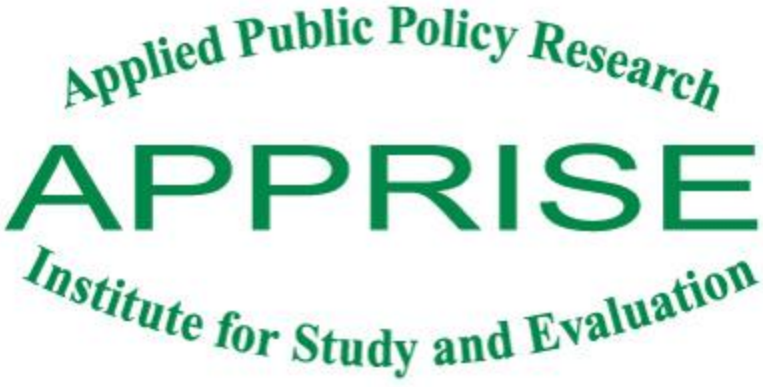

Meeting the Energy Needs of Low-Income Households in Connecticut

Final Report

Prepared for Operation Fuel, Inc / December 2016

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Executive Summary

The purpose of this report is to furnish Operation Fuel and other interested parties with information that they can use to understand the energy needs of Connecticut's low-income households, assess the effectiveness of existing low-income energy assistance and energy efficiency programs, and consider whether there are options and alternatives that could enhance the effectiveness of those programs.

Study Methodology

The information presented in this report was developed from a number of different sources.

- Energy Needs of Low Income Households – The primary source of information on low-income households in Connecticut was the Census Bureau's American Community Survey (ACS).
- Program Design, Funding, and Participation – Multiple sources of information were used to understand the design, funding, and participation in the publicly-funded and ratepayer-funded programs in Connecticut, including documents available from the Department of Social Services (DSS), the Department of Energy & Environmental Protection, (DEEP), the Energy Efficiency Board, and the Public Utilities Regulatory Authority.
- Programs Implemented in Other Jurisdictions – In this report, Connecticut's programs are compared to and contrasted with programs implemented by other states and/or utilities. This information was developed by APPRISE as part of a comprehensive study of low-income energy assistance and energy efficiency programs across the country.

At the initiation of this study, Operation Fuel convened a meeting with many of the low-income program partners in the state, including DSS, utility companies, and a community-based organization that serves as a local service provider for energy assistance and energy efficiency purposes. These individuals furnished important information on Connecticut's program operations and made valuable suggestions for information sources that could help us to better understand the programs. Operation Fuel circulated this report for comment. This report addresses comments made by those knowledgeable individuals.

Context for the Study

APPRISE is a nonprofit research institute. Our mission is to furnish high quality and unbiased information that policymakers and program managers can use to better understand the needs of the populations that they serve, the efficiency and effectiveness of the programs they implement, and the options and alternatives that might be available to help them enhance program efficiency and/or effectiveness.

In this report we look at five important questions related to Connecticut's low-income programs.

1. *Who are Connecticut's low-income households and what are their energy needs?*
2. *What evidence is there that Connecticut's low-income programs are efficient in terms of the cost to the public and ratepayers, as well as for the low-income program participants?*
3. *What evidence is there that Connecticut's low-income programs are effective in meeting their stated objectives, as well as any other objectives that are in the public interest?*
4. *What evidence is there that the low-income programs give all low-income households an opportunity to participate and target the highest benefits to households with the greatest needs?*

5. *What other options and alternatives are available to Connecticut that might improve their low-income programs in terms of efficiency, effectiveness, or fairness?*

In the report, we do not advocate for a particular approach to Connecticut's programs. Rather, based on the available information and the findings from programs implemented in other jurisdictions, we identify options and alternatives that Connecticut policymakers might consider if they wish to improve their programs' performance with respect to a particular objective.

We do, however, make recommendations related to the information and performance measures that are tracked by program managers. To effectively manage programs against objectives, it is critical for programs to generate ongoing performance management statistics. As American businesses have learned, developing an effective information tracking system is one essential ingredient to ensuring success. We have found that public programs are the same; the programs that are most successful are those that develop good quality and timely information on program performance.

Energy Needs of Low Income Households

Publicly-funded and ratepayer-funded low-income energy programs in Connecticut are available to households with incomes at or below 60% of state median income; for a one-person household the income limit is $33,132 and for a four-person household the income limit is $63,716. Data from the American Community Survey shows that 436,483 of Connecticut's 1,356,206 households are income-eligible for these programs.

The low-income population is diverse; it includes all types of households in all different types of housing units. However, there are certain populations that are particularly at risk for having energy affordability problems, including:

- About 29% (127,970) have income below the HHS poverty guidelines.
- About 25% (110,312) have a single elderly person living alone.
- About 12% (53,457) include a non-elderly disabled individual.
- About 16% (70,603) include a child younger than age 6.

The energy needs of these households are significant. The average energy bill for Connecticut low-income households - based on self-reported ACS data - is over $3,000. Since the average income for Connecticut low-income households is $25,810, the energy burden for the average household is 11.8% of income. However, for some the energy burden is substantially higher.

- It is 13.3% for low-income households who heat with fuel oil.
- It is 30.6% for households with income below the HHS poverty guideline.
- It is 58.2% for households with income of less than $10,000.

Connecticut is not unique in having households that face these energy affordability challenges. However, when compared to national averages, Connecticut energy bills for low-income households are about 60% higher than the national average and the average energy burden is over 30% higher.

Energy Assistance Programs

The Connecticut Energy Assistance Program, also known as CEAP, is funded by a grant from the federal government and administered through the Low Income Home Energy Assistance Program (LIHEAP). In program year 2015, the program used over $47 million to furnish proactive heating assistance grants to 97,752 low-income households with an average grant of about $486. In addition, the program delivered almost $21 million to furnish responsive crisis assistance benefits to households that heat with a delivered fuel. Combining the CEAP program statistics with the information on low-income energy needs demonstrates the following:

- The program delivers regular benefits to about 22% of low-income households (97,752 of 436,483) and covers about 16% of the average energy bill ($486 of $3,034).
- In addition to regular grants, delivered fuel households are eligible to receive Winter Crisis benefits (over 90% of delivered fuel households receiving regular benefits also received Winter Crisis) and Safety Net Benefits (about 49% of delivered fuel CEAP clients). On average, households who receive a Heating Assistance benefit, a Winter Crisis benefit, and one or more Safety Net Assistance benefits, receive an average of about $1,405 in assistance.
- The CEAP program also delivers Renters Benefits to 1,336 households with heat included in rent and delivers "nominal benefits" to 95,299 Supplemental Nutrition Assistance Program (SNAP) recipients who have heat included in rent. The "nominal benefits" can allow SNAP recipients to qualify for higher SNAP benefits that then frees up other funds for paying rent and energy bills.

The CEAP program is effective in reducing energy burdens for low-income households. However, certain population groups still have very high energy burdens even after receiving energy assistance.

- Natural Gas Main Heat – Households with income below the HHS poverty guidelines have average post-CEAP energy burdens of almost 25% of income, and those with income between 100% and 150% have energy burdens of over 11% of income.
- Electric Main Heat - Households with income below the HHS poverty guidelines have average post-CEAP energy burdens of almost 14% of income, and those with income between 100% and 150% have energy burdens of almost 8% of income.
- Fuel Oil Main Heat – Households with income below the HHS poverty guidelines have average post-CEAP energy burdens of 29% of income, and those with income between 100% and 150% have energy burdens of over 12% of income, even accounting for the receipt of Winter Crisis benefits. Even after accounting for Safety Net Assistance benefits, households with income below the HHS poverty guidelines have a net energy burden over 20% of income.[1]

These high post-CEAP energy burdens mean that many low-income households who participate in CEAP still have affordability problems. Households who participate in CEAP, heat with natural gas or electricity, and have overdue electric and/or gas bills can participate in the ratepayer-funded Matching Payment Program (MPP). [Note: Customers of United Illuminating companies are not required to have an

[1]The energy burden findings for households heating with fuel oil reflect the experiences of low-income households during the period from 2010-2014 as reported in the American Community Survey. Recently, fuel oil prices have declined and the energy burdens for low-income households heating with fuel oil also have declined. However, they are still higher than the energy burdens for households that heat with natural gas or electricity.

arrearage to participate.] In addition, Eversource and United Illuminating offer electric arrearage forgiveness program for their non-heating electric customers (MaPP and New Start). [Note: To participate in this program, customers of United Illuminating are required to have an arrearage.]

- Funding – The ratepayer-funded programs are estimated to have furnished $65,600,241 in benefits in 2014. [Note: There is no one document that clearly states the amount of program funding. We made these estimates from a number of different reports.]

- Benefits – These programs offer benefits to clients who successfully complete a payment plan. In 2014, the MPP programs reported having 68,471 participants and 36,693 successful participants (54%). We did not locate information on the number of successful participants for the New Start and MaPP programs.

- "Below Budget" Bills – These programs also have a special procedure for customers who are concerned that they cannot pay the requested budget bill amount. They work with a social service agency to complete a financial assessment form that determines an affordable payment amount. This program is likely to increase the success rate for customers. However, we were unable to find information on how many customers use this program option or how it relates to success.

These programs offer substantial benefits to low-income households with affordability problems. However, the limited availability of program statistics makes it difficult to assess which low-income households are receiving assistance and which are not able to receive benefits because they are unsuccessful at meeting the requirements of the payment plans.

Energy Efficiency Programs

The Weatherization Assistance Program (WAP) is funded by a grant from the federal government. In 2014, the program used about $2.5 million in funding to furnish weatherization services to 433 households with average spending per home of about $5,690. Results from the National WAP Evaluation suggest that WAP program savings for states in Connecticut's climate zone is about 18.5% of heating fuel usage and about 7% of electric usage. For low-income households in Connecticut, that would represent about $385 per year in long-term energy savings.

The Home Energy Solutions – Income Eligible program (HES-IE) is a ratepayer-funded low-income energy efficiency program that is part of Connecticut's comprehensive Energize CT program. In 2014, the program used about $33.5 million in funding to furnish energy efficiency services to 19,659 low-income customers with an average spending per home of about $1,700. An evaluation of the program showed that natural gas heating savings were 9% of pre-program usage, baseload electrics savings were about 14% of pre-program usage, and electric heating savings were about 14% of pre-program usage. Those percentages would represent about $135 per year in natural gas savings, about $210 in electric baseload savings, and about $280 in electric heating savings.

The HES-IE program serves about 5% of Connecticut's low-income households each year and, if it were targeted to customers who participate in energy assistance programs, it could serve about 20% of those customers each year. However, while the WAP and HES-IE programs are coordinated, there is no direct connection between the energy assistance programs and the energy efficiency programs (i.e. clients apply separately for CEAP and the energy efficiency programs). [Note: The utilities conduct extensive outreach to CEAP households encouraging them to apply for the HES-IE program.] And, there are no reports on the number of low-income households in each population segment that are served by the programs.

Summary of Findings

This study developed statistics on the energy needs of Connecticut's low-income households. It found that most low-income households face challenges with respect to energy affordability - the average low income household has an annual income of $25,810 and an annual energy bill of over $3,000 resulting in an energy burden of almost 12% of income. However, it found that certain groups of households face much larger challenges than others.

Using federal LIHEAP and WAP funds, and ratepayer funds, Connecticut spends about $134 million on low-income energy assistance programs and about $36 million on low-income energy efficiency programs. This represents a significant investment in helping Connecticut's low-income households to meet their energy needs. However, it is important to consider whether those funds are being used in an efficient and effective way, and whether they are targeted to the households with the greatest needs.

What evidence is there that Connecticut's low-income programs are efficient in terms of the cost to the public and ratepayers, as well as for the low-income program participants?

Within each type of program, the Connecticut programs appear to be striking an appropriate balance between administrative efficiency and program integrity. Since federal funds and ratepayer funds are used for these programs, it is appropriate to ensure that households receiving benefits meet the eligibility requirements; that imposes some costs on the programs and some costs on the participating households. However, it appears that all programs use the same income-eligibility criteria and that once a household has completed the required financial statement, they are able to use that certification to participate in all of the available programs.

In some other jurisdictions, state agencies and utilities have a more direct link between energy assistance programs and energy efficiency programs. For example, in New Jersey and Ohio, the energy assistance households with the highest energy usage are targeted for outreach and recruitment into the energy efficiency programs, thereby reducing recruitment costs. However, working in partnership with local CEAP/WAP agencies, the utilities have encouraged at least some coordination between the programs.

What evidence is there that Connecticut's low-income programs are effective in meeting their stated objectives, as well as any other objectives that are in the public interest?

The CEAP program furnishes detailed statistics on which households are served and what benefits they receive. The program serves about 22% of income eligible households with LIHEAP funds, and also ensures that another 22% of low-income households receive higher SNAP benefits to help address energy affordability problems. This program clearly has a proactive impact on energy affordability for low-income households.

Only limited information is available for the MPP, New Start, and MaPP programs. The MPP program statistics show that there is a very high overlap between the CEAP program and the MPP program. Further, the program statistics show that 54% of MPP program participants are successful; that is a relatively high rate that compares favorably with programs implemented in other jurisdictions. However, there is almost no information on which low-income customers are served by the program and which customers are successful on the program.

