NYSERDA LOW- TO MODERATE-INCOME MARKET CHARACTERIZATION STUDY
SPECIAL TOPIC REPORT – HOUSEHOLD ENERGY BURDEN

1.0 Introduction

The purpose of this Special Topic Report is to furnish detailed information on energy burden for New York State's low- to moderate-income (LMI) households, including:

- Summary Statistics
- Energy Burden Factor Analysis
- Subgroup Analyses
- Policy Implications

This Special Topic Report is designed to supplement the information presented in the NYSERDA Low- to Moderate-Income Market Characterization Report.

1.1 Energy Burden and Policy

As part of the Reforming the Energy Vision (REV) initiative New York State established an Energy Affordability Policy that set the goal of limiting energy costs for low-income utility customers to an average of no more than 6 percent of income. That policy includes a commitment to giving low-income households greater access to clean energy and to the state's energy efficiency and assistance programs.[1] This Special Topic Report furnishes an in-depth analysis of the dimensions of high energy burden and identifies strategies for serving high-burden households.

1.2 Energy Burden Dimensions

This Special Topic Report examines the factors that have the greatest impact on a household having high energy burden, including:

- Low Income
- Fuel Prices
- Energy Usage

It demonstrates that the most effective strategy for addressing high energy burden for any individual household will depend on which of these three factors is most responsible for the household's burden level.

[1] Visit: https://www.governor.ny.gov/news/governor-cuomo-announces-new-energy-affordability-policy-deliver-relief-nearly-2-million-low to view the related press release dated May 19, 2016.

1.3 Data Sources

This analysis uses data from two surveys conducted by the Federal government; the American Community Survey (ACS) and the Residential Energy Consumption Survey (RECS).

- The ACS is conducted annually by the U.S. Bureau of the Census. It collects self-reported data on household demographics, housing unit characteristics, and energy expenditures. This analysis used the 2013, 2014, and 2015 survey data files and examined records for households who are residents of New York State.

- The 2009 Residential Energy Consumption Survey (RECS) was conducted by the U.S. Energy Information Administration (EIA) and included a household survey on energy end uses and a follow-up energy supplier survey to collect data on energy consumption and expenditures for the RECS respondents. This analysis used the RECS public use data file and examined records for households who are residents of New York State.

The ACS data furnish up-to-date information reported by NYS households about their direct energy burden (i.e., self-reported energy expenditures divided by self-reported income). The RECS data are useful in that they collect data from energy suppliers and report on both consumption and expenditures. In addition, the RECS data include modeled estimates of consumption and expenditures for households that have heat included in rent. However, the RECS sample size is too small to allow for sub-state estimates and the data are from 2009.[2] These two data sources furnish the best quality information for calculating and understanding energy burden for LMI households in NYS.

2.0 Energy Burden Summary Statistics

The ACS furnishes the most up-to-date estimates of household energy burden. Table 2.1 shows the average energy bill, the average income, and the average energy burden for households that pay their energy bill directly to their energy supplier.[3] It shows that the average energy burden for low-income households is 12.6 percent and the average energy burden for moderate-income households is 6.4 percent, compared to 2.4 percent for non-LMI households. The average LMI household has energy burden that exceeds the Energy Affordability Policy target of 6.0%. The average energy burden for non-LMI households does not exceed the target.

[2] Although the RECS data used is from 2009, prior analyses comparing data from different iterations of the RECS have shown that the energy end uses and consumption patterns of low-income households remain relatively stable over time, suggesting that any changes since the 2009 RECS was administered would be minor.
[3] This table excludes households that have their heating bill and/or electric bill included in their rent since the survey respondent does not know what share of their rent pays for their energy bills.

