Living in the Energy Efficient New Construction Program World

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ABSTRACT

The implementation of new construction programs in Wisconsin have evolved over time. By listening to the customers, program efficiency has been streamlined resulting with a high level of customer satisfaction. Five years ago, there were about 20 buildings in the new construction pipelines. Today, we have experienced over 600% growth in our implementation portfolio with a 200% increase in manpower. Energy efficiency program personnel are serving hundreds of new buildings, even through a poor construction economy.

This topic covers how the marketplace works, identify the major players and what their needs to succeed are, while focusing on growth, savings and customer satisfaction. This paper discusses construction structures, and ownership arrangements. As a building project moves through the construction cycle, there are critical milestones to keep energy and program influence in the forefront of decision making. Timing is everything. From the financial close, to construction completion we align the opportunities that influence design and maximize savings.

How do we meet these needs? What are strategies to meet and exceed savings goals, even as the building codes become more stringent? Where do energy efficiency grants fit in?

Introduction to the New Construction World

Over the last 15 years, the author has served in various new construction market provider roles cumulating in managing the implementation of several new construction energy efficiency programs. This includes firsthand knowledge of the market players, how buildings are owned, setting the construction budget, what bidding and value engineering mean, the impacts of the schedule on design and construction, and effectively driving energy efficiency in design.

It is important to set energy efficiency program boundaries to match the market needs, using simplicity, predictability, proper timing and incentives to find the many opportunities. Understanding how the entire industry works includes the financing component to achieve savings goals. In order to serve both the energy efficiency programs and the customer base, the general market barriers are noted throughout this paper. This paper will share some general lessons that helped influence the market while positively impacting the benefit cost ratio.

How Does This Market Work?

The Market Players

A new construction project is a team effort with many different components. There are many players with different skills coming together to make a project successful.

Owners/Developers (owners). For this paper, owners and developers are considered to be the same and are defined as the one who pays the bills for a construction project. They are the visionaries who develop a concept, take the risk, obtain the reward and are the final authority on

a project. Often, they have limited technical knowledge. They set the energy efficiency levels they are willing to pay for. However, when the owners understand the financial ramifications of energy efficiency, they are very effective in improving the building energy savings. At times program personnel can define the contracted design scope directly.

Designers. The designers are hired to incorporate the owner's requirements into a comfortable, safe and usable building. Designers are hired to deliver a specific design to meet project goals such as energy efficiency or building aesthetics. These highly skilled professionals include architects, mechanical (HVAC) engineers, lighting designers, and so forth.

In many cases, the architects write a scope of work which is bid on by the other design professionals or contractors bid on. The architect can develop early design packages as part of the financing process. Architects tend to have limited technical knowledge of energy efficiency, not understanding the cause and effect of energy efficiency in their design. Energy efficiency is not tangible to what they do. For example, while their thought process might be "the extra windows let in the light", they don't often consider that they can also cause the need to upsize the cooling equipment significantly. Architects value the translation of their design features into the energy impact. The architects see value to the owner with a more energy efficient design.

Engineers and other designers work with architects to complete the building design. They compete for the contract so there is minimal money in most design contracts for new ideas or research. They win the work by designing new buildings similar to old buildings and keeping their design fees down, especially if linked to the construction budget. They are not paid to make improvements, even if they would like to. At minimum, they design to meet the energy codes. All professionals are liable for the design and have a profound impact on the energy efficiency of the building. They view efficiency from a system level.

To successfully work with designers, it is really important for energy efficiency program personnel to work with them to help them create and meet the owner's expectations. The designers are making key energy decisions. Keep in mind; they are still limited by what the owner hires them to do. Ideally, it is best to collaborate with both the designers and the owner.

Contractors. Contractors are hired to build the building. General contractors control the schedule, scope, subcontracts and financial details of a project. They usually build the building shell, interiors and finishes. They are hired to build the building as designed, on time and within budget. In certain circumstances, the general contractor can move money between subcontracts making them a very effective program ally. Contractors are required to follow the scope they are given which limits their ability to include energy efficiency in the project. At times their technical knowledge is limited. Working with contractors is discussed throughout this paper.

