New Business Model for Large Scale Deployments of Small Commercial Energy Efficiency Projects

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ABSTRACT

Large commercial buildings are common targets for efficiency projects, where the energy savings solution can be cost effectively engineered and managed. These types of projects require significant investments in design, implementation and monitoring that are balanced by the revenue from the resulting energy savings. Unfortunately, for small commercial buildings, the energy savings opportunity rarely justifies the same level of engineering and analysis. This paper describes a new operating business model that leverages innovative financial strategies, technology service providers and insurance to provide a cost effective approach to large scale deployments of small commercial building energy efficiency projects.

The model utilizes specific procedures to manage risk that enables streamlined funding administration for large numbers of small projects. The energy efficiency insurance is underwritten for pools of projects from individual contractors—based on their risk profile and the types of energy savings measures (ESMs) deployed. This approach is designed to reward or penalize contractors based on their delivered performance. The paper also describes one of the financed and underwritten project pools, presenting several examples of small commercial projects under contract.

Using this approach, capital markets can value energy efficiency as a predictable yield generator, with enhanced end-user credit performance, thereby driving down the cost of capital. This result, in turn, encourages more deployment of competitively-priced capital into a growing base of energy efficiency investment opportunities.

Introduction

Despite the availability of proven technology with demonstrated economic benefits, the large market for deep energy efficiency retrofits in small commercial buildings remains virtually untapped. A number of well documented barriers hold back progress including: a lack of time on the part of small business owners, lack of capital to invest in energy efficiency upgrades, lack of understanding and confidence in the economics of these upgrades, relatively long and expensive sales cycles and shortage of sophisticated financing products to address the specific needs of this market (McKinsey 2009).

This paper documents a market transformation effort to package commercially-available and tested technical solutions within a deployment process that focuses squarely on the known barriers that hold back market scale in small- and mid-size building (SMB) deep retrofits. Components of the program include:

- A turnkey energy efficiency upgrade that guarantees 20-50+% savings. The retrofit typically includes:
    - A small building automation system that is "Demand Response (DR)-enabled"

- Compatibility with most of the DR program signaling and reporting regimens—including OpenADR2.0b, in those geographic regions that utilize it
- Interior and exterior lighting upgrades
- HVAC control retrofits including variable frequency drives on motors
- Building-specific measures addressing refrigeration, kitchen ventilation, etc.
- Continuous oversight of energy use and system operation for term of project
- Continuous monitoring (whole-building and main loads) and automated Measurement and Verification (M&V)

- A financing structure that usually requires no capital expenditure on the part of facility owners, with repayment through the project savings
- Investment grade performance insurance assuring that certain energy savings levels will be met thereby reducing technical risk and protecting base cash flows for the investor
- Capture of all qualified Energy Efficiency (EE) and DR incentives and payments

There are approximately 5.4 million commercial buildings in the U.S, of which 98% are 100,000 square feet or less—i.e. SMB. These smaller buildings account for over half the energy used in U.S. commercial buildings: nearly four quadrillion Btu (Quads) of energy annually. Even if the SMB market definition is narrowed to buildings of 50,000 square feet or less, it still accounts for 96% of buildings and nearly 50% of total commercial consumption (EIA 2003).

With the approach described above, the primary financial barriers are removed for small commercial customers—namely, the requirement for verification and capital. Financing is available to the customer, which includes interim funding of rebates until received, resulting in zero up-front costs to participate. The innovations—technical, operational and financial set the stage for unprecedented market transformation with the potential to impact thousands of SMBs.

Retrofit Solution and Energy Savings

To have an impact on the market and “move the needle,” any successful SMB market transformation solution must address thousands of buildings, at a minimum. The chosen measures target the most common energy consuming equipment in small commercial buildings. The technical approach taken by this initiative was to identify and develop a set of standard ESMs with largely interchangeable, off-the-shelf technologies. This allows for maximum flexibility in sourcing equipment, while at the same time standardizing the analysis, installation, and ongoing operations. Every project is turnkey for the SMB owner and each solution includes, at a minimum, a building control system with cloud-based energy information management. Most also include lighting and miscellaneous HVAC retrofits.