Table 2.1 - Energy Burden for New York State Households by Income Group

Household Group	Average Energy Bill	Average Income	Average Energy Burden
Low-Income Households	$2,712	$21,074	12.9%[4]
Moderate-Income Households	$3,064	$48,048	6.4%
Non-LMI Households	$3,452	$142,243	2.4%
All Households	$3,186	$93,860	3.4%

Source: ACS (2013-2015) / Households that pay energy bills directly to energy suppliers

Since the Energy Affordability Policy sets a goal of limiting energy burden for low-income utility customers to an average of no more than 6 percent of income, it is important to have information on the distribution of energy burden, not just average energy burden. The ACS furnishes a good estimate of the average energy burden for groups of households but cannot be used to show the distribution of energy burden for individual households because of the way the survey question is asked for electric and gas expenditures.[5] The RECS collects annual energy expenditure data directly from the energy suppliers for each respondent household and can be used to examine the distribution of energy burden. The data show that 82 percent of LMI households spend more than 6 percent of their income for energy, while only 7 percent of non-LMI households do. Further, 18 percent of LMI households spend more than 25 percent of their income on energy.

Table 2.2 - Energy Burden Distribution for New York State Households by Income Group (2009)

Energy Burden	Percent of LMI Households	Percent of Non-LMI Households	Percent of All Households
Less than 3%	1%	55%	28%
3% to Less than 6%	17%	38%	27%
6% to Less than 10%	30%	6%	18%
10% to Less than 15%	22%	1%	12%
15% to Less than 20%	6%	0%	3%
20% to Less than 25%	6%	0%	3%
25% or More	18%	0%	9%
All Households	100%	100%	100%
Average Burden	10.4%	2.8%	5.2%

Source: 2009 RECS

[4] This is the "group mean burden" computed by taking the ratio of the average energy bill divided by the average income. An "individual mean burden" would be higher than the "group mean."

[5] See the Energy Burden Computation section of the LMI Study ACS Methodology Report.

3.0 Energy Burden Factor Analysis

The most significant factor in energy burden is income; the lower a household's income, the greater the share of that household's income that is needed to pay the energy bill. That is because energy is a basic necessity and the amount that households pay for energy does not increase in proportion to the amount of income available to the household. Table 3.1 shows the average income, energy expenditures, and energy burden for LMI households by income group. Households with incomes of less than $10,000 have average energy bills of $2,394 and an average energy burden of 49.1 percent. By comparison, LMI households who have between $20,000 and $30,000 in income have average income of $24,796 - about five times the average for the lowest income group - but have energy bills that are only about 12.5 percent higher ($2,693). As a result, their average energy burden is 10.9 percent, about one-fifth that of the lowest income group.

Table 3.1 - Energy Burden for LMI Households by Income Group

Income Group	Percent of LMI Households	Average Energy Bill	Average Income	Average Energy Burden
Less than $10,000	14%	$2,394	$4,877	49.1%
$10,000 - <$20,000	19%	$2,484	$14,948	16.6%
$20,000 - <$30,000	20%	$2,693	$24,796	10.9%
$30,000 - <$40,000	18%	$2,788	$34,524	8.1%
$40,000 - <$50,000	13%	$2,992	$44,309	6.8%
$50,000 or More	16%	$3,722	$61,898	6.0%
All LMI Households	100%	$2,839	$30,726	9.2%

Source: ACS (2013-2015) / Households that pay energy bills directly to energy suppliers

Energy prices also are a significant factor in energy burden. Many households in New York State use natural gas or fuel oil as their main heating fuel; 65 percent heat with natural gas and 13 percent heat with fuel oil.[6] At this time, it is more expensive for a household to heat with fuel oil than it is for them to heat with natural gas. Table 3.2 compares the average expenditures and energy burden for each of the listed income groups and shows that fuel oil main heat households have higher energy burdens than natural gas main heat households. For example, LMI households that heat with fuel oil and have incomes in the $20,000 to $30,000 range have average energy bills that are 67 percent higher than LMI households who heat with natural gas in the same income group. Overall, the average energy burden for LMI households that heat with fuel oil is 12.8 percent, compared to 8.6 percent those that heat with natural gas.

[6] Other main heating fuels used by a significant number of households include electricity, propane, wood, and coal.

