Testimony provided to the United States Senate Committee on Energy and Natural Resources

by Susan Leeds, Chief Executive Officer, New York City Energy Efficiency Corporation

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Introduction

Thank you for inviting me to testify on innovative non-federal programs for financing energy efficient building retrofits.

My name is Susan Leeds, and I am the Chief Executive Officer of the New York City Energy Efficiency Corporation. I have worked in energy efficiency financing for the past four years in various capacities including advocacy, consulting, financial transaction execution, and business management. My prior professional experience spans capital markets, municipal finance and financial guaranty insurance.

The New York City Energy Efficiency Corporation – we call ourselves "NYCEEC" – was created as an independent non-profit corporation by New York City's Office of Long-term Planning and Sustainability. Our mission is to help New York City achieve its energy and climate action goals by catalyzing energy efficiency retrofit financing markets for private building owners. We were created because our City leaders believe that New York City residents can reap economic and environmental benefits through greater investment in energy efficiency in existing buildings, and that insufficient financing is a barrier to such investment.

What is the potential for energy efficiency investment?

Retrofitting commercial buildings to make them more energy efficient is widely acknowledged to have multiple benefits to building owners, occupants and the community at large. Yet actual investment in energy efficiency measures remains well below potential.

In March 2012, the Rockefeller Foundation and the Deutsche Bank Group published a report, titled, "United States Building Energy Efficiency Retrofits, Market Sizing and Financing Models."[1] This report provides a "snapshot" of the current investment potential in building retrofits of $279 billion dollars or approximately 3 trillion BTUs of annual energy savings, with $97 billion of this investment potential residing in the commercial and institutional building sectors. Studies vary in methodology, but in comparing these figures to the U.S. energy efficiency potential study published by McKinsey in 2009, we find reasonable consistency.[2]

[1] Note that this analysis is based on an assumption of 30% energy savings in buildings built before 1980.
Fulton, Mark and et al. "United States Building Energy Efficiency Retrofits: Market Sizing and Financing Models." The Rockefeller Foundation and Deutsche Bank Climate Change Advisors, March 2012.
<http://www.rockefellerfoundation.org/uploads/files/791d15ac-90e1-4998-8932-5379bcd654c9-building.pdf>.

[2] Granade, Hannah Choi and et al. "Unlocking Energy Efficiency in the U.S. Economy." McKinsey & Company, July 2009.
<http://www.mckinsey.com/client_service/electric_power_and_natural_gas/latest_thinking/unlocking_energy_efficiency_in_the_us_economy>.

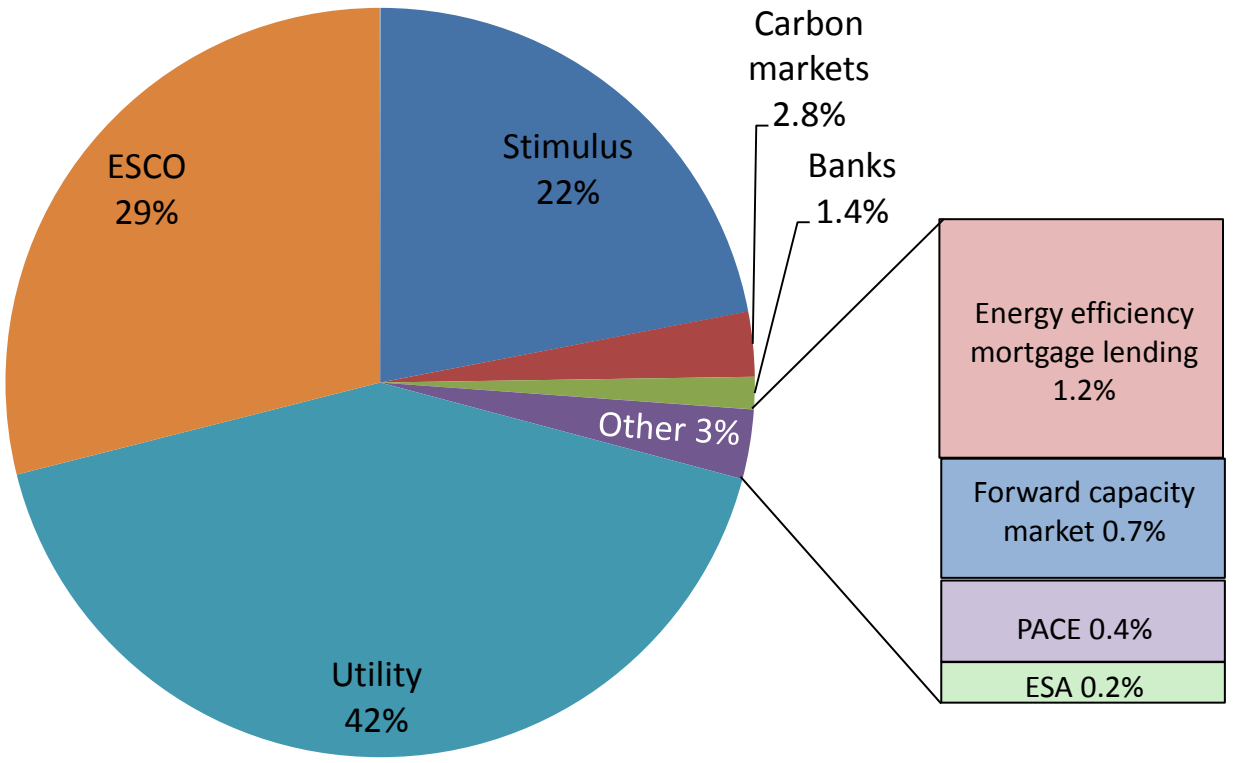
Figure 1. What is the energy efficiency investment potential?[3]

