



Long Island Towns Successfully Strengthen Residential Energy Codes

Serving as a Model for State Action

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A Green Paper

Executive Summary

A campaign to require ENERGY STAR® Homes standards for new home construction has been successful in ten out of thirteen Long Island towns. This is an unusual success in a region known for very independent local governments, and not often for regional cooperation. The endeavor was notable for being a cooperative effort between the building industry, municipal officials and environmental activists, and resulted in unanimous final votes from all town boards that voted on the measure.

This report reviews the debate carried on when this law was first proposed in 2005-2006, and evaluates the claims and arguments made for and against the proposal in light of the experiences in the towns that have adopted the law. Based upon this evaluation, the Sustainability Institute puts forth specific policy recommendations.

All ten towns are now fully implementing the new standards and we have uncovered no reports of significant difficulties. Long Island Power Authority (LIPA) and the Long Island Builders Institute (LIBI) have trained a new “green collar” industry of home energy raters. Long Island is unique in the nation as a region where the vast majority of new homes constructed

are now subject to ENERGY STAR Homes standards. In just two years, there has been a great increase in the market penetration of ENERGY STAR Labeled Homes in the region, although for many reasons the exact percentage is difficult to establish.

This program has demonstrated that establishing higher efficiency standards can result in significant reductions in CO2 emissions, with little or no taxpayer expense, while creating long-term savings for consumers, and fostering new green jobs. This provides a model for implementing similar standards for residential construction state-wide or nation-wide. It also argues for enhancing efficiency standards for commercial and multi-family construction and for renovations and retrofits.

Among the recommendations of the Sustainability Institute are the following: ENERGY STAR Homes standards for residential construction should be adopted State-wide. Long Island municipalities with zoning powers that have not yet adopted the law should move to adopt it. Building permit renewals should be subject to the new, more stringent requirements. LIPA should modify their program to enhance energy efficiency standards for installed appliances, lighting fixtures and air conditioning, and to restructure incentives to eliminate discrepancies between towns that have made ENERGY STAR Home mandatory and those that have not.

The SUSTAINABILITY INSTITUTE AT MOLLOY COLLEGE Green Papers are non-partisan issue analyses presented with the goal of developing viable recommendations, viewed through the lens of sustainability and the “triple bottom line” of environment, economy and social equity, that can make Long Island a better, more sustainable place to live. The purpose is to identify policies that will establish Long Island as a national leader in implementing sustainable solutions. Green Papers provide facts, arguments and proposals in a manner that will encourage informed, respectful interchange among parties with varying viewpoints.

A core mission of the Sustainability Institute is to foster informed debate concerning issues of environmental sustainability, consistent with Molloy College’s mission of developing ethical leadership through transformative education. Molloy is committed to academic excellence with respect for each person. To further these ends, Green Papers are intended to raise the level of public discourse through the free, respectful exchange of differing ideas. The Sustainability Institute’s recommendations included in this paper are based on the research and experience of the authors, and do not necessarily represent the opinions of the administration or Board of Trustees of Molloy College.

A Regional Campaign for Stricter Home Energy Conservation Construction Codes

This report explores the adoption and implementation of ENERGY STAR Homes code requirements on Long Island.

The proposal to adopt local codes and make the national standard for ENERGY STAR Labeled Homes a mandatory code requirement rather than just a voluntary, incentive-driven program, was first developed in 2005 at meetings of the Clean Energy Leadership Task Force facilitated by Neal Lewis, the current executive director of the Sustainability Institute, and coauthor of this report. The idea was borrowed from a similar effort in the Town of Greenburgh, New York.

The concept was further debated at two meetings of the Long Island Association's (LIA) Environment/Energy Subcommittee, which helped to identify concerns of the Long Island builders, and led to the proposal eventually gaining the support of LIBI. As a result, LIBI became one of the first builders trade groups in the country to support higher efficiency standards. The LIA board of directors formally endorsed the policy, and has directly encouraged all towns to adopt the standard. Newsday printed a number of editorials urging towns to adopt the measure. There was broad support from environmental groups such as the Sierra Club and the Group for the East End.