Table 1. below provides a description and associated energy savings realized for the types of ESMs being deployed. In all buildings that receive this solution, the minimum installation includes the control algorithm measures and real-time monitoring of the main loads and whole-building meter. In the projects completed to date, the owners have realized savings of 15% to as much as 50% when implementing most of the indicated measures. Where feasible, these projects seek to achieve savings across as many different fuel-types as possible to maximize the overall financial benefits.

In addition to the installation of the measures, each project is actively tracked and operationally managed for the duration of the contract term. This ensures that schedules and setpoints are maintained, equipment is off during unoccupied periods and that the expected savings are realized and persist.

Table 1. Example of Typically Installed Energy Savings Measures

Category	ESM description	Typical savings	Peak load reduction
Control algorithms	Schedule management	5-15%	NA
	Set point/dead band optimization	3-10%	NA
	Optimal start/stop	2-8%	NA
	Nighttime flush	1-5%	NA
	Compressor staging	2-5%	5-10%
HVAC retrofits	Demand-controlled ventilation	2-10%	NA
	Economizers	5-15%	NA
	VFD controlled supply fan	20-40%	2-5%
	VFD controlled compressors	15-30%	30-50%
Lighting retrofits	LED indoor lighting replacements	30-75%	30-75%
	LED outdoor lighting replacements	30-75%	30-75%

Innovative Financing

The lack of sophisticated approaches to financing efficiency upgrades in SMBs is a core issue holding back market scale. The most critical barrier that the financial industry has faced in entering this market is the lack of standardization and risk control of EE project development. Following close behind are the SMB customer's assumption of debt without an assurance of delivery of savings and finally, if savings are measured, presenting the transaction to the SMB customer in a easy-to-understand arrangement.

The whole building approach outlined above creates an opportunity to overcome these challenges through; 1) presentation of an easy-to-understand customer value proposition where the SMB customer can look at their entire facility's savings rather than needing to digest the performance of specific ESMs; 2) project origination that follows a uniform process and creates standardized projects, 3) whole building ESMs access to multiple cash flow streams, enabling these small projects to meet investment hurdles and be fully financed, and 4) M&V that enables monitoring to (i) confirm savings for utility incentive access, (ii) demonstrate savings to the SMB customer, and (iii) achieve active management of performance at project sites.

The financing offered is uniquely suited to the needs of SMBs and overcomes two critical barriers to adoption: 1) the unwillingness of small business owners to commit capital, either by directly investing or with a fixed debt, to energy saving projects—even those that are highly cost-effective, and 2) the lack of confidence that proposed savings will be achieved. The performance-based financing provided under this market transformation model is insured, meaning the customer only pays for what is delivered while investors can rely on an assured cash stream, removing major sources of customer resistance and investor concern.

Scalable Financing Model

The success of this financing approach depends on achieving scale, which in turn depends, in part, on a standardized model (Figure 1.) for project origination—starting with contractor onboarding and Master Agreement structuring and culminating in project review, approval and funding using templated customer agreements, and ongoing performance monitoring. Highlights of this process are:

- Contractor approval puts the engineering, underwriting and contracting requirements into the upfront process and allows the contractor to then scale deployment under a standard model. Contractors can be defined as any of the following organizations that are willing to stand behind the performance of their projects through the customer agreement term and may include (i) general contractors who manage building improvements including HVAC, controls and lighting; (ii) regional lighting and/or HVAC contractors who are incorporating controls in their solutions and migrating to an integrated offering (HVAC, lighting, controls); (iii) experienced ESCOs who have direct experience in whole-building solutions via their performance contracting businesses.
- Contractors with signed customer agreements in the form of an Efficiency Services Agreement (shared savings) or Managed Efficiency Services Agreement (guaranteed savings delivery) follow a standardized approval process for projects. The capital provider conducts a full cash flow analysis and cost evaluation using a financial model accessable to both the investor and the Contractor, including access to databases to incorporate additional cash flows from sources such as demand response, permanent peak demand reduction and incentives. Although these additional cash flows are oftentimes difficult to understand and often overlooked, they are important and realizable sources of value for these projects since they are enabled using essentially the same installed technologies.

