioning services.
- **Load management and optimization:** Comprehensive management solutions to optimize energy supply,

demand, and load at an enterprise-wide level, including demand response (DR), distributed energy storage, microgrid controls, EV charging equipment, and building energy management, analytics, and controls.

Navigant Research defines EaaS solutions as follows:

The management of a customer's energy needs across its portfolio of properties — such as portfolio strategy, program management, energy supply, energy use, and asset management — by applying new products, services, technology solutions, and both project and enterprisewide financing instruments that avoid customer capital expenditures while reducing energy use, spend, and risk.

The confluence of new DER solutions availability, when combined with financing innovations leading to new business model development under the EaaS umbrella, has the potential to disrupt the traditional utility business model and to open new opportunities for energy service companies to respond to customer demand for energy solutions that are clean, distributed, intelligent, and mobile.

FINANCIERS NOW LOOKING TO SUPPORT EAAS SOLUTIONS

While the energy transformation and customer needs are combining to create the demand for new financed EaaS solutions, traditional energy project financiers are also facing new challenges. Considering both new demand for electrification and demand reduction associated with the growth of DER, Navigant Research anticipates that, by 2030, up to a 50% reduction in demand for large, centralized power-generating plants on transmission and distribution systems is possible.

This trend is driving energy project finance investors to look beyond traditional fossil fuel-based coal and natural gas centralized generation and large-scale renewable energy project finance investment instruments, driving them to new DER solutions. However, the deployment of financed DER solutions on C&I energy users' properties, which can provide both customer and grid optimization benefits, will be undertaken across increasingly complex use case scenarios.

This is new territory for most energy sector project finance investors. For the first time, many of them are examining the risks associated with these types of investment.

Third-party solutions providers will increasingly need to deliver a full set of integrated financed DER solutions across portfolios of C&I energy users' properties. Solutions include onsite energy supply and load management solutions. Key enabling factors are the integration of energy efficiency, offsite energy supply, and intelligent buildings analytics and controls.

This evolution portends increasingly complex interactions between building-load and tariff-specific energy, demand, and time-of-use (TOU) charges and the operation of onsite energy supply, energy efficiency, and load management technology.

To support the growth of DER financing at stand-alone C&I facilities, this interaction will require increasingly sophisticated pre-project analytics, operational control, and optimization capabilities across

intelligent building-enabled DER software platforms.

Specifically, C&I energy users will increasingly seek proven, investment-grade DER technology partners and balance sheet-backed project delivery vendors that can guarantee energy and cost savings through innovative DER financing. Navigant Research anticipates that the continued growth of DER project finance asset classes will be required for solutions that go beyond stand-alone energy efficiency to support the need for deployment of customer-sited DER at C&I facilities without CapEx.

INNOVATIVE EaaS FINANCING EXAMPLES

The following three projects highlight innovative financed EaaS solutions that have recently been delivered to the C&I energy user segment.

Metrus Energy Efficiency as a Service Agreement

Many C&I energy users face internal challenges when trying to reduce their energy use and spend. Two challenges are their hesitancy to deploy their own

capital for noncore operations (such as energy management) and their capital expenditure payback expectations, which are often too short for energy management. Many of these same customers are also hesitant to sign the kind of long-term EaaS financing agreements that eliminate these CapEx and payback challenges.

One solution that is helping to overcome these hurdles is the efficiency as a service agreement (ESA) being offered by Metrus Energy. Metrus Energy's ESA is analogous to a solar PV power purchase agreement, in the sense that sources of private capital are used within a project finance instrument. However, in an ESA, service payments by the C&I energy user are based on actual avoided kilowatt hours (kWh) of electricity or therms of natural gas. The ESA allows for the C&I energy user to transfer the risk related to project design, execution, and performance monitoring to Metrus and its network of project deployment support partners.

According to a recent project announcement, Metrus Energy is executing a \$5 million ESA transaction over a four-year term

with a Fortune 100 technology customer. This project is part of a rollout of LED lighting and building management system (BMS) upgrades at multiple sites in two separate states. Metrus has now financed more than \$41 million under this customer's ESA program, resulting in over one billion kWh of energy savings.

Efficiency as a service offerings like Metrus's avoid capital outlay from the C&I customer, allowing for the transfer of project execution risk. Such EaaS offerings — performed under a short-term agreement as part of an ongoing, repeatable series of projects across a C&I energy user's portfolio — are exactly the kinds of solutions for which C&I energy users are looking.