The other concern about the effectiveness of the ratepayer-funded programs is that they are mostly reactive - most only serve customers after they have arrearages - rather than proactive - working to address affordability problems before the customer builds up arrearages. [Note: Only the United

Illuminating company MPP programs allow clients to enroll with a zero balance.] In most other jurisdictions, such reactive programs were replaced with proactive rate discount programs.

The energy efficiency programs appears to reach a large number of households and to deliver good savings. However, we were unable to locate any information that documents which low-income households receive the program benefits and to determine how the programs affect energy affordability.

What evidence is there that the low-income programs give all low-income households an opportunity to participate and that they target the highest benefits to the households with the greatest needs?

The CEAP program is restricted to households who pay directly for their main heating fuel and to renters with heat included in rent that pay more than 30% of their income for rent. In addition, it helps certain SNAP households to receive higher benefits. However, the benefits to households with heat included in rent are modest and the Renter Assistance program has a very low participation rate. It may be appropriate for Connecticut to consider the actual energy burden of households with heat included in rent and to consider whether the existing program treats all households fairly.

The CEAP program furnishes higher benefits to lower income households as required by the federal LIHEAP statute. However, statistics suggest that, even after receipt of CEAP benefits, the lowest income households still have substantially higher energy burdens than other CEAP recipients. [Note: DSS should have better information on this for the FY 2016 program year for which they will be collecting energy expenditure data for program participants.]

We were unable to locate any information on the distribution of benefits by household group for the ratepayer-funded energy assistance program (MPP, New Start, and MaPP) or for the ratepayer-funded energy efficiency programs. Therefore, we cannot comment on whether those programs are available to all low-income population segments, nor whether they serve the households with the greatest need.

What other options and alternatives are available to Connecticut that might improve their low-income programs in terms of efficiency, effectiveness, and fairness?

Connecticut makes a significant investment in addressing the energy affordability problems faced by their low-income households. About $170 million is spent on low-income energy assistance and energy efficiency programs. That investment is comparable to or higher than the investments made in most other jurisdictions. However, it is impossible to judge whether those funds are spent in a way that is efficient, effective, and fair. There is simply not enough information on which households are served and what kinds of benefits they receive to identify whether any changes are warranted to meet program objectives.

Summary of Recommendations

One important recommendation to policymakers and program managers in Connecticut is that all programs need to have better performance management information.

- The CEAP program has the most effective information system; it tracks the number and types of benefits granted, and the characteristics of the households that receive benefits. In addition, the program is increasing the amount of information available for program management by collecting energy expenditure data for clients in FY 2016.

- The HES-IE program has conducted a program evaluation. That evaluation appears to furnish good quality information on program impacts. However, it did not appear to furnish information on

the characteristics of households served by the program, nor did it look at questions of whether there were important population segments that have not been served.

- The ratepayer-funded energy assistance programs furnish very little information on program performance or on program participants. There are some excellent examples of standard reporting procedures from other jurisdictions, most notably Pennsylvania which requires a comprehensive evaluation of all ratepayer-funded low-income programs every five years.

- The low-income information system is fragmented. The CEAP program has the core geographic and demographic information on participating low-income households. The electric and natural gas utilities have information on which CEAP households participate in the ratepayer-funded energy assistance programs, the retail value of the energy they use, the amount each participant has paid on their accounts, and which households have been successful in making the required payments. The HES-IE program implementers have the required information on which low-income households received energy efficiency services. Starting with the core information on CEAP participant households, it is feasible for each party to furnish information to a central repository that could integrate that information and develop the program performance statistics.

- The Connecticut Low Income Energy Advisory Board (LIEAB) includes all of the parties that have one or more of the required sets of information. It is recommended that the LIEAB members work together to find an appropriate strategy for integrating the different data sources and developing an annual report on the population served by the combined set of programs.

The taxpayers and ratepayers in Connecticut would be well-served by the development of a comprehensive information system that furnishes performance management data on how the $170 million in taxpayer and ratepayer dollars are being spent to meet the needs of Connecticut's low-income households. Using the information that could be developed using ***existing data sources,*** Connecticut's policymakers could then consider whether to make other changes in the energy assistance and/or energy efficiency programs that could increase the effectiveness of those programs in meeting the needs of the diverse population of low-income households in the state. Examples of potential enhancements include:

- Targeting the highest LIHEAP benefits to the households with the highest home energy needs as required by the federal LIHEAP statute.

- Allocating as much as 15 percent of LIHEAP funds for weatherization services that can target LIHEAP households with the highest energy usage and that can complement the ratepayer-funded Home Energy Solutions - Income Eligible by addressing health and safety barriers.

- Developing ratepayer-funded energy assistance programs that work more proactively with low-income households that have high energy burdens to resolve their affordability problems before they have bill payment problems.

- Making sure that both publicly-funded and ratepayer-funded energy efficiency programs address the needs of all types of low-income households, including both homeowners and renters, and treating both single family and multifamily homes.

Connecticut's publicly-funded and ratepayer-funded programs deliver substantial benefits to low-income households. But, it is appropriate to consider how those benefits could be increased by looking more carefully at who is served, how they are served, and whether the current program designs maximize the benefits from the public and ratepayer dollars that are spent.

Section 1. Introduction

The purpose of this report is to furnish Operation Fuel and other interested parties with information that they can use to understand the energy needs of Connecticut's low-income households, assess the effectiveness of existing low-income energy assistance and energy efficiency programs, and consider whether there are options and alternatives that could enhance the effectiveness of those programs.

This introduction is followed by four report sections.

- Energy Needs of Low Income Households – Furnishes information on low-income households, including: number of households, demographics, housing unit characteristics, and energy expenditures and burden.

- Energy Assistance Programs – Describes the publicly-funded and ratepayer-funded ***energy assistance*** programs available to low-income households in Connecticut, including: program eligibility guidelines, funding levels, and participation rates.

- Energy Efficiency Programs – Documents the publicly-funded and ratepayer-funded ***energy efficiency*** programs available to low-income households in Connecticut, including: program eligibility guidelines, 2014 funding levels, and participation rates.

- Summary of Findings – Identifies the information that we perceive is most important for Connecticut's program managers and policymakers to consider when examining options and alternatives for program design, implementation, and funding.

The information presented in this report was developed from a number of different sources.

- Energy Needs of Low Income Households – The primary source of information on low-income households in Connecticut was the Census Bureau's American Community Survey (ACS). This national survey is conducted annually and collects detailed information on households and housing units. In 2014, over 23,000 households in Connecticut were interviewed for the ACS. We used a data file published by Census that covers the time period from 2010 to 2014 and has records for over 100,000 Connecticut households.

- Program Design, Funding, and Participation – We obtained Low Income Heating Assistance Program (LIHEAP) data from the Department of Social Services, WAP data from the Weatherization Assistance Program Technical Assistance Center (WAPTAC), and other program data from reports filed with the CT Department of Energy & Environmental Protection (DEEP) and the CT Public Utilities Regulatory Authority (PURA).

- Best Practice Research - APPRISE has developed information on the program designs, funding levels, participation rates, and impacts of energy assistance and energy efficiency programs in twenty other states. That information was compared and contrasted with the information developed for Connecticut.

We reviewed information with Operation Fuel and with other interested parties in Connecticut. However, APPRISE is solely responsible for the content of this report. The views and opinions expressed herein do not necessarily reflect those of Operation Fuel or any other party who furnished information for this study.

Section 2. Energy Needs of Low-Income Households

This section of the report furnishes information on Connecticut's low-income households, including the number of low-income households, the demographic characteristics of those households, the characteristics of the housing units occupied by low-income households, energy expenditures, and energy burden. The primary source of information used to develop these statistics is the Census 5-year ACS public use microdata file (2010-2014) that has information on over 110,000 Connecticut households, about 36,000 of which can be classified as low-income.

2.1 Low-Income Households

The federal statute limits the LIHEAP income eligibility threshold to the greater of 60% of state median income and 150% of the HHS poverty guidelines. Any state can use federal LIHEAP funds to serve households with incomes up to the higher of those limits. Table 2.1 shows that the median income published by HHS in 2016 for Connecticut for a family of four was $106,193 and that the LIHEAP income limit for a household of 4 was $63,716 (60% of state median). Table 2.1 also shows 150% of the HHS poverty guidelines by household size. For some states, 150% of poverty is above 60% of state median income. However, for Connecticut, 60% of state median is higher.

Table 2.1
Income Eligibility Requirements[2]

FY 2016 HHS Guidelines	
Median Income (family of 4)	$106,193
60% of Median Income	$63,716
60% of Median in Connecticut	
1 person	$33,132
2 people	$43,327
3 people	$53,521
4 people	$63,716
5 people	$73,910
6 people	$84,105
150% of HHS Poverty Guidelines *(all states except AK and HI)*	
1 person	$17,655
2 people	$23,895
3 people	$30,135
4 people	$36,375
5 people	$42,615
6 people	$48,855

Source: 2010-2014 ACS Public Use Microdata Sample (PUMS)

Since the federal maximum income standard is 60% of state median income, the definition of low-income household used in this section of the report is households with income at or below 60% of state median income. This also can be referred to as Connecticut's "income-eligible" households. Table 2.2 shows that, out of the 1.4 million households in Connecticut, about 436 thousand households (32%) are "low-income" according to this definition.

[2] http://www.liheapch.acf.hhs.gov/profiles/povertytables/FY2015/ctsmi.htm

Table 2.2
Income-Eligible Households

Household Group	# of Households	% of Households
Low-Income	436,483	32%
All Households	1,356,206	100%

Source: 2010-2014 ACS PUMS

However, like many other states, Connecticut policymakers have chosen to set additional limits on LIHEAP program eligibility. For households that pay their energy supplier directly for their main heating fuel, the income limits are 60% of state median income (i.e., the federal maximum income threshold). However, for households with heat included in rent, the income limit is set at 150% of poverty. (See Table 2.1 for the values by household size.) In addition, such households are only eligible for assistance under two conditions. First, a household whose rent is greater than 30% of their income can receive a benefit. Second, if a household's rent is not greater than 30% of income, but the household receives benefits from the Supplemental Nutrition Assistance Program (SNAP) and pays at least part of their electric bills, they are eligible for a LIHEAP benefit that triggers an additional benefit from SNAP.

Table 2.3 shows the complete set of income requirements and other program requirements for LIHEAP eligibility in Connecticut. These guidelines are referred to as program eligibility requirements.

Table 2.3
Program Eligibility Requirements[3]

FY 2016 HHS Guidelines	
Median Income (family of 4) in CT	$106,193
60% of Median Income in CT	$63,716
CT Income Guidelines for Households that Pay Directly for Heat	
1 person	$33,132
2 people	$43,327
3 people	$53,521
4 people	$63,716
5 people	$73,910
6 people*	$84,105
CT Income Guidelines for Households with Heat Included in Rent *[Rent Greater Than 30% of Income]*	
1 person	$17,655
2 people	$23,895
3 people	$30,135
4 people	$36,375
5 people	$42,615
6 people*	$48,855
SNAP Households with Heat Included in Rent *[Rent Less Than 30% of Income / With Shelter or Energy Obligation*	

Source: 2010-2014 ACS PUMS

* Households with additional people have higher guidelines

[3] http://www.liheapch.acf.hhs.gov/profiles/povertytables/FY2015/ctsmi.htm

Table 2.4 shows what share of the income-eligible households identified in Table 2.2 fall into each program eligible population group. In total the ACS estimates that about 436 thousand households are "income-eligible" for LIHEAP using the 60% of state median income standard. Among those households, Table 2.4 shows that about 85% make direct payments to vendors and are "program-eligible" for LIHEAP, while 15% have heat included in rent and are subject to additional program requirements, including:

- Additional Income Limits – Among 67,154 households with heat included in rent, 37% have incomes above 150% of the HHS poverty guidelines and are not eligible for LIHEAP.

- Rent Requirements – Among 42,096 households with heating included in rent and incomes below 150% of poverty, about 69% are estimated to pay more than 30% of their income for rent and therefore are eligible for LIHEAP benefits.

In total, about 369 thousand of the 436 thousand "income-eligible" are "program-eligible" for LIHEAP. As will be discussed in more detail in Section III of the report, about 98 thousand of those households received LIHEAP benefits in FY 2015.

Table 2.4
Program-Eligible Households

Household Group	# of Households	% of Households
Low-Income Households	436,483	100%
Energy Bill Payment Type		
Direct Payment to Vendor	369,329	85%
Heat in Rent	67,154	15%
Heat in Rent Households		
Income > 150% Poverty	25,058	37%
Income <= 150% Poverty	42,096	63%
Heat in Rent < 150% Poverty		
Rent > 30% of Income	27,441	69%
Rent < 30% of Income	12,135	31%

Source: 2010-2014 ACS PUMS

The remainder of this section of the report will focus on the population of "income-eligible'" households. Tables for important subgroups identified in Table 2.4 are furnished in the Appendices to the report.

2.2 Demographic Characteristics of Low-Income Households

In order to better understand the population of low-income households, it is important to look at some of the demographic characteristics of these households.

Tables 2.5 and 2.6 furnish two different ways of looking at the incomes of these households. Table 2.5 shows the number of households by their poverty group and Table 2.6 shows the number of households by income group.

The federal government sets a poverty guideline that takes into account income and family size; a one-person household with income of $11,770 is considered to be at the poverty line, as is a four-person household with income of $24,250. Table 2.5 shows that about 29% of Connecticut's low-income

households have income below the poverty line (average income = $8,913). 27% have income at or above 200% of the poverty line (average income = $39,076).