Suppliers. The suppliers' role is to provide the equipment specified. Often they recommend better equipment, but through the bidding cycle they are limited to what the budget allows or what is specified. They are competing for the same work and cost is a driver.

Most often, the owners have the most influence over what is in the building. The general contractor can have the second strongest influence when they can move money between sub-contracts. The designers integrate the systems together that make the building work. It is unlikely that two buildings will have the same design team, construction crew energy efficiency goals, building codes or financing package. Each building is a custom design solution.

Ownership

The ownership structure of any building varies. It is negotiated on each entity's business goals. It cannot be assumed that a customer or tenant owns the building. Ownership structure examples are discussed in Table 1. A single purpose entity is often created, for example, a limited liability corporation (LLC). The LLC gives the banks a single entity to lend money to and expect repayment from for the loan through the generated property income (Thode 2010).

When a building is not owned outright, there can be different lease structures. Often the utility costs are negotiated with the tenants. This situation is great for the end-user to manage their own utility costs, but it reduces the building owner's responsibility to incorporate energy saving features in the building. The tenant, by default, inherits what is designed. Some tenants have their own energy efficiency requirements for the building. If the tenants pay the utility bills and there are no direct energy costs for the owner, why does the owner care about energy efficiency? Some reasons are that the owner can build a better building, or energy efficiency is used as a marketing tool to improve the return on investment. It can be the difference between leasing the space or not; making money or paying more expenses. It is a calculated risk.

It is important to understand who the actual decision makers are. For example, it is critical to make sure the mechanical system design message is delivered to the correct design team. If a corporate tenant or government agency is leasing a building, they might have no authority over the developer running the system design. It is important to make sure the incentive is paid to the owner since they pay for the upgrade. Remember, owner for this paper is not who possesses the building in the end, but the one who is financially responsible during construction. Programs need to target the correct owner - the decision maker - to correctly influence the energy efficiency of the project. If program personnel understand why the owner is paying to install energy efficiency, the effort matches the project goals. It reduces the program cost of chasing energy efficiency measures that there is no chance of implementing and reduces the risk of value engineering. This can be easily understood, if the right questions are asked.

Table 1. Ownership Discussion

Ownership Example	Example Highlights
1. Owner owned and occupied	• Owner self funds project
2. Developer owned building with long term lease to corporation	• Example – Big box store • Corporate tenant owns equipment, and lighting, and pays utilities • Developer owns walls and parking lot lights
3. Condominium structure	• Multiple building owners, based on area of building • One condo owner owns the walls and public areas • Condo owners split the HVAC system with operational agreement • Each owner pays his own utilities

Financing and Paying the Bills

Over the last few years, the new construction industry was hit hard by the economy. Money is available for investment, projects continue to be built, and the standards are higher requiring more equity. This discussion ties into the entire industry. It is important to have a comprehensive understanding to effectively work with the market drivers. By understanding general project financing, programs not only help increase building energy savings, but also help

make energy efficient buildings happen, increasing market penetration. Interviewing several local developers confirms alignment of the local program steps with the financing process.

Obtaining funding. A financial model is created with the correct financing factors which include: interest rates, debt coverage ratio, reserves, amortization period, closing costs, fees and so forth. The owner creates a business plan using two main categories: uses and sources. Figure 1 references some examples of uses and sources. If the energy efficiency incentive commitment is given during the financing and listed as a use, this can help the process. This is the best time to influence major components of design. This often happens before the full design team is hired, long before the design is complete. This step can strongly influence the scope documents that the design and construction teams will bid on.