	Residential	Commercial	Institutional	Total
Economic / Financial Impact				
Energy Savings (Trillion Btu)	1,892	848	293	3,033
Investment Opportunity ($ billion)	182	72	25	279
Social Impact				
Cumulative Job Years Created (# FTEs, '000s)	2,152	857	296	3,305
Environmental Impact				
Greenhouse Gas Emission Reduction (million metric tons of CO_2 mitigated per year)	382	175	59	616

However, actual investment is significantly lower. According to research published by Bloomberg New Energy Finance, approximately $18-20 billion was invested in energy efficiency projects in the U.S. in 2010.[4] An estimated $3.5 to 5.5 billion of this amount is direct spending by homeowners, landlords, small business owners, real estate companies and corporations. Approximately 25% (or $4.5-5 billion) was funded through debt financing – primarily municipal debt associated with energy performance contracting. Innovative financing approaches, which comprise NYCEEC's core mission, accounted for only 3% of non-owner equity funding sources.

[3] Fulton 7.
[4] Hesser, Theodore Gates. "Is debt financing opening up for energy efficiency?" Energy Smart Technologies – Built Environment – Research Note. Bloomberg New Energy Finance, 25 April 2012.

Figure 2. What is the actual level of energy efficiency investment? (2010)[5]



Total U.S. 2010 energy efficiency expenditure other than owner equity ≈ $14 bn

What is the role of financing?

Energy efficiency retrofits require upfront capital investment, and the payback happens over time in the form of energy cost savings and improved property values. The "upfront cost" factor and lack of targeted financing options for building efficiency projects are consistently cited as barriers to the growth of energy efficiency retrofit markets.[6]

[5] Hesser 2.

[6] For the past six years, Johnson Controls has conducted an annual, global Energy Efficiency Indicator survey that tracks the energy priorities and investments by executives from the commercial, industrial and institutional sectors. The survey results have consistently cited limited capital availability as the most significant barrier to businesses undertaking energy efficiency investments. In 2012, there were 1,139 respondents in the U.S. and Canada. There were nearly 3,500 respondents worldwide in

In Johnson Controls' 2012 "Energy Efficiency Indicator Survey," U.S. and Canadian executives cited a lack of funding as the most significant barrier to undertaking energy efficiency investments (37%), followed by insufficient payback/return on investment (21%).[7]

As previously mentioned, in 2010, only 25% of the total U.S. energy efficiency expenditure was financed via debt, and this was concentrated among high credit quality institutions. In comparison, the $16 trillion U.S. housing market is financed 60% via debt through mortgages. We conclude that a paucity of financing is likely to prevent energy efficiency investment from reaching its full potential.

That said, I must also emphasize that availability of financing options is *only one* component of what is necessary to ensure increasing throughput of retrofit activity across building sectors. Demand is also critically necessary, which in my experience must be supported by local policy drivers, a skilled workforce, including a robust energy audit profession, information on building energy use and retrofit performance, and effective service delivery business models for project implementation.

2012.
"Energy Efficiency Indicator Survey: U.S./Canada Results." Johnson Controls Institute for Building Efficiency, 2012. <http://www.institutebe.com/InstituteBE/media/Library/Resources/Energy%20Efficiency%20Indicator/2012-EEI-United-States-and-Canada-Fact-Sheet.pdf>.

[7] Johnson Controls Institute for Building Efficiency 2012.

Why is so little capital provided to this sector through financing today?