Table 2.5
Low-Income Households by Poverty Group

Poverty Group	# of Households	% of Households	Average Income
Less than 100% FPL	127,970	29%	$8,913
100-150% FPL	91,322	21%	$20,944
150%-200% FPL	98,096	22%	$30,006
>200% FPL	119,095	27%	$39,076
Total	436,483	100%	$24,134

Table 2.6 shows how households are distributed by income group. About 18% of Connecticut's low-income households have income of less than $10,000. About 15% have income of more than $40,000 per year. The definition of "low-income" household includes some households with incomes above $80,000. However, most Connecticut households defined as being "low-income" have incomes below $40,000.

Table 2.6
Low-Income Households by Income Group

Income Group	# of Households	% of Households	Average Income
Less than $10,000	77,789	18%	$4,752
$10,000 to less than $20,000	109,403	25%	$15,106
$20,000 to less than $30,000	108,348	25%	$24,791
$30,000 to less than $40,000	74,292	17%	$34,274
$40,000 or more	66,651	15%	$50,949
Total	436,483	100%	$24,134

Table 2.7 furnishes information on the types of households in the low-income population. It shows that about one-third (34%) of low-income households have children, a little over one-third (38%) have a senior head of households, and that a little less than one-third have only non-elderly adults (28%). Of those households with children, about 40% have two parents in the home while the other 60% only have one parent in the home interview for the ACS. Among elderly households, about two-thirds are elderly individuals, while the other one-third have an elderly head of household and more than one person in the home.

Table 2.7
Low-Income Households by Type of Household

Type of Household	# of Households	% of Households	Average Household Size
Elderly Head of Household	165,460	38%	1.4
Elderly Individual	110,312	25%	1.0
Elderly Household	55,148	13%	2.2
Households with Children	147,269	34%	3.8
Two Parent Household	57,735	13%	4.5
Other Circumstances	89,534	21%	3.5
Other Households	123,754	28%	1.6
Total	436,483	100%	2.3

One reason that it is important to understand the type of households in the low-income population is that it furnishes a better understanding of the longer term services that income-eligible households might

need. For example, most elderly households have fixed incomes; that means that they are likely to need the same services year after year. That would be particularly true for one-person elderly households. However, the households with children are likely to see their needs change over time as the number of children changes or as children get older and start attending school. Those changes can result in changes in economic circumstances and may affect the need for energy assistance.

Table 2.8 shows the percent of households with a vulnerable household members as defined by the LIHEAP program; 42% of households have an elderly individual; 16% have a young child; and, 36% have a disabled individual. About 70% of households have at least one vulnerable household member.

Table 2.8
Low-Income Households by Vulnerable Household Member

Vulnerable Households	# of Households	% of Households
Elderly Member (60+)	182,127	42%
Young Child (< 6)	70,603	16%
Disabled Individual	155,791	36%
Any Vulnerable Member*	306,187	70%
Total	436,483	100%

*At least one member who is elderly, disabled, or a young child.

Table 2.9 furnishes information on the language spoken at home by low-income households. It shows that about two-thirds (67%) of low-income households speak English at home and that one-third speak a different language. The most common other language is Spanish spoken by 21% of the population. However, 12% of households speak another language, including Asian or Pacific Islander, Other Indo-European, and other.

Table 2.9
Low-Income Households by Language Spoken at Home

Language	# of Households	% of Households
English	292,582	67%
Spanish	89,825	21%
Asian and Pacific Islander	8,191	2%
Other	45,885	10%
Total	436,483	100%

Language can be a barrier to participation in public programs. While most program literature is now available in English and Spanish, it is less common for materials to be available in other languages that might be spoken by a significant share of the population.

2.3 Housing Characteristics of Low-Income Households

Housing characteristics of low-income households also affect the way that households can be served. For example, working with a household who owns their own home makes it easier to work with the household on improving the energy efficiency of the home. Households in multi-family buildings have less control over their energy use than households in single family homes because they are affected by the energy practices of their neighbors.

Table 2.10 shows how Connecticut low-income households are distributed in terms of building type. Table 2.11 shows how they are distributed in terms of tenure (i.e., own vs. rent). Table 2.12 shows how those two factors are related.

Table 2.10 shows that the most common types of housing units are single family detached homes (37%), apartments in small multifamily buildings (27%), and apartments in large multifamily buildings (29%). About one-third of low-income households live in each of these housing unit types.

Table 2.10
Low-Income Households by Building Type

Building Type	# of Households	% of Households
Single Family Detached	161,231	37%
Single Family Attached	25,438	6%
Small Multifamily (2-4 units)	119,488	27%
Large Multifamily (5+ units)	125,108	29%
Other	5,218	1%
Total	436,483	100%

Table 2.11 shows that the majority of low-income households (60%) live in rental housing. However, a substantial share (40%) own their homes.

Table 2.11
Low-Income Households by Tenure

Tenure	# of Households	% of Households
Own	176,507	40%
Rent	259,976	60%
Total	436,483	100%

Table 2.12 shows that the tenure of households is very different by building type. Most low-income households who live in single family homes are owners, while most low-income households who live in multifamily buildings are renters. [Note: For purposes of this and following tables, we have combined the categories of single family detached, single family attached, and other.]

Table 2.12
Low-Income Households by Building Type and Tenure

Building Type	Own		Rent		Total	
	N	%	N	%	N	%
Single Family	147,601	77%	44,286	23%	191,887	100%
Small Multifamily	16,560	14%	102,928	86%	119,488	100%
Large Multifamily	12,346	10%	112,762	90%	125,108	100%
Total	176,507	40%	259,976	60%	436,483	100%

Tables 2.13 through 2.16 show how the households in each housing unit type are different. Table 2.13 shows the average household size for each group. Table 2.14 shows the average income for each group. Table 2.15 shows the average percent of poverty for each group. Table 2.16 shows the percent of households that are elderly and the percent of households with children in each group.

Table 2.13 shows that households in large multifamily buildings have fewer members than households that live in other types of housing. And, it shows that renters have larger household sizes than owners.

Table 2.13
Average Household Size by Building Type and Tenure

Building Type	Own	Rent	Total
Single Family	2.2	2.8	2.4
Small Multifamily	2.2	2.8	2.6
Large Multifamily	1.6	1.8	1.8

Table 2.14 shows that owners are generally higher income than renters, and households in large multifamily buildings have lower incomes than households in other types of housing. When put together with the information from 2.13, it appears that renters in large multifamily buildings are likely to have the greatest need with respect to assistance programs; they have larger household sizes and lower incomes.

Table 2.14
Average Income by Building Type and Tenure

Building Type	Own	Rent	Total
Single Family	$28,595	$26,242	$28,052
Small Multifamily	$28,640	$23,427	$24,150
Large Multifamily	$22,293	$18,682	$19,038

Table 2.15 shows the combined effect of household size and income. The average renter has income below 150% of poverty, while the average homeowner has income above 150% of poverty. The lower poverty groups are likely to have greater needs for energy assistance.

Table 2.15
Average Percent of Poverty by Building Type and Tenure

Building Type	Own	Rent	Total
Single Family	168%	138%	161%
Small Multifamily	170%	129%	134%
Large Multifamily	158%	125%	129%

Table 2.16 shows how two important vulnerable population groups are distributed. In Table 2.8 we saw that about 42% of households had an elderly household member. However, about 60% of single family homeowners have an elderly household member, while only 25% of renters do. We also see that 39% of renters in large multifamily buildings have an elderly household member; that is likely to be related to the number of affordable housing projects for senior citizens.

Table 2.16
Percent with Elderly and Percent with Children by Building Type and Tenure

Building Type	Own		Rent		Total	
	% Elderly	% Children	% Elderly	% Children	% Elderly	% Children
Single Family	60%	10%	25%	25%	52%	13%
Small Multifamily	55%	12%	21%	26%	26%	24%
Large Multifamily	58%	6%	39%	14%	41%	13%

2.4 Energy Needs of Low-Income Households

The ACS has information that helps to develop a better understanding of the energy needs of low-income households. It includes information on the household's main heating fuel type, their electricity bills, and their main heating fuel bills. Part of the information that it collects with respect to the household's energy bill is whether the household pays their bill directly to the energy supplier, or if their energy costs are included in the household's rent or condominium fee. These data, in combination with the household income data, allow us to characterize households in terms of annual energy cost and burden.

Table 2.17 shows how Connecticut low-income households are distributed in terms of main heating fuel. Table 2.18 shows how they are distributed in terms of bill payment for their main heating fuel (i.e., direct vs. in rent or fee). Table 2.19 shows how those two factors are related.

Table 2.17 shows that the most common main heating fuels are natural gas (38%), fuel oil (34%), and electricity (23%). Other fuels include propane, wood, coal, and kerosene.

Table 2.17
Low-Income Households by Main Heating Fuel

Main Heating Fuel	# of Households	% of Households
Natural Gas	167,567	38%
Electricity	99,354	23%
Fuel Oil	147,353	34%
Other Fuels	22,209	5%
Total	436,483	100%

Table 2.18 shows that the majority of low-income households (85%) pay directly for their main heating fuel. However, a substantial share (15%) have their heating fuel included in their rent or fee.

Table 2.18
Low-Income Households by Payment of Main Heating Fuel Bill

Tenure	# of Households	% of Households
Direct to Vendor	369,329	85%
Included in Rent or Fee	67,154	15%
Total	436,483	100%

Table 2.19 shows that the share of households that have heat included in rent does not vary much by main heating fuel type. About 20% of households with electric main heating fuel have their heat included in rent, somewhat higher than the average of 15% for all low-income households.

Table 2.19
Payment of Main Heating Fuel by Main Heating Fuel

Main Heating Fuel	Pay Directly		Included in Rent or Fee		Total	
	N	%	N	%	N	%
Natural Gas	142,312	85%	25,255	15%	167,567	100%
Electricity	79,508	80%	19,846	20%	99,354	100%
Fuel Oil	127,440	86%	19,913	14%	147,353	100%
Other	20,069	90%	2,140	10%	22,209	100%
Total	369,329	85%	67,154	15%	436,483	100%

Tables 2.20 and 2.21 shows how housing unit characteristics related to energy characteristics for low-income households. Table 2.20 shows how bill payment type varies by housing unit type. Table 2.21 shows how main heating fuel varies by housing unit type.

Table 2.20 shows that housing type has a significant impact on the payment of a household's main heating fuel. Households in large multifamily buildings have the highest rate of having their heat included in rent; 37% have heat included in rent compared to only 3% for single family homes. However, even for those households, the majority of households pay directly for their main heating fuel.

Table 2.20
Payment of Main Heating Fuel by Building Type

Building Type	Pay Directly		Included in Rent or Fee		Total	
	N	%	N	%	N	%
Single Family	186,809	97%	5,078	3%	191,887	100%
Small Multifamily	103,135	86%	16,353	14%	119,488	100%
Large Multifamily	79,385	63%	45,723	37%	125,108	100%
Total	369,329	85%	67,154	15%	436,483	100%

Table 2.21 shows the distribution of main heating fuel by building type. More than 60% of low-income households in single family homes use delivered fuels as their main heat, while only 16% of households in large multifamily buildings use delivered fuels. In contrast, only 9% of single family homes have electric main heating fuel while 46% of large multifamily buildings have electric main heat. Electric heat is common in large multifamily buildings because electric heat does not require ducting; both fuel oil and natural gas need ducting of some type to exhaust the combustion gases. Elimination of those ducts can reduce the cost of constructing large multifamily buildings.

Table 2.21
Main Heating Fuel by Building Type

Building Type	Natural Gas		Electricity		Delivered Fuels	
	N	%	N	%	N	%
Single Family	55,581	29%	17,971	9%	118,102	62%
Small Multifamily	66,010	55%	24,096	20%	29,119	24%
Large Multifamily	45,976	37%	57,287	46%	20,325	16%
Total	167,567	39%	99,354	22%	167,546	39%

2.4.1 Energy Burden for Households with Direct Payment for Main Heat

The American Community Survey collects data on the household's main heating fuel and electric bills. For those households that pay a main heating fuel bill directly to the energy supplier, Table 2.22 shows an estimate of the average main heating fuel bill and electric bill by main heating fuel type. [Note: Based on data from the national Residential Energy Consumption Survey, we allocate one-third of electricity expenditures to heating and two-thirds to other uses for electric heat households.] The average energy expenditures for low-income households in Connecticut who pay directly for their heating fuel is just over $3,000. Households that heat with fuel oil report the highest average expenditures – $3,719 – while households that heat with electricity report the lowest average expenditures – $1,919.

Table 2.22
Energy Expenditures by Main Heating Fuel [Direct Payment Only]

Main Heating Fuel	Heating Expenditures	Other Electric Expenditures	Total Energy Expenditures
Natural Gas	$1,513	$1,578	$3,091
Electricity	$639	$1,279	$1,919
Fuel Oil[4]	$2,003	$1,716	$3,719
Other Delivered Fuels	$1,778	$1,777	$3,555
Total	$1,473	$1,560	$3,033

Table 2.23 shows how energy expenditure levels translate into energy burden (i.e., the share of income spent on energy). Households with electric main heat have the lowest reported energy burden – 8.8% of income – while households with fuel oil main heat have the highest reported energy burden – 13.3%.