Figure 1 – Example of Uses and Sources

Example Uses (Costs)	Example Sources (Funding)
Architectural, legal, accounting fees	Banks and Loans (including construction)
Appraisals	Bonds
Real Estate Taxes	Corporate underwriting
Capital budget with construction costs	Developer fees
Operations budgets	Investors

(Gake 2010)(Thode 2010)

Contacting sources. The first step is to contact potential sources to secure funding. This may include going to several banks to pitch the idea. It is difficult to predict who can lend money. The bank hires an appraiser to evaluate the site. In addition to the equity a developer or investor has to contribute, the bank looks at cost, market valuation and net operating income. (Gake 2010) (Thode 2010). Program personnel providing energy efficiency savings estimates can reduce the potential operating expense, thereby increasing net income. This is a place to incorporate energy efficiency building into the basic project scope. If there is a difference in market valuation and construction costs, more money sources are required to cover the shortfall. If the developer cannot cover the shortfall, the deal is dead. (Lenhart 2010). Committed energy efficiency incentives can be a solution to help cover the shortfall. The funding sources available are specifically related to the type of building or size of project. For example, a school project going to referendum might look to bonds for additional money (Gake 2010) (Lenhart 2010).

The construction loan. Once a bank approves a pro forma, or financial concept plan, they will then issue a construction loan for a specific amount. The loan commitment usually precedes the construction loan closing by three to four months. The construction loan sets the budget. This is the financial threshold for the project. After the loan closes, construction can start and design is completed. If the project exceeds its budget during construction, there are minimal options to bridge the gap. Most likely the construction costs will be cut, the quality of the building will be reduced, or there is an attempt to obtain more money from the bank. The worst case scenario is that members of the construction team are not paid or the LLC files for bankruptcy. If a project is partially funded through energy incentives, energy efficiency measures usually stay in the project. (Arneson 2010) (Gake 2010) (Lenhart 2010).

Why is this important? If timing is right, this is the best program opportunity. It can help finalize the deal, in essence requiring the building to be designed with a certain level of energy efficiency for the least amount of effort. At the end of the day, the most effective customers are

the owners. Our experience has taught us that. Once the owners know of the program and how it works, they are the ones calling in and requiring their designers and builders to incorporate energy efficiency and to work with program personnel to get there. Aligning with the financing process, the buildings are successfully pushed to a much higher energy efficiency threshold, as dictated by the program. This is the most cost-effective time for both the program and the owner to incorporate energy efficiency into a project. There are minimal drawings to change, which lowers cost. Incentive dollar commitments can fill a critical financing need in this market. Working with the owners and developers through financing is a very successful approach.

Bidding

Once scope documents are done, the work goes out for competitive bids, which sets the construction cost. During concept development, the owner hires an architect. The architect prepares drawings. Depending on the construction structure, the contractors might bid on the drawings, with both design and construction in their bid. In this case, the mechanical, electrical, plumbing (MEP), and other designs are buried in the total construction cost. Sometimes the architect is under this contract. It is possible, and at times easy, to incorporate energy efficiency into design after bidding since design is not complete. In other cases, the architect usually hires the design engineers directly. Design is completed before contractors are hired. The design is competitively bid by different contractors. In this case, the design fees are usually separate from the total construction cost. It is typically very expensive to change the design after bids have been accepted and is very difficult to incorporate energy efficiency after bidding. Energy efficient upgrades can be bid as alternates to see if there is room in the budget.

Value Engineering

One definition of "value engineering" related to construction is "an activity which helps to design [projects] which meet customer needs at the lowest cost while assuring the required standards of quality and reliability" (BNET Dictionary n.d.). When project bids come in over budget, the team looks at ways to reduce cost. This is a critical time to keep focus on the energy efficiency items in the project which are tied to grant money. Any measure in the design is on the chopping block. For example, the choice is between high-end finishes and an efficient cooling system, the program grant dollars can keep in the good cooling system in the project, instead of the finishes. The budget is then maintained.

The Construction Process

Construction can generally be broken down into a simple process. The method by which these steps are applied varies greatly from project to project and has a big impact on the construction process. This process is discussed over the next few sections.

Financing → Planning → Design → Construction → Occupancy

- **Construction delivery methods.** There are several different construction delivery methods in the United States today. The main delivery methods are: Design-Build, Design-Bid-Build and Construction management. Nationally, the market is roughly

equally split between design-build and design-bid-build with construction management serving a small percentage. In 2005 the design build market percentage was increasing. (DBIA n.d.).

