

Energy Efficiency in NYC: The problem of split incentives

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Introduction

The importance of energy efficiency has re-emerged into the public discourse as an important goal for the national, state and local economy, after having been long dormant during decades of low energy prices and relatively secure energy supplies. These two conditions no longer seem to be the case: accompanied by public concern over greenhouse gas emissions that cause global climate change, these three factors comprise the bulk of the rationale for the growing emphasis given to improving the efficiency of the energy we use in the United States. New York City is no exception to this trend.

New York City is unique for many reasons, one being its uncommonly energy efficient economy. Energy use per capita in the City is the lowest in the country, largely because many New Yorkers use public transportation and live in small living spaces.¹ Less uniquely, the City has a large amount of residents who are renters, rather than homeowners. Owner-occupants represent about 68 % of residents across the country, while in New York City, only 33 % of residents own their apartment or house.² The large proportion of renters (including the commercial and industrial sectors) in New York City poses a long-recognized yet unresolved problem to the goal of improved energy efficiency of the building stock.³

The split incentive problem, considered by some a market barrier and by others a market failure, is principal-agent problem in the pursuit of energy efficiency investments in rental buildings in New York City.⁴ This problem arises when the tenant pays the operating costs for the space (e.g. the electric bill), while the landlord/owner pays the capital costs for the building and its energy-using amenities: The owner wants to minimize capital costs, maximize rental revenues, and has no incentive to invest more up-front in measures that would improve efficiency [i.e. reduce the electricity bill] over time if the tenant is the one paying for it.⁵ In light of the large proportion of commercial, industrial and residential rental units in the City, and the City goals to reduce carbon dioxide emissions, resolving the split incentive barrier to greater investment in energy efficiency is imperative.

¹ This figure does not include the energy use of the local airports. Bloomberg, Michael. April 22, 2007. *PlaNYC 2030*. Office of the Mayor, City of New York.

² International Energy Agency. 2007. "Mind the Gap" and Lee, Moon Wha. February 10, 2006. "Select Findings of the 2005 New York City Housing and Vacancy Survey." New York City Department of Housing Preservation and Development.

³ Improving the energy efficiency of the built environment is considered important to Mayor Bloomberg's PlaNYC goal of reducing carbon dioxide emissions by 30% by 2030 because it is estimated that two-thirds of the City's energy is used in buildings. Bloomberg, Michael. April 22, 2007. *PlaNYC 2030*.

⁴ The tenant is the principal and the landlord is the agent, because he/she has the agency to choose how the structure is built and what appliances, energy using equipment is installed. International Energy Agency. 2007. "Mind the Gap" and see Jaffe and Stavins, 1994. "The energy-efficiency gap" in *Energy Policy* 22 (10)

⁵ There is little data regarding the benefits realized from energy efficient investments by the landlord when the tenant pays the energy bills—benefits that include higher property values and reduced operating costs. Sierra Club, Atlantic Chapter. July 6, 2007. Testimony to the New York Public Service Commission, Case #07-M-0548.

This paper will look at the various mechanisms, policies, or programs that address the split incentives problem. It will analyze each one's suitability to New York City's regulatory and political context, as well as the City's agency to implement, legislate, fund, or enforce each potential remedy. The paper will differentiate between the commercial and residential, and affordable (low-income) housing sectors, as each poses different challenges and potential avenues for success to greater investment in energy efficiency. It will conclude with a look at current City government action being taken to address split incentives, as well as sensible future policy options.

While many local and international policy experts agree that there is no single solution to the pervasive problem of split incentives in the rental market, there are several mechanisms that may successfully lower the barrier that split incentives create for investments in energy efficiency in New York City.⁶ The mechanisms that I will discuss below include: a Pay-as-You-Save (PAYS®) system, energy efficient mortgages or energy efficiency construction loans, supplemental rental lease agreements, appliance standards and building codes, and structured Requests-for-Proposals (particularly applied to affordable housing). This is not meant to be a comprehensive list, but rather a sampling of measures, some of which are used in the City already, some of which are not, that could grow investments in energy efficiency in the City.