Table 3.2 - Energy Burden for LMI Households by Main Heating Fuel and Income Group

Income Group	Natural Gas Main Heat		Fuel Oil Main Heat	
	Expenditures	Burden	Expenditure	Burden
Less than $10,000	$2,350	49.1%	$4,188	86.4%
$10,000 - <$20,000	$2,407	16.1%	$3,965	26.0%
$20,000 - <$30,000	$2,523	10.2%	$4,209	16.9%
$30,000 - <$40,000	$2,611	7.6%	$4,269	12.3%
$40,000 - <$50,000	$2,773	6.3%	$4,594	10.3%
$50,000 or More	$3,430	5.5%	$5,281	8.4%
All LMI Households	$2,681	8.6%	$4,477	12.8%

Source: ACS (2013-2015) / Households that pay energy bills directly to energy suppliers

Energy usage also is an important factor in energy burden. Table 3.3 shows how the average energy burden for LMI households who use natural gas for their main heating fuel changes with usage. Almost 50 percent of LMI households use 75 MBtu of natural gas or less; they have an average energy burden of 9.3 percent. Eleven percent of LMI households use 150 MBtu of natural gas or more; they have an average energy burden of 14.2 percent. The highest usage LMI households have energy usage and energy expenditures that are more than twice those of the lowest usage LMI households, but have average energy burden that is only about 50 percent higher than the lowest usage group because their income also is higher.

Table 3.3 - Energy Burden for Gas Main Heat LMI Households by Usage Group (2009)

Natural Gas Usage	Percent of LMI Households	Average Expenditures	Average Energy Burden
Less than 75 MBtu	49%	$1,646	9.3%
75 - <100 MBtu	22%	$2,442	9.1%
100 - <125 MBtu	13%	$2,874	9.2%
125 - <150 MBtu	5%	$3,222	11.3%
150 - <175 MBtu	5%	$3,092	14.0%
175 MBtu or More	6%	$3,847	14.3%
All LMI Households	100%	$2,261	9.7%

Source: 2009 RECS

One final challenge in understanding energy burden for LMI households is that a significant share of LMI households live in multifamily buildings where their heating and/or electric bills are included in their rent. For these LMI households, energy burden only is observable by documenting the share of their rent that goes to pay the building's energy bills.

This analysis shows that high energy burden for LMI households is an outcome of the combined effects of low income, high energy prices, and high energy usage. For any individual household, successfully limiting the energy burden to 6 percent of income in a sustainable way requires the application of policy tools that address the specific factors that have the greatest impact on that individual household's energy burden.

4.0 Detailed Energy Burden Statistics

Organizations and individuals engaged in delivering clean energy or energy affordability initiatives each will be working with different income groups, varying types of buildings, and in different parts of the state. This section of the Special Topic Report furnishes more details on how energy burden varies by some of those factors so that energy affordability and access to clean energy options can be considered in the development of energy policy and clean energy initiatives. [Note: All of the statistics presented in this section are for households that pay their energy bills directly to their energy supplier.]

4.1 Energy Burden by Income Group

The LMI Market Characterization Study furnishes statistics for three different ways of looking at financial circumstances of households; annual income, household poverty level, and household LMI group. Table 3.1 presented energy burden statistics by annual income group. Table 4.1 shows energy burden by poverty group and Table 4.2 shows energy burden by LMI group. A household's poverty level is a function of both the household income and the number of household members.

Table 4.1 shows that households with income less than the HHS Poverty Guideline have average energy burden of 25.2 percent. Households with income of 200 percent of the HHS Poverty Guideline or more are not included in the low-income population referenced by the Energy Affordability Policy. These households are generally considered to be "moderate income." The average energy burden for this group is 6.6 percent, still above the 6 percent of income target.

LMI households with income less than poverty have average annual income of $10,168. To limit energy burden for these households to an average of no more than 6 percent of income, the average energy expenditures for those households would need to be reduced to about $610, a reduction of about 76 percent. For this household group, both energy assistance and energy efficiency would be needed to reduce the average energy bill to that amount.

LMI households with income greater than 200 percent of poverty have average income of $45,883. Achieving an average 6 percent energy burden for that group would require reducing the average energy bill from $3,019 to $2,753, a reduction of $266, about 9 percent. Since

comprehensive energy efficiency programs usually reduce energy consumption by about 15 to 25 percent, energy efficiency might be a good choice for many of these moderate-income households.