Beginning in 2006, the towns of Babylon and Brookhaven adopted the codes, with the sponsorship of Brookhaven Town Councilwoman Connie Kepert and then-Supervisor Brian Foley (now a State Senator) and Babylon Town Supervisor Steve Bellone. The new code has been adopted by 10 of 13 Long Island towns as of November 2009 and has been in effect in 10 towns since early 2009 (see Chart A for the list of towns and implementation dates). After much discussion by the Sustainable Southampton Committee, the town of Southampton adopted a tiered approach, requiring greater efficiency for larger homes. Southampton now has one of the most stringent energy

construction codes in the nation. The Suffolk County Planning Commission has adopted a policy similar to Southampton's for new residential construction that falls under its jurisdiction. Despite the momentum of the efforts, three small East End towns have failed to adopt the new code standards, and none of the villages on Long Island have acted on the measure.

The LIPA supported towns that adopted the new codes with grants of \$25,000 to prepare their building departments to implement the changes. LIPA and LIBI partnered to develop training programs for builders and home energy raters to help prepare them for the new mandates.

During the debate in 2005-2006, many arguments were advanced both in favor and against this proposed legislation. This report evaluates those arguments with the benefit of hindsight.

Chart A: Towns adopting mandatory ENERGY STAR codes and their initial effective dates:

Town	Effective Date
Babylon	April 2007
Brookhaven	April 2007
Riverhead	April 2008
Hempstead	August 2008
Oyster Bay	August 2008
Smithtown	October 2008
Southampton	October 2008
Huntington	January 2009
North Hempstead	January 2009
Islip	February 2009

Towns that have NOT adopted mandatory ENERGY STAR Standards:

East Hampton, Shelter Island, Southold



Front row: Brookhaven Town Council members Kathleen Walsh, Kevin McCarrick, Tim Mazzi and Connie Kepert, Brookhaven Supervisor Brian Foley, Neal Lewis, and Babylon Supervisor Steve Bellone visit a model ENERGY STAR Home in August 2006, shortly after Brookhaven passed the mandatory ENERGY STAR Homes code.

The ENERGY STAR Labeled Homes Program

The ENERGY STAR Labeled Homes program was established in 1995 by the federal government as an outgrowth of its labeling program for individual appliances. (See energystar.gov.) The program sets stringent energy specifications designed to save at least 20% of energy consumed for heating, cooling, and water heating as compared with an equivalent home built to state code requirements. Since 2002, the Long Island Power Authority (LIPA) has offered rebates to participating builders.

Integral to the ENERGY STAR Labeled Homes program is the Home Energy Rating System (HERS). HERS raters review plans, visit the site during construction to visually verify that insulation and air sealing measures are properly installed, and perform tests on the ducts and home after construction is completed to measure duct tightness and air infiltration rates. The data from this review is entered in software that compares the energy efficiency of the home to a home of the same size and layout built to meet minimum state code requirements.

ENERGY STAR Homes save both energy and money on heating, cooling, hot water, and electric usage. This is accomplished through:

- better insulation
- tight building envelope

- electric savings through at least one ENERGY STAR-rated appliance, or use of ENERGY STAR lighting
- more efficient windows

ENERGY STAR Homes on Long Island must meet a minimum New York State Home Energy Rating System (HERS) score of 84 (indicating 20 percent energy savings compared to state code requirements) to earn the ENERGY STAR label, and must save a minimum of 500 kilowatt hours per year based on standard savings estimates provided by LIPA for certain choices of appliances and lighting. (Addendum to the ENERGY STAR® Partnership Agreement LIPA New York ENERGY STAR® Labeled Homes Program.)

ENERGY STAR forms the basis for the energy efficiency requirements of LEED for Homes, so is compatible with that standard as well.