Pay-as-You-Save

One mechanism that holds considerable promise toward overcoming the split incentives barrier is the Pay-as-You-Save (PAYS®) system.⁷ It is a new market infrastructure that enables either the building owner (landlord) *or* tenant to install energy efficient products, with no capital expenditure and no debt, through a third party vendor that will be paid for on a monthly basis through an energy service charge that is lower than the amount of the resulting savings realized by the bill-payer.⁸ It is the energy service charge mechanism that ensures that she who gets the savings pays the bill, a mechanism which is transferable to the subsequent tenant, should the tenant who used a PAYS product relocate.⁹ In the case of a smaller PAYS product, such as a window unit air conditioner, the energy service charge would be transferred to the new residence, along with the air conditioner. Other essential components in a successful PAYS system include a third party who verifies the efficiency and savings of the products, a local utility that provides the billing and transfer of charges to the provider of the PAYS product, and the provision of capital to the vendor in order to finance the capital costs of the PAYS products (in addition to what the vendor may be able to bear on its balance sheet).¹⁰ Although there has been a successful pilot system implemented through two local utilities in New

⁶ Anderson, Nancy, Executive Director, The Sallan Foundation. Personal correspondence on December 12, 2007, and, International Energy Agency. 2007. "Mind the Gap."

⁷ PAYS® was created by Harlan Lachman and Paul Cillo of the Energy Efficiency Institute, Inc. www.paysamerica.org

⁸ Cillo, Paul, Lachman, Harlan, Rosenblum, Daniel, and Zalzman, Fred. August 3, 2005. "Potential for Development of PAYS® in New York State. www.paysamerica.org

⁹ Cillo, Paul and Lachman, Harlan. December 1, 1999. "Pay-as-You-Save Energy Efficiency Products: Restructuring Energy Efficiency," The National Association of Regulatory Utility Commissioners.

¹⁰ Cillo, Paul and Lachman, Harlan. December 1, 1999. "Pay-as-You-Save Energy Efficiency Products: Restructuring Energy Efficiency," The National Association of Regulatory Utility Commissioners.

Hampshire, successfully implementing this new market infrastructure in New York City may be politically tricky and require a long time frame.¹¹

Overcoming split incentives in rental properties by implementing a Pay-as-You-Save market infrastructure seems to make economic sense, yet there may be several problems with implementing it in New York City. This system, or any system requiring separate charges on the rate-payer's electricity bill, that need to be collected and then distributed by the local utility, necessitates the New York State Public Service Commission (PSC). The City of New York, qua the City Council or the Office of the Mayor, does not hold any direct power over the rulings of the PSC—each body can only submit testimony to the PSC or otherwise participate in the proceedings. Consolidated Edison, the local utility that would be required to administer, collect, and then distribute to the vendor all energy service charges, can also submit testimony and evidence to the PSC. Their testimony (indeed, their position) is likely to be unsupportive for the following reasons: Con Edison has not decoupled revenues from profits, meaning a decrease in the delivery of electricity would affect its profits, and because the system creates an added complication to the billing process that Con Edison would have to bear.¹² A Pay-as-You-Save system could be addressed within an electricity rate case—this type of system has not however been discussed in the electricity rate case that is underway.¹³

In addition to the PSC, the New York State Energy Research and Development Authority (NYSERDA) would also be a key actor in a successful Pay-as-You-Save system. NYSERDA, while working closely with the City on many programs, policies and initiatives, is largely funded by the Systems Benefit Charge, utility contributions, and New York Power Authority (NYPA) contributions, and does not direct all funding or programming into the City market. Because New York City holds the majority of the state's population, and is a city with high-profile energy issues, NYSERDA would likely be closely involved in this type of new system. Specifically, NYSERDA can act as a collaborator on the coordination of a PAYS system, as it already provides “contracted independent oversight of resource efficiency vendors to assure customers that they are getting good value for their energy efficiency investments,” and it is also acknowledged that “it is a relatively simple adjustment to adapt the existing system [in place from NYSERDA's existing work] to a PAYS certification system.”¹⁴