- **Design-Build.** In design-build, there is one main contract. All subcontracts, including design, are under the main contract (DBIA n.d.). In my experience, the architect is not usually under that contract. In many parts of the country, design-build is very common for simpler construction projects, large or small. There are some large high rise design-build projects. The contractors that design the building are also building it. These contractors are usually called design-build contractors. Final design, including energy modeling, for MEP systems usually starts after construction has started. It is not uncommon for pieces of the building to still be in design phase while the construction is 25% or more complete. Since the general contractor oversees both design and construction, they can shift money between the different disciplines. For example, the size of the electrical contract can be reduced, by reducing the total lighting scope. The extra money is moved to the mechanical budget to help pay for a efficient cooling.
- **Design-Bid-Build.** The remaining 50% of construction projects are design-bid-build, also known as the "traditional" construction delivery method. The design contracts are held separately from the construction contracts (DBIA n.d.). The designers are hired to complete full construction documents. The design is bid out together or as bid packages. This structure works well for complex projects such as hospitals or government projects requiring the lowest bidder.
- **Construction management.** Construction management delivery service hires professional representation on behalf of the owner. They deliver and coordinate construction services covering planning, design, construction and post construction, cost, schedule, and scope. The construction manager supports other delivery methods. This professional service is usually used on complex projects when the owner is not skilled to cover these services. (CMAA n.d.)

It improves the percentage of the construction market reached when the timing of the main delivery methods are understood, bringing in more opportunities that are available in the market. The program can raise energy efficiency effectively maximizing the energy savings a project can achieve for all construction projects and not just the design-bid-build projects.

Timing

Timing is a critical component of a construction project. There are several main timelines that are important to be aware of while meeting the major construction milestones.

Figure 2. General Financing Timeline

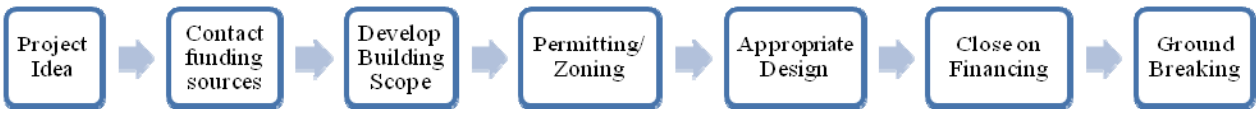
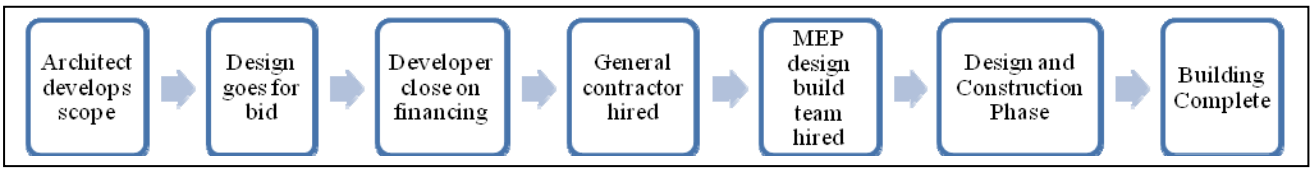


Table source: (Arneson 2010) (Gake 2010) (Lenhart 2010)

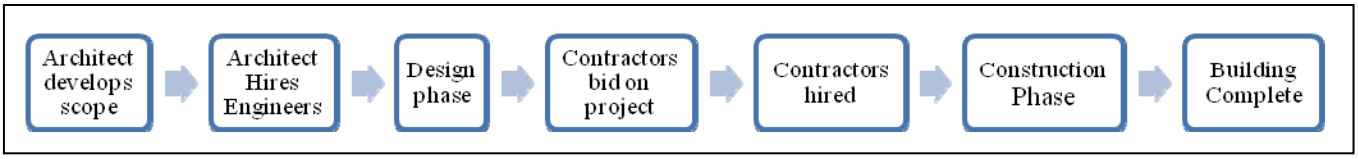
In Figure 2, the general timeline for the owner is shown. It includes the following steps: financial underwriting; market study; zoning; plans and specifications; and building permits. Construction financing typically finalizes midway through design. This design might include architectural design only. The architect is usually hired early to develop the building scope or to help with the permitting process and zoning. The general contractor is hired once the financing is closed and the construction loan is in place (Gake 2010). Ground breaking occurs after the financing close occurs. Often the design still needs to be completed after the ground breaking ceremony, which might halt construction, especially in design-build projects.