Arguments Against

A number of concerns and objections were raised in the vigorous public discourse during the consideration of the law:

ARGUMENT: *The requirement would increase construction costs and add the cost of Home Energy Rating System (HERS) rating to new homes. This would result in less affordable housing.*

FINDINGS: There was some concern when the law was first proposed that the scarcity of HERS raters would result in prohibitively high rating fees, but phase-in periods in the first towns that adopted the law and an aggressive training program from LIPA and LIBI have mitigated these problems. Communications with town building departments and HERS raters found reports that ratings do cost more than was projected. However, materials and construction cost increases for meeting the new requirements have not been as high as initially assumed. Therefore, the total increase in a builder's cost for building an ENERGY STAR Labeled Home over standard construction is not significantly higher than original estimates.

It is difficult to precisely quantify and estimate increases in housing prices due to increased construction costs and HERS rating. Estimates for total increased costs to Long Island builders are between \$2,000 and \$4,000. (The Kentucky Office of Energy Policy estimates a building cost increase of \$1,763. Dave Berman, executive vice president of KB Homes Charleston estimates an increase of \$1,000 [The Post and Courier, Charleston, S.C., 12/22/09]. A local HERS rater estimated \$2500 for a typical home.) Exactly how building costs affect purchase price is unknown. However, it is clear that these costs are more than offset by long-term energy savings, resulting in **more sustainably affordable homes**. This concern was in part alleviated by the national economic downturn and subsequent decrease in housing prices across the country and Long Island.

ARGUMENT: *The New York State Fire Prevention and Building Code Council sets code requirements for the entire state; that is where changes to code should be adopted.*

FINDINGS: New York State law specifically allows municipalities to adopt energy conservation codes that are more stringent than the State code. (NY State Energy Law §11-109) Although the New York State Fire Prevention and Building Code Council has the primary authority to change the energy conservation code statewide, it has generally been slow to do so. This is in part due to the necessity of demonstrating the cost effectiveness of any code amendments, defined as having a payback period of ten years or less (NY State Energy Law § 11-103). As a result, the New York State energy code is always a few years behind the most recent ASHRAE and International Energy Code standards. Even if completely up to date, those codes still lack key attributes of the ENERGY STAR Homes law, e.g. independent verification of energy efficiency standards through Home Energy Rating System (HERS) ratings. Making the change at town level has allowed the towns to serve as "laboratories of democracy" by being more flexible and innovative than the State, and the experience of the towns in implementing the policy can inform future decisions of the Code Council. (See Recommendations 1 and 2 in "Recommendations" below.)

ARGUMENT: *The ENERGY STAR Labeled Homes program was structured as a voluntary program, designed to achieve market transformation by rewarding builders who improve their homes' energy efficiency, and helping them to market that fact. It was never designed as a mandatory energy efficiency code.*

FINDINGS: The ENERGY STAR Labeled Homes program was not designed as a prescriptive code. It is a performance-based standard. Towns that have adopted the law now require the presentation of a third-party HERS rating certificate demon-

strating compliance with the program in addition to meeting the prescriptive requirements of the State code, prior to the issuance of a Certificate of Occupancy. There have been no reported problems of integrating the third-party verification model into existing building department procedures.

ARGUMENT: Towns should not adopt laws that base code requirements on programs outside their control, because this effectively abdicates their power and responsibility to the third party administering the program.

FINDINGS: ENERGY STAR Homes is a program of the Federal Environmental Protection Agency (EPA), administered in New York by the New York State Energy Research and Development Authority (NYSERDA), and on Long Island by the Long Island Power Authority (LIPA), all of which are government entities. Any changes to the program are made through a process that requires notice and public input, and generally take a few years to complete. There is no danger of the program changing without sufficient notice to allow towns to respond. For example, the EPA is currently conducting a public comment process in 2009, for proposed program changes to be instituted in 2011.

ARGUMENT: The scarcity of HERS raters, and the increased burden on building departments to ensure requirements of the law are met, would cause delays in obtaining Certificates of Occupancy (COs), resulting in unreasonable increased costs for builders.

FINDINGS: According to our surveys and interviews with town employees, the new requirements have not created any difficulties for building departments, or resulted in any delays in granting COs. This concern was mitigated by the phase-in periods and training efforts discussed above.