Despite the reliance on the PSC to adopt the PAYS system, if adopted, there are ways in which the City can act to ensure successful deployment. First, the City has the capacity to issue municipal bonds, which could provide a critical mass of capital—necessary to ensure the PAYS feature of no up-front payment by the customer—by providing the extra

¹¹ PAYS America. January 2004. “New Hampshire PAYS® Pilot Results” www.paysamerica.org

¹² The PSC is expected to rule on the current Con Edison electricity rate case hearing this month, a ruling which may include measures that address decoupling of their profits from the volume of electricity delivered. Norlander, Gerry, Executive Director, Public Utility Law Project. Personal Correspondence on December 14, 2007.

¹³ Rosenlum, Daniel. Pace Energy Project. Personal correspondence on December 13, 2007.

¹⁴ Cillo, Paul, Lachman, Harlan, Rosenblum, Daniel, and Zalzman, Fred. August 3, 2005. “Potential for Development of PAYS® in New York State. www.paysamerica.org

capital needed by the vendor in order to keep acceptable debt levels on its balance sheet, given that it would need to provide many products without up-front payments. Similar to municipal bonds, NYSERDA could issue low interest public bonds as well, though the City cannot direct NYSERDA to do so.

Mayor Bloomberg's *PlaNYC 2030* calls for the establishment of a City Energy Efficiency Authority, which would "direct all of New York City's efficiency and demand reduction efforts."¹⁵ Establishing this Authority requires state legislation, but supposing that it does get established, a city-wide Energy Efficiency Authority could coordinate, monitor and provide public education for a PAYS system, thereby fostering the market infrastructure in a manner that is less disparate and dependent on state agencies or state funding. Unfortunately, this Authority does not yet exist. Therefore, the speculation surrounding the role that a City Energy Efficiency Authority could play in any comprehensive system that would lower the split incentives barrier to energy efficient investments, such as PAYS could, is largely academic.

Although the breadth of coordination and the limited capacity of the City to implement a PAYS market infrastructure make it a daunting option with which to address the split incentives problem, there are factors particular to New York City that synergize with the PAYS features. Electricity prices are some of the highest in the country in New York City, therefore any savings on electricity make a larger impact than with low initial electricity prices, nor are these prices expected to fall.¹⁶ Secondly, there is little public funding needed and there is no subsidy involved for this system, which means it could garner bi-partisan support based on fiscal ideology. Thirdly, the City has the force of the momentum of *PlaNYC 2030* (and other public concerns over energy-related issues) behind it, upon which it could capitalize and channel to coordinate the myriad stakeholders needed to implement PAYS. Nevertheless, the skepticism from the low-income community may detract from support for PAYS, due to the critical feature it employs regarding disconnection of electricity service if the customer fails to pay. This combined with the time-consuming regulatory process, utility synergy, and levels of education needed to inform consumers about the system may prevent its implementation, absent a maintained level of urgency and political will focused on urban energy efficiency.

Structured Contracts and Financing

Other market mechanisms that are feasible remedies to the split incentives problem in New York City involve unique financing or structured contracts that realign the stakeholder's financial incentives in order to foster adequate investment in energy efficient technologies: energy efficient mortgages, energy efficient construction loans, or supplemental rental lease agreements. Energy efficient mortgages (EEM) and energy efficiency construction loans (EECL) are designed to incent the agent (landlord or building owner) to invest initially in energy efficient equipment, the building envelope,

¹⁵ Bloomberg, Michael. April 22, 2007. *PlaNYC 2030*. Office of the Mayor, City of New York.