Table 4.1 - Energy Burden for LMI Households by Poverty Group

Percent of Poverty	Percent of LMI Households	Average Energy Bill	Average Income	Average Energy Burden
Less than 100%	25%	$2,563	$10,168	25.2%
100% - <150%	17%	$2,746	$22,956	12.0%
150% - <200%	17%	$2,897	$31,958	9.1%
200% or More	41%	$3,019	$45,883	6.6%
All LMI Households	100%	$2,839	$30,726	9.2%

Source: ACS (2013-2015) / Households that pay energy bills directly to energy suppliers

Table 4.2 shows burden by LMI group.[7] Table 4.2 shows that very low income households have average energy burden of 19.4 percent. Households in the low-income group still have an average energy burden significantly above the Energy Affordability Policy target, but do not have energy burden as high as the very low income group. These households have average income of $30,230; a 6 percent energy burden for them would require an energy bill of about $1,813, a reduction of just over $1,000. It seems reasonable that the combination of assistance benefits (LIHEAP benefits, electric utility discounts, and gas utility discounts) and energy efficiency could help many of these households reach the 6 percent energy burden target.

Table 4.2 - Energy Burden for LMI Households by LMI Group

LMI Group	Percent of LMI Households	Average Energy Bill	Average Income	Average Energy Burden
Very Low Income	35%	$2,616	$13,488	19.4%
Low Income	29%	$2,830	$30,230	9.4%
Moderate Income	36%	$3,064	$48,048	6.4%
All LMI Households	100%	$2,839	$30,726	9.2%

Source: ACS (2013-2015) / Households that pay energy bills directly to energy suppliers

[7] LMI group segments households based on the types of public assistance and energy efficiency programs that they can access. Very low income households (i.e., income at or below 130% of poverty) are often eligible for public assistance programs. Low-income households are eligible for energy programs, but usually are not eligible for other public assistance. Moderate-income households are eligible for some housing programs, but not for energy programs or public assistance.

4.2 Energy Burden by Main Heating Fuel

Table 3.2 compares energy expenditures and burden for natural gas households to those for fuel oil households by income level. The tables in this section furnish additional detail on energy expenditure and energy burden differentials by main heating fuel.

Table 4.3 shows average income, average expenditures, and average burden by main heating fuel for all LMI households. LMI households who use fuel oil or propane as their main heating fuel have the highest average energy burden because their average energy bills are higher than average, while LMI households who use electricity as their main heating fuel have energy burdens below the average. Energy bills are low for electric main heat households because electricity is most often used for heat in multifamily buildings where the housing units are somewhat smaller than for other types of housing units.

Table 4.3 - Energy Burden for LMI Households by Main Heating Fuel

Main Heating Fuel	Percent of LMI Households	Average Energy Bill	Average Income	Average Energy Burden
Natural Gas	65%	$2,681	$31,117	8.6%
Fuel Oil	13%	$4,477	$34,892	12.8%
Electricity	15%	$1,857	$25,246	7.4%
Propane	4%	$3,503	$29,970	11.7%
Wood/Coal	2%	$3,288	$33,633	9.8%
All LMI Households	100%	$2,839	$30,726	9.2%

Source: ACS (2013-2015) / Households that pay energy bills directly to energy suppliers

Table 4.3 shows that not only average energy bills, but average income also varied somewhat for the different main heating fuels. Table 4.4 furnishes similar information for a more homogeneous population - moderate-income households in single family homes. Because these are the same type of households (moderate income) who live in the same type of housing units (single family) this table makes it clear that the main difference among the households is the energy bill which results from differences in prices for the different fuels.

Table 4.4 - Energy Burden for Moderate-Income Households in Single Family Homes by Main Heating Fuel

Main Heating Fuel	Percent of LMI Households	Average Energy Bill	Average Income	Average Energy Burden
Natural Gas	61%	$3,321	$49,556	6.7%
Fuel Oil	25%	$4,710	$50,974	9.2%
Electricity	6%	$2,975	$47,799	6.2%
Propane	4%	$3,997	$45,836	8.7%
Wood/Coal	4%	$3,296	$48,708	6.8%
All Moderate Income	100%	$3,675	$49,625	7.4%

Source: ACS (2013-2015) / Households that pay energy bills directly to energy suppliers

4.3 Energy Burden by Housing Unit Type

Table 4.5 shows how average energy bills, income, and energy burden vary by housing unit type. One important limitation of Table 4.5 is that it can only show the direct energy burden for LMI households; the energy burden for households that pay energy bills directly to their energy supplier. In total, 41 percent of LMI households live in large multifamily buildings. However, they are only 24 percent of households that pay directly their energy bill directly to an energy supplier.