ARGUMENT: The twenty percent efficiency improvement represented by a HERS score of 84 is too stringent, and puts an unreasonable demand on the building industry.



HERS rater Frazer Dougherty demonstrates how a blower door is used to measure the airtightness. The ENERGY STAR Homes Law requires a HERS rating of at least 84 before a CO is issued.

FINDINGS: Builders embraced the program, educated themselves, and committed to constructing a better product. Many in the industry have found an 84 HERS score is easily achievable, with relatively few changes to their techniques.

ARGUMENT: Existing homes represent far more energy use than new homes because there are more of them and many were built prior to the adoption of the current energy conservation code.

FINDINGS: Although the existing housing stock outnumbers new homes, and is generally old and less efficient, energy efficiency is easiest and most economical to achieve in the initial design and construction of new buildings. Later retrofits are more disruptive and less cost effective, and because government has no recourse to require retrofits, they may never be done. New codes are the most effective and efficient means to begin implementing energy efficiency.



Tom DeJesu of LIPA, Beth Fiteni, Neal Lewis, Hempstead Town Supervisor Kate Murray and home builders, at one of the first homes subject to the new law in America's largest town.

Claims Made in Favor

CLAIM: The ENERGY STAR Labeled Homes program is a long-established initiative, administered by the EPA beginning in 1995, with impressive successes elsewhere in the nation. The program has resulted in over one million homes nationwide being constructed to be more energy efficient. Surveys indicate greater owner satisfaction with ENERGY STAR Homes. Although ENERGY STAR Homes were being embraced throughout the nation, on Long Island only 75 had been built by the end of 2005. (LIPA Clean Energy Initiative Report 2005) Making ENERGY STAR standards mandatory would raise the bar for all new homes built on LI.

FINDINGS: After the debate, the ENERGY STAR Homes Law was implemented in 10 Long Island towns with effectively no cost to taxpayers. The law resulted in a dramatic increase in the market penetration of ENERGY STAR Homes, according to LIPA figures. In 2007, only 87 ENERGY STAR Homes were completed (about four [4] percent of the market), that increased to 253 built in 2008 (about 14 percent of the market) when the codes came into full effect in the first towns. LIPA is projecting 406, or about 28 percent, of the new homes constructed in 2009 will be ENERGY STAR Labeled Homes and 550, or 42 percent, in 2010.

The Sustainability Institute has identified a few issues that have slowed the actual and apparent market adoption of ENERGY STAR Labeled Homes:

- Although the 10 towns that have adopted the law encompass where most new homes are being constructed, there are still three towns, two cities, and almost 100 incorporated villages with zoning control that have not adopted higher energy efficiency codes.
- No multi-family homes over four units in one building are included in the count of ENERGY STAR Homes. At least some towns adopted more stringent requirements for multi-family housing when they adopted ENERGY STAR Homes requirements. Although multi-family buildings built in these towns are more efficient than they would have been before the change, there is no protocol for performing a HERS rating on buildings with more than four units or with common egress. Therefore no multi-family buildings can receive an ENERGY STAR Homes Label, and they cannot be counted in ENERGY STAR market penetration.
- Building permits granted prior to the effective date of the law have allowed the construction of non-ENERGY STAR Homes, even in towns where the law has gone into effect. There is anecdotal evidence that there was a significant reserve of grandfathered permits that are getting renewed (discussion with Brookhaven Town Building Department personnel), slowing the market penetration of ENERGY STAR Homes.
- Another impact of the housing slowdown has been a longer average conversion period between the issuance of a building permit and the completion of construction. The slowdown in the housing market has meant that many granted building permits do not result in completed homes in the same year. This can artificially depress the market penetration percentage for that year.

CLAIM: Designing, building and verifying homes to be energy efficient is less costly and more effective than retrofitting them after they have been built.