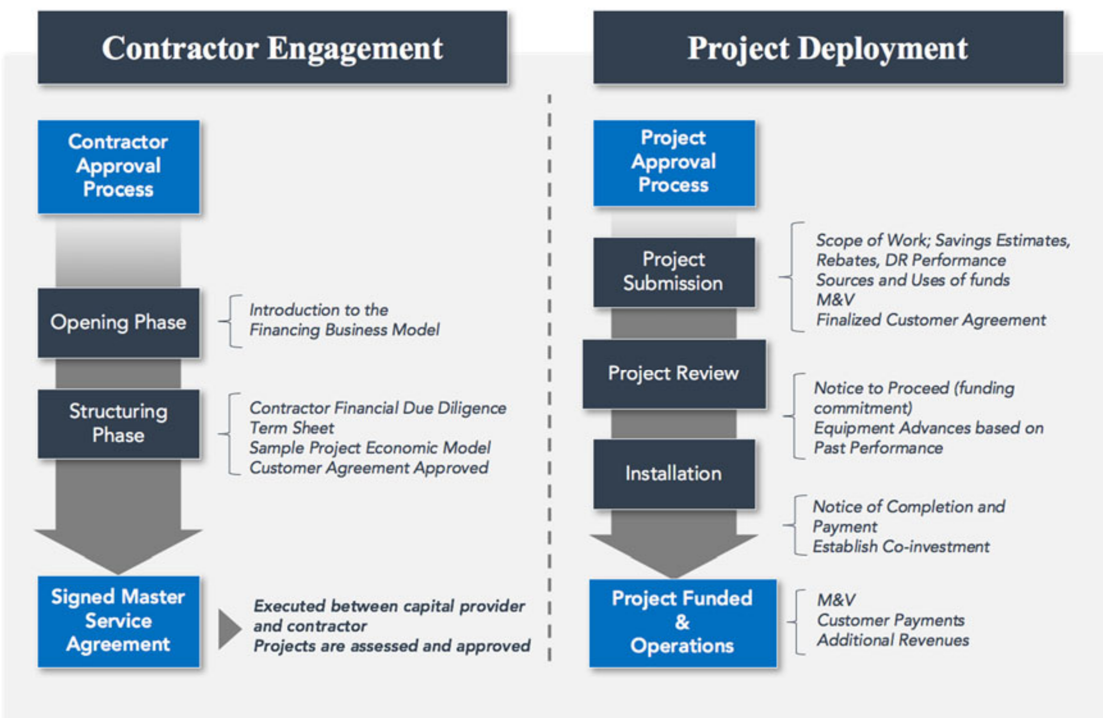

Figure 1. Contractor Engagement and Project Deployment Process

As Figure 1. demonstrates, the Master Agreement serves as the guidance document for the types of ESMs the Contractor may deploy. This, of course, may be updated and modified via exhibits (e.g. if energy storage is later added, DER technologies, etc.) for technologies that are proven and warranteed. Once in place, the Contractor may now sell its projects with confidence by accessing the financial model directly to preview project economics. It is at this evaluation stage that additional cash flows are captured. For example, the Contractor would identify the amount, advance notice and duration of curtailable loads within the building. This triggers access to a database of available incentives and DR revenue opportunities that are then included in the model. DR is accessed and measured with the same installed equipment, thereby creating incremental revenue controlled via automation.

The completed financial model is now used to confirm the value proposition and provides the Contractor with the tools needed to finalize the Customer Agreement and collect the customer's application data for underwriting. Since customer payments are based on delivered savings (e.g. not an incremental customer obligation), underwriting is a tool to evaulate whether the customer will remain in business through the Customer Agreement term, typically 4-5 years.

Once this information is collected, approvals and project Notice-to-Proceeds can be turned around quickly (often weekly) by the investor, thereby shortening the deployment cycle. Following the Notice to Proceed, capital advances from the investor enables materials procurement, allowing the Contractor to complete the installation in a timely manner. Once completion is confirmed, customer payments begin via outsourced invoice and cash management and active oversight is underway.

Standardization (see below) allows for a quick Customer Agreement review, underwriting and financial evaluation – all necessary for rapid project approvals by the investor.