¹⁶Ibid.

etc. regardless of who pays for the energy costs during the operation of the building.¹⁷ Ideally, these two mechanisms would obviate the split incentives problem, as the building would be constructed to maximize efficiencies, and there would be a minimal need to invest in retro-fits. Both the EEM and the EECL mechanisms require lending companies to provide large amounts of capital, which usually occurs in the private sector, and/or with public revolving loan funds, public underwriting, or public low interest loans. While NYSERDA and Con Edison have low interest loan programs, the City does not currently have a similar dedicated program or revolving loan fund, and is likely unable to guarantee large amount of loans, given its debt capacity.¹⁸ With the ongoing implementation of *PlaNYC 2030*, the City may be able and willing to partner with many private lenders to provide assurances of the cost-effectiveness of energy efficient investments, thus decreasing the risk-levels associated with non-traditional lending mechanisms such as EEMs and EECLs.

The third mechanism, a supplemental rental lease (i.e. a “green” lease), is a contract that realigns the incentives of the landlord and the tenant, in order to overcome the problem of split incentives. Such a contract could be a two party agreement that places a surcharge on the rent each month in an amount that is less than the savings realized by the tenant, but sufficient to provide a revenue stream to the landlord in order to payback the capital investment he or she has made in energy efficiency in the building/apartment.¹⁹ Alternatively, a “green” rental lease could be structured as a three-party contract: the landlord, the tenant, and an energy service company (ESCO). This model was successfully tried by the U.S. Department of Defense (DOD), in a government-leased office building in Alexandria, Virginia that is owned by Hoffman Management.²⁰ Like the renter-landlord problem of split incentives in New York City, DOD did not own the Hoffman building, wanted to improve its energy efficiency, and paid the utility bills. Ultimately a tri-party agreement was reached with Hoffman, DOD, and Pepco Services, Inc. (the ESCO) that stipulates that DOD will pay Hoffman Management a part of its savings over a predetermined period and Hoffman agreed to finance the renovation costs.²¹ This tri-party agreement was possible largely because DOD “entered into a supplemental lease agreement with the owner.”²² Call it what you will, leases structured to induce owners and tenants to invest in energy efficiency and share saving cash flows will need to be creative, transparent, and enforceable.

Supplemental, structured, or “green” leases in New York City would likely work best for large institutional, commercial or industrial tenants, who have large energy loads, pay their own energy bills, and foresee a protracted tenancy period. Utilizing a reputable

¹⁷ Zerkin, Alan, and Newman, Douglas. March 2004. “Report of the High Performance Building Initiative: Mainstreaming High Performance Building in New York City.” Center for Economic and Environmental Partnership, Inc.

¹⁸ Ibid.

¹⁹ The idea of a “green” rental agreement comes from the Clinton Foundation, but this particular proposal of how the lease would be structured comes from the author.

²⁰ Johnson, Josephine. Nd. “DOD Partnership Results in an Energy-Efficient Office.” Retrieved from <http://www.epa.gov/epp/pubs/case/hoffman.htm>

²¹ Ibid.

²² Ibid.

ESCO as the third party who provides the actual products or services is critical to the success of this model in New York City, where markets are bigger, costs are higher, and business is fiercely competitive. The Mayor's Office of Long-term Planning and Sustainability could provide a list of "recommended" ESCOs to reduce the transaction costs, search time, and risk, in order to better ensure a sound investment. Just as the federal government provided a model in the D.C. area, the City could enter into a similar type of supplemental lease agreement in New York (assuming that the City does not own every agency or office that is occupied by them), thus "leading by example" for other private commercial or institutional tenants and the landlords who must engage with them. "Leading by example" is highlighted as an important feature of the Mayor's long-term sustainability plan for the City: setting the precedent for this type of green lease would not provide such leadership, it would further the City's own goal of reducing energy use by 30% by 2017.²³

This "green" contract model, even if successfully crafted as a public-private-private agreement, may not however, transfer seamlessly to a private-private-private contract. Rents in New York City are high relative to many other U.S. cities, as are the property values. In this "seller's/landlord's market" tenants have little leverage to negotiate creative leases, and landlords/owners may be highly reluctant to engage in innovative leasing, when they could rent traditionally to another. However, with looming mandates on energy codes, increasingly stringent building codes, and general public demand for greater energy efficiency, landlords and owners—with the goals and actions of the City guiding the way, and a reputable selection of ESCOs with whom to work—may be more willing to experiment with lease contracts than they would have been ten years ago.