FINDINGS: Estimated increased construction cost for an ENERGY STAR Home is \$2,000 to \$4,000, and results in at least 20 percent less energy use. The experience of the Green Homes Long Island Homes energy retrofit program in Babylon, which is recognized as an excellent program, has been that the average retrofit costs approximately \$7,862 to achieve projected energy savings of \$1004 per year, about 21 percent of the estimated average Long Island household's energy cost (Dorian Dale, Town of Babylon Energy Director).

CLAIM: During the housing boom approximately 5,500 permits for new homes were being issued per year on Long Island. Building new homes to a higher energy efficiency standard was seen as a valuable means of curbing increasing energy demand, pollution and greenhouse gas emissions resulting from new construction.

FINDINGS: At the time the law was being discussed, LIPA was projecting approximately three (3) percent annual increase in electricity demand for the foreseeable future. At least a portion of this increase was attributable to new home construction. The recession and the housing slow-down have contributed to a reduction in electric usage in 2008, and a slower projected increase in the next few years, so the full impact of the law on electric demand is yet to be seen. Based on EPA estimates of emissions saving from a typical ENERGY STAR Home, the law has so far resulted in the avoidance of 840 tons of greenhouse

gas emissions (see "Assumptions and Calculations" section below for details of how these numbers were calculated).

CLAIM: Verification through HERS rating ensures code compliance and realization of energy savings.

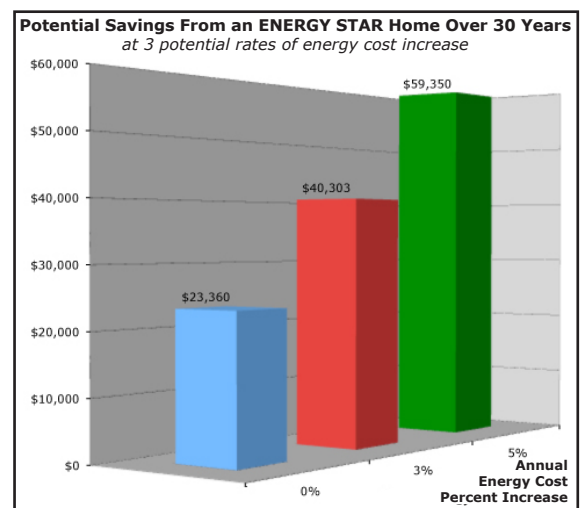
FINDINGS: Reviews conducted by the states of Arkansas and Massachusetts found 45 percent and 54 percent (respectively) of homes checked failed to meet energy code standards. (White Paper on Using Home Energy Ratings to Improve Energy Code Implementation — Residential Energy Services Network (RESNET), November, 2001). Municipal building departments are primarily concerned with ensuring safety and fire standards are met; many do not have the resources, training or opportunity to verify energy code compliance. The American Recovery and Reinvestment Act (ARRA), better known as the "stimulus package," set a condition of achieving 90 percent compliance with energy conservation codes as a condition for receiving funding. Many areas in the nation will have difficulties demonstrating that level of compliance. In towns with ENERGY STAR requirements, compliance verification is now mandatory.

CLAIM: The law would spur the creation of a new green collar industry on Long Island, promote worker training, and develop markets for energy efficient products and materials that would then carry over to the home improvement and renovation sectors.

FINDINGS: There were only two or three HERS raters based on Long Island in 2005. The demand created by the new law, and the training provided by LIPA and LIBI has resulted in a significant increase to 55 HERS raters (37 certified HERS raters with approximately 18 raters in training) by the end of 2008, according LIPA. LIPA also reported that 208 builders were involved in the ENERGY STAR Homes program in 2008, compared to 32 listed in mid-2006, when the first towns adopted the new law.

CLAIM: More efficient homes and resulting lower energy bills would result in significant money staying in the local economy, providing an economic benefit to the region as a whole. Estimates of potential Island-wide savings ranged from \$500 million to \$2.9 billion over 20 years, depending on energy cost inflation.

FINDINGS: Based on estimated average energy expenses on Long Island, the Sustainability Institute calculates that in their first two years, ENERGY STAR requirements have already saved area homeowners \$265,260 cumulatively in avoided energy costs. This is considerably less than initial projections for savings, due to the issues that slowed market penetration discussed above, a drop in current energy prices, and primarily from a drastic slowing of home building on Long Island.