Barriers to energy efficiency finance differ by building segment. However, it is generally true that there must be a credible source of repayment, either through a strong balance sheet or supported by assets with collateral value. The flow of financing for commercial retrofit projects is hampered by the absence of collateral with significant value in the event of default (in contrast to mortgage or auto lending), and by borrowers who are not creditworthy entities (these are often limited liability entities in the commercial real estate sector). Further, high transactions costs, limited performance data and pre-existing liens on real property are additional complicating factors. Split incentives, and in some regions, low energy prices reduce the economic feasibility of projects.

The chart below enumerates various barriers relevant to financing energy efficiency projects in large buildings:

Barriers that limit EE Retrofit Investments & Financing	Description
*Property owners are often **unwilling to commit capital** to non-core investments; structural and economic disincentives compound the challenge.*	• Efficiency is rarely viewed as a core investment; equity is scarce or viewed as better invested elsewhere; borrowing carries risk and balance sheet implications • Holding periods may be shorter than payback periods – short holding periods render longer term projects uneconomic unless the value can be translated into exit price • The structure of many leases results in split incentives, making projects unattractive • Transaction costs are high or perceived as high • Energy cost savings may have limited impact on overall financial position
Common **contractual terms**	• Conventional loans are unattractive to many borrowers; terms

constrain both borrowers and lenders, if debt financing is an option.	may be short, rates high and security requirements not feasible • Pre-existing mortgage liens may render an efficiency loan subordinate to a significant amount of existing debt; existing mortgages often restrict additional debt financing • Securing actionable liens against equipment can be problematic • Real estate ownership vehicles often limit access to a business balance sheet • Term limits often reduce scope of measures, thereby reducing efficiency gains, rendering projects less attractive and reducing financial impact
Information limitations reduce demand for and supply of financing by increasing (perceived) risk for property owners, investors and lenders.	• Lack of transparent data on financial savings from efficiency measures make it difficult for owners to "pull the trigger" and lenders to underwrite loans • Efficiency is not incorporated in most real estate valuation, limiting the value proposition for both owners and lenders • Limited track record on EE measure performance results in relatively high risk premiums
Investors perceive a **lack of investment opportunities** at scale with attractive returns, strong risk management and sufficient volume.	• Volume of potential investable transactions is uncertain • Many property owners and projects are not independently of investment grade quality, so traditional finance products do not offer appropriate risk / return profile • Underwriting protocols and standardization of financing products are lacking • Variations in energy consumption patterns introduce unfamiliar risks • Currently there is no secondary market, and no liquidity

What is the strategy of New York City Energy Efficiency Corporation?

NYCEEC is structured as a non-profit, public-private partnership, as reflected in our Board structure. We are an example of the type of specialized organization that is necessary to

undertake the development of effective energy efficiency financing programs, which we believe involves managing both energy efficiency technical risk and real estate finance risk, and balancing policy objectives with the need to prove and capture data on demonstrable financial value of energy efficiency investments.

Figure 3. What is NYCEEC?

A non-profit created by NYC to catalyze energy efficiency and clean energy finance

Capital Sources:

- ✓ $37.5 million from ARRA for energy efficiency
- ✓ $5 million from NYC for clean heat financing
- ✓ $1.6+ million grants from philanthropy

Short-term goals:

- ✓ Pilot clean energy finance products across building types
- ✓ Deploy capital with significant leverage
- ✓ Create lender partnerships

Longer-term goals:

- ✓ Achieve financial sustainability
- ✓ Expand balance sheet
- ✓ Develop lending and origination capacity of marketplace