Codes and Mandates

As there is no simple panacea for solving the split incentives problem in the City to date, obviating the problem may be the best way to address it in the future.²⁴ Designing, legislating, and enforcing stringent building codes, energy codes, and appliance standards that promote high energy performance in the built environment would obviate the tenant-landlord investment problem over time, as new buildings would be legally required to be energy efficient initially.²⁵ The Netherlands are a good example of strict coding. In 1995 the country established building standards that include requirements about energy performance in new residences, which are upgraded over time.²⁶

New York City recently updated its building code (which had not been changed since the 1960s) with increased energy efficiency in mind. The code, which can be modified every three years, includes requirements for more efficient heating and cooling systems and white roofs that reflect rather than absorb sunlight, to name just two changes.²⁷ Additionally, the City Council passed Local Law 86, which requires all new municipal

²³ Bloomberg, Michael. April 22, 2007. *PlaNYC 2030*. Office of the Mayor, City of New York.

²⁴ Anderson, Nancy, Executive Director, The Sallan Foundation. Personal correspondence on December 12, 2007.

²⁵ International Energy Agency. 2007. "Mind the Gap"

²⁶ *Ibid.*

²⁷ Ryley, Sarah. May 8, 2007. "Mayor's Green Building Code Still Behind Other Cities," *Brooklyn Daily Eagle*.

projects with construction costs of two million dollars or more to build according to Leadership in Energy and Environmental Design (LEED) Silver certification standards. This law was passed with the expectation that by building according to LEED standards, the City will reduce its electricity consumption and water use, although given the design of the LEED point system, a LEED Silver certified building may not have earned many of its points in the energy efficiency category.²⁸ Another important feature of Local Law 86 includes the requirement that all municipal capital projects with an estimated cost of twelve million dollars or greater be built to reduce energy [operating] costs by 20-30 %.²⁹ The building code, which applies to *all* construction, and the Local Law 86, which applies to municipal, or publicly funded construction, will likely improve the energy efficiency of the affected projects, assuming that there is an enforcement mechanism and the buildings are not built to consume greater energy due to superfluous appliances, etc.

Unfortunately, much of these construction projects are unlikely to affect the incidence of split incentives between the landlord and tenant: City buildings are often owner-occupied. The building code may obviate the split incentives problem to a certain degree in newly constructed buildings: looking to the City's own data however highlights that "by 2030, at least 85% of our energy usage and carbon emissions will come from buildings that already exist today."³⁰ Much of the split incentives problem toward energy efficient investment occurs in these existing buildings, which neither new construction codes nor municipal green building laws can solve nor obviate.³¹

Mandating appliance standards is another route that could remedy the split-incentives problem: the owner would be required to invest in energy-efficient appliances, and the tenant would realize the savings in the energy costs over his or her period of occupancy. In fact, New York City Council Law 107-2005 does precisely that, by amending the administrative code to require the purchase of Energy Star® appliances whenever appliances in apartment buildings are replaced.³² That this law is actually enforced is unclear, but given that large appliances such as the refrigerator use the single largest amount of electricity in most households, the turnover of this equipment over time would improve energy efficiency in the residential sector. Nevertheless, refrigerators have a long life, the enforcement of the law is dubious, and many smaller appliances are purchased by the tenant. Despite the good intentions of Local Law 107 to address improved energy efficient investments in existing buildings that are tenant-occupied, these factors will likely result in a relatively small impact in a solution toward the split incentives problem for energy efficiency in New York City.