Recommendations

Further action should be taken to refine the program and make it universally adopted across Long Island. The Sustainability Institute at Molloy College makes the following policy recommendations:

1. TO THE STATE CODES COUNCIL: **Adopt codes for residential construction State-wide that will generate energy savings that meet or exceed current ENERGY STAR standards.**
2. TO THE STATE LEGISLATURE AND GOVERNOR: **Amend the State Energy Law to streamline code adoption, mandate swift adoption of the highest standard codes from ASHRAE and/or the International Code Council, and require code compliance verification for all homes, through HERS rating or an equivalent testing protocol.**

(Note: The Sustainability Institute has submitted comments on the NY State Draft Master Energy Plan that substantially follow recommendations 1 and 2)

3. TO THE TOWNS OF EAST HAMPTON, SHELTER ISLAND AND SOUTHOLD AND ALL INCORPORATED VILLAGES WITH ZONING POWERS: **Make the ENERGY STAR Homes Program mandatory as quickly as possible.** A recent Funding Opportunity Announcement from the U.S. Department of Energy indicated that adoption of more stringent energy efficiency codes would be an important selection criterion for a major competitive grant (the Retrofit Ramp-up Program). It is possible that future grants will have similar conditions. Adopting ENERGY STAR requirements will fulfill this condition for single-family home residential codes.
4. TO LONG ISLAND TOWNS (EXCLUDING SOUTHAMPTON): **Modify energy savings requirements by adopting Southampton's tiered approach.** According to U.S. Census Bureau, cited by National Association of Home Builders in "Housing Facts, Figures & Trends 2004," average family size has dropped by one person since 1950 nationwide, while average home size has increased by 1,247 square feet. Larger homes tend to use more energy. A tiered approach to mandatory ENERGY STAR Homes standards ensures that as the size of the home increases, so do efficiency requirements. All Long Island towns should require higher efficiency for larger homes (Chart B).

Chart B:
Southampton has adopted a tiered approach based on the size of the new home.

Square footage	HERS requirement
Under 3,500	84
3,500 - 4,499	87
4,500 - 6,499	90
6,500 and above	93

5. TO ALL LONG ISLAND TOWNS: **Close the permit renewal loophole.** Our research detected a loophole in the law that allows old building permits issued prior to the law to be renewed — over a period of years — without being required to comply with the more efficient building code. The ENERGY STAR code requirement should be applied to

anyone requesting a permit renewal who has not yet started construction beyond the foundation of the building.

6. TO ALL LONG ISLAND TOWNS: **Require efficiency upgrades for permitted home renovations.** In a nearly built out region with older housing stock, such as Long Island, there is much more opportunity to realize energy savings in existing homes than in new construction. Towns should require energy efficiency improvements be included in any home renovations that require a permit and expand the home by a significant percentage, or involve changes to a significant percentage of the envelope of the home. These improvements should be documented by a "test-in, test-out" process (rating the home before and after the renovation), and should be required to demonstrate savings of 30 percent of the home's energy use.
7. TO THE LONG ISLAND REGIONAL PLANNING COUNCIL AND ALL LONG ISLAND TOWNS, CITIES AND VILLAGES: **Improve data collection.** We are unable to determine the exact percentage of the total number of homes built that are ENERGY STAR Homes, because there is no official source of data for the number of COs granted for new homes on Long Island each year. The common approach to determining housing starts nationally is based on building permits issued. The Long Island Regional Planning Council follows this approach and tracks building permits, which do not necessarily correlate to number of homes actually built. Municipalities and the Long Island Regional Planning Council should track the total number of homes actually completed and issued COs each year.
8. TO LIPA: **Modify electric savings requirements by enhancing standards.** According to the current LIPA program, as little as 10 compact fluorescent light bulbs could meet the basic electric savings requirements. The marginal cost to install ENERGY STAR appliances is considerably less than the life cycle savings they represent. All of the following major appliances, if included in a new ENERGY STAR Home, should be required to be ENERGY STAR: refrigerators, clothes washers, dishwashers, and wall unit air conditioners. Allowing non-ENERGY STAR appliances in ENERGY STAR Labeled homes undermines program integrity.
9. TO LIPA: **Improve energy efficiency through new lighting and air conditioning requirements.** At least 20 percent of light fixtures should be required to accommodate only fluorescent tubes, and the minimum SEER rating for air conditioners should be raised to at least 16.