Shell New Energies GridPoint Sparkfund Technology Subscription Partnership

One key challenge for these C&I customers is to provide the right mix of financed solutions such as energy efficiency, solar PV, energy storage, demand response, microgrid technology, intelligent building platforms, and EV charging infrastructure. For example, deploying a mix

of solutions complicates the potential for predictable energy savings for the customer.

And now, with the move away from centralized generation, traditional energy sector project financiers are looking to integrate these project components for the first time to meet these customer needs.

An example of this type of integrated solution delivery is represented by Shell New Energies' recent announcement of a new business model approach called Shell Energy Inside.

Shell Energy Inside represents an innovative approach to bundling EaaS solutions, both to avoid customer CapEx and to better manage energy across a new business model. Specifically, Shell Energy Inside will leverage Grid Point's Energy Manager, a smart buildings energy management and controls platform, to the end of making bundled energy management solutions available to customers as a monthly subscription through Sparkfund's SparkOS technology subscription platform.

Shell Energy Inside's new partnership represents a bundled,

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commercial buildings-focused energy as a service business model to deploy analytics, HVAC and lighting upgrades, energy storage, electric vehicle charging, advanced building controls, retail power supply, and demand response across a single operating expense payment.

NantEnergy SmartStorage®

The C&I distributed energy storage system (DESS) market is defined by battery energy

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storage systems that are installed behind the customer meter at C&I buildings to provide a variety of energy management services. These services can include having the DESS:

- respond automatically to building-load changes to reduce tariff-specific electricity demand charges relative to the customer's load profile,
- manage battery charging and discharging protocols and tariff-specific electricity rates, to provide time-of-use energy cost savings,
- maximize the consumption of onsite solar PV generation to reduce tariff-specific energy and demand-charge savings, and

- provide backup power and improve power quality to protect sensitive equipment from power-quality fluctuations and outages, to ensure operability during grid outages.

Although these solutions can create customer value, the payback for the deployment of these systems often exceeds the one- to two-year CapEx return on investment expectations of many C&I energy customers. NantEnergy, which recently acquired Sharp Electronics Corp.'s Energy Systems and Services business, leverages a series of financing options:

- NantEnergy's SmartStorage® systems can be leased under a 10-year asset management agreement that includes a 10-year performance guarantee. If guaranteed demand reduction savings are not met, NantEnergy will compensate the customer for peak demand costs that were not avoided. These 10-year asset management agreements include operations and maintenance. Potential system downtime is covered by the performance guarantee.
- NantEnergy's SmartStorage® systems can also be deployed

with solar PV systems under a leased solar-storage asset management solution that includes the asset management services outlined above and a demand-charge reduction performance guarantee.

With financing options that avoid CAPEX deployments, NantEnergy's innovative financing approach is well positioned to enable C&I customers to deploy and install these systems.

CONCLUSIONS

The following takeaways underpin the move toward more financed distributed energy resources solutions being provided under the EaaS banner at commercial and industrial energy user properties:

- C&I energy users seek balance sheet-backed vendors that can guarantee energy and cost savings through innovative DER financing offerings. This need shifts the challenge to DER deployment away from CapEx — which is less favorable from an accounting perspective due to financial balance sheet implications — and toward service contracts categorized as an operating expense (OpEx), which do not

have financial balance sheet implications.

- Traditional energy sector project finance investors will increasingly look beyond traditional fossil fuel-based coal and natural gas central generation and large-scale renewable energy project finance investment instruments.

These new investors will seek new EaaS solutions to address the anticipated reduction in centralized generation demand. Consequently, they are looking more closely at the risks and cash-flow predictability of financed DER projects as part of new EaaS solutions.



William Tokash

william.tokash@navigant.com

William Tokash is a senior research analyst in Navigant Research's Distributed Energy Resources (DER) Solutions program in Chicago.

He leads the utility customer solutions and energy as a service research. His expertise covers sustainability; enterprise-wide energy management; and DER, with emphasis on strategy development, technology assessment, project development, business development, investment analysis, and project finance. Mr. Tokash also held leadership positions with Panasonic Enterprise Solutions and Invensys PLC, a UK-based engineering technology and software company. He cofounded an investment firm, Carbon Opportunity Group, in 2008, after working for DOMANI, a sustainability consulting firm. He holds a BS in medical technology from Indiana University in Bloomington.