The most effective combination of building codes, energy codes and appliances standards would include strict requirements on both new construction and periodical upgrades

²⁸ Thelen Reid Brown Raysman & Steiner LLP. January 15, 2007. "New York City Enacts Broad Green Building Law for its Projects." *Construction Weblinks*.

²⁹ Ibid.

³⁰ Bloomberg, Michael. April 22, 2007. *PlaNYC 2030*. Office of the Mayor, City of New York.

³¹ The City recognizes this problem and intends to incentivize energy efficient retro-fits now and mandate such upgrades in the future. Ibid.

³² Energy Star® appliances are certified by the U.S. EPA and DOE as energy efficient products. City Council of New York. December 19, 2005. *Local Law 107*.

(retro-fits). The split incentive barrier toward energy efficiency would be removed because the owner/landlord would be mandated to invest in energy efficiency, particularly as the owner makes necessary capital upgrades. Strict and enforced policy mandates however are often difficult to implement in the U.S. due to political ideologies and a relative lack of urgency surrounding energy consumption. With rising energy prices, concerns over energy security, and improved public discourse about climate change, mandates of this nature may become increasingly politically feasible in the future. Should the policy environment become ripe for stricter codes and mandates, the City Council will be able to legislate, and the Mayor and executive agencies can provide enforcement and assistance.

Affordable Housing

The split incentive problem to energy efficient investments is a particular problem in affordable housing around New York City, where energy costs are often the second highest (after rent itself) expenditure for the tenant, and a greater burden as a percentage of disposable income.³³ The problem is amplified by the fact that many affordable housing buildings are built based on first costs and number of resident units, not on future operating costs, which are borne by the tenants.³⁴ The *Mainstreaming High Performance Buildings in New York City* report addresses the problem of split incentives in affordable housing, and suggests remedies that are applicable specifically toward increasing investments in energy efficiency: 1) The Housing Preservation and Development's (HPD) program to foster inclusion of equipment by means of credits that the landlord could apply toward rent increases, 2) improvements in NYSERDA's affordable housing production program, and 3) a City Council mandate for Energy Star appliances in all municipally-financed programs.³⁵

The City has the capacity to modify HPD's program in order to better incent owners/landlords to include energy efficient equipment, given the opportunity to realize a return through higher rents. Given the shortage of affordable housing in the City however, this mechanism would likely face less opposition if the projected rent increases were proven to be less than the amount of the savings realized by the tenant in lower energy bills. These savings, per unit, may be too small to appeal to the landlord as a sufficient increase in revenues to satisfy his or her payback threshold. As for NYSERDA's affordable housing program, that is a state program over which the Mayor has no official jurisdiction to modify it (the local population however, as rate-payers, do theoretically, and are purportedly represented by elected officials in the State Assembly). Instead of relying on changes to a state program, the City could craft its Requests for Proposals (RFP) for affordable housing to incorporate energy efficiency criteria, or to

³³ Low-income New York City Housing Authority (NYCHA) housing does not present a similar split incentive problem, as the tenants do not pay directly for their electricity bills. Marder, Howard, New York City Housing Authority. Personal correspondence on December 14, 2007.

³⁴ Zerkin, Alan, and Newman, Douglas. March 2004. "Report of the High Performance Building Initiative: Mainstreaming High Performance Building in New York City." Center for Economic and Environmental Partnership, Inc.

³⁵ Ibid.

give preference to the proposals that are “Energy Star® rated”.³⁶ The third option is certainly feasible in City Council, as was discussed earlier regarding a similar law mandating Energy Star® appliance replacements that passed in 2005. A version of this law applied to affordable housing may be easier to enforce, given that affordable housing is subject to City approval and inspection, and the developers of the housing rely on receiving 421-a tax abatement certificates or other financial incentives: incentives which may be revoked for non-compliance.