Table 2.23
Energy Burden by Main Heating Fuel [Direct Payment Only]

Main Heating Fuel	Total Energy Expenditures	Average Income	Average Energy Burden
Natural Gas	$3,091	$26,144	11.8%
Electricity	$1,919	$21,876	8.8%
Fuel Oil	$3,719	$28,019	13.3%
Other	$3,555	$27,977	12.7%
Total	$3,034	$25,810	11.8%

Table 2.24 shows how energy expenditures and burden vary by poverty group. Households with income at or above 200% of poverty have the highest energy bills, they also have the highest average income and the lowest energy burden – an average of 8.2%. Households with income less than the poverty line have energy bills that are about 10% lower than households with incomes at or above 200% of the poverty line. However, because their income is lower, their average energy burden is over 30%.

Table 2.24
Energy Burden by Poverty Group [Direct Payment Only]

Poverty Group	Average Energy Expenditures	Average Income	Average Energy Burden
Less Than 100%	$2,842	$9,275	30.6%
100% to < 150%	$2,970	$21,849	13.6%
150% to < 200%	$3,058	$30,509	10.0%
200% or More	$3,231	$36,602	8.2%
All Households	$3,034	$25,810	11.8%

[4] The energy burden findings for households heating with fuel oil reflect the experiences of low-income households during the period from 2010-2014 as reported in the American Community Survey. Recently, fuel oil prices have declined and the energy burdens for low-income households heating with fuel oil also have declined. However, they are still higher than the energy burdens for households that heat with natural gas or electricity.

Table 2.25 shows that low-income households with incomes of less than $10,000 per year have average energy burdens of 58.2% of income. In comparison, low-income households with incomes of $40,000 or more have average energy burden of 7.5% of income.

Table 2.25
Energy Burden by Income Group [Direct Payment Only]

Income Group	Total Energy Expenditures	Average Income	Average Energy Burden
Less than $10,000	$2,667	$4,582	58.2%
$10,000 to < $20,000	$2,718	$15,287	17.8%
$20,000 to < $30,000	$2,914	$24,811	11.7%
$30,000 to < $40,000	$3,176	$34,382	9.2%
$40,000 or More	$3,802	$51,007	7.5%
All Households	$3,034	$25,810	11.8%

These statistics are useful in understanding the impacts of the publicly-funded LIHEAP program – which targets reduction of heating burdens – and the ratepayer-funded Matching Payment Programs (MPPs) which help low-income households to address arrearages for their gas and electric heating bills. They also are useful in understanding the participation of direct payment households in the New Start programs which help low-income households with their electric bills when electricity is not their main heating fuel.

2.4.2 Energy Burden for Households with Direct Payment for Electricity

Table 2.4 shows that about 15% of low-income households have their heat included in their rent. However, many of those households have direct payment for their electricity bills. Table 2.26 shows the number and percentage of low-income households with direct payment for heat, direct payment for non-heating electric only, and those with all energy bills included in rent. Of the total of households with heat in rent, about one-half pay for electricity and the other one-half have all energy payments included in rent.

Table 2.26
Energy Payment Type

Payment Group	Number of Households	Percent of Households
Direct Payment for Main Heat	369,329	85%
Direct Payment for Non-Heating Electric Only	30,938	7%
All Energy Payments in Rent	36,216	8%
All Low-Income Households	436,483	100%

Table 2.27 shows how these energy payment patterns vary by Poverty Group. It shows that households with income less than poverty have the lowest direct bill payment rate; about 80% pay directly for their main heating fuel. Households with income of 200% of poverty or more have the highest direct bill payment rate; almost 90% pay directly for their main heating fuel. About 12% of the lowest income households have all of their energy bills included in rent while only 5% of households in the highest income group have all of their energy bills included in rent.

Table 2.27
Energy Payment by Poverty Group

Poverty Group	Pay Directly for Main Heat		Pay Directly for Electric Only		All Energy Included in Rent		Total	
	N	%	N	%	N	%	N	%
Less than 100%	102,313	80%	10,341	8%	15,316	12%	125,503	100%
100% to < 150%	74,883	82%	7,348	8%	9,091	10%	90,708	100%
150% to < 200%	85,634	87%	6,128	6%	6,334	6%	98,096	100%
200% or More	106,499	89%	7,121	6%	5,475	5%	119,095	100%
Total	369,392	85%	30,938	7%	36,216	8%	436,483	100%

Tables 2.28 and 2.29 shows the electric energy burden for households who pay directly for non-heating electricity use only. Table 2.28 shows the burden by poverty group and Table 2.29 shows the burden by income group. It shows that, even for households with heat included in rent, energy bills are significant. Households with income below 100% of the poverty line pay over 13% of their income for their electric use. The average energy burden for all low-income households with heat included in rent is 5.2% of income. Similarly, Table 2.29 shows that the average electric energy burden for households with income of less than $10,000 per year is 21.8% of income.

Table 2.28
Energy Burden by Poverty Group [Direct Payment of Non-Heating Electric Only]

Poverty Group	Percent of Households in Group	Total Energy Expenditures	Average Income	Average Energy Burden
Less Than 100%	33%	$1,137	$8,405	13.5%
100% to < 150%	24%	$1,023	$18,185	5.3%
150% to < 200%	20%	$1,139	$27,574	4.1%
200% or More	23%	$1,102	$37,130	3.0%
All Households	100%	$1,102	$21,379	5.2%

Table 2.29
Energy Burden by Income Group [Direct Payment of Non-Heating Electric Only]

Income Group	Percent of Households in Group	Total Energy Expenditures	Average Income	Average Energy Burden
Less than $10,000	21%	$1,061	$4,865	21.8%
$10,000 to < $20,000	30%	$1,015	$14,714	6.9%
$20,000 to < $30,000	23%	$982	$24,439	3.4%
$30,000 to < $40,000	16%	$1,135	$33,626	3.4%
$40,000 or More	9%	$1,706	$48,865	3.4%
All Households	100%	$1,102	$21,379	5.2%

Section 3. Low-Income Energy Assistance Programs

This section of the report furnishes information on the publicly-funded and ratepayer-funded energy assistance programs that are available to Connecticut's low-income households. Connecticut receives a substantial amount of funding from the federal LIHEAP program. Connecticut ratepayers also make a significant contribution to energy affordability for low-income households. In the past, there was funding for energy assistance from state taxpayers; however, that program has been discontinued.

3.1 Publicly-Funded LIHEAP Energy Assistance

Connecticut's Department of Social Services (DSS) manages the state's LIHEAP funds through the Connecticut Energy Assistance Program (CEAP) and the Connecticut Heating Assistance Program (CHAP). Connecticut's Community Action Agencies (CAA) are responsible for intake and for assisting with program administration.

In FY 2015, Connecticut had $87.8 million available for LIHEAP assistance. The sources of these funds are listed in Table 3.1. The primary source of funding was the LIHEAP Block Grant of $85.8 million. Connecticut received an additional $90 thousand in block grant funds that were returned to the federal government by other grantees and the program carried over about $2.0 million from the prior fiscal year.

Table 3.1
Sources of LIHEAP FY2015 Funds

Source of Funds	Dollars	Percent
FY2015 Block Grant	$85,764,007	98%
FY2014 Reallotment	$90,300	<1%
Carry Over from FY2014	$1,977,926	2%
Total	$87,832,233	100%

Table 3.2 shows how the available funds were used for each type of assistance and the number of households served by each type of assistance.

- Heating Assistance - About one-half of the funds were used for Heating Assistance and distributed benefits to over 99,000 households.
- Crisis Assistance - About one-fourth of the funds were used for Crisis Assistance. About 32,000 of the households who received Heating Assistance also received a Winter Crisis grant. About 17,000 households who received a Heating Assistance grant and a Winter Crisis grant also received one or more Safety Net Assistance grants.
- Nominal Benefits - Over 95,000 SNAP households with heat included in rent who pay less than 30% of their income for rent received small grants called "nominal payments." Those payments help SNAP households to verify that they have an energy payment obligation. Those households receive additional benefits from the SNAP program because they receive the LIHEAP "nominal payment."
- Other Purposes - About one-fourth of the LIHEAP funds were used for other purposes.
    - Carryover - About 10 percent was carried over to FY 2016 to make sure that the program could start on time in the next fiscal year.

- Program Administration - About 9 percent was used for Program Administration.
- Assurance 16 - About 1 percent was used for Assurance 16 case management services delivered to clients by the service delivery agency.

Connecticut is allowed to carry over up to 10% of funds, to spend up to 10% of funds on Program Administration, and to spend up to 5% of funds on Assurance 16 activities. Connecticut also is allowed by the LIHEAP statute to spend funds for Cooling Assistance, to transfer up to 15% of funds to the Weatherization Assistance Program (WAP), and to spend up to 0.08% of their funds on leveraging activities. Connecticut does not currently spend funds on any of those activities. For FY 2016, Connecticut added an equipment repair and replacement program for households with inoperable or unsafe heating equipment.

Table 3.2
Uses of LIHEAP FY2015 Funds

Uses of Funds	Dollars	Percent	Households	Percent
Heating Assistance	$47,493,534	54%	99,088	100%
Cooling Assistance	$0	0%	0	0%
Any Crisis Assistance	$20,558,988	24%	31,888	32%
Winter Crisis	$10,330,867	12%	31,888	32%
Safety Net Assistance	$10,228,121	12%	16,960	17%
Transfer to Weatherization	$0	0%	0	0%
Nominal Payments to SNAP Households	$1,998,119	2%	(95,229)*	N/A
Carryover to FY 2016	$8,471,338	10%	**	**
Development of Leveraging Resources	$0	0%	**	**
Assurance 16 Activities	$985,380	1%	**	**
Administrative and Planning Costs	$8,324,874	9%	**	**
Other	$0	0%	**	**
Total	$87,832,233	100%	99,088	100%

* Nominal Payment SNAP households not included in total recipients

In total, about 194,000 of the 436,000 low-income households in Connecticut receive some type of LIHEAP assistance (44%). The type of benefits and total amount received by low-income households varies considerably by income, vulnerability, and bill payment type[5].

For FY 2016, all households that pay their utilities direct-to-vendor are eligible to apply for LIHEAP if their income is at or below 60% of State Median Income (SMI). As required by the LIHEAP statute, vulnerable households (i.e., households with an individual 60 or older, with a disabled individual, or a child under age 6) are eligible for higher benefit. The heating assistance benefits matrix for those who pay their utilities direct-to-vendor is documented in Table 3.3. In FY 2015, 97,752 households received this assistance.

[5] http://www.ct.gov/dss/lib/dss/pdfs/energy/liheapallocationplan.pdf

Table 3.3
FY2016 LIHEAP Heating Assistance Benefit Matrix
for Households that Pay Utilities Directly

Program Name	Income	Benefits for Vulnerable Households	Benefits for Non-Vulnerable Households
CEAP	Up to 100% FPL	$585	$535
	101% - 125% FPL	$500	$450
	126% - 150% FPL	$425	$375
	151% - 200% FPL	$350	$300
CEAP	201% - 60% SMI*	$290	$240

Households that pay their heat as part of their rent and have a housing burden of more than 30% are also eligible for CEAP if their income is at or below 150% FPG. The heating assistance benefits matrix for those who pay their utilities through their rent documented in Table 3.4. In FY 2015, 1,336 households received this assistance.

Table 3.4
FY2016 LIHEAP Heating Assistance Benefit Matrix
for Households with Energy Bills Included in Rent

Program Name	Income	Rental Assistance Benefits
CEAP	Up to 100% FPL	$120
	101% - 125% FPL	$110
	126% - 150% FPL	$100

Winter Crisis assistance is available to delivered fuel low-income households who have exhausted their benefits under the heating assistance program. CEAP participants are eligible to receive up to $550 in crisis assistance, while CHAP participants are eligible to receive up to $250 in crisis assistance. In FY 2015, 31,888 delivered fuel households received Winter Crisis benefits.

Delivered fuel households with incomes at or below 200% of the poverty line (CEAP participants) that exhaust both their heating assistance funds and their crisis assistance funds may be eligible for safety net assistance if they are in a life-threatening situation. Vulnerable households can receive a safety net assistance of $415 up to three times a year, and non-vulnerable households can receive that amount up to twice a year. CHAP participants many not receive safety net assistance.

Table 3.5 displays the total amount of funds allocated to Bill Payment assistance (Heating Assistance, Winter Crisis, and Safety Net Assistance) and the total number of households served by those programs in FY 2015 (excluding nominal payment households). It shows that Connecticut LIHEAP participants received an average benefit of $687.

Table 3.5
Total Bill Assistance Funds & Total Households Served in FY2015

Statistic	FY2015 Totals
Funding for Bill Assistance	$68,052,522
Households Served	99,088
Average Benefit	$687

Table 3.6 displays the FY2015 funds, households served, and average benefit for each type of benefit. While the numbers are not strictly additive (e.g., the average Heating Assistance benefit for households that received Winter Crisis Assistance could be either higher than or lower than the average heating assistance benefit), it is useful to consider the approximate size of the benefit for each type of household.

- Households that received only Heating Assistance received a benefit of about $479.
- Households that received Heating Assistance and Winter Crisis received a benefit of about $802.
- Households that received Heating Assistance, Winter Crisis Assistance, and Safety Net Assistance received benefits of about $1,405.

It is important to remember that only delivered fuel households can receive Winter Crisis benefits and only delivered fuel households with income at or below 200% of Poverty can receive Safety Net Assistance. As was demonstrated in Table 2.22, the average energy costs for households who heat with delivered fuels are higher than for households who heat with natural gas, and much higher than those who heat with electricity.