Figure 3. Design Build Timeline



Design-Build timeline. The timeline and major milestones are defined in Figure 3. The architect is usually hired early in the process and completes a preliminary design to develop a general building scope for financing. Often, a full set of architectural plans and specifications are completed. Contractors bid on the building, with or without any direction on the potential building systems. In addition to the building envelope design, the main contractors influencing energy efficiency design are the MEP contractors. Mechanical design usually occurs first, followed by electrical including lighting, which can be completed late in construction. Design can occur throughout the construction process. In Wisconsin, it is not unheard of for drawings to come in after the building is completed. The general contractor has the power to move cost between contracts and is a very effective partner in a design-build project since they have so much control. During construction, it is possible to upgrade the mechanical system and still manage to the construction budget and schedule.

Figure 4. Design-Bid-Build Timeline



Duration of construction cycle. There is a large variation on how long a building takes to build. The project can take a few months for a tenant build-out to several years for a complex building. Delays are caused by unexpected site conditions, material procurement issues, design issues, construction issues and so forth. Currently, the economy is one of the main causes for delays. Projects placed on hold typically start back up when additional funding is available. Delays can cause a building to fall under a new building code, and the energy efficiency recommendations change. Working within the construction schedule and delays are important for energy efficiency programs to consider and plan to. Providing committed funding helps buildings become active projects again.

The Building Energy Code

The energy codes are constantly changing. Not all states have a statewide energy code and it is not consistent from state to state. The referenced energy standard's full name is "ANSI[1]/ASHRAE[2]/IESNA[3] Standard 90.1, *Energy Standard for Buildings Except Low-Rise Residential Buildings*" (ASHRAE 2010). The code standard was changed by law to match ASHRAE Standard 90.1-2004 (EPACT 2005). There is continual adoption of upgraded standards (DOE 2010). The energy code can change during the project or program life.

The energy code sets the new construction program baseline standard. Program savings are calculated by comparing equipment or a system design to what the code minimum is. As the codes change, the potential savings change. Another code concern is when the code is not consistently enforced, then the bidding process can drive the market to supply equipment worse than code and push down the energy efficiency of the market. Energy efficiency programs work well to offset that with energy efficiency incentives.

The codes affect design and budget. Many simple energy efficiency measures are now required by code. Also as the codes change it is important to understand what is required so it can be improved upon. Using the code as a baseline allows for program consistency especially since designers work on many different projects. It also brings credibility to program personnel allowing the design teams to use them as a peer on the team while enforcing the standard.

Responding To Those Needs

In the new construction market, there are several areas that maximize the success of an energy efficiency program including: understanding the market; providing program simplicity; offering appropriate technical support; ensuring program predictability; making sure program timing is appropriate; and supplying program incentives.

Understanding the Market

The main financial driver for owners is maintaining the construction budget. As many developers interviewed for this paper indicated, projects end if they cannot afford the costs. No two buildings are the same and they stand on its own merit. The program rules need to be guidelines, and they need to measure intent. Flexibility to work with this "custom" scenario is critical, especially working within the constraints of the project delivery method. By understanding the market, it allows for the program to successfully work within the market.

Simple payback is not often used in the new construction market. It doesn't match the market complexity. (Gake 2010). Simple payback is defined as the total cost over the total savings. It is difficult to define a cost based on a corresponding scope. For example, if someone is considering installing roof top unit versus air handling units, what is the cost boundary? Is it with the equipment or the reinforcing steel? In new construction, payback is used to rank the relative differences between items as a budgeting tool, but the construction budget is the main financial indicator. It is important to understand that and speak the same language.