NYCEEC's First Transaction
November, 2011

125 Maiden Lane

Total project cost: $1.4 million

NYCEEC credit enhancement: $190,000

Leverage: 7.4 to 1

Energy savings: 23.6% or 5,743 MBTUs/yr

Jobs created: 15

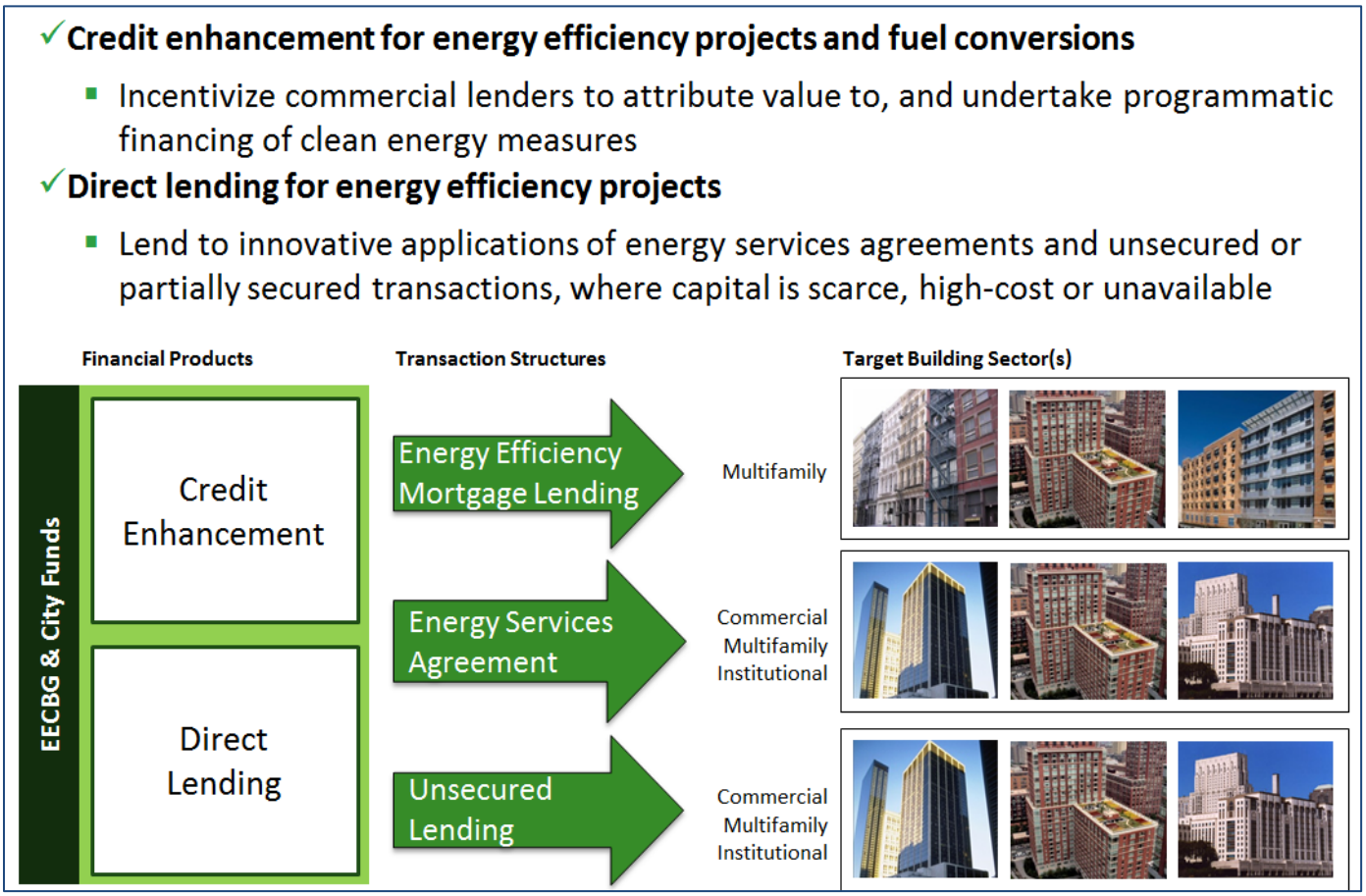
Our goal is to partner with private financial institutions to leverage our core capital for greatest impact. While there are many government sponsored programs that promote energy efficiency, NYCEEC is novel because we are operating as a non-profit specialized financing entity – with an ethos that balances risk management with customer-service.

We are filling gaps in the availability of capital, and piloting partnerships and financial products that we believe are replicable, eventually at scale. This work is generally not being undertaken by the private finance sector (with the exception of certain CDFIs[8]), primarily due to high transactions costs, unproven revenue streams and a current reticence on the part of many financial institutions to participate in innovative financing structures (within means of mitigating credit risk). We are generating a return on our capital, albeit calibrated to our non-profit, mission purpose. We seek to maximize energy efficiency investment within our community by attracting commercial lenders to the sector.

NYCEEC is using two main strategies to improve the availability of financing for building retrofits. We are providing credit enhancement to mitigate risks that commercial and mortgage lenders are currently unwilling to accept, and incentivize lenders to attribute value to energy efficiency investments. We are also offering loans (often in partnership with commercial lenders) to innovative applications of energy services agreements and unsecured or partially secured transactions, in cases where capital for technically sound energy efficiency investments is scarce, high-cost or unavailable.

[8] Community Development Financial Institutions

Figure 4. NYCEEC's strategy



What are the innovative financing approaches?

I am going to briefly discuss five financing approaches that have merit for supporting the development of retrofit markets. We are working with three of these products at present: energy services agreements, energy efficiency mortgages, and unsecured lending This reflects what is feasible today in New York City (without additional regulatory or legislative action) and what we believe has the greatest applicability to the building stock we are targeting: primarily multifamily, commercial and to a lesser extent, institutional buildings in NYC.