For those households that pay their energy bills directly to their energy supplier, Table 4.5 shows that LMI households in large multifamily buildings who pay their energy bills stand out as having the lowest average energy burden, only slightly above the energy efficiency target of 6 percent. However, the survey cannot furnish information on the part of rent used to pay energy bills where heat and/or electric is included in rent.

Table 4.5 - Energy Burden for LMI Households by Housing Unit Type

Housing Unit Type	Percent of LMI Households	Average Energy Bill	Average Income	Average Energy Burden
Single Family	48%	$3,557	$34,370	10.4%
Small Mulitfamily	24%	$2,644	$29,227	9.0%
Large Multifamily	24%	$1,567	$25,696	6.1%
Mobile Home	4%	$3,093	$26,804	11.5%
All LMI Households	100%	$2,839	$30,726	9.2%

Source: ACS (2013-2015) / Households that pay energy bills directly to energy suppliers

Table 4.6 shows how average energy bills, income, and energy burden vary by housing unit type for households with income less than the HHS Poverty Guideline. Compared to Table 4.5, this table shows that a greater share of this lowest income group lives in small multifamily homes and

large multifamily buildings. It also shows that these households have an average energy burden that exceeds the 6 percent target by a wide margin.

Table 4.6 - Energy Burden for Households with Income Less than 100% of Poverty Guideline by Housing Unit Type

Housing Unit Type	Percent of LMI Households	Average Energy Bill	Average Income	Average Energy Burden
Single Family	34%	$3,500	$10,312	33.9%
Small Mulitfamily	29%	$2,503	$10,865	23.0%
Large Multifamily	33%	$1,588	$9,332	17.0%
Mobile Homes	4%	$3,095	$10,680	29.0%
Income Less than Poverty	100%	$2,563	$10,168	25.2%

Source: ACS (2013-2015) / Households that pay energy bills directly to energy suppliers

Table 4.7 shows how average energy bills, income, and energy burden vary by housing unit type for households that have income from 100% to 200% of the HHS Poverty Guideline. Households in this income group who live in single family homes have energy bills and energy burdens that about two times those of households who live in large multifamily buildings. Households in small multifamily buildings have much lower energy burdens than those living in single family homes because their energy bills are lower. Household who live in mobile homes have lower energy bills than households who live in single family homes, but also have lower income and about the same average energy burden.

Table 4.7 - Energy Burden for Households with Income 100% to 200% of Poverty by Housing Unit Type

Housing Unit Type	Percent of LMI Households	Average Energy Bill	Average Income	Average Energy Burden
Single Family	47%	$3,491	$28,309	12.3%
Small Mulitfamily	25%	$2,636	$28,303	9.3%
Large Multifamily	23%	$1,563	$25,143	6.2%
Mobile Homes	5%	$3,162	$25,274	12.5%
Income 100% to 200%	100%	$2,821	$27,441	10.3%

Source: ACS (2013-2015) / Households that pay energy bills directly to energy suppliers

Table 4.8 shows how average energy bills, income, and energy burden vary by housing unit type for moderate-income households. Table 4.8 shows that more than one-half of these households live in single family homes; those households have the highest energy bills and the highest energy burden. However, the 7.7 percent energy burden these households experience is considerably lower than the average energy burden for lower income groups. Moderate-income households

who live in small multifamily and large multifamily buildings have energy burdens close to and below the 6 percent target, respectively.

Table 4.8 - Energy Burden for Moderate-Income Households by Housing Unit Type

Housing Unit Type	Percent of LMI Households	Average Energy Bill	Average Income	Average Energy Burden
Single Family	56%	$3,626	$47,377	7.7%
Small Mulitfamily	21%	$2,771	$45,564	6.1%
Large Multifamily	20%	$1,549	$42,743	3.6%
Mobile Homes	3%	$3,008	$41,267	7.3%
Income 200% or More	100%	$3,019	$45,883	6.6%

Source: ACS (2013-2015) / Households that pay energy bills directly to energy suppliers

4.4 Energy Burden by Geography

There are significant differences in the factors contributing to energy burden in different parts of the state. The LMI Market Characterization Study uses two different regional groups for analysis of the geographic dimensions of the LMI market. The first is based on NYS economic development regions. The second was developed by APPRISE for the project to furnish regions with more consistent populations; it consolidates regions in upstate and divides New York City into more regions that are more homogeneous in terms of housing unit types. The figure below furnishes a map of the NYS Economic Development Regions.