Energy Savings Performance Insurance

Nationally, a wide array of different energy efficiency retrofits and new technologies for the private and public sectors are being proposed, with varying levels of investment and risk. Increasingly, larger building owners are turning to Energy Service Companies (ESCOs) to engineer and manage the implementation of ESMs that deliver insured savings. Yet a challenge for small to mid-size ESCOs is providing assurance to building owners and their creditors, or investors, that those initiatives will generate the savings expected. Due to the complex nature of energy conservation systems and technical uncertainty over the effectiveness of specific energy efficiency programs, third parties often see such projects as an unfavorable credit risk. Many contractors and building owners with viable energy conservation projects can be forced to leave viable deals "on the table" due to financial considerations like poor credit, delinquent utility bill payments, and inadequate balance sheets (Hayes, Nadel, Granda, and Hottel 2011) .

In response to this opportunity, innovative insurers have begun to underwrite the performance of ESMs. The insurer on this market transformation team has a patented approach to achieve credit risk reduction which removes the technical uncertainty for lenders and capital providers allowing them to concentrate on credit risk. Insuring the performance of projects with a highly rated insurer helps to reduce financial exposures. This results in a quantifiable improvement in credit worthiness, lowering interest rates and financing costs.

The insurer's patented approach on how this type of insurance can improve the credit worthiness of energy efficiency projects has been described previously in an ACEEE Summer Study Paper (Jones and Barats 2012) and (Jones and Tine 2014). In this application, the model uses the insurer's computed expected annual energy savings distribution and assessments of the credit worthiness of the borrower. In this example the borrower can be the contractor, building owner or a Special Purpose Entity (SPE). The model currently uses inputs from nationally recognized statistical rating organizations (NRSROs), which provide assessments of default probabilities and expected losses. NRSROs include institutions like Standard & Poors Rating Services, Moody's Investors Service, A.M. Best Company, and Fitch (US SEC 2012). The NRSROs typically categorize the riskiness of a company by symbols ranging from AAA to D. (See Figure 2) For this paper we chose S&P rating categories but the category interest rates and default probabilities can come from any NRSRO rating.

S&P	An obligor rated 'AAA' has extremely strong capacity to meet its financial commitments. 'AAA' is the highest issuer credit rating assigned by Standard & Poor's.	An obligor rated 'BBB' has adequate capacity to meet its financial commitments. However, adverse economic conditions or changing circumstances are more likely to lead to a weakened capacity of the obligor to meet its financial commitments.	An obligor rated 'B' is more vulnerable than the obligors rated 'BB', but the obligor currently has the capacity to meet its financial commitments. Adverse business, financial, or economic conditions will likely impair the obligor's capacity or willingness to meet its financial commitments.

Figure 2. S&P definitions for AAA, BBB, and B categories (Source US SEC 2012)

Even though it is doubtful the contractors will have S&P ratings, the model is applied but assuming a given contractor is in the B, or BB range: e.g. within the interval (BB-, BB, BB+). The prequalification analysis for contractors to participate in this business makes this assessment possible.

To illustrate a representative application of the credit enhancement value of energy efficiency insurance for a given contractor, we apply the credit risk model to a portfolio of projects for a given contractor. Suppose Contractor 1, implementing six projects with a total estimated energy savings of $500,000 over five years with a capital investment of $600,000. If we apply a 20% deductible to the total estimated energy savings of $500,000, the insured savings amount is $400,000.

From a credit worthiness assessment based on Contractor 1's financial qualifications, we believe the contractor to be in the S&P BB range. The model is then applied using BB- and BB+ categories and the results are combined to show a range of credit enhancement valuations. Due to the uncertainty in the energy savings input data, range analysis allows the user to make practical valuation decisions if upper and lower limits can be applied with certainty. In other words, if we know the credit rating is definitely above a B and definitely not investment grade (BBB-) then, the BB valuation range represents realistic enhancement limits. The results of the range analysis are shown in Table 2.