First, I want to share my observation that the energy efficiency retrofit market is highly fragmented. There is no one predominant or obvious approach to financing that will suit the needs of all owners and major tenants. Market segmentation is absolutely necessary and not well-defined at this moment.

There is need and opportunity for both modifications of standard financial products that can responsibly accommodate the retrofit process, and for new and innovative approaches that are specifically designed to facilitate investment in energy efficiency retrofits. There is important transactional activity underway representing initial progress in both of these categories of activity.

Energy Services Agreements have historically been used by the ESCO industry, along with performance contracting, to finance retrofits. The innovation we are interested in developing is applying a modification of this approach to the commercial real estate sector, which we call "ESA Version 2.0". In the ESA 2.0, a third party project sponsor funds the cost of improvements. These companies (and their capital sources) effectively invest in the energy savings potential in buildings directly, although they do not own the buildings. To varying degrees, they may assume the risk that the energy efficiency retrofit project will perform as expected and benefit from some or all of the "savings upside". Often, ESA payments from building owners are considered to be operating expenses, as opposed to debt payments per se. This is a sophisticated approach that, generally speaking, seems to make the most sense for

capital intensive projects, e.g., chillers, boilers, electrical and control systems, automated energy management systems, certain envelope measures and co-generation.

Unsecured lending for energy efficiency projects and equipment is not new, and is primarily applicable to high credit quality borrowers including MUSH sector entities and high-quality corporates. This category includes commercial loans that are either unsecured or are flexible with respect to collateral, accepting equipment or collateral arrangements other than first or second liens on real property, and equipment finance including leasing arrangements. We believe that this is an important tool in our toolbox, but not a solution for scaling retrofit financing across the full range of commercial buildings.

Energy efficient mortgages allow building owners to add borrowings specifically for building retrofits on top of a conventional mortgage. This may be achieved by increasing the base loan amount at the time of a refinancing to accommodate the cost of specific energy efficiency improvements, or by providing a supplemental first or a second lien loan for this purpose in conjunction with the first mortgage. Bloomberg New Energy Finance espouses the high potential of energy efficient mortgages, "…the potential market for energy efficiency debt derived through energy efficient mortgages is greater than any other financing mechanisms…, and could theoretically total up to $270bn in outstanding energy efficiency debt on top of the $13.5tn US mortgage market.[9]

[9] Hesser 7.

Few if any conventional mortgage lenders are providing this form of finance today. By providing credit enhancement to mitigate the risk of that retrofit measures won't achieve projected cost savings, and by bringing technical expertise with respect to best practices for energy efficiency implementation to lenders, NYCEEC's goal is to help lenders systematically incorporate the value of energy efficiency-related operating savings (and additional value attributes) into the mortgage lending process. This is a potentially highly scalable solution in that it is based on a modification to standard lending practices that are commonly used to finance buildings across various building sectors. Furthermore, we believe that this approach has good applicability in low- to moderate-income communities.

Programmatic approaches that we are not currently deploying (but may in the future) include PACE commercial and on-bill financing programs through the regulated utilities.

Property assessed clean energy (PACE) programs employ the ability of local governments to assess properties for improvements that have public benefit. Given appropriate state-enabling legislation, this assessment capability can provide a voluntary mechanism that permits property owners to finance clean energy improvements, including efficiency improvements, on individual properties. The assessment is attached to the property, not the owner, and is paid back through the property tax system. The assessment has the same status as property taxes, and therefore is empowered to attach a lien to the property in the event of nonpayment that is senior to any existing mortgage debt. Assuming adequate demand for retrofit investment, the biggest issue in relation to uptake of this model is likely the requirement for lender

acknowledgement or consent. PACE commercial programs all require some form of it, and this creates a barrier that many owners may not care to deal with, and some mortgage lenders may reject.

On-utility bill financing takes advantage of the important relationship that a utility already has with its building owner customers, and utilities often seek to increase penetration of existing energy efficiency programs by offering to finance measures on the utility bill. In essence, the upfront cost of efficiency upgrades is financed through a repayment charge on the monthly utility bill. In tariffed programs, the charge is tied to the meter, so the tariff stays with the property when the customer moves; in loan programs, the repayment is tied to the customer, so must be repaid at property sale.

According to Bloomberg New Energy Finance, "scaling on-bill lending…will require programmes to break away from rate-payer coffers, and tap into outside credit from the capital markets."[10] Our research concludes that most existing on-bill programs are active primarily in the single-family residential building markets, although both New York State and California (and possibly others) are piloting effort to promote this financing mechanism for commercial properties.

[10] Hesser 11.