Table 3.6
Funding, Households Served, And Average Benefit by Benefit Type in FY 2015

Type of Assistance	FY2015 Funds	FY2015 Households	Average Benefit	Estimated Total Benefit
Heating Assistance	$47,493,534	99,088	$479	$479
Winter Crisis Assistance	$10,330,867	31,888	$323	$802
Safety Net Assistance	$10,228,121	16,960	$603	$1,405
All Benefits	$68,052,522	99,088	N/A	$687

3.1.1 LIHEAP Impacts for Households Who Pay Directly for Main Heat

The combination of information from the American Community Survey and the reports from the Connecticut LIHEAP office allow us to look at some important statistics regarding the share of the population served and the effectiveness of the LIHEAP program in reducing home energy burden for the population of low-income households in Connecticut.

Table 3.7 shows the number of households who pay the vendor directly for their main heating fuel, the number of LIHEAP recipients, and percent of program eligible households served by vulnerable population group. It shows that about 31% of households with a young child are served by LIHEAP, while only about 20% of households with an elderly individual are served.

Table 3.7
Direct Payment Households Served by LIHEAP by Vulnerable Group in FY 2015

Vulnerable Group	Direct Pay Households	LIHEAP Recipients	Percent Served
Elderly	152,808	31,014	20%
Disabled	125,830	31,399	25%
Young Child	62,764	19,296	31%
Any Vulnerable Member	256,514	66,641	26%

Table 3.8 shows the number of households who pay the vendor directly for their main heating fuel, the number of LIHEAP recipients, and percent of program eligible households served by poverty group. It

shows that 39% of households with income below the poverty guideline who pay directly for their main heating fuel receive LIHEAP. In comparison, only 19% of eligible households with incomes greater than 200% of the poverty guideline receive LIHEAP.

Table 3.8
Direct Payment Households Served by LIHEAP by Poverty Group in FY 2015

Poverty Group	Direct Pay Households	LIHEAP Recipients	Percent Served
Less than 100%	102,313	39,541	39%
100% to less than 150%	74,883	25,627	34%
150% to less than 200%	85,634	12,187	14%
More than 200%	106,499	20,397	19%
All Direct Pay Households	369,329	97,752	26%

Table 3.9 shows the total number of households who pay the vendor directly for their main heating fuel, the number of LIHEAP recipients, and percent of program eligible households served by main heating fuel. For most types of heating fuels - natural gas, electricity, and fuel oil - about one-fourth of direct payment households are served by the program. But, only about 15% of households who use other types of delivered fuels (i.e., wood, kerosene, and propane) are served.

Table 3.9
Direct Payment Households Served by LIHEAP by Main Heating Fuel in FY 2015

Main Heating Fuel	Direct Pay Households	LIHEAP Recipients	Percent Served
Natural Gas	142,312	41,408	29%
Electricity	79,508	21,991	28%
Fuel Oil	127,440	31,324	25%
Other Delivered Fuel	20,069	3,029	15%
All Direct Pay Households	369,329	97,752	26%

Tables 3.10a through 3.10d show the gross and net energy burden for each of three most common main heating fuels, based on the estimates of energy bills from the ACS and the specified benefits from the LIHEAP state plan. Each table shows the gross energy burden for households (i.e., burden before receiving LIHEAP) and the net energy burden (i.e., the energy burden after receiving LIHEAP).

As was observed in tables 2.23 through 2.25, gross energy burdens are highest for households who heat their home with fuel oil and for households with incomes below 100% of the poverty guideline. Even after taking into account LIHEAP Heating Assistance benefits for homes heated with natural gas and electricity, and taking into account LIHEAP Heating Assistance and Winter Crisis benefits for homes heated with fuel oil, those same patterns remain. Net energy burdens are highest for households who heat their homes with fuel oil, next highest for households who heat their homes with natural gas, and lowest for households who heat their homes with electricity. And, even though households with income less than 100% of the poverty guideline get higher benefits, their net energy burdens are still considerably higher than households in the other poverty groups.

Table 3.10a
Gross and Net Energy Burden by Poverty Group in FY 2015 - Natural Gas Main Heat

Poverty Group	Average Energy Bill	Average Income	Gross Burden	Average Benefit	Net Burden
Less than 100%	$3,097	$10,271	30.2%	$568	24.6%
100% to less than 150%	$3,022	$23,170	13.0%	$446	11.1%
150% to less than 200%	$3,089	$32,108	9.6%	$333	8.6%
More than 200%	$3,141	$40,561	7.7%	$273	7.1%

Table 3.10b
Gross and Net Energy Burden by Poverty Group in FY 2015 - Electric Main Heat

Poverty Group	Average Energy Bill	Average Income	Gross Burden	Average Benefit	Net Burden
Less than 100%	$1,676	$8,125	20.6%	$568	13.6%
100% to less than 150%	$1,974	$19,712	10.0%	$446	7.8%
150% to less than 200%	$1,996	$28,156	7.1%	$333	5.9%
More than 200%	$2,141	$37,247	5.7%	$273	5.0%

Table 3.10c
Gross and Net Energy Burden by Poverty Group in FY 2015 - Fuel Oil Main Heat[6]

Poverty Group	Average Energy Bill	Average Income	Gross Burden	Average Benefit*	Net Burden
Less than 100%	$3,714	$8,933	41.6%	$1,118	29.1%
100% to less than 150%	$3,661	$21,712	16.9%	$996	12.3%
150% to less than 200%	$3,689	$30,485	12.1%	$883	9.2%
More than 200%	$3,771	$39,559	9.5%	$523	8.2%

* Note: Includes Winter Crisis Benefit

Table 3.10d shows the net energy burden for fuel oil households who receive a Heating Assistance benefit, a Winter Crisis benefit, and at least one Safety Net Assistance benefit. For those households, it appears that the added benefits reduce their energy bills enough that their net energy burden (i.e., energy burden after receipt of LIHEAP) is similar to the net energy burdens for households who heat their homes with natural gas. However, their net energy burdens are still greater than those for households who heat their homes with electricity.

[6]The energy burden findings for households heating with fuel oil reflect the experiences of low-income households during the period from 2010-2104 as reported in the American Community Survey. Recently, fuel oil prices have declined and the energy burdens for low-income households heating with fuel oil also have declined. However, they are still higher than the energy burdens for households that heat with natural gas or electricity.

Table 3.10d
Gross and Net Energy Burden by Poverty Group in FY 2015 - Fuel Oil Main Heat

Poverty Group	Average Energy Bill	Average Income	Gross Burden	Average Benefit*	Net Burden
Less than 100%	$3,714	$8,933	41.6%	$1,716	22.4%
100% to less than 150%	$3,661	$21,712	16.9%	$1,599	9.5%
150% to less than 200%	$3,689	$30,485	12.1%	$1,486	7.2%
More than 200%	$3,771	$39,559	9.5%	$523	8.2%

* Note: Includes Winter Crisis and Safety Net Assistance grants for households with income less than 200%

3.1.2 LIHEAP Impacts for Households with Heat Included in Rent

The LIHEAP program offers two benefits for households with heat included in rent. First, all households with heat included in rent can apply for Rental Assistance Benefits. Those households with income at or below 150% of the HHS poverty guideline who document that their rent payments are greater than 30% of their income can receive a benefit. The benefit amounts are $120, $110, or $100 depending on the household's poverty level. Second, all households who receive SNAP benefits, have their heat included in rent, and pay less than 30% of the income for rent can receive a "nominal benefit" of $20.01.

Table 2.4 shows that 42,096 households have income at or below 150% of poverty and have their heat included in rent. Table 2.4 further shows that – based on responses to the ACS – 27,441 of those households have rent payments that are greater than 30% of their income. In FY 2015, the LIHEAP program reported serving 1,336 households with Rental Assistance Benefits, about 5% of the low-income households who appear to be eligible for the program.

Recent administrative statistics from the SNAP program show that 248,368 Connecticut low-income households received SNAP in January, 2015. That represents about 56% of all low-income households in Connecticut. The LIHEAP office reported that they furnished "nominal benefits" to 95,299 SNAP households in FY 2015; that is about 38% of all SNAP recipients. It is important to remember that SNAP recipients who pay directly for the main heating fuel and SNAP recipients who paid more than 30% of their income for rent also were eligible to receive other types of LIHEAP assistance.

3.2 Ratepayer-Funded Energy Assistance Programs

There are a number of types of assistance that are offered to low-income households who have energy affordability problems. These include:

- Shut-Off Restrictions – Gas and electric companies may not refuse to provide service at any time during the year where a lack of service is life-threatening. Each fall electric utility customers and gas utility heating customers can apply for "hardship" status that - if they are eligible - protects them from shutoff during the period from November 1 to May 1.

- Heating Assistance Arrearage Forgiveness – The investor-owned electric and natural gas utilities administer arrearage forgiveness programs for their heating customers who receive LIHEAP heating assistance.

- Electric Arrearage Forgiveness – The investor-owned electric utilities administer arrearage forgiveness programs for their electric non-heating customers for hardship customers.

In addition to these assistance programs, ratepayers incur other costs related to serving low-income customers, including write-offs of uncollectible accounts and active charge-offs.

In this section of the report we focus on the Arrearage Forgiveness programs and show how these programs interact with the LIHEAP program in terms of the number of households served and the impact on energy affordability.

3.2.1 Heating Assistance Arrearage Forgiveness - Matching Payment Plan

All five investor-owned utilities in Connecticut offer an arrearage forgiveness program called Matching Payment Plan (MPP). The Investor-Owned Utilities (IOUs) are required by law to offer an arrearage forgiveness program to low-income customers; specifically, they must "provide such residential customer whose account is delinquent an opportunity to enter into a reasonable amortization agreement."[7]

The arrearage amortization plans offered by the two electric utilities and the three natural gas utilities follow a fundamentally similar design. Though the utilities were initially asked to submit separate plans, the Public Utility Regulatory Authority (PURA, formerly the Department of Public Utility Control) decided early on that all utilities should align their plans so that a customer's benefits did not vary according to their service provider. After examining the separate plans submitted by the gas utilities in 1993, the PURA released the following decision:

> "For reasons of equity, a customer's monthly payment amount should depend on the amount of the arrearage and the fuel assistance benefit, not on whether he or she happens to live in Hartford, Meriden or Bridgeport. We conclude that there should be uniformity in the formulas used by the Companies in determining a customer's monthly payment amount, and, by extension, the formulas used in calculating the forgiveness applied to a customer's arrearage."[8]

In 2004, the PURA decided that the electric utilities' arrearage forgiveness programs should "mirror and achieve parity with the existing gas utility programs."[9] As a result, from 2006 onward, all five of Connecticut's electric and gas utilities have submitted a single joint plan for their arrearage forgiveness programs.

The MPP eligibility requirements are as follows:[10]

- Customers must have applied and been deemed eligible for CEAP, even if no benefits were available at the time they applied. This means that maximum income eligibility is 60% of SMI for households that pay their energy bills directly to the utility.

[7] Conn. Gen. Stat. §16-262c(b)(2) https://www.cga.ct.gov/current/pub/chap_283.htm

[8] Applications of the Connecticut Natural Gas Company, the Southern Connecticut Gas Company, and the Yankee Gas Services Company for Approval of Implementation Plans for Hardship Customers Arrearage Amortization Policy Pursuant to Public Act 91-150, Decision, Docket Nos. 93-06-20, 93-06-21, 93-07-03 (consolidated), Decision, September 29, 1993. http://www.dpuc.state.ct.us/FINALDEC.NSF/0d1e102026cb64d98525644800691cfe/518715835ba0b9e085255fb3005085e4?OpenDocument

[9] http://www.dpuc.state.ct.us/FINALDEC.NSF/2b40c6ef76b67c438525644800692943/db801f8e7b3638a985256ef50066c62d?OpenDocument

[10] Arrearage Forgiveness Program Joint Plan Submission for 2015-2016

- Customers must enter into and comply with an amortization agreement that is consistent with MPP program policies.

- Customers must have a delinquent account. For example, Eversource customers must have an account balance of $100 or more that is at least 60 days overdue.[11] [Note: United Illuminating (UI), Southern CT Gas (SCG), and Connecticut Natural Gas (CNG) customers are not required to have an arrearage to participate in the MPP program.]

The MPP programs all operate as follows:[12]

- Customers can apply to join the program when their account becomes delinquent. They must also apply for energy assistance at the same time. This means that, in practice, arrearage forgiveness eligibility matches state CEAP (LIHEAP) eligibility. [Note: UI, SCG, and CNG customers do not have to have an arrearage to participate. UI has not been able to furnish statistic on what share of MPP customers start the program with a $0 balance.]

- The utility calculates the customer's monthly payment based on 1/12th of their annual electric or gas consumption minus the amount of bill payment assistance they expect to receive, then adds on an affordable payment towards their arrears. Utilities must include CEAP (LIHEAP) funds as well as energy assistance payments from non-traditional sources such as "community based organizations, Operation Fuel, the Salvation Army, the American Red Cross, churches and other faith-based and civic organizations when CEAP funds are not available and the customer has completed the CEAP application process and been deemed eligible to receive CEAP funding."[13]

- On April 30th, if the customer has made their payments since November 1st (or since joining the program, if they joined after November 1st), the utility will forgive an amount equal to the total amount of the customer's payment plus the amount of bill payment assistance they have received. This is referred to as Phase I of the program. Any payments missed during Phase I must be made up by May 1st in order for the customer to qualify for a matching payment.