Table 2. Credit Enhancement Valuation for Contractor 1

	Lower Limit on Contractor Rating					Upper Limit on Contractor Rating			
		BB	BB+	BBB-	BBB		BBB-	BBB	BBB+
No Insurance	BB- >	81%	37%	56%	36%	BB+ >	92%	48%	25%
With Insurance	BB- >	100%	99%	99%	99%	BB+ >	100%	90%	50%
Required Loss Reserves	$37,259	$28,312	$17,341	$13,221	$4,984	$17,341	$13,221	$4,984	$4,168
% Reduction in Loss Reserves with Rating Increase	---	24%	53%	65%	87%	---	24%	71%	76%

The probabilistic analysis values signify the likelihood of a BB- client exceeding the loss reserve requirements for a BB. From Table 2 there is an 81% likelihood that the energy savings distribution will provide sufficient revenue for a BB- borrower to achieve a BB or greater rating.

The "No Insurance" row includes the energy savings distribution as viewed by insurance engineering and underwriting but no insurance is present and therefore, no lower limit where insurance would respond. The "With Insurance" row adds a lower bound: the insurance threshold, to the analysis and limits the financial exposure.

The range analysis is then performed by comparing the "With Insurance" rows of the left and right hand sides of the information in Table 2: BB- & BB+ results to decide on what rating enhancement, if any, can be applied. In this example, there is a 99% likelihood of exceeding the requirements for achieving the BBB level for the BB- and a 90% likelihood for the BB+ cases. It should be noted that the credit enhancement value of insurance diminishes as the contractor's credit rating increases. Using this approach, the lender or capital provider could enhance the credit rating of the contractor from a BB- to a BBB with 99% confidence and a BB+ rated contractor to a BBB with 90% confidence and in turn lower their required loss reserves and perhaps provide better loan interest rates.

The "Required Loss Reserves" row shows the expected loss that is computed using standard credit risk modeling methods. Looking at this line in Table 2, if an improved rating category of BBB is chosen, then the loss reserves can be reduced from $37,259 to $4,984. This corresponds to an 87% reduction in loss reserves if energy efficiency insurance is applied to Contractor 1's projects. This is the financial value created by the insurance. This type of analysis can also be used to test if insurance should be applied. If the credit enhancement value is not created from the analysis as demonstrated in Table 2, then insurance value must come from another source, if at all.

There are inherent differences between the capital provider's and the insurer's financial risk. Insurance always has exclusions whereas the bank's financial risk, once the money is lent, is absolute. Another layer of analysis is required to determine the breadth of coverage obtained from the insurance. The process requires a detailed understanding of what is covered and what is not. Not all insurance policies, even for the same type of coverage, are equal and this exercise guides all parties to provide the best risk transfer product admissible under regulatory and corporate guidelines.

The inclusion of performance insurance in its many forms provides a financial and competitive advantage to financial institutions, contractors and building owners. The range analysis describe above is tool that can add more science to the art of underwriting energy efficiency projects. Figure 3 highlights some of the key benefits for each stakeholder. ESCOs currently benefit as it allows them to reduce the balance sheet liabilities associated with multiyear energy savings project guarantees. However, in this program, the insurer has the option to take it a step further by providing this same investment grade coverage to a portfolio of ESCOs and smaller projects which is an industry first. In doing so, it helps ESCOs, large or small, equipped to conduct energy conservation projects, to focus on their core business with a performance insurance product backed by a highly-rated insurer.

Figure 3. Benefits of Key Stakeholders from Performance Insurance

Process and Document Standardization

Scalability requires a level of standardization in process documents and procedures. This is a common challenge with utility rebate and loan programs, with direct install programs, etc. and is no different in scaling this market transformation model. Significant success has been achieved thus far in creating standardized templates for the components that comprise this approach. Development of a standardized term sheet and associated master agreement (described in more detail below) where contractor-specific and region specific terms are captured in the exhibits, has shortened the Contractor onboarding period to as little as 45 days (from up to six months in the past) while at the same time driving down legal review and support costs. Additionally, by reducing the Customer Agreement types from five (MESA, ESA, loan, operating lease, capital lease) to two (MESA and ESA), the customer can now be presented with two options, depending on the Contractor's desired business model. This has saved months in the customer adoption process per transaction. The look and feel of a standardized agreement mirroring, in many respects, the mobile phone plan approach, allows the customer to focus on the proposal and summary of terms rather than the legaleze.