Figure 5. Innovative financing approaches for commercial retrofits in New York City (NYCEEC's assessment)

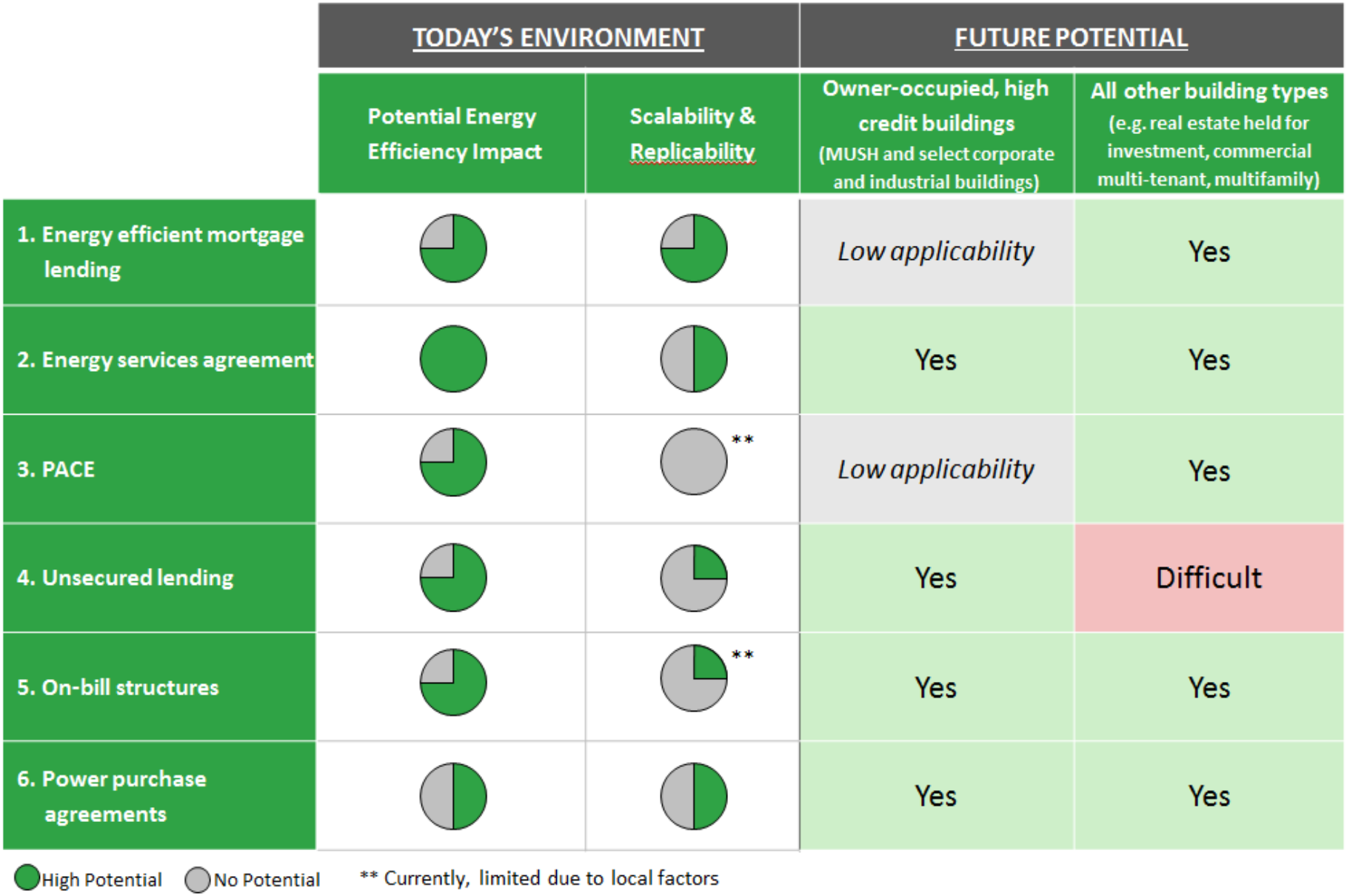
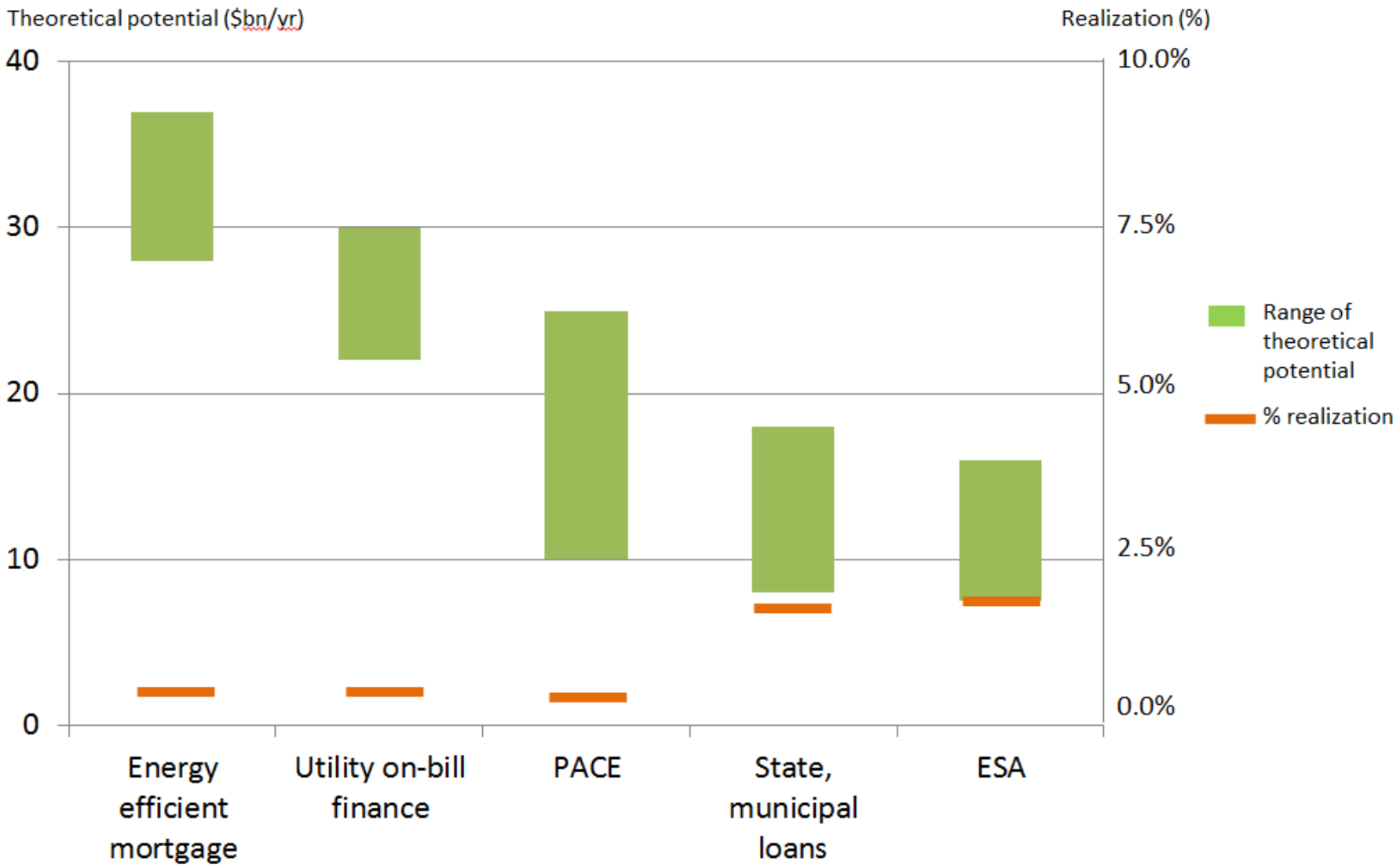