- If customer compliance continues from April 30th to October 31st, the utility must again forgive an amount equal to the customer's total payments plus their assistance payments. This is referred to as Phase II of the program. Any payments missed in Phase II must be made up by October 31st.

- Customers may participate in a Matching Payment Program until their balance is zero, but they may not receive a credit to their account through the program.

Funding for the electric utilities' arrearage forgiveness programs comes from a Systems Benefits Charge (SBC). Connecticut's public electric utilities collect funds for a variety of programs through the Combined Public Benefits (CPB) charge on all electric bills. The CPB charge is a combination of three separate fees -- the System Benefits Charge (SBC), the Conservation and Load Management (C&LM) charge, and the Renewable Energy Investment charge – all of which were authorized in Connecticut's 1998 electric utility restructuring legislation.[14] Section 18 of the restructuring act allows the PURA to set the amount of the SBC. PURA reviews electric utilities' SBC annually to reconcile the amount collected with the amount spent.

[11] https://www.eversource.com/Content/ct-c/residential/programs-services/financial-assistance/nu-start

[12] Arrearage Forgiveness Program Joint Plan Submission for 2015-2016.

[13] Docket No. 15-06-25, Sept. 15 2015.

[14] https://www.cga.ct.gov/ps98/Act/pa/1998PA-00028-R00HB-05005-PA.htm

The gas utilities are also permitted to recover the costs of their arrearage forgiveness programs. However, there is no SBC on gas bills. Instead, the cost of the program is included in the gas companies' rates. Utilities provide the PURA with information on program costs during their rate case negotiations.

Table 3.11 shows each utility's spending on MPP in 2014. In total, the five IOUs in Connecticut spent at least $43.3 million on the MPP program. We estimate that the CEAP LIHEAP program furnished about $33.8 million in heating assistance to households that heat with natural gas or electricity. So, the MPP program more than doubles the amount of energy assistance available to low-income households in Connecticut. However, those funds are only available to households who have arrearages on their accounts.

Table 3.11
2014-15 MPP Funding by Utility

Utility	2014-15 Funding	% of Total Funding
United Illuminating	$6,886,547*	16%
Connecticut Light & Power (Eversource)	$7,384,053	17%
Southern Connecticut Gas	$21,065,678	49%
Connecticut Natural Gas	$7,968,815	18%
Yankee Gas (Eversource)	N/A	N/A
Total	$43,305,093	100%

Source: 2016 Report of the Low-Income Advisory Board.
Source for CL&P/Eversource: Filing to PURA dated 1/8/2015 re: Docket No. 99-03-36RE15.
* Funding for MPP for electric heating customers and MaPP for non-heating electric customers.

Table 3.12 shows levels of MPP program participation for 2014-2015.[15] It shows that the utilities reported serving 68,471 customers. It is useful to note that the LIHEAP program reported serving 63,399 natural gas and electric heat clients during that same time period. This suggests that there was a very high rate of overlap between LIHEAP program participation and MPP program participation.

Table 3.12
2014-15 MPP Participants by Utility

Utility	Participating Households	Successful Households	Success Rate
United Illuminating	3,255	1,701	52%
Connecticut Light & Power (Eversource)	18,039	11,579	64%
Southern Connecticut Gas	14,625	6,815	47%
Connecticut Natural Gas	14,964	7,406	49%
Yankee Gas (Eversource)	17,588	9,192	52%
Total	68,471	36,693	54%

It is unclear whether the funding levels presented in Table 3.11 represent "commitments" by the utilities to forgive arrearages for participants, or if they represent actual program matching cost

[15] 2015-2016 Joint Arrearage Forgiveness Plan
http://www.dpuc.state.ct.us/dockcurr.nsf/8e6fc37a54110e3e852576190052b64d/5b157084549b863585257e7500710da2?OpenDocument

"expenditures" for successful program participants. Tables 3.13a and 3.13b show estimates of the average benefits per customer. Table 3.13a shows the average "potential" benefit to customers if they are successful on the program assuming that the reporting funding levels represent "commitments." Table 3.13b shows the average "actual" benefit to customers that were successful on the program assuming that the reported funding levels represent actual customer credits.

Table 3.13a shows that the "commitments" for forgiveness (assuming that reported funding represents commitments rather than credits) made by the different utilities vary considerably, from an estimated $409 per customer for CL&P/Eversource to an estimated $1,442 per customer for Southern Connecticut Gas. Since the two statistics used to develop this table came from different sources, it is possible that they are not reporting on the same populations. However, the spending levels came from data submitted by the utilities to the Low Income Energy Advisory Board (LIEAB) and the number of participants came from the utilities' Joint Plan Submission to PURA. So, it seems that they should be consistent.

Table 3.13a
Benefits per Customer: Funding = Commitments

Utility	Program Funding	Participants	Commitment per Customer
United Illuminating	N/A*	3,255	N/A
Connecticut Light & Power (Eversource)	$7,384,053	18,039	$409
Southern Connecticut Gas	$21,065,678	14,625	$1,442
Connecticut Natural Gas	$7,968,815	14,964	$534
Yankee Gas (Eversource)	N/A	N/A	N/A
Total	$43,305,093	50,883	$851

* MPP electric heating funding not separated from MaPP funding in LIEAB Report.

Similarly, Table 3.13b shows considerable variation in the benefits granted to each successful participant (assuming that the reported funding represents credits granted to customers), from $636 per customer for CL&P/Eversource to over $3,000 per participant for Southern Connecticut Gas.

Table 3.13b
Benefits per Customer: Funding = Actual Forgiveness

Utility	Program Funding	Successful Participants	Spending per Customers
United Illuminating	N/A*	1,701	N/A
Connecticut Light & Power	$7,384,053	11,579	$636
Southern Connecticut Gas	$21,065,678	6,815	$3,090
Connecticut Natural Gas	$7,968,815	7,406	$1,075
Yankee Gas	N/A	N/A	N/A
Total	$43,305,093	36,693	$1,180

*MPP electric heating funding not separated from MaPP funding in LIEAB Report.

Based on these statistics, it appears that the benefits offered through the arrearage forgiveness program are considerably higher than those paid through CEAP/CHAP energy assistance by the LIHEAP program. And, it appears that almost all LIHEAP heating assistance recipients who use natural gas or electricity for their main heating fuel are likely to participate in the arrearage forgiveness program.

It is important to note that the Matching Payment Program has one component that is particularly proactive in helping to make payments for low-income customers affordable. Households who cannot afford to pay the amount requested by the utility for the arrearage forgiveness program "can ask to be referred to a social service agency for a review of the household's income and expenses to determine if a lower payment will be allowed." If such a household makes all required payments, they will have their arrearage (the shortfall between their retail bill and their "below budget") payment forgiven. We were not able to locate any information that documents the number of MPP participants who are granted these "below budget" payments.

United Illuminating company customers who enroll in the program and do not have an arrearage can receive a "below budget" payment amount. The program matching payments are applied to the difference between the customer's budget amount and the "below budget" payment amount. The combination of the customer's CEAP payment, their "below budget" bill payments, and their matching payments can result in a zero balance at the end of the payment period. However, if those three amounts are less than the total customer bill, the customer will end the payment period with a positive balance.

3.2.2 Non-Heating Electric Arrearage Forgiveness Programs

The two investor-owned electric utilities in Connecticut offer an arrearage forgiveness program for customers with electric accounts who do not heat with electricity. The CL&P/Eversource program is called the New Start Program. The United Illuminating Program is called the MaPP program. The following statistics are available for the programs.

- UI MaPP - Funding for the UI MaPP program was included in the funding reported to the LIEAB in their January 2016 report. We do not have additional details on this program.

- CL&P/Eversource New Start - In a filing to PURA on 1/8/2015, CL&P/Eversource furnished detailed information on the New Start program. CL&P/Eversource reported that the New Start program had 33,232 program participants in the 2013-2014 program year and that the "New Start balances as of November 2014" were $22,295,148 – about $670 per participant.

It is important to note that the "Matching Payments" for the New Start 2013-2014 program year were much higher than they were for the 2012-2013 program year. The report notes that "New Start was converted from a 3 year program to a 1 year program, resulting in an increase in monthly write-offs."

3.3 Operation Fuel Assistance Programs

Operation Fuel is a nonprofit fuel fund in Connecticut that is funded in part by ratepayer dollars. It partners with local community-based organizations to provide energy assistance grants. Table 3.14 shows the total amount of energy assistance funds and the total number of households that received assistance from Operation Fuel from July 2014 through June 2015. During that time period, Operation Fuel provided about $3.6 million in energy assistance to 8,314 Connecticut low-income households.

Table 3.14
Total 2014-15 Operation Fuel Energy Assistance Funds & Recipient Households

	2014-15 Total
Energy Assistance Funds	$3,614,809
Households Served	8,314
Average Benefit	$435

Operation Fuel currently has a contract with the state of Connecticut to distribute some of the money collected through the Systems Benefit Charge (SBC) on electric bills. In the period from July 2014 through June 2015, Operation Fuel received $2,100,000 from the SBC. This represents 60% of its total income for residential programs, which was $3,506,886 during the same period.[16] Utility customers can also contribute to Operation Fuel through the Add-a-Dollar option on their monthly bills. As of 2015, municipal utilities in Connecticut were also required to include the Add-a-Dollar option on their customers' bills. Two utilities, Eversource and United Illuminating, match their customers' Add-a-Dollar contributions. Table 3.14 shows the sources of funding for residential programs for Operation Fuel for July 2014 through June 2015.

Table 3.14
Operation Fuel 2014-2015 Residential Program Funding

Source of Funds	Dollars	%
Systems Benefit Charge	$2,100,000	60%
Add-a-Dollar	$460,010	13%
Utility Shareholder Match	$124,599	4%
Foundation Grants	$305,770	9%
Individuals	$382,077	11%
Energy Related Industry	$53,610	2%
Corporations & Small Business	$46,156	1%
Faith Communities	$21,820	<1%
Special Events	$7,760	<1%
Interest Income	$5,075	<1%
Total	$3,506,886	100%

More than 100 community-based organizations conduct intake for Operation Fuel. These organizations also provide referrals for food, clothing, health services, childcare, and other forms of assistance. The organizations that work with Operation Fuel are not part of the CAA network that implements MPP and CEAP.

3.4 Low Income Energy Assistance Program Evaluations

Our research did not identify an independent evaluation of Connecticut's ratepayer-funded energy assistance programs. However, the program has twice been reviewed by other parts of the state government.

The Department of Energy and Environmental Protection reviewed MPP in order to determine if SBC funds should be used to fund a low-income discount rate instead of an arrearage forgiveness program.[17] The goals of this report were to analyze:

- "possible impacts [of a discount rate] on existing customers who qualify for state assistance"
- "any recommended modifications to current state assistance programs [MPP]"
- "steps to achieve a low-income rate no less than ninety per cent of the standard service rate"

[16] http://www.operationfuel.org/wp-content/uploads/FINAL-Proof-Operation-Fuel-2014-2015-Annual-Report1.pdf

[17] This report was required by Section 112(e) of Public Act 11-80, An Act Concerning the Establishment of the Department of Energy and Environmental Protection and Planning for Connecticut's Energy Future.

The report concluded that “the longstanding Matching Payment Program for low income utility customers has worthy attributes and goals, but may be underperforming in terms of reducing utility uncollectible expenses, improving customer payment habits, and other factors.”

The Low-Income Energy Advisory Board (LIEAB) also conducted a review of the ratepayer-funded energy assistance and energy efficiency programs and made recommendations to improve the program implementation. That report furnishes an excellent overview of and statistics about the different publicly-funded and ratepayer-funded programs that assist low-income households in Connecticut. The LIEAB made a series of recommendations to make these programs more efficient and more effective.

Section 4. Low-Income Energy Efficiency Programs

This section of the report furnishes information on the publicly-funded and ratepayer-funded energy efficiency programs that are available to Connecticut's low-income households. Connecticut receives some funding from the federal government for the WAP program. Connecticut ratepayers make a significant contribution to energy efficiency programs for low-income households.

Energy efficiency programs complement the impact of energy assistance by helping to reduce the energy usage in homes and make energy more affordable for low-income households over the long run. Energy efficiency programs are demonstrated to reduce energy usage in low-income households by between 5% and 25% depending on the level of investment made in the home and the type of energy efficiency measures installed. That reduction can have a significant impact on energy affordability for low-income households.

4.1 Publicly-Funded Energy Efficiency Programs - Weatherization Assistance Program

The Department of Energy & Environmental Protection has administered WAP funds in Connecticut since 2012. Prior to 2012, WAP was run by the Department of Social Services. DSS was also responsible for administering all American Recovery and Reinvestment Act (ARRA) funds. Five CAAs implement the program as sub-grantees to DEEP.

The WAP funds available to Connecticut have historically been low when compared to the other low-income energy efficiency programs in the state. The following table shows the total amount of funding and households served by WAP in 2014. In 2014, the WAP program spent an average of about $5,690 per home it served. However, the program was only able to serve 433 households, less than 0.1% of the 434,000 low-income households in Connecticut.

Table 4.1
Total WAP Funds & Total Households Served in 2014

	2014 Totals
WAP Funds	$2,463,560
Households Served	433
Average per Household	$5,690

The WAP eligibility requirements in Connecticut are as follows.[18]

- Income must be at or below 60% SMI for single-family buildings; at least two-thirds of tenants must be at or below 60% SMI for multi-family buildings.
- The dwelling cannot have been weatherized by the Connecticut Weatherization Program at any point after September 30, 1994.
- The dwelling cannot be for sale or listed for sale within six months of the work's completion.
- The dwelling cannot be in foreclosure or loan mediation.