One key to standardization has been the development of a template Master Agreement where differences in characteristics of the technologies, performance measurement and sharing, and deployment strategies are contained in the exhibits. In this way all of the capital provider's counterparties to the Master Agreement are treated consistently. This is a critical element in securing energy savings performance insurance, where insurers look for a consistent treatment of contractors and ESMs for purposes of underwriting portfolio risk.

The capital provider has also developed template customer agreements which serves several purposes, most notably providing consistency across security, business models, obligations, and capture of key terms and conditions.

Additionally, the capital provider has created a financial model used by both the capital provider and the contractor as a way of presenting a mutual view of a project opportunity so that projects are more consistently presented in a mature condition for ultimate approval with minimal misunderstandings regarding assumptions.

Solving for a comprehensive modular approach encourages participating contractors to propose projects with broader sets of ESM solutions. The capital provider shares best practices as it serves to improve project performance, deploys capital more efficiently and delivers contractors more value by informing them of new ESMs they may not yet be deploying.

Finally, the capital provider seeks to incorporate best practices from others who have developed standardization improvement tools for scalability. As an example, the standard process now includes certification by the Investor Confidence Project (ICP). ICP was developed to create the core infrastructure necessary for markets to emerge, by training and organizing industry players such as ESCOs, contractors, engineers, and auditors to generate standardized projects that can easily be underwritten by programs and investors, and will have the confidence of building owners.

Example Projects

Example 1: Quick-Service Restaurant

The complete market transformation model described above is being deployed in an increasing number of real-world projects. The first example is a quick-service restaurant in New York. The restaurant, part of a national chain, has an annual energy spend of approximately $100,000. The total financed amount for this project (net of incentives) was $21,000 and the portion of annual savings insured was $8,300 per year. New York is a particularly attractive market for these projects as it has a combination of high energy costs, generous utility efficiency incentives and the availability of conditional cash flow opportunities such as DR. The project team worked closely with NYSERDA, who administers the efficiency incentives for this part of New York. Subsequent to the completion of the first few installations, NYSERDA was able to streamline their incentive approval and inspection process for these types of projects—greatly streamlining the process. We have found the first few projects under any new utility efficiency program to be labor intensive as both sides familiarize themselves with the other’s analysis approach, procedures and approval processes. However, we have also observed that subsequent projects are much easier to move through the process.

This project began with a basic control system retrofit, converting the existing independently operating HVAC subsystems into an integrated Building Management System (BMS). This ensured consistent setpoint and schedule discipline and also enabled DR via the cloud-based supervisory control interface. Additional control algorithms implemented include: compressor staging, nighttime flush, optimal start/stop and dead-band optimization.

One of advantages of these projects is that they are relatively long term—affording the opportunity to deploy multiple retrofits over time. Following the BMS installation, the customer was approached to discuss the benefits of upgrading the interior lights. The LED upgrade had the multiple benefits of improving the lighting quality and updating the dining room ambiance while simultaneously reducing the energy costs. The pro forma financial model used on these projects readily allows for additional ESMs to be layered into the project over time, with the resulting cash flows and financial metrics easily evaluated. In this case, the analysis revealed that the lighting retrofit could be added without extending the contract term or seeking capital from the customer.

The cloud-based supervisory controls and analytics provides for continuous oversight of these projects—resulting in several benefits. First, it ensures that the expected savings are achieved and persist for the contract term. All projects include both interval meter data and utility bill-based M&V. Second, and very important, is that they assist in diagnosing mechanical malfunctions and generate alerts when conditions are outside of normal operating parameters. This often creates additional energy savings opportunities. For this restaurant, it helped identify abnormal cooling behavior for the large kitchen RTU. The analytics showed unexpected compressor activity during expected economizing periods. Upon site inspection, it was determined that the unit had a non-functioning economizer. Since the kitchen required cooling almost all year long, significant savings were possible by addressing this opportunity. Once again, the pro forma financial model was used to determine the viability of an economizer retrofit, which was readily approved by the capital provider and installed at the site. Figure 4. shows the cumulative savings over time for the project as the different phases were implemented.