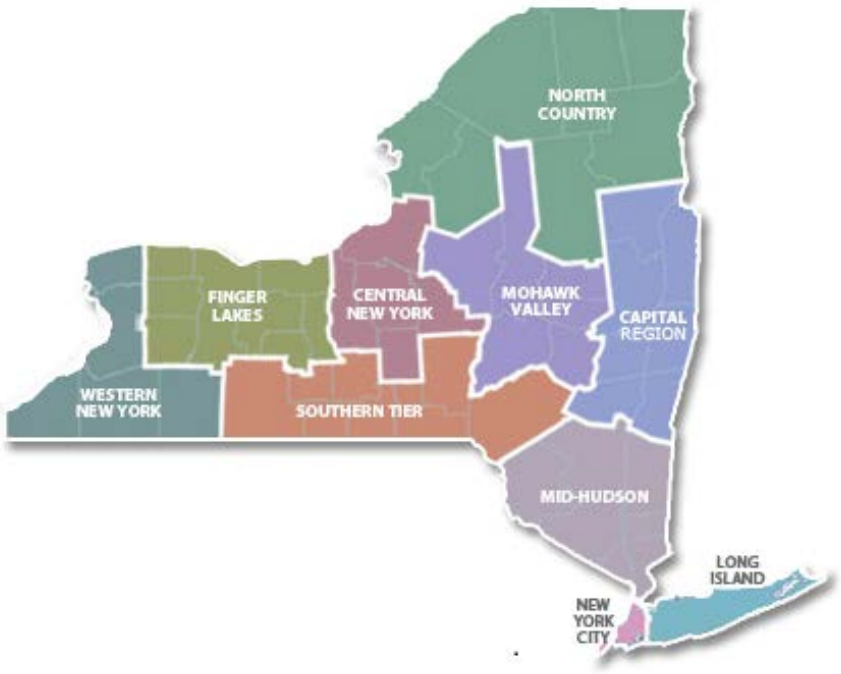


Table 4.9 shows how average energy bills, income, and energy burden vary by NYS Economic development region. This table shows that average energy bills vary quite a bit across regions; the lowest energy bills are observed in Western New York, while the highest are observed in Long Island. However, since incomes also are substantially higher in Long Island, the average energy burden of 10.1 percent for LMI households in Long Island is only slightly above the 9.2 percent for LMI households in Western New York.

Table 4.9 - Energy Burden for LMI Households by Economic Development Region

NYS Economic Development Region	Percent of LMI Households	Average Energy Bill	Average Income	Average Energy Burden
Capital District	7%	$2,674	$28,799	9.3%
Central New York	5%	$2,502	$27,449	9.1%
Finger Lakes	8%	$2,492	$28,273	8.8%
Long Island	12%	$4,008	$39,744	10.1%
Mid-Hudson	10%	$3,464	$33,908	10.2%
Mohawk Valley	3%	$2,935	$27,378	10.7%
New York City	36%	$2,557	$30,440	8.4%
North Country	3%	$2,928	$27,690	10.6%
Southern Tier	5%	$2,630	$26,973	9.8%
Western New York	11%	$2,438	$26,539	9.2%
All LMI Households	100%	$2,839	$30,726	9.2%

Source: ACS (2013-2015) / Households that pay energy bills directly to energy suppliers

Table 4.10 shows how average energy bills, income, and energy burden vary by LMI study region.[8] This regional analysis shows similar information as Table 4.9; regional differences in average energy burden are small relative to the differences observed for energy bills and income.