Figure 6. Bloomberg New Energy Finance's assessment of innovative financing approaches[11]

Models	Potential level of activity ($bn /yr)	Current level of activity ($m/yr)	Sources of funds	Applicable market segments	Strengths	Weaknesses
Energy efficient mortgage (EEM)	28 – 37	170 – via community development finance institutions	• Mortgage lenders • Federal Housing Administration	• Residential • Multi-family • Commercial	• Largest potential market opportunity • Fuses energy efficiency finance with real estate finance	• Additional debt via EEMs is currently not feasible because the real estate market is deleveraging
Utility on-bill finance	22 – 30	100 – 150	• Utility funds • Federal grants • Capital markets • Municipal bonds	• Residential • Commercial • Industrial • Public	• Threat of meter shut-off allows junior lien status • Current legislative momentum	• Requires utility cooperation • Even decoupled utilities will slow down adoption
PACE	10 – 25	61	• State / City funds • Federal grants • Capital markets	• Residential • Commercial	• Offers investors a secure structure for securitizing energy efficiency loans	• Senior lien status has made an enemy of mortgage providers
State, municipal loans	8 – 18	226	• Revolving loans • State / City funds • Federal grants • Municipal bonds • Tax appropriations	• Residential • Commercial • Industrial	• Can provide seed capital to develop collateralized energy efficiency finance structures for capital markets lending	• Reliant on government support • Funds will dwindle post-stimulus
Energy services agreement	7.5 – 16	20 – 30	• Private equity • Banks • State municipal funds	• Commercial • Industrial	• Solves numerous principle agent issues within commercial buildings	• Long sales cycles • Correct accounting treatment unclear • Complex mechanism
Virtual utilities	3.4 – 4.9	100 – 150	• Utility surcharge • Municipal bonds • Commercial banks • Carbon markets	• Residential • Multi-family • Commercial • Public	• Provides strong credit rating for a bank to issue energy efficiency bonds	• Limited scale • Requires regulatory support via utility decoupling

[11] Hesser 3.