Households that live in rental units are eligible for WAP. However, landlords of rental applicants may be asked for a landlord contribution of 20% of the material cost, up to a maximum of $500 per eligible unit.

[18] http://www.ct.gov/deep/cwp/view.asp?a=4405&q=509366&deepNav_GID=2121

Connecticut has not used any of its LIHEAP grant to fund weatherization services. [LIHEAP is allowed to transfer up to 15% of its LIHEAP grant to the WAP program.] A small amount of LIHEAP funds are spent on energy education through Assurance 16. Using Assurance 16 funds, CAAs offer educational brochures and/or workshops on energy efficiency. They also provide referrals to weatherization services that provide energy saving measures like high efficiency light bulbs. [Note: In the FY 2017 State Plan, the LIHEAP program indicates that they are planning to make some LIHEAP funds available for WAP.]

The FY 2016 LIHEAP State Plan indicates that the LIHEAP program intends to spend $1.5 million on a heating equipment repair and replacement program. However, the purpose of a heating equipment repair and replacement program is not to increase energy efficiency in the home. Rather, the purpose is to ensure that the household can heat its home safely.

4.2 Ratepayer-Funded Energy Efficiency Programs

Connecticut's main ratepayer-funded low-income energy efficiency program is the Home Energy Solutions – Income-Eligible (HES-IE). Like Connecticut's other ratepayer-funded energy efficiency programs, HES-IE is run by Energize CT, the state's energy efficiency administrator. Along with the non-low-income Home Energy Solutions program, HES-IE is seen as a way to comply with the legislature's 2011 goal of weatherizing 80% of Connecticut homes by 2030.[19]

Low-income customers can apply to the program either through their utility or through their local agency. The basic HES-IE eligibility guidelines are the same as WAP eligibility guidelines. Customers are eligible if their household is at or below 60% SMI. Multi-family buildings are eligible if two-thirds of the residents are at or below 60% SMI. Low-income customers who live in rental units are eligible to participate in the HES-IE program, but landlords are required to sign off on the program application and may be required to provide a co-pay.

HES-IE is one of a number of programs funded by the Connecticut Energy Efficiency Fund (CEEF) which in turn is funded by Connecticut ratepayers, the Regional Greenhouse Gas Initiative (RGGI), and the ISO New England forward capacity market. Connecticut's electric and natural gas utilities develop a triennial plan for energy efficiency programs, including HES-IE. The Connecticut Energy Efficiency Board (EEB) advises and assists the utilities in the development of the plan. The Department of Energy and Environmental Protection reviews and approves or modifies the plan.

Until 2005, there was no statutory requirement that any energy efficiency money be spent on low-income customers. In 2005, a bill[20] was passed that required the inclusion of low-income customers in gas utilities' conservation programs. This language was eventually also applied to the statewide conservation and load management plan, and thus to electric utilities as well as gas utilities. Specifically, the statute says that energy conservation funds must be used for "conservation and load management programs, including programs that benefit low-income individuals."[21]

[19] Connecticut Public Act No. 11-80, Section 33 https://www.cga.ct.gov/2011/act/pa/pdf/2011PA-00080-R00SB-01243-PA.pdf

[20] https://www.cga.ct.gov/2013/act/pa/pdf/2013PA-00298-R00HB-06360-PA.pdf

[21] Conn. Gen. Stat. §16-245m https://www.cga.ct.gov/current/pub/chap_283.htm

Table 4.2 displays the total funds and total households served by the HES-IE program in 2014.[22] The program received approximately $33 million in 2014.

Table 4.2
Total HES-IE Funds & Total Households Served in 2014

	2014 Totals
HES-IE Funds	$33,453,293
Households Served	19,659
Spending per Household	$1,702

Table 4.3 displays the sources of funding for the HES-IE program.[23] In 2014, the program received significantly more money from the electric C&LM charge than from the natural gas CAM.

Table 4.3
Sources of 2014 HES-IE Funds

Source	2014 Funds
Electric Utilities	$21,385,612
Gas Utilities	$12,067,681
Total	$33,453,293

Table 4.4 shows that the HES-IE program served 5% of Connecticut's income-eligible population in 2014.

Table 4.4
Percent of Income-Eligible Population Served by HES-IE

	2014 Totals
2014 Households Served	19,659
Income-Eligible Population	436,483
% of Eligible Population Served	5%

4.3 Low Income Energy Efficiency Program Evaluations

The HES-IE program was evaluated in 2014 by the NMR Group and the Cadmus Group.[24] The evaluation covered the 2010 and 2011 program years for both the market-rate Home Energy Solutions (HES) program and the low-income HES-IE program. The evaluation includes two sections:

- A whole-house bill analysis
- Estimates of measure-level savings

In the first section, the evaluators used billing data to calculate whole-house energy savings. The change in energy usage was calculated for 2011 program participants as well as for a comparison group of later program participants. To find the net savings that result from the program, the difference between the

[22] Energy Efficiency Board 2014 Programs and Operations Report. 1 Mar 2015. http://www.energizect.com/sites/default/files/uploads/Final%20ALR%202014%20Pages.2.26.15.pdf
[23] Energy Efficiency Board 2014 Programs and Operations Report. 1 Mar 2015. http://www.energizect.com/sites/default/files/uploads/Final%20ALR%202014%20Pages.2.26.15.pdf
[24] http://www.neep.org/sites/default/files/resources/HES%20and%20HES-IE%20Impact%20Evaluation%20(R16),%20Final%20Report,%2012-31-14.pdf

2011 participant group's savings and the comparison group's savings was calculated. These net savings results are summarized in Table 4.5 below.

Table 4.5
2011 HES-IE Energy Savings from 2014 Evaluation Report

Account Type		Pre-Program Usage	Savings	Savings as % of Pre-Usage
Electric	Electric Heating	8,918 kWh	1,231 kWh	14%
	Non-Electric Heating	6,485 kWh	905 kWh	14%
Natural Gas		840 ccf	73 ccf	9%

In the second section, the evaluators used several methods to estimate measure-level savings. First, they used a fixed-effects savings regression model to estimate measure-level savings based on billing data. These estimates had large margins of error. Next, they used an engineering analysis to predict measure-level savings using the characteristics reported about each home. This method does not make use of any real usage data. The evaluation also reports the installation rate for each measure. These are displayed in the table 4.6.

Table 4.6
HES-IE Measure Installation Rates from 2014 Evaluation Report

Measure Type	Measure Category	Measure	Installation Rate by Utility	
			CL&P/Eversource	UI
Electric	Lighting	CFLs	84%	96%
	Water Heat	Water heating bundle (low-flow showerheads, faucet aerators, pipe insulation)	40%	21%
		Water heater replacement	3%	0%
	Shell	Air sealing	32%	53%
		Attic insulation	9%	2%
		Wall insulation	2%	<1%
		Other insulation	2%	0%
		Windows	2%	0%
	HVAC	Ductless heat pump	21%	7%
		Duct sealing	<1%	4%
		Window AC	4%	n/a
		Central AC	0%	<1%
	Appliance	Refrigerator	26%	0%
		Freezer	3%	0%
		Other appliance	0%	13%

Measure Type	Measure Category	Measure	Installation Rate by Utility		
			CNG	SCG	YGS
Natural Gas	Shell	Air sealing	77%	96%	68%
		Attic insulation	5%	4%	26%
		Wall insulation	12%	3%	22%
		Windows	2%	0%	5%
	Water Heating	Water heating bundle (low-flow showerheads, faucet aerators, pipe insulation)	82%	90%	63%
		Water heater temperature setback	32%	<1%	5%
	HVAC	Duct sealing			
		Heating system replacement	<1%	0%	12%
	Appliance	Other appliance	<1%	0%	1%

4.4 Equitable Distribution Data

DEEP is required by statute to furnish an annual report to the legislature regarding the "Equitable Distribution of Conservation and Renewable Energy Funds." The 2013 report noted that it "considers whether funding is distributed on an equitable basis to "small load" customers in distressed census tracts." That report focuses on the geographic distribution of all energy efficiency funds.

This study is focused on the demographic distribution of energy efficiency spending on low-income households. It accepts that DEEP reviews and reports on the geographic distribution of spending on energy efficiency programs. However, it finds that DEEP does not assess or report on the demographic distribution of spending on energy efficiency programs.

Section 5 – Summary of Findings and Recommendations

The purpose of this report is to furnish Operation Fuel and other interested parties with information that they can use to understand the energy needs of Connecticut's low-income households, assess the effectiveness of existing low-income energy assistance and energy efficiency programs, and consider whether there are options and alternatives that could enhance the effectiveness of those programs. In this section of the report we review the key findings from the study and identify opportunities for program managers and policymakers in Connecticut to further expand their understanding of the low-income population and the programs that serve them. We also compare and contrast the Connecticut programs with those implemented in other jurisdictions, and discuss the extent to which the Connecticut programs have adopted "best practices" in their energy assistance and energy efficiency programs.

5.1 Energy Needs of Low-Income Households

Connecticut defines low-income households as those with incomes at or below 60% of state median income. About 32% of Connecticut's households (436,483) are income-eligible for low-income energy assistance and energy efficiency programs. [Note: Previously Connecticut's income threshold was 150% of the HHS poverty guidelines; about 16% of Connecticut's households (219,292) qualified for low-income programs under those guidelines.] The current guideline is the maximum allowable for the Federal LIHEAP program. About one-half of states set their income guidelines above 150% of poverty, about one-fourth set them at 150% of poverty, and one-fourth set them below 150% of poverty. Most states in the Northeast and Midwest set their income guidelines at or above 150% percent of poverty.

The following are some important demographic and housing statistics related to Connecticut's low-income households.

- Income – The average income for low-income households in Connecticut is $24,134. Almost one-half of these households have income of less than $20,000. The income limit for some larger households is above $80,000. However, only 15% of the households who are defined as low-income have income of $40,000 or more.

- Types of Households – The two most common types of households in the low-income population are elderly individuals (25%) and one parent families (21%). However, there are a substantial number of households with two or more elderly individuals, two-parent families, and non-elderly individuals without children.

- Vulnerable Household Members – About 70% of low-income households have a vulnerable member, including an elderly individual, a disabled person, or a child under age 6.

- Housing Unit Type – About 40% of low-income households live in single family homes while 60% live in apartments in multifamily buildings. Of those in multifamily buildings, about one-half are in small buildings (2-4 units) and the other one-half are in large buildings (5+ units).

- Ownership Status – About 40% of low-income households own their homes, while 60% are renters. Over three fourths of the households in single family homes are owners, while almost 90% of the households in multifamily buildings are renters.

No one type of household or housing units typifies low-income households in Connecticut. They are a diverse population that has diverse needs. However, there are certain population segments that might serve as a focus for various types of initiatives. For example, about 60% of low-income households live in multifamily buildings. Delivery of energy efficiency programs to these households would need to be

different from delivery of those services to single family homes since building owners would need to be engaged in the process for multifamily buildings.

The following are some important energy statistics related to Connecticut's low-income households.

- Main Heating Fuel – Almost 40% of low-income households use natural gas as their main heating fuel, one-third use fuel oil, and about one-fourth use electricity. However, that varies by housing unit type. Delivered fuels are the main heating source for over 60% of single family homes. Natural gas is the main heating fuel for over 50% of small multifamily buildings. Electricity is the main heating fuel for almost one-half of large multifamily buildings.

- Payment for Fuels – About 85% of low-income households pay for their main heating fuel directly, while 15% have their heat included in their rent or fee. Almost all low-income households in single family homes pay for their main heat directly, but only 60% of low-income households in large multifamily buildings pay directly.

- Average Energy Bills – The average total energy bill for low-income households that pay for their main heating fuel directly is $3,033; about one-half of that is for their heating fuel and about one-half is for their electricity. Households whose main heating fuel is fuel oil have the highest average bills of $3,719. Those whose main heating fuel is electricity have the lowest average energy bills of $1,919.

- Energy Burden – On average, low-income households in Connecticut who pay directly for their main heating fuel have a "group mean energy burden" of 11.8%. [Group mean is obtained by dividing the average energy expenditures for the group by the average income for the group.] Households with income less than 100% of the poverty guidelines have group mean energy burden of over 30% of income, while those with income that is 200% of the poverty guideline or higher have group mean energy burden of about 8%.

The energy needs of low-income households in Connecticut are similar to those in neighboring states, but are quite different from those of low-income households in other regions. About 80% of low-income households nationally use natural gas or electricity as their main heating fuel. But, in Connecticut and most other New England states, only about 60% of low-income households use those fuels, while 40% use delivered fuels. The national average energy expenditures for low-income households is about $1,850, while the average for Connecticut is over $3,000, about 60% higher than the national average.

The differences between Connecticut and other states are important when considering "best practices" for energy assistance and energy efficiency programs. First, the higher energy costs in Connecticut will make it more expensive to implement energy affordability programs for Connecticut than it would for states in lower cost regions. Second, the higher energy costs in Connecticut make energy efficiency measures comparatively more competitive as an affordability strategy; households in Connecticut have greater benefits from any therm of natural gas, kWh of electricity, or gallon of fuel oil saved through energy efficiency measures.