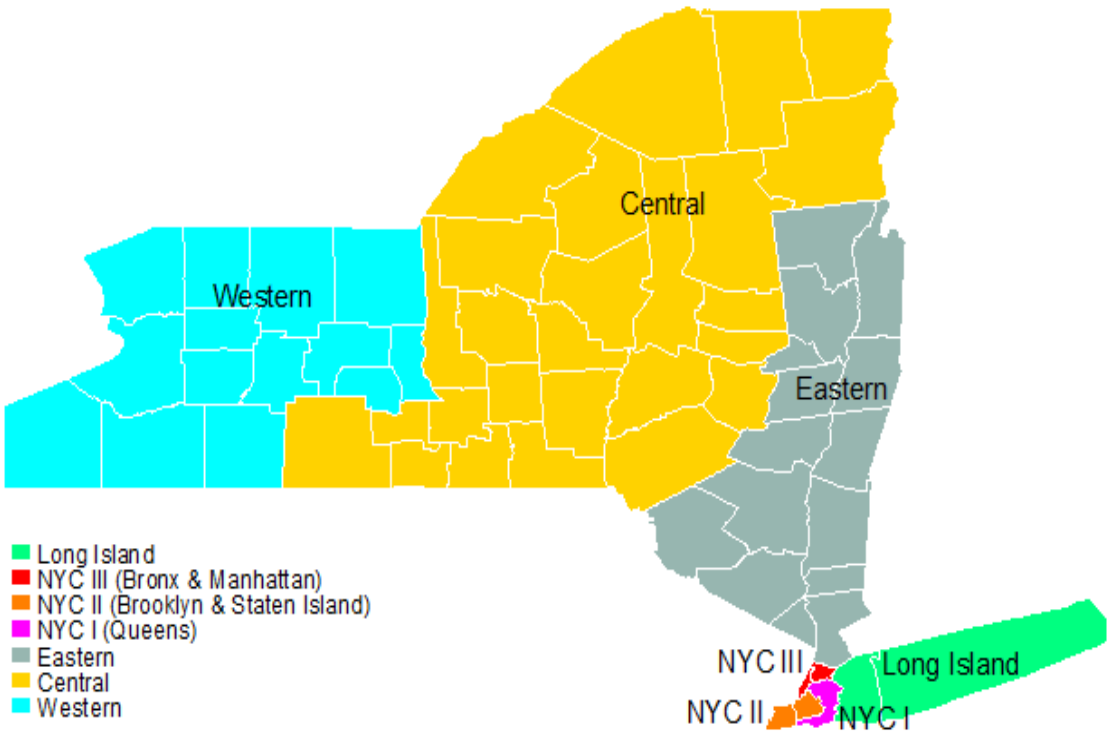
[8] For the LMI Market Characterization Study, the LMI Study Team developed economic development regions that combine NYS Economic Development Regions that have similar energy and housing characteristics (e.g., Western NY and Finger Lakes Regions) and divided the New York City Economic Development Region into groups that are different in terms of housing characteristic (e.g., Bronx and Manhattan have a much larger share of households in large multifamily buildings than the other NYC boroughs).

Table 4.10 - Energy Burden for LMI Market Characterization Study Region

LMI Study Region	Percent of LMI Households	Average Energy Bill	Average Income	Average Energy Burden
Western NYS	19%	$2,461	$27,291	9.0%
Central NYS	16%	$2,707	$27,341	9.9%
Eastern NYS	17%	$3,148	$31,864	9.9%
NYC III (Bronx/Manhattan)	9%	$2,115	$26,780	7.9%
NYC II (Brooklyn/Staten Island)	17%	$2,622	$30,623	8.6%
NYC I (Queens)	11%	$2,819	$33,192	8.5%
Long Island	12%	$4,008	$39,744	10.1%
All LMI Households	100%	$2,839	$30,726	9.2%

Source: ACS (2013-2015) / Households that pay energy bills directly to energy suppliers

The figure below furnishes a map of the LMI Study Regions.



5.0 Policy Implications

The Energy Affordability Policy set the goal of limiting energy costs for low-income utility customers to an average of no more than 6 percent of income and made a commitment to giving low-income households greater access to clean energy and to the state's energy efficiency and assistance programs. The energy burden data presented in this Special Topic Report help to identify both challenges and opportunities related to meeting those commitments.

