

# Features

## Possible and Profitable: Energy Efficiency Investments in the Building Sector

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The McKinsey Global Institute [released a study](#) in June predicting large, profitable opportunities for energy efficiency in the U.S. building sector. Between the residential, commercial, and industrial sector, it estimated that we could reduce projected energy demand by 15 quadrillion BTUs (QBTU), 19 percent of the country's current 92 QBTU usage per year.

Another [recent study](#) [PDF] on the U.S. Energy Service Company (ESCO) industry from the Lawrence Berkeley National Laboratory and the National Association of Energy Services Companies (NAESCO) underscored this challenge. ESCOs, companies that work to improve the energy efficiency of buildings, are usually paid based on a percentage of the efficiency gains they achieve -- a seeming win-win for building owners and ESCO providers.

While the ESCO market is large and growing, it is having trouble breaking into the private market. Despite spending \$2.5 billion, which is as much put toward energy efficiency improvements as all utility programs combined, only about one-fifth of this investment was in the private sector. Obviously, there is something preventing greater investment in energy efficiency for buildings.

So what are the factors that will determine whether energy efficiency gains will be realized? As these studies show, these gains are not inevitable, but instead are reliant upon the initiative of the public and private sector.

In general, there are three types of market barriers that prevent these energy efficiency improvements from being realized. The first involves information and perception. The second barrier is a split incentive between those paying for improvements and those enjoying the gains. The difficulty of financing energy efficiency improvements poses the third challenge. Like any other profitable opportunity, there are ways around these market barriers, as illustrated by several public and private entrepreneurs.

### Market Barriers

One of the most widespread and frustrating energy efficiency market barriers is a lack of information among key decision makers in the private sector. In addition to commonplace ignorance of the opportunities available, there also is a strong perception that energy efficiency investments are not at the same level as traditional business investments. The McKinsey study estimated only about a quarter of commercial energy users were willing to invest in efficiency measures with paybacks longer than two years. This translates to an Internal Rate of Return (IRR) of 50 percent. By comparison, the average IRR for Real Estate Investment Trusts (REIT) over 30 years is about 16 percent, while the average stock IRR is roughly 10 percent.

What this means is that stakeholders generally perceive higher risk from efficiency improvements than they do from playing the stock market. In reality, the financial risks posed by efficiency improvements, including increased technology performance and the highly unlikely event that energy prices will fall, mean that these projects should at most be only as risky as stocks, and in fact be closer to the safer investments of Treasury Bonds.

In addition to changing stakeholder perceptions, there is the more fundamental barrier of split incentives, usually in the form of owner-tenant, developer-buyer, or tenant-tenant relationships. In the former case, a building owner does not have a strong incentive to make energy efficiency improvements since any gains will primarily flow to tenants.

Similarly, developers may not invest in a more energy efficient buildings if they are going to flip properties soon after completion. Since developers will not enjoy the savings, they will be reluctant to make the investment.

Another form of split incentives involves the length of tenancy. If a building owner only plans to occupy a building for three years, an investment with a five-year payback would not make sense because the next tenant would enjoy the majority of the savings.

The final category of market barriers is difficulty in financing energy efficiency improvements. End-users often have competing priorities for capital use in addition to facing the above-mentioned barriers. Many companies also separate capital and operating expenses in such a way that it is difficult to justify a capital expense that reduces operating

expenses. And in the world of third-party capital, banks often have difficulty underwriting loans based on energy efficiency criteria. Despite the recent hoopla surrounding Energy Efficient Mortgages (EEMs), the market will remain relatively small until banks learn how to underwrite these new loans.

The main difficulty is the fact that hard assets cannot collateralize the incremental amount of money loaned for efficiency improvements. It is not practical to take ownership of an HVAC system if someone defaults on the loan. So banks are left to determine how much money can be lent without any collateral, or the same amount of collateral as a conventional loan, which is a problem for traditionally conservative lending institutions.

### **Public and Private Responses**

Given these endemic market barriers to energy efficiency in the building market, how can public and private actors take advantage of the opportunities identified by the McKinsey study? While there is now no silver bullet, there are encouraging signs from both the public arena and private market indicating that these market barriers can be overcome, with significant economic gains to all involved parties.

The [Cambridge Energy Alliance](#) (CEA) is leading one exciting public-private initiative that aims to overcome information/perception market barriers. The CEA is a not-for-profit umbrella group trying to reduce Cambridge's energy demand by 15 percent over five years through energy efficiency improvements in all building types. They have gained the support of the local government and have lined up \$100 million in financing, which includes 80 percent from private financial institutions and 20 percent from current utility incentive programs.