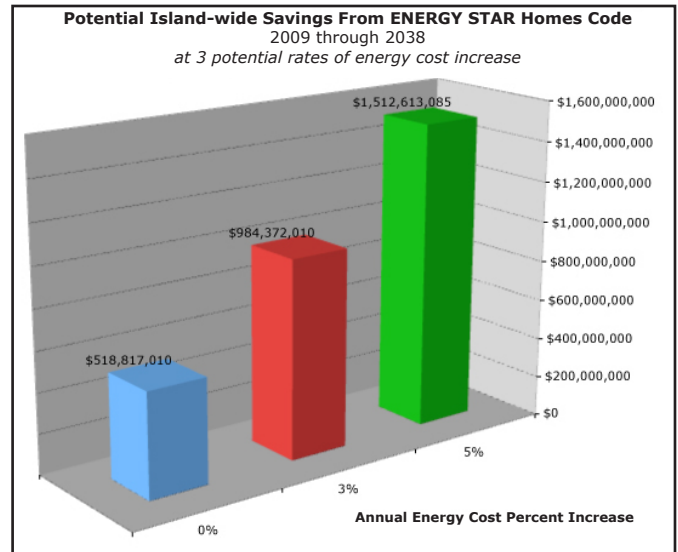


10. TO LIPA: **Re-structure incentives.** In those towns that have adopted ENERGY STAR code requirements, LIPA does not offer incentives to builders who build a home that meets the minimum ENERGY STAR code requirement (HERS rating of 84), but they do provide incentives for homes built to the same standard in towns and villages that have not updated their energy efficiency code. This creates an inequity between homes built in municipalities that have adopted the requirement and those that have not. Precluding builders in their jurisdiction from receiving a payment for which they are now eligible creates disincentive for the remaining municipalities to adopt the law. LIPA should change the incentive structure to, first only provide incentives for homes that achieve a HERS rating of 87, regardless of the municipality where the home is located. In towns where higher HERS ratings are required for larger homes, incentives should only be given to homes that achieve the next higher incentive tier than the minimum required. This would “raise the bar,” encouraging the construction of more efficient homes in towns where ENERGY STAR is mandated, and equalize the incentive across Long Island.

11. TO LIPA and Home Builders: **Homeowner education:** Since ENERGY STAR Homes are built tighter, mold growth due to improper ventilation is a potential health problem. Homeowners must be educated about the importance of using and maintaining mechanical ventilation devices.

Assumptions and calculations

- According to the EPA, average carbon equivalent emissions avoided by an ENERGY STAR Home is 2.25 tons annually.
- Annual energy costs for a new home on Long Island were estimated at \$4,800. (Based in part on a survey of energy costs conducted by staff of the Suffolk County Legislature, average residential electric bills of \$154.63/month [Newsday, 11/2/09], average annual heating oil consumption on Long Island of 900 gallons [testimony of Kevin Rooney, Oil Heat Institute before LI Regional Planning Council 12/1/09], NYSERDA historic heating oil price data [http://www.nyserdera.org/Energy_Information/nyepd.asp].)
- The amount of this average energy cost going towards heating, air conditioning and water heating was calculated at \$2,880, based on national average figures from the EPA of 60 percent for those uses. (Space Heating, hot water and A/C 60% of energy bill http://www.energystar.gov/index.cfm?c=products.pr_pie Source: Typical House memo, Lawrence Berkeley National Laboratory, 2009 and Typical house_2009_Reference.xls spreadsheet.)
- The average energy savings on heating, hot water, and air conditioning for an ENERGY STAR Home are 30 percent, based on information from LIPA and



New York State Energy Research and Development Authority (NYSERDA).