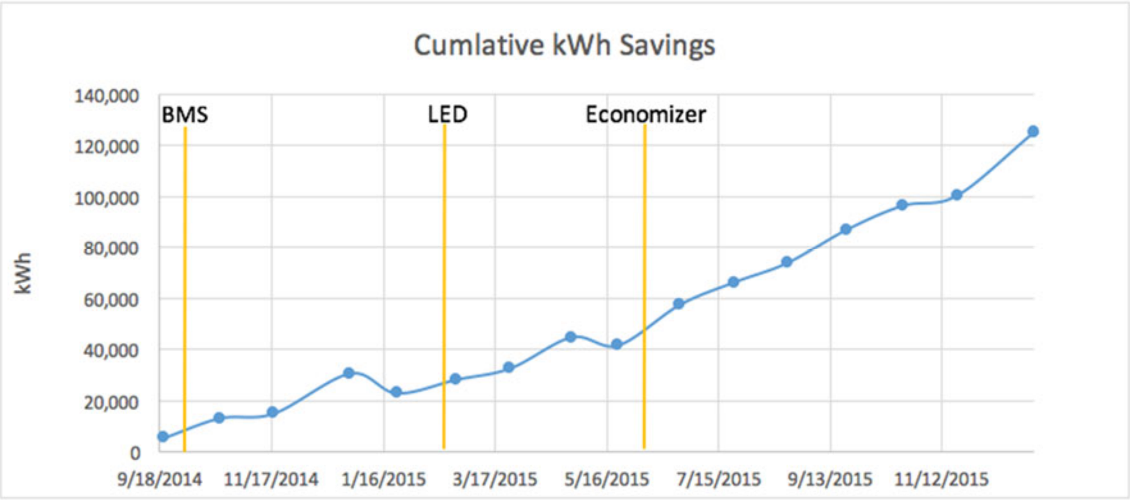

Figure 4. Cumulative Savings Over Time for Phased ESMs (New York)

Example 2: Recreation Center

The second example is a recreation center (bowling, video games, dining, etc.) in Oregon. The site is a standalone building, with an annual energy spend of approximately $61,000. The total financed amount for this project (net of incentives) was $60,000 and the portion of annual savings insured was $19,000 per year. The Energy Trust of Oregon (ETO) recently implemented new incentives for control-related measures with a mandatory multi-year service agreement to ensure that the savings persist for at least five years. The ETO's innovative, performance-based incentive is a perfect fit for this market transformation model.

This example project shows the benefit of a multiple measures combining to provide deep energy savings of 30%+. Table 3. below summarizes the various HVAC control and lighting retrofit measures that were installed in the building.

Table 3. Energy Savings Measures Installed at Recreation Center (Oregon)

ESM Category	Description	Typical Quantities	Installed
HVAC	Programmable RTU Controller	1/Air Handler	12
	Permanent Demand Reduction Opt. Module	1/Air Handler	7
	Supply Fan/Compressor VFD Control	1/Air Handler	5
Lighting	LED Replacement Lamp	(1-4)/Fixture	579
	LED Outdoor Pole Light	1/Pole	4
	LED Wall Pack	1/Fixture	7

One of the keys of cost-effective comprehensive retrofits in small commercial buildings is standardization of the ESMs. While not every measure described in Table 1 is installed in each building, the hardware, installation, commissioning and ongoing monitoring for each is the same from building to building. New measures (and technology vendors) are being evaluated all the time, but care is taken in introducing them into the process, as problems can quickly multiply if untested ESMs are incorporated into large numbers of sites over time.

The lending and insurance partners participate in these projects, in part, because of the high-fidelity M&V that is performed for every installation. Each building is continuously monitored at the whole-building meter and key sub-loads (e.g. HVAC units). This provides each stakeholder with visibility into real-time project performance and enables early detection of problems that inevitably occur over the course of a long-term contract. Analysts review all sites in the portfolio on a frequent basis to identify outliers that need attention, long before the problems show up on the utility bill. Figure 5. shows one of the analytical tools that is used to compare the recreation center's post-retrofit performance to its baseline.