The key to success is its consolidated marketing campaign. They are currently qualifying local ESCOs to perform energy audits and efficiency improvements on Cambridge buildings under the auspices of the CEA brand. The third-party capital and utility programs will then finance the improvements themselves, with loans paid back through the energy improvements.

The CEA's goal is to improve half or more of Cambridge's buildings, a goal that may or may not be realistic depending on consumer reaction to the campaign and the effects of other market barriers. But by aggregating marketing and energy demand reductions under one umbrella, the CEA hopes to make significant headway. Although not yet implemented, the Cambridge model has already persuaded Massachusetts Governor Deval Patrick to set aside a revolving loan fund to set up similar systems across the state.

Traveling north of the border, an innovative financing scheme that overcomes the split incentives problem between developers and condominium buyers is spreading rapidly. These Condominium Energy Efficiency Loans (CEELs), to coin a phrase, are developer loans that designate extra money for energy efficiency in the design process or for specific improvements.

The loan is given after the energy efficiency gains are verified, but the liability for the loan is immediately transferred to the Condominium Corp., similar to U.S. condominium associations. The loan is incorporated into owners' monthly condominium fees on a pro-rata basis. The remaining details are a bit complicated, but the basic principle is that the beneficiaries of the efficiency improvements -- condo buyers -- should pay for the gains -- lower energy bills -- as long as the costs never exceed the modeled savings.

The pioneer of these loans is the [Toronto Atmospheric Fund](#), [PDF] a quasi-public organization that makes investments to reduce greenhouse gases. TAF made a CEEL to Tridel, Toronto's largest condominium developer. The model is now expanding in Toronto, as well as to other parts of Canada with private financing, although many lending institutions are still wary. While this model has not yet migrated south, it is probably only a matter of time. Windmill, a sustainable developer based in Canada, has employed this financing model and is moving into the American market.

Closer to home, another financing system aims to make it easier for third-party capital to safely invest in energy-efficiency improvements. Under a [Pay As You Save](#) (PAYS) program, ESCOs can offer pre-certified energy efficiency improvements financed by third-party capital. The key is that payments are made directly through utility bills. This has the two-fold effect of increasing the security of the payments and making it easier for consumers to equate savings with loan payments since it is all on the same bill.

Another important feature of PAYS is that loans are tied to meters, not people, so if owners or tenants change, liability for the loans are transferred in kind. By tying the loan to the asset, the PAYS system can overcome the split incentives between owners and tenants as well as current and future tenants.

The experience to date has been positive, albeit sparse. The New Hampshire Electric Cooperative and Public Service Company of New Hampshire performed PAYS pilots with public financing and reported positive results. Hawaii is currently entertaining legislation to require utilities to offer PAYS for solar water heating installations.

### **The Goal: 100 Percent Private Energy Efficiency Financing**

As the above examples demonstrate, most of the activity in the realm of energy efficiency finance for buildings has

involved a partnership between the public and private sectors. To truly exploit the opportunities available, however, the private sector will have to take the lead. The capital markets will always be able to finance investments more efficiently and on a larger scale than government or not-for-profit spending. The key is to establish a self-sustaining model that puts energy efficiency investments on an equal playing field with investments that yield similar risk and return ratios.

Perhaps the company that has come the closest to making this model a reality is [Transcend Equity](#) based in Dallas, Texas. Transcend takes on the utility payments of a building for 10 years. In exchange, the building pays Transcend a payment based on its historic utility costs and energy prices. Transcend then make improvements on the building and pockets any energy savings.

Unlike other systems, Transcend's business model is based on equity, not debt. They take all the risk and reap all the rewards. By providing their services as truly cost-neutral for customers, the traditional market barriers are removed.

Transcend's largest public client is Corporate Office Properties Trust (COPT), a large mid-Atlantic REIT. Capitalizing on the success of their relationship with COPT, Transcend has recently begun raising money from hedge funds to expand their business model. If their success continues, don't be surprised if many of the large ESCOs and banks start getting into the act.

### **What's Next?**

It is becoming increasingly clear that there is a large, untapped market demand for energy efficiency services. As public and private actors look to reduce their carbon footprint in profitable, economically sustainable ways, energy efficiency finance in the building sector will continue to loom large.

So what's next? What will the market look like in five or 10 years? Nobody knows for sure, but it is fairly certain that any financial models will contain elements from the above case studies. Energy efficiency is no longer seen as a personal attribute to be commended but ultimately ignored. Investments in energy efficient buildings are now seen as a business problem with a business solution. And just like any other business problem, whoever gets there first will make a whole lot of money.

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