5.1 Energy Assistance Programs and Information Systems

In the current federal fiscal year 2017, New York State received about $325 million in LIHEAP funds to furnish energy assistance and energy efficiency services to low-income households. The energy discounts mandated under the Energy Affordability Policy will furnish about $260 million in utility bill discounts to low-income utility customers. This is a substantial amount of energy assistance funding for low-income households. It is possible that those resources will be sufficient to meet the target of having an average energy burden of 6 percent for low-income utility customers who receive energy assistance. However, the detailed tables in this Special Report show that many of the households in the broader population will still have energy burdens that exceed the 6 percent of income target.

The statistics presented in this Special Topic Report showed that high energy burdens were seen for those households with the lowest income, those who used the highest priced fuels, and/or those that had the highest usage levels. To comply with the Federal LIHEAP statute, the New York State Office of Temporary and Disability Assistance (OTDA) has developed a LIHEAP benefit matrix that accounts for at least two of those factors; lower income households and households that use more expensive main heating fuels receive higher LIHEAP benefits. To meet the requirements of the Energy Affordability Policy, utilities are implementing programs that furnish varying discounts by customer tiers and account types. Those factors are intended to move participating low-income households towards the 6 percent of income goal.

However, if policymakers are interested in measuring the extent to which the overarching goal has been met, they will need to continue to develop information resources on low-income household energy burden. One important part of such an information system is currently being developed by OTDA to fulfill an HHS LIHEAP reporting requirement. For FY 2016, all LIHEAP grantees were required to collect and report data on energy burden for their clients. The system developed by OTDA includes client income, electric and main heating fuel bills, and LIHEAP benefits. That information was recently used by OTDA to submit the required LIHEAP Performance Data Form report. However, it also could be used to examine the distribution of energy burden for LIHEAP clients after they receive utility discounts and LIHEAP benefits. That

system does not furnish information for all low-income households, but it does help to furnish information for one segment of the population.

5.2 Energy Burden and Energy Efficiency Programs

Increasing energy efficiency for low-income households can have a significant impact on energy burden. For example, if a low-income household that has an energy burden of 12 percent (e.g., an energy bill of $2,400 and an income of $20,000) receives efficiency program services that cut usage by 25 percent (i.e., from $2,400 to $1,800), the household will then have an energy burden of 9 percent. Under those circumstances, an additional $600 in energy assistance will reduce the household's energy bill to $1,200 and their energy burden to 6 percent of income. Moreover, it is expected that those energy savings will persist and that the household will have a reduced energy burden in future years.

For some low-income households, participation in an energy efficiency program eliminates the need for energy assistance. For example, if the household described above had annual income of $30,000, the household's pre-program energy burden would have been 8 percent (i.e., $2,400 / $30,000 = 8%), and the household's post-program energy burden would have been 6 percent (i.e., $1,800 / $30,000 = 6%). A household in those circumstances could be considered to have an affordable energy bill without receiving energy assistance.

At the same time, research has shown that, for some households, energy assistance is a more effective way to address an energy burden problem than energy efficiency. For example, consider a low-income household who has an income of $10,000 and an energy bill of $1,000 (i.e., a 10 percent energy burden). Such a household would need an energy assistance grant of $400 to have an affordable energy burden. As an alternative, one might consider using energy efficiency programs to reduce the energy consumption for this household. However, the fact that the household has an energy bill of only $1,000, when the statewide average for low-income households is about $2,839 suggests that the household is already being relatively efficient in their energy usage. For such a household, it would be expected to see very modest savings from even very comprehensive energy efficiency services.

Where high energy burden results from having high usage relative to other households or from using a higher-priced fuel, energy efficiency programs can complement or even replace energy assistance programs. But, where a household has high energy burden despite having low usage, energy assistance is usually the most effective approach to energy burden reduction.

5.3 Information Systems for Low-Income Households

The information presented in this Special Topic Report shows that there is considerable variation in energy burden in the LMI market. All organizations and individuals working in the LMI market would benefit from having more information about the households that they are serving. Better information on household energy burden will help to better target energy assistance benefits. Better information on energy usage and energy expenditures could help to identify opportunities for energy efficiency programs and for clean energy initiatives. The OTDA LIHEAP client data collection and report system furnishes a good example of how such a system could be developed. However, significant additional work would be needed to make such data accessible to all the parties that could benefit from it. All parties should examine existing systems and consider how they, or a system with similar components, could be developed to help to meet the commitments of the New York State Energy Affordability Policy.