[1] American National Standards Institute
[2] American Society of Heating Refrigeration and Air-Conditioning Engineers
[3] Illuminating Engineering Society of North America

Early in design, incentive estimates, energy savings and providing preliminary paperwork supports the financing on the project. It is ideal to commit incentive dollars, but that can be very difficult, especially since design is not always complete. It is important to influence energy efficiency decisions before the close of financing, since the scope is still being defined and the total construction cost can be adjusted.

Simplicity

As discussed earlier, in a competitive situation, there is minimal time for research. There is cost to learn about new technology. There is also the cost of the energy efficiency improvements. The goal is to have a simple program process that the customer and program personnel can understand. This is possible.

- Step 1: New construction project identified
- Step 2: Preliminary customer contact
- Step 3: Preliminary project recommendations and incentive commitments
- Step 4: Final energy calculations and incentive proposal
- Step 5: Completed work verification
- Step 6: Incentive paid

The steps required to receive incentives need to be laid out early in design so requirements can be included in decision making and in the scope documents. It helps to have program personnel guiding customer(s) through the process and help retains program customers.

Simplicity works with this market. A big hurdle we can overcome is that many people are not paid to learn new things and they won't do what is too hard. By keeping it simple, the customers come back with more projects while living within their budgets.

Technical Support

Many of construction professionals do not have time to research all the different technology options for a building and rely on program personnel. Program personnel should serve as an energy consultant and be an equal member of the team. The building team has a learning curve to work through if they are not used to constructing energy efficient buildings or there is new technology. If program personnel provide unbiased information to the design and construction teams, it will help the design team mitigate risk. Not all customers have the same background or are technical. It can be helpful to have someone explaining the technology or whether the sales brochure data is valid.

Providing preliminary design recommendations in a simple list format has been a great tool to share information with busy professionals. Many customers want to simply incorporate what works. They are also very concerned with what items they can get incentives for. They depend on that guidance.

Energy modeling, which is discussed later, is an estimating tool to provide understanding of the interactive energy use for a building as a whole, or for different systems. The results can help team members make decisions using energy and cost information at the right time. It is important to understand when to use the energy modeling, since this engineering analysis can be expensive for programs to pay for. It is ideal for large, complicated projects with enough savings.

Predictability

It is difficult for banks and other investors to lend money. They are more risk adverse or just not able to participate. Financing these projects can be complex. As discussed, not meeting the budget can have serious consequences. An energy efficiency program needs to be stable over time to meet the critical nature of maintaining the construction budget. If incentive commitments for energy efficiency technologies are provided early on, the owner can use the proposals as part of the funding package. The developer need for this money is great, so the ability to provide a commitment is critical. The ability of the program to pay out when the owner completes the project years later is also critical. They are counting on that money for the financial success of the project. Types of incentive qualifying technologies need to be locked in. A year can go by between signing the building contracts and building completion. Equipment can be ordered months prior to installation based on the rewarded technology at that time. It is important to recognize this delay in rewarding new construction technology, especially if programs pay incentives only when the equipment is installed. It is not reasonable to expect the project can change the installed technology as the program standards change. Allow an early binding commitment for both prescriptive and custom incentives.

As the codes change, make sure that a program baseline doesn't change after the design is done. That is an insurmountable barrier especially if the codes have conflicting requirements.

Timing

Timing is everything. It is most cost effective for all parties to be involved in the design decisions as they happen, prior to drawing completion and bidding on that work. The less on paper the better. It can be very expensive to change the design after this step. Once the financing is in place, it is difficult for the owner to change the project scope without a major financial impact. Owners will need to obtain money from more sources.

In many design-build projects, the different design steps might happen at significantly different times, including well into construction. It is worth reinforcing that the design timeline can fairly independent of the construction timeline. That is also true for multiple-tenant buildings. This process is much more straightforward in design-bid-build projects. Ideally, the grant commitment occurs when the design is decided. The energy efficiency effort is significantly easier earlier in design, no matter what the delivery structure is. For energy efficiency programs to work well, information needs to be coordinated at the right time and to the right people to influence design. Even if the project is well under construction, the lighting package might still be available for influence, because it is still in design.

Incentives

The incentives for energy efficiency measures need to be large enough to work with multi-million dollar construction budgets. In my experience, it serves the customer well to have an appropriate mix of prescriptive and custom incentives. Prescriptive incentives have an equipment focus. Custom grants can look at a system to system comparison. They allow for the program to support the complexity of the marketplace. Energy modeling is one tool that can calculate savings for custom incentives, and is best used on complex buildings, where the program cost increase is justified by the potential energy savings. Prescriptive measures alone will miss a fair portion of opportunity to influence the market, even during construction.

When incentives are developed based on energy savings, the calculations need to be straightforward enough to estimate on the front end to help with the financing package. On simpler buildings, prescriptive and custom grants with simple calculations can keep the cost of the measures down and improve the benefit cost ratio of the program. A factor that needs to be considered is that the incentive should be more than the labor cost of putting the paperwork together. The owner is already covering the energy efficiency costs. These are busy people; every hour wasted cuts into their profit margin.

Program Strategies that Work Well

There are many tools that help increase energy savings in new buildings including design checklists, customer service, building rating or certification programs and energy modeling.

Preliminary design checklists. A custom checklist developed from specific building design review shares information quickly and succinctly, reducing the design team's cost to research new energy efficiency ideas. They can cover all disciplines, such as plumbing or lighting. It allows for team brainstorming to be documented early in design. All team members like a simple list of what they can do to help make a building more efficient. The list allows energy efficiency to be incorporated effectively. It can allow for the brainstorming discussions to be shared with all team members. Any member of the team can have great ideas to incorporate.

Customer service. Customer service is key to program growth. Often, in my experience, a customer comes in too late on a project to do anything other than upgrade light fixtures. By guiding them through the program, even if it is for just a few light fixtures, they learn and understand to get the full benefit. Next they come in with their entire portfolio, when they see the value, and once conversation influences multiple buildings. They share this with other professionals they work with and the program expands greatly through word-of-mouth.

Building energy rating or certification programs. ENERGY STAR® and Leadership in Environmental and Energy Design (LEED) are programs that push buildings become more energy efficient. It is important when using other programs, the focus stays on energy. These programs encourage comprehensive energy efficiency into their buildings.

Energy modeling. Energy modeling is an energy estimating tool that can help evaluate options for complex buildings. If used correctly with different options, the tool helps with decision making based on estimated energy savings and potential incentive amounts. Preliminary energy modeling can estimate savings and incentive estimates even on a design-build job. It is most cost effective to do a final energy model when design is complete. For design-build projects, the final model can occur late in construction. For design-bid-build, it is ideal to complete the energy model prior to construction start and bidding. Timing and the project schedule needs to be considered when using this tool. It is also strongly suggested to have experienced energy modeling engineers doing the work. Quality has a profound impact on the results. Energy modeling is also an effective tool to use for comparing more complex single measures, like a major mechanical system comparison. It pays to only model what is necessary.

Achieving Energy Savings

The most important thing to achieve higher efficiency savings is to correctly time the design support and to focus on the correct decision makers. The owners have to be able to afford the changes. Each designer and contractor needs to have the correct support based on the construction structure. To start, a customized list of recommendations is reviewed with the design team. Early incentive commitments allow for the design and construction teams to prioritize energy efficiency measures. These estimates are completed prior to the design being done. It is very important to do the design estimates correctly. Energy modeling is also a tool that can identify more savings opportunities. This market allows for a building system comparison to occur, not only chance a piece of equipment.

Conclusion

The new construction market has many opportunities to engage the customer base to save energy. Understanding who the players are and how they make their decisions is critical to success and working together to save more energy. The energy bar is rising through codes, and it is important to have the tools and incentive money moving projects to the next level to meet the challenge. With code and other market changes, it is becoming more important to review the buildings from a system level, making sure the details are correct to maximize the efficiencies of the systems installed and use program dollars wisely.

It is critical to address both design-build and design-bid-build project structures to minimize missing energy savings opportunities due to timing. Understanding how all these pieces fit together, including the critical financial piece, a new construction energy efficiency program can maximize the energy savings potential, cost-effectively meeting the customer's needs making sure the entire market can be brought into the program.

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