Figure 7. Bloomberg New Energy Finance's view of the highest potential financing solutions[12]



[12] Hesser 4.

What is our experience so far?

NYCEEC commenced operations one year ago. We have closed transactions and are in-discussions on many more. Highlights of our learning to date include:

- We are seeing demand for the financing products we are offering across a range of building segments including commercial, multifamily, retail, hospitality and health care.
- However, base demand for retrofit investments is an issue – this means that more information and education is required to propel building owners to act. We are also anticipating increased demand as the full effect of local regulation – primarily as the local laws and regulations implemented as part of New York City's Greener, Greater Buildings Plan take effect.
- Almost all lenders require some form of credit enhancement to finance energy efficiency projects for all but the most credit-worthy borrowers.
- Individual transactions costs are high, and thus is it critically important to promote programmatic approaches.
- Few financial institutions are willing to invest in developing and integrating the engineering expertise with the specialized finance expertise that is required to implement effective retrofit financing programs in the commercial sector. To take this step, institutions must perceive strong local demand drivers.
- No one financing product is likely to dominate, particularly in the commercial sector.

What federal support is appropriate and needed to ensure success?

My observation is that most of the policy drivers for building retrofits are happening at the municipal and state level. Retrofit markets are primarily local - and to an extent regional - markets, and need to be supported at these levels. That said, NYCEEC could simply not exist without Federal stimulus funding. What can the federal government do to help promote the development of energy efficiency financing markets?

- Provide continued financial support through federal grant funding to emerging programs such as NYCEEC that are demonstrating success;
- Promulgate learning and promote the sharing of experience and best practices among local and regional energy efficiency financing programs;
- Consider adjusting tax policy (by revising 179D so that it works better for existing buildings; by providing accelerated depreciation for retrofit capital equipment; by allowing efficiency improvements to qualify as real estate under REIT regulations; by including tenant-driven as well as owner-driven approaches) with the objective of driving demand for retrofits through tax incentives, and improving the balance of tax subsidy directed at renewables with that directed at energy efficiency, as such subsidy is currently more weighted towards renewables although there is a strong argument that energy efficiency is more cost effective;
- Encourage the GSE's to develop energy efficiency lending strategies.
- Continue and expand efforts to aggregate and provide public access to data on building energy performance, energy efficiency retrofit activity and performance, tenant energy consumption, and municipal initiatives on benchmarking and disclosure.

An area for future consideration may be developing pathways for the integration between building retrofit and energy markets by encouraging or incentivizing utilities to purchase aggregated energy efficiency in the form of “negawatts”.

References

"2012 Energy Efficiency Indicator Survey: U.S./Canada Results." Fact sheet. Johnson Controls Institute for Building Efficiency, 2012. <http://www.institutebe.com/InstituteBE/media/Library/Resources/Energy%20Efficiency%20Indicator/2012-EEI-United-States-and-Canada-Fact-Sheet.pdf>.

Fulton, Mark and et al. "United States Building Energy Efficiency Retrofits: Market Sizing and Financing Models." The Rockefeller Foundation and Deutsche Bank Climate Change Advisors, March 2012. <http://www.rockefellerfoundation.org/uploads/files/791d15ac-90e1-4998-8932-5379bcd654c9-building.pdf>.

Granade, Hannah Choi and et al. "Unlocking Energy Efficiency in the U.S. Economy." McKinsey & Company, July 2009. <http://www.mckinsey.com/client_service/electric_power_and_natural_gas/latest_thinking/unlocking_energy_efficiency_in_the_us_economy>.

Hesser, Theodore Gates. "Is debt financing opening up for energy efficiency?" Energy Smart Technologies – Built Environment – Research Note. Bloomberg New Energy Finance, 25 April 2012.

"Policy Brief Property Assessed Clean Energy (PACE) Financing: Update on Commercial Programs." Lawrence Berkeley National Lab, Clinton Climate Initiative and Renewable Funding Corporation, March 23, 2011. <http://pacenow.org/blog/wp-content/uploads/LBL-RF-PACE-Commercial-Policy-Brief.pdf>.