- Although the minimum program requirement is 20 percent less energy use, a significant number of ENERGY STAR Homes achieve far greater savings. LIPA reports approximately 27 percent of ENERGY STAR Homes built from 2007-2009 achieved 35 percent energy savings or greater.
 - Studies have indicated that as many as half the homes built do not meet energy efficiency code standards when there is no required performance testing. When third party testing to demonstrate performance is required by the new codes, the average energy efficiency of actual homes improves by a substantially greater amount than the stated program requirement.
- The LIPA ENERGY STAR Labeled Home program requires electric savings of 500 kwh annually from installed appliances or lighting. This results in a savings of \$100 per year.
 - Based on the above, the annual energy bill savings for an average ENERGY STAR Home on Long Island was set at \$964. This is calculated by: \$2,880 (heat, a/c, hot water) x 30% + \$100 (electric savings) = \$964.
 - Long Island median home price \$415,000 (Newsday 10/23/08).
 - For the purpose of calculating economic benefits, the average increase in home price for an ENERGY STAR Homes was estimated to be \$3,000.
 - At 10 percent down, and a 30-year, 5.0 percent fixed-rate mortgage, an increased home price of \$3,000 would result in a down payment increase of \$300, and an annual mortgage increase of \$175.32 (as calculated by mortgagecalculator.org).
 - This results in an average net savings per home of \$488.68 in the first year of home ownership, and \$788.68 each subsequent year.
 - There is an additional tax benefit derived by shifting part of the cost of ownership of a home from energy expenses to deductible mortgage interest payments, that has not been included in these calculations.
 - LIPA reports 253 ENERGY STAR Homes were completed in 2008, and projects 406 for 2009 and 550 for 2010.
 - Based on the past performance of the ENERGY STAR Homes program on Long Island, it was estimated that without code changes 101 ENERGY STAR Labeled Homes would have been built in 2008, and 115 in 2009.
 - Homes are completed and sold throughout the year. To simplify, it was assumed that all homes constructed in any year are occupied for half of that year.

Chart C			
Estimated Island-wide net savings from ENERGY STAR Homes codes currently adopted			
Year	2008	2009	2010
ESLH built (2008 actual, 2009-10 projected)	253	406	550
Projected from program history	101	115	130
Cumulative homes resulting from law	152	443	863
COs granted for new homes	Unknown	Unknown	Unknown
First year ownership savings	\$37,139.68	\$71,102.94	\$102,622.80
Savings from homes built in prior years	\$0.00	\$119,879.36	\$349,385.24
Annual savings	\$37,139.68	\$190,982.30	\$452,008.04
Cumulative savings	\$37,139.68	\$228,121.98	\$680,130.02

Chart D			
Estimated Island-wide greenhouse gas emissions avoided from ESH codes adopted (tons CO ₂ equivalent)			
Year	2008	2009	2010
First year ownership CO ₂ equivalent savings	171	327.375	472.5
Savings from homes built in prior years	0	342.0	996.75
Annual CO ₂ equivalent savings	171	669.375	1469.25
Cumulative CO ₂ equivalent savings	171	840.375	2309.625

Chart E			
Potential long-term environmental and economic benefits from Island-wide ENERGY STAR Homes code			
	10 years	20 years	30 years
Avoided greenhouse gas emissions (tons CO ₂ equivalent)	48,037.5	843,187.5	1,492,312.5
Savings in L.I. Economy			
0% annual energy cost increase	\$69,380,730	\$291,282,830	\$518,817,010
3% annual energy cost increase	\$88,898,859	\$459,115,647	\$984,372,010
5% annual energy cost increase	\$107,918,577	\$626,460,257	\$1,512,613,084

Green Paper Working Group

*The Sustainability Institute is committed to an open exchange of ideas and information on issues important to Long Island. **Please provide us with your comments on this Green Paper.** All comments received in a timely manner will be posted on our web site with the public release of the Green Paper and reviewed for inclusion in, or modification of the final Green Paper.*



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