5.2 Effectiveness of Publicly-Funded Energy Assistance Programs

There are 436,483 low-income households in Connecticut. Of those, 99,088 were served with LIHEAP energy assistance in the 2014-2015 program year, and another 95,229 SNAP households received a "nominal benefit" that helps the household to qualify for higher SNAP benefits. Overall, about 45% of low-income households received a LIHEAP grant of some type and about 23% received a grant of $100 or more. At the national level, about 16% of low-income households received LIHEAP grants. With respect

to nearby states, Massachusetts served about 21% of eligible households, New York served about 25% of eligible households, New Jersey served about 28% of eligible households, and New Hampshire served about 24% of eligible households. [Note: In all cases the statistic represents the number of households served with benefits of $100 or more.]

There are two important considerations with respect to the benefit determination procedures for LIHEAP. First, it is important to consider whether lower-income households who have higher energy burden receive higher benefits to offset their higher burden. Second, it is important to consider whether low-income households who use higher priced fuels receive higher benefits.

Table 5.1 shows the gross (i.e. pre-LIHEAP) and net (i.e., post-LIHEAP) energy burdens for households that heat with natural gas. It shows that the lowest income households have the highest gross energy burden and that these households receive the highest benefits. However, even after accounting for receipt of LIHEAP, the average energy burden for the lowest income households is still almost 25% of income, while households with incomes at or above 150% of the poverty guideline have average energy burdens of less than 10% of income. In some other states, the benefit matrix has a greater differential in terms of the benefit size by income.

Table 5.1
Gross and Net Energy Burden by Poverty Group in FY 2015 - Natural Gas Main Heat

Poverty Group	Average Energy Bill	Average Income	Gross Burden	Average Benefit	Net Burden
Less than 100%	$3,097	$10,271	30.2%	$568	24.6%
100% to less than 150%	$3,022	$23,170	13.0%	$446	11.1%
150% to less than 200%	$3,089	$32,108	9.6%	$333	8.6%
More than 200%	$3,141	$40,561	7.7%	$273	7.1%

Table 5.2 shows the gross and net energy burdens for the lower-income households by main heating fuel. Since it appears that almost all households that use fuel oil as their main heat receive a Winter Crisis benefit, we have included that benefit in the analysis. And, we also look at the gross and net energy burdens for households who receive Winter Crisis and Safety Net Assistance benefits. Households with income at or below 100% of the poverty guideline receive the same Heating Assistance benefit for all fuels. However, after receipt of assistance, the net energy burden for households with natural gas as their main heating fuel is almost 2 times the net burden for households who heat with electricity. And, even after receiving a Winter Crisis benefit, the average net burden for households who heat with fuel oil is still higher than either the net burden for natural gas main heaters or electric main heaters. It is only when the household receives additional Safety Net Assistance grants that the net burden for fuel oil main heat households falls below that of natural gas main heat households.

Table 5.2
Gross and Net Energy Burden by Main Heat in FY 2015
Households with Income < 100% of Poverty

Main Heating Fuel	Average Energy Bill	Average Income	Gross Burden	Average Benefit	Net Burden
Natural Gas	$3,097	$10,271	30.2%	$568	24.6%
Electricity	$1,676	$8,125	20.6%	$568	13.6%
Fuel Oil	$3,714	$8,933	41.6%	$1,118	29.1%
Fuel Oil w/ Safety Net	$3,174	$8,933	41.6%	$1,716	22.4%

It is important to note that the statistics presented in these tables are based on self-reported energy expenditures for all income-eligible households in Connecticut who report paying a heating bill directly to their energy vendor. These data could be subject to reporting error. For FY 2016, the Connecticut LIHEAP office is required by the federal LIHEAP office to collect and report energy expenditure data for LIHEAP recipients served in FY 2016 (i.e., program year 2015-2016). Those data can be expected to furnish better quality data on actual energy expenditures for LIHEAP recipient households.

In many other states, the benefit matrix will furnish higher benefits to households who use higher priced main heating fuels. However, a Connecticut statute prevents the LIHEAP office from offering different benefits to households that have different main heating fuels. In some states, the benefit determination for LIHEAP uses the household's actual energy bills to set benefit levels so that benefits are more closely targeted to individual household need. The data being collection by the Connecticut LIHEAP office for FY 2016 could be used to set benefit levels that are more closely aligned with individual household energy needs. However, it is unclear whether setting benefits based on actual bills would be consistent with or contrary to the Connecticut statute.

5.3 Effectiveness of Ratepayer-Funded Energy Assistance Programs

The ratepayer-funded energy assistance programs include the MPP programs offered by the IOUs to hardship customers who heat with natural gas and electricity and have arrearages, the New Start and MaPP programs offered by the electric IOUs to their non-heating electric hardship customers, and the supplemental programs offered by Operation Fuel.

One important question is whether the publicly-funded and ratepayer-funded programs are coordinated. In general, Connecticut's program receive high marks from that perspective. In order to be eligible for the ratepayer-funded programs, natural gas and electric customers must apply for and be determined to be eligible for energy assistance through the CEAP/LIHEAP program. That coordination helps to ensure that households receive all of the benefits for which they are eligible. The approach used by Connecticut is consistent with programs implemented by New Jersey, Ohio, Wisconsin, and Nevada from that perspective. In Pennsylvania, the ratepayer-funded programs are not consistently coordinated with the publicly-funded programs; a fact that sometimes results in eligible households not receiving LIHEAP benefits and instead relying completely on ratepayer-funded benefits.

A second important question is whether program participants are successful on the ratepayer-funded program. Table 5.3 shows levels of MPP program participation for 2014-2015.25 It shows that the utilities reported serving 68,471 customers and that 36,693 households successfully made their required payments. Overall, the program success rate was 54%. That compares favorably with the success rate of programs implemented in other jurisdictions. However, as will be discussed below, the interpretation of success is quite different for programs implemented in other jurisdictions.

[25] 2015-2016 Joint Arrearage Forgiveness Plan
http://www.dpuc.state.ct.us/dockcurr.nsf/8e6fc37a54110e3e852576190052b64d/5b157084549b863585257e7500710da2?OpenDocument

Table 5.3
2014-15 MPP Participants by Utility

Utility	Participating Households	Successful Households	Success Rate
United Illuminating	3,255	1,701	52%
Connecticut Light & Power (Eversource)	18,039	11,579	64%
Southern Connecticut Gas	14,625	6,815	47%
Connecticut Natural Gas	14,964	7,406	49%
Yankee Gas (Eversource)	17,588	9,192	52%
Total	68,471	36,693	54%

However, there are several questions related to the program success rate that are unanswered by the utilities' Joint Plan Submissions.

- First, what are the characteristics of the households who are successful on the program? Are the successful participants evenly distributed across income groups? Or, is one income group more likely to succeed than another?

- Second, how does the "Below Budget" payment option affect program success? If a household believes that they are unable to make the requested budget payment amount, they are allowed to complete a financial statement and thereby receive a "Below Budget" payment amount that can be as low as $50 per month. It seems the households who take advantage of this option would be more likely to be successful on the program. However, the submission does not look at that question.

- Third, it is unclear how many households use this program just for one year, compared to the number who participated year after year. As noted in Section 3 of the report, the LIHEAP program served 63,399 households who have natural gas or electric main heat. This suggests that there is a very high overlap between the MPP program and the LIHEAP program.

Most ratepayer-funded energy assistance programs in other jurisdictions are "proactive" affordable payment programs. In those programs, low-income customers are assigned a payment amount based on some type of affordable payment determination procedure. One common approach is to ask customers to pay a certain percentage of their income for their energy; New Jersey targets 6% of income, Ohio targets 12% of income, and the Pennsylvania Bureau of Consumer Services sets different targets by income level that are in the range of 15% of income. In other jurisdictions, low-income customers are given a rate discount; California offers a discount of 25% and Massachusetts offers a discount of 25%.

There are two very important differences between the programs in other jurisdictions and the Connecticut MPP program.

- Proactive vs. Reactive – The programs in other jurisdictions acknowledge that many low-income customers face challenges in paying their energy bill, offer an "affordable" bill, and define program success as the share of customers who pay their "affordable" bill. The MPP and MaPP programs, in comparison, only offer benefits to customers after they have incurred an arrearage. [Note: The UI MPP programs are the exception.] So, first the customer has to "demonstrate" that they cannot afford to pay the bill, and then they are offered an opportunity to receive what amounts to a "retroactive discount" on their bill. Moreover, once they have incurred an arrearage,

they are allowed to receive a "Below Budget" monthly payment amount that is based on what is determined to be "affordable."

- Incremental vs. Episodic – The programs in other jurisdictions usually grant low-income program participants benefits for each successful payment they make to the utility. If the customer has a budget bill of $150 and is assigned a payment amount of $100, they receive a $50 credit each time they make their $100 payment. The Connecticut MPP and MaPP programs are "all or nothing." If the customer successfully makes all of their payments during Phase 1 of the program, they receive a matching arrearage forgiveness amount. However, if they do not make all payments, they receive no benefit. While the Connecticut program furnishes the customer a very strong incentive to make all payments, it is unclear whether the program success is evenly distributed across the different types of customers.

The Connecticut program offers certain advantages over ratepayer-funded energy assistance programs that have been implemented in other jurisdictions.

- Demonstrated Affordability Problems – Some households may be low-income, but have sufficient resources to pay their energy bills; they might have a home with no mortgage, might be healthy and have few medical bills, and/or they receive financial support from a relative. Other households may have higher income, but do not have sufficient resources to pay their energy bill; they might have to live in an expensive community to retain their job, they might have a health problem and high out of pocket health care costs, they might be paying education costs for their child. One advantage of the Connecticut program is that it furnishes benefits only to those households with a "demonstrated" need.

- Short Term Cost Minimization Strategy – In the short run, the Connecticut program is likely to be the lowest cost. It only serves those customers who have an arrearage; it doesn't give benefits to customers who pay their bills.

- Below Budget Assessment – The below budget financial assessment tailors payments to the circumstances of individual clients. Rather than assign a simple "percent of income" payment amount, it looks more carefully at the client's actual financial circumstances before assigning a payment amount.

However, the Connecticut program appears to have disadvantages in other respects.

- Penalty for Customers Who Pay Bills – All customers, including low-income customers, are paying for the energy assistance programs. Those low-income customers who pay their bills on time even when they must do without other basic necessities to do so, receive no benefit from the program.

- Fairness – Under other types of programs, all customers are treated in the same way. If the target percent of income is 10%, a customer with $10,000 in income is expected to pay $1,000 per year, a customer with $20,000 in income is expected to pay $2,000 per year, and a customer with $40,000 in income is expected to pay $4,000 year. If the bill discount is 25%, every customer who documents that they are income-eligible for the program receives a 25% discount. Under the Connecticut program, the amount received is dependent on the size of the customer's original arrearage and the amount they pay during the program period.

- Long-Term Cost – In the long run, it is unclear how Connecticut's low-income customers will respond to the incentives implicit in the Connecticut program. Since a customer can only receive program benefits if they are in an arrearage situation, it appears that, over the long run, the program would encourage low-income customers to build up an arrearage on their bills. While there is no evidence that this actually occurs, there also is no evidence that it does not occur.

Additional data and statistics would be needed to more effectively compare and contrast the Connecticut energy assistance programs with those implemented in other jurisdictions.

5.4 Effectiveness of Publicly-Funded Energy Efficiency Programs

The primary source of funding for publicly-funded energy efficiency is the Department of Energy Weatherization Assistance Program. In 2014, the program used $2,463,560 in funding and served 433 households.

The LIHEAP program is allowed to transfer up to 15% of the LIHEAP allocation to the WAP program. (Note: The share is 25% if the program applies for and is granted a waiver from the federal LIHEAP office). LIHEAP statistics show that about one-half of state programs transfer 10% or more of their funds to WAP. In a recent program year, only ten state LIHEAP programs did not transfer any funds to WAP.

If the Connecticut LIHEAP program had transferred 15% of funds to the WAP program, about $12.9 million would have been transferred. That would have served about 2,250 households. However, that would have meant either that the LIHEAP program would have served about 20% fewer households or that the program would have needed to cut benefits by about 20%.

The National WAP Evaluation showed that the WAP program saved about 18.5% of natural gas usage and about 7.1% of electric usage for single family homes treated by the program in the Cold Region. Applying those percentages to the Connecticut low-income energy expenditures for natural gas, it is likely that the delivery of WAP services would generate about $392 per household in energy savings.

It is difficult to make the trade-off between the very important short-term benefits of energy assistance and the equally important long-term benefits of energy efficiency. However, it is certainly important for Connecticut policymakers to periodically review those choices.

5.5 Effectiveness of Ratepayer-Funded Energy Efficiency Programs

Connecticut ratepayers have made a significant investment in low-income energy efficiency programs. In 2014, the programs served 19,659 with $33,453,293 in funding. The average investment per home - $1,702 - is somewhat lower than the investment per home through the WAP program. However, program funding is more than 13 times the funding for the WAP program and the number of households served is more than 45 times the number served by the WAP program. Over a five-year period, the Connecticut ratepayer-funded energy efficiency programs will serve close to 100,000 households. That is over 20% of all low-income households in the state, and is approximately equal to the number of households served each year by ratepayer-funded energy assistance programs.

The investment that Connecticut ratepayers make in low-income energy efficiency programs is one of the highest in the country among the twenty states that we have studied. In 2014, Connecticut spent about $77 per low-income household; that is higher than all of the other states we studied except for Wisconsin ($77) and Vermont ($138). On average, the twenty states that we studied spent about $35 per low-income household, less than one-half the amount spent by Connecticut. