

A report from the Economist Intelligence Unit

Achieving scale in the US

A view from the construction and real estate sectors



Commissioned by

A study commissioned by the
Global Buildings Performance Network (GBPN)
in collaboration with its U.S. Hub, the Institute for Market
Transformation (IMT).



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Executive summary

Energy efficiency is not only smart, it's good business: the retrofit sector alone could provide \$1trn in energy savings in the US over the next decade. Our October 2012 briefing paper *Energy efficiency and energy savings—a view from the building sector*, produced by the Economist Intelligence Unit (EIU) and commissioned by the Global Buildings Performance Network (GBPN), revealed that 40% of survey respondents from the US buildings sector accept no business responsibility for carbon emissions. This was more than double an average of 17% of respondents in Europe, China and India who shared the same view. That doesn't mean, however, that US business leaders won't invest in green initiatives should the terms prove favorable. Good, consistent legislation and innovative financing are needed to entice them.

In the US, buildings account for 41% of primary energy consumption, more than the transport (29%) or the industrial (30%) sectors, according to the US Department of Energy. Many existing buildings are energy inefficient, and new ones do not always comply with the latest building codes that seek to promote efficiency. Moreover, efforts in the US—both legislative and corporate—tend to focus on new buildings when retrofitting would bring the most the potential gains in efficiency.

Goals set at the federal and state levels, such as “Better Buildings” (federal) or New York

State's “Build Smart” initiatives, aim to increase energy efficiency by 20% by 2020. Regulation, however, varies from state to state; accordingly, company compliance can be problematic. Other impediments to investment come from within the private sector itself. The most important of these are misperceptions about the true costs of and benefits of energy efficiency.

Key findings from the report include:

- **Energy efficiency regulation in the US is patchy, confusing and inconsistent.** Building codes and other policies often differ between states—and sometimes within them. This leads to a suboptimal situation in which the vast majority of US companies manage energy efficiency at the building level rather than at the portfolio level. Regulation also tends to focus on new builds rather than retrofits; the latter would, however, offer most of the potential gains in energy efficiency.
- **Innovative financing offers opportunities to achieve greater scale.** Aggregating projects across and within sectors through green banks and large mortgage financing organisations allows for a more efficient allocation of capital and would likely attract large institutional investors.

- **Both the public and the private sectors must work to address the data challenge.** Data on energy efficiency performance are limited, unshared and often inconsistent between measurements. Creating a supply of standardised data on the energy and financial performance of projects will help institutional investors to choose investments based on risk profiles and will also facilitate comparison of the energy efficiency performance of investments.
- **Co-benefits of energy efficiency retrofits include higher occupancy rates and higher tenant retention.** While many of these co-benefits like reduced carbon emissions have yet to be priced into the market, some—for example, greater comfort—are almost immediately tangible for both companies and their customers. ■

About our research

Achieving scale in the US: a view from the construction and real estate sectors is an Economist Intelligence Unit (EIU) report commissioned by the Global Buildings Performance Network. It is a follow-up briefing to our October 2012 report *Energy efficiency and energy savings: a view from the building sector*, which drew on a survey of 423 senior executives in the buildings sector. This paper focuses on how companies in the US approach energy-efficiency investments, the challenges and opportunities they face and the role played by innovative financing in scaling up energy-efficiency initiatives. The EIU bears sole responsibility for the content of this report. The findings do not necessarily reflect the views of the sponsor. The paper was written by Dr Elie Chachoua and edited by Janie Hulse.

This report's findings are based on:

- Extensive desk research using the latest data, documents and reports.
- Analysis of our June 2012 survey of 423 executives in the US building sector. Fifty-four percent of the respondents were C-level; 52% of their companies were listed as having annual revenue above \$500m; 63% came from the real estate segment (commercial, residential and industrial); and 37% were in the building construction industry.
- In-depth interviews with key experts from leading companies involved in energy efficiency

in the US building sector.

We would like to thank the following individuals for sharing their time and insights:

- Philip Payne, CEO of Ginkgo Residential
- Christopher Wilson, managing director and global sustainability officer at LaSalle Investment Management
- Brenna S. Walvaren, managing director, USAA Real Estate Company
- Dr Chris Pyke, director of research, U.S. Green Building Council
- Mary Barber, director of clean energy initiative, Environmental Defense Fund
- Sukanya Paciorek, vice president, corporate sustainability, Vornado

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Building blocks of the US market

The US building sector's energy consumption is on the rise. According to the US Department of Energy, primary energy consumption in the sector increased by 48% between 1980 and 2009 and is projected to grow by a further 19% by 2035. The latest available data (collected in 2010) show that the sector accounted for 40.3 quads or 41.1% of total US primary energy consumption. This is more than the industry sector (30.3 quads) or the transport sector (27.6 quads).

Improving energy efficiency in buildings therefore represents a tremendous opportunity. A 2012 Deutsche Bank report claims that energy efficiency retrofits alone could bring \$1trn worth of energy savings to the US economy over the next 10 years. Should the current wave of financial innovation in energy efficiency in buildings succeed (see part V), the potential exists for a rapid scale up of current piecemeal investments.

It won't be smooth sailing. US actors tend to expect to recoup costs associated with energy-efficiency investments within a very short time frame. According to our June 2012 survey, more

than half (56%) of US respondents expect to recover such expenditure within three years or less. This is especially problematic for deep retrofit investments, which can have higher net present value compared with light retrofits but often require more time to recover investment cost.

Furthermore, while two-thirds of US building executives surveyed last year have a good grasp of energy consumption associated with heating, ventilation and cooling (HVAC) systems, equally as many overestimate the costs of making improvements in energy efficiency. Only one-fifth of US respondents have an accurate perception of energy-efficiency costs.

Finally, US companies must make sense of a patchwork of federal and state regulations, segmented markets (ie residential, commercial, industrial, etc) and a plethora of ownership structures. Finding ways to aggregate projects will be important to attracting large investors, including institutional investors, which have so far had limited involvement in energy-efficiency projects. ■

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Regulatory stumbling blocks

While federal regulation exists, it is often focused on federal buildings. Regulation pertaining to the private sector is implemented mostly at the state or city level. States use similar models for building codes, but they tend to differ on which version they use as a model, how consistently they apply it, which segment they apply it to and whether or not compliance is mandatory (see Table 1). In some states, North Carolina among them, standards even vary depending on the local (eg city or municipal) jurisdiction.

Requirements for energy performance disclosure, particularly important for existing

stock, are even more uneven and inconsistent in application. Such policies, which require owners to obtain energy efficiency information about their buildings and share it with prospective buyers and tenants, or with the public, are gaining traction but are often dependent on changing local political leadership rather than on comprehensive legislation (state or federal).

Energy performance disclosure is being touted by experts as a policy that would benefit from being made mandatory and would help achieve widespread market transparency. “Mandatory performance disclosure, as a means to encourage

Table 1. Examples of regulation in US states

State	Version (In IECC equivalent ⁺)	Applies to	Types of buildings	Stringency
New York	IECC 2009	New builds and major retrofits	Government, commercial and residential buildings	Mandatory
Maryland	IECC 2012	New builds and major retrofits	Government, commercial and residential buildings	Mandatory
Alaska	IECC 2009	New builds	Residential	Voluntary*
Illinois	IECC 2012	New builds and major retrofits	Government, residential and commercial	Mandatory
Kansas	IECC 2006	New builds	Commercial	Voluntary [#]

⁺ The IECC (International Energy Conservation Code) is a standard defining the energy efficiency performance in buildings.

* Mandatory for state owned new buildings as well as residential or commercial buildings that are benefiting from financing from the Alaska Housing Finance Corporation.

[#] Although Kansas does not have state regulation on standards for residential buildings, it requires disclosure of energy related information when selling houses.

Sources: ACEEE, 2012; OCEAN, 2013, DSIRE, 2013.

greater market transparency, is the first step to promoting energy efficiency performance in our buildings,” avers Christopher Wilson, managing director and global sustainability officer at LaSalle Investment Management.

The patchwork nature of regulation creates inefficiencies for the private sector. These include higher transaction and compliance costs as well as lessening the ability to achieve economies of scale. “We are approaching energy efficiency investments asset by asset,” explains Philip Payne, CEO of Ginkgo Residential. “There is no coordination at all. What happens in one place can be completely different from another even if they’re only 20 miles away,” he continued. This

isn’t unusual: 69% of US respondents to our 2012 survey said they manage energy efficiency at the building level rather than at portfolio level— more than in any other country/region.

Consistent mandatory regulation, by increasing penalties for those who don’t comply, could also create an advantage for market participants engaging in energy efficiency. Of course, the degree to which the private sector benefits from greater stringency will depend on whether mandatory regulation helps to level the playing field and reduce policy uncertainty. The latter was identified by 27% of US survey respondents as a barrier to pursuing energy efficiency. ■

Cities leading in energy efficiency: The case of New York City

New York City is a trendsetter in fashion, the arts, crime fighting and, now, green buildings. The city government’s recent efforts reveal how adopting a carbon emission reduction objective can lead to improvements in energy efficiency in the existing building stock. In 2008, NYC established PlaNYC: a low-carbon development plan that aims to reduce emissions by 30% by 2030. With buildings accounting for 75% of the city’s carbon emissions—more than twice the national average—gains depend on revamping existing building stock. Eighty-five percent of the city’s currently standing buildings are expected to still be standing in 2030. NYC is a dense city of tall buildings: 2% of the building stock accounts for half of the city’s total square footage and 45% of energy use. PlaNYC regulation, therefore, specifically targets large structures.

According to NYC law, large private buildings of more than 50,000 sqft and public structures of more than 10,000 sqft are required to monitor and publicly report their energy and water consumption annually as well as undergo an energy audit every 10 years. Lighting systems

must also be upgraded by 2025 in all existing buildings larger than 50,000 sqft. NYC’s mandatory energy code, which has been regularly amended to reflect the latest developments in NY state law, applies to both new and existing buildings. According to city authorities, these laws are expected to generate net savings of \$7bn and create more than 17,000 construction-related jobs over 10 years.

Not everything is top-down. Under the PlaNYC, a bottom-up taskforce was set up in 2008 to propose a series of measures the city could take to improve its codes and regulations with a view to improving the sustainability of buildings. Of the 111 measures proposed, 37 have been adopted and enacted into law. Nearly half of the measures enacted (16) deal with energy and carbon emissions reductions.

The city is also doing its part. As of 2012, the city government had undertaken 130 energy retrofit projects in public buildings, leading to annual energy savings of \$5m. ■

Sources:
PlaNYC website: <http://www.nyc.gov/html/gbee/html/home/home.shtml>
PlaNYC Progress report 2012

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Capitalizing on co-benefits

The time needed to recoup investment costs is one of the critical data points that US companies consider when undertaking energy-efficiency investments. It can often be 5-10 years for retrofits in commercial buildings, beyond the acceptable maximum time frame for most US companies. Of US survey respondents, 56% said they expect to recover investment costs in less than three years.

Yet, as the co-benefits of energy efficiency programmes become more widely known, companies may become less demanding about the existing payback criteria. Co-benefits include increased comfort for occupants; potentially higher rents; longer occupancy; and, of course, carbon emission reductions. As Dr Chris Pyke, director of research, US Green Building Council, says, "energy efficiency is seen in many cases as a proxy for the quality of management of the asset"—and, therefore, of a more reliable net operating income. This is particularly true for retrofitted buildings.

Many co-benefits, however, have yet to be priced into the US market. For example, real estate appraisal methods do not necessarily take into account improvements in energy efficiency, thereby reducing the financial benefits of such investments for the owner. Lack of regulation can also be a limiting factor. Notably, lack of carbon pricing is preventing the US building sector from

putting a financial value on the carbon emission reductions achieved via investments in energy efficiency.

That co-benefits haven't all been priced doesn't necessarily mean they can't be captured. A more energy-efficient HVAC system, for example, will offer more comfort and be less likely to fail, thereby increasing occupancy rates and reducing operating costs. "We are convinced that there are a number of co-benefits that come from energy reductions, as we believe that our buildings will be seen as more competitive, will lease faster because of lower operating expenses than their peer set and will command better pricing on sale," argues Mr Wilson of LaSalle Management.

There is light at the end of the tunnel as quantifiable evidence of co-benefits is starting to appear, notably at the asset level. Studies have shown, for example, that an energy-efficient building will tend to attract higher rents and have longer occupancy rates. More recently, a March 2013 study by the University of North Carolina at Chapel Hill reveals that single-family home mortgage default risks in the US are, on average, 32% lower for energy-efficient homes.

Policymakers and corporate executives will have to do their part in promoting information disclosure and better reporting on energy

efficiency if efforts are to scale up. Little data is available on the impact of energy-efficiency improvements for the valuation of a portfolio and the impact on the equity value of large property-owning companies. In the meantime, private actors can use what are termed “refined numerical simulations” to make the business case to

investors. Yet, as Mr Wilson from LaSalle Management points out, “isolating the contribution of energy savings to the value of a portfolio is hard in practice since many other factors also influence how the portfolio gets priced (eg leasing rates, local markets, the economy etc.). ■

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Pushing legislation toward retrofits

Most of the potential energy-efficiency gains in OECD countries lie in the existing building stock. Yet, nearly two-thirds of US respondents (64%) in our 2012 survey said they focus their energy-efficiency efforts on new builds. Improving energy efficiency at scale in existing buildings is inherently more challenging because of the variety of building types, of equipment and of designs found within a typical portfolio. To maximize energy-efficiency gains, two things need to happen: regulation must focus more on retrofits of existing stock (regulation push) and financing must be made available to scale up investments in retrofits (market pull). According to Bloomberg New Energy Finance, only \$18-20bn was invested in energy efficiency in US buildings in 2011—well below the nearly \$300bn that could be invested cost effectively in retrofits over the next 10 years, according to Deutsche Bank.

While most states have building energy-efficiency codes, not all apply such regulation to retrofits of existing buildings. This shortage of coherent regulation push, combined with the lack of harmonization across states, can make market players reluctant to invest in retrofits of existing buildings. Even when they do invest, efforts tend to focus on simple improvements (eg changing to energy-efficient lighting).

Going beyond the low-hanging fruit to achieve what experts refer to as “deep retrofits” will require, in addition to clear and coherent policies, financing mechanisms to tackle well-known barriers to energy-efficiency retrofits. These include, for example, high upfront capital investment and the split incentives between owner and tenant (or seller and buyer).

Targeting the older part of the building stock may be most effective, in part because it allows companies interested in deep retrofits to acquire financing from lenders that otherwise might have hesitated to finance energy efficiency in newer buildings. Mr Payne explains it this way, “If I go to a lender saying ‘I want to put in a new HVAC system and that new system is going to cost \$5,000 per apartment,’ this giant debate starts with having to prove the economics of the new system and immediately leads to arguments over split incentives. But if I go for a 40-year-old property with a 40-year-old HVAC, nobody argues that I have to replace the HVAC system.”

Another way could be to redefine the lease terms so that incentives are better aligned between owners and tenants. “Every commercial property around the world has a lease between owner and occupiers. If we can drive lease forms into the market that solve the split incentive problem, such

that both owner and occupier share in the financial benefits of energy retrofits, it would truly be a game changer,” observes Mr Wilson of LaSalle Management.

Gaining traction with retrofits will also require a change in attitudes, notably towards the issue of embodied energy—that is, the energy that has been used to create the asset in the first place. In fact, 43% of US respondents to our survey do not

consider embodied energy in their construction material— more than in EU (30%), India (31%) or China (27%). As Mr Payne notes, “There’s a cultural issue in the US of new versus old. Americans as a rule like new. But we often forget the importance of embodied energy even in new construction. This makes the overall energy impact of retrofit versus new build fundamentally different.” ■

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Leveraging large institutional investors

Attracting large institutional investors will require new thinking. According to the New York City Energy Efficiency Corporation, about 25% of the non-owner finance was achieved via debt in 2010. Not all the associated debt-related vehicles will be easily accessible to large investors. They may be privy to equity investments but less knowledgeable about financial vehicles like utilities, or the size of the investments may be too small to justify transaction costs. The good news is that with innovative financing accounting for less than 6% of retrofits in 2010 (see Figure 1), there is a huge opportunity to increase scale.

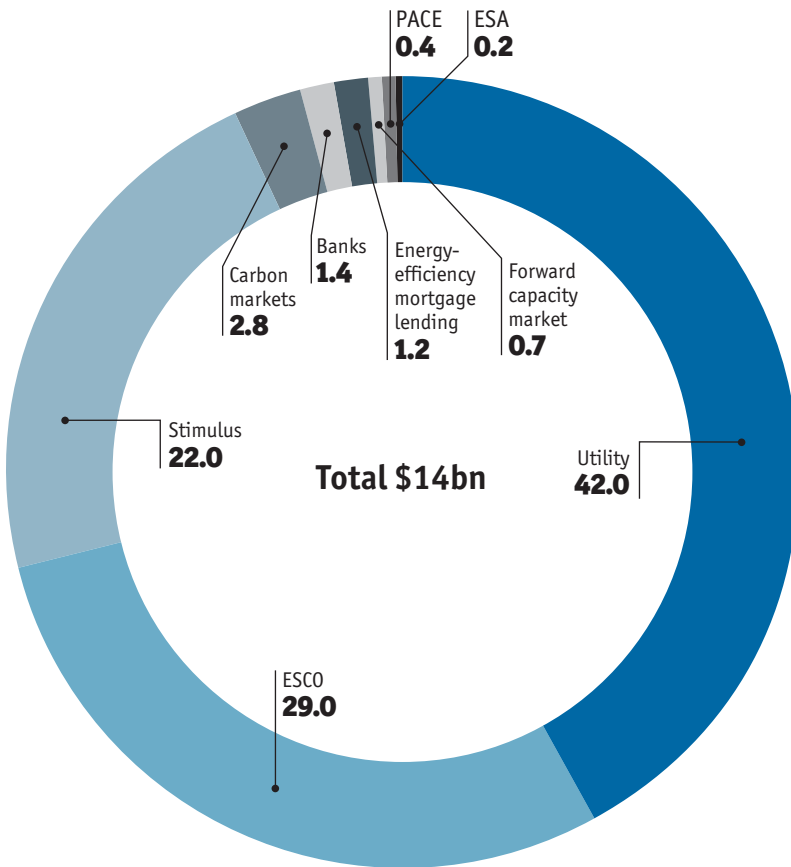
Greater policy harmonization could help encourage innovative financing. Large real estate companies, for example, could adopt a portfolio approach to energy-efficiency investments. Their ability to fully leverage economies of scale, however, is influenced by available financing mechanisms. As Brenna Walvaren, managing director, USAA Real Estate Company notes, “We have looked at doing multiple retrofits at the portfolio level but there can be some limitations as a result of being involved in different financing vehicles that have different risk/return requirements [open-ended funds, value funds, joint ventures, etc]. It’s a delicate balance.” The ability to achieve full economies of scale is also hindered by the differing market dynamics of each segment (eg residential, commercial, industrial)—

which makes a “one size fits all” approach impossible.

Innovative forms of financing for retrofits can be achieved by aggregating projects in a way that allows large investors to engage both at scale and in a more traditional manner. In the commercial building segment, Real Estate Investment Trust Funds are natural “aggregators” as they typically have a large portfolio of properties and can access capital markets. However, since associated costs are lower, they tend to prefer on-balance-sheet financing to third-party financing for their energy-efficiency investments. “It is much faster to use your own capital than to have to deal with lenders,” says Brenna Walvaren of USAA Real Estate Company. Sukanya Paciorek, vice president of corporate sustainability at Vornado Realty Trust, agrees: “Vornado established a stand-alone energy-efficiency capital allocation in 2010, helping to identify opportunities at the asset level while aggregating and financing them at the corporate level.” According to Ms Paciorek, this allows the company to track energy-efficiency projects and their impact on a portfolio-wide basis.

In the public sector, local governments (eg municipalities) have been able to play the aggregator role, for example, via the issuance of qualified energy-conservation bonds. In the residential sector, this role can be played by mortgage financing institutions (eg Freddie Mac,

Figure 1. Energy-efficiency expenditures in US buildings (excluding owner equity, 2010, %)



Source: NVEEC, 2012

Fannie Mae and the Federal Housing Association), utilities, cooperatives and housing associations—although each at a different scale. Large mortgage financing institutions might be particularly helpful if they were to adjust underwriting and appraisal guidelines to promote deep retrofits. Since they are financing such a high percentage of residential retrofits, they can leverage their size and good credit ratings to create a strong dynamic in the single- and multi-family housing segments.

While attractive, the downside to segment-specific aggregators is that they do not necessarily allocate capital in the most efficient manner across

segments. Cross-segment aggregators are able to provide tailored risk/return opportunities to investors. This is the case for quasi-public green investment banks, which act as investment vehicles that leverage public money to attract private funds and offer attractive financing for a wide range of energy-efficiency and renewable energy projects. The first green bank in the US was established by Connecticut in June 2011; other states, including New York, are now exploring the idea.

Standardization and transparency of information are needed both to encourage innovative financing and quickly achieve scale. This will be a huge task since information requirements will be different depending on the financing mechanism and the stakeholder. For example, bill payment history is important to assess credit risk but less important for evaluating performance risk. Moreover, information is not always available and, even when collected, is not always shared.

“Collecting data on energy efficiency from utilities can be particularly difficult in multifamily housing because of privacy issues,” notes Mr Payne. In addition, the nature and granularity of the data will depend on the asset and the type of retrofits undertaken. For example, a frequently repeated, detailed on-site evaluation could be affordable for a large project but not for a small one (as monitoring costs would be too high as a percentage of total costs).

Although difficult, standardization will be necessary to provide investors with information they can understand and use to evaluate risks. It will also be crucial to securing buy-in from existing lenders. “Showing lenders that energy-efficiency investment increases the value of the collateral asset will be key in securing agreement for mechanisms that give the energy-efficiency loan a senior status over the existing mortgage loan,” explains Ms Walvaren. ■

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Conclusion

The energy consumption of the US buildings sector is high and on the rise. Investing in energy efficiency now could create energy savings to the tune of \$1trn according to Deutsche Bank.

For this to happen, however, US regulators need to adopt a more coordinated and coherent approach to energy-efficiency regulation, one that is more focused on retrofits—where most potential gains lie.

Simultaneously, it is crucial to develop financing mechanisms that can address the well-known barriers associated with energy efficiency while

also providing a reasonable, easily understood investment platform for large institutional investors.

Achieving economies of scale and making retrofits commonplace will require standardization of efforts to measure energy-efficiency savings, as well as of the types of financial products being offered. The challenge should not be underestimated, but the effort is worth the prize: more and better information will help quantify the many co-benefits and make the business case stronger. ■



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