The aforementioned suggestions would apply to energy efficiency in *new* affordable housing. Two programs that address split incentives in existing buildings—where the majority of the need for investment exists—include the Weatherization Assistance Program (WAP) and NYSERDA’s EmPower New York Program.³⁷ Both are state programs and the investments made—at no cost to the tenant—reduce energy use by 25% on average.³⁸ These programs are highly utilized, particularly WAP, indicating that the design of the program and the results of the weatherization measures are compatible with the tenant, the landlord, and the providers, thus a sensible remedy to the split incentive problem in affordable housing.³⁹ The primary barrier to increased investments in energy efficiency via these programs is insufficient funding on the state and local level.⁴⁰ The City could budget funds for a municipal WAP program, modeled after the state program, which would simultaneously contribute to the City goal of decreased emissions from buildings. As for NYSERDA’s EmPower New York, there is less room for the City to either expand it or modify it, as NYSERDA has an exclusive contract with Honeywell International to implement the program.⁴¹ Overcoming the split incentive barrier in affordable housing is both particularly challenging and particularly critical—New Yorkers who have less disposable income at hand to invest in even the smallest means of energy efficiency (e.g. compact fluorescent lightbulbs) often have the greatest difficulty paying electricity bills that are higher due to minimal capital investments on the part of the owner.

Conclusion

Reviewing the many remedies to the split incentive problem toward investments in energy efficiency in New York City buildings, one notices a common theme: the

³⁶ “Energy Star rated” means that the building beats the New York State Energy code by 30%. Zerkin, Alan, and Newman, Douglas. March 2004. “Report of the High Performance Building Initiative: Mainstreaming High Performance Building in New York City.” Center for Economic and Environmental Partnership, Inc.

³⁷ To be eligible for WAP or EmPower, the building owner’s or the tenant’s income must be 60% or less than the state’s median income level.

³⁸ Dafoe, Jack. November, 2007. “Growing Green Collar Jobs in New York City: Energy Efficiency.” *Urban Agenda*

³⁹ WAP is commonly implemented as a tri-party contract: the landlord invests a portion in energy efficiency (when he or she is not income-eligible for WAP), the agency invests a portion, and the tenant, who invests nothing, may be protected from future rent increases in the contract among the three. Norlander, Gerry, Executive Director, Public Utility Law Project. Personal correspondence on December 14, 2007.

⁴⁰ Dafoe, Jack. November, 2007. “Growing Green Collar Jobs in New York City: Energy Efficiency.” *Urban Agenda*.

⁴¹ New York State Energy Research and Development Authority. EmPower New York, *Get Energy Smart*, www.getenergysmart.org

cooperation of multiple stakeholders is imperative, and enforcement mechanisms are essential. Split incentive solutions that utilize tri-party contracts, including a Pay-as-You-Save system, a supplemental lease agreement exemplified in the DOD model, and the weatherization contracts offer successful mechanisms that the City could consider. The City however, qua the executive or legislative branches, often requires the state to be a part of any solution discussed throughout this paper, be it through the PSC, NYSERDA, or the State Assembly. It may be because of this co-dependence that the City has made no concrete policy advancements as part of *PlaNYC 2030* implementation, or otherwise, to resolve the split incentive problem.⁴² Alternatively, it may be due to the complicated nature of the problem—a problem which could ultimately be obviated with strict building codes, energy codes, and appliance mandates, or mitigated with restructured electricity prices: all of which may be looming on an energy constrained horizon. Indeed, the split incentive problem may be one issue where it is sensible to wait for a time where the stick is preferable to the carrot. With the recent passage of the City Council Climate Protection Act, the goals of *PlaNYC 2030*, and rising energy prices, tightening codes and mandates for energy efficiency may be the best route for the City to take: it is a route in which the City currently has significant leverage to legislate, implement, and enforce.

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⁴² Aggarwala, Rohit. Director, Office of Long-term Planning and Sustainability. Personal correspondence on December 12, 2007.

International Energy Agency. November, 2007. "Mind the Gap: Quantifying the Principal-Agent Problems in Energy Efficiency"

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