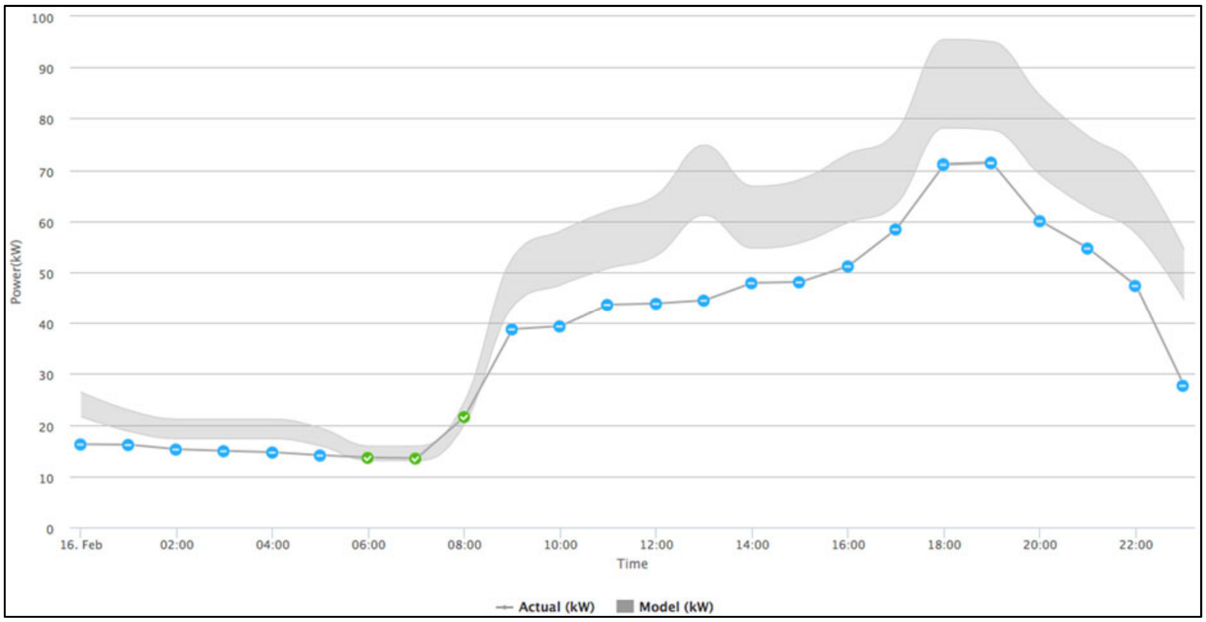

Figure 5. Baseline Modeled vs. Actual Demand—Post Retrofit (Oregon)

Decision-Making Process and Project Timelines

To profitably scale this business model, it is critical that the level of effort and timeline associated with the sales, analysis, utility incentives and installation activities are appropriate to the project sizes and customer expectations. In our experience, the ideal time period from initial customer contact to final commissioning is less than 90 days for these small retrofit projects. A strong argument supporting scalability of this model is that most of the process steps are within the direct control of the principal stakeholders—customer, contractor, financier and insurer. Customers usually decide very quickly whether they wish to proceed with the project. We have developed standardized processes using the same analysis methodology, ESMs, financial modeling, documentation and installation partners to ensure project move rapidly through the various stages.

Perhaps, it is no surprise that the single biggest uncontrollable factor is the utility incentive process. Since the utilities and the financier generally will not allow you to proceed to the implementation phase until the incentive offer is in hand, this usually determines how fast the overall project can proceed. (Note: The time to actually receive the incentive, while important, is largely mitigated through financing) Based on the projects completed to date, the timeline for the application and approval process of the energy efficiency incentives varies widely by utility. At some utilities, the time period can be as little as 2 weeks. At others, it can take 6 to 9 months (or even longer).   As a result, these projects will invariably be concentrated in markets where the utility incentive process supports the rapid project deployment necessary to profitably scale.

Conclusions

Innovations in financing, insurance, standardization and technology are driving new business models and market transformation opportunities for the small commercial building sector. The model described above shows how an end-to-end solution, which directly addresses key market barriers and involves the primary stakeholders can lay the fundamental groundwork for change.

The example projects show the high degree of flexibility that is possible with this approach—in terms of geographic regions, project size, building type, and even staging of the installation of measures. Current efforts include further streamlining and standardization of the methodology with the goal of rapidly deploying capital and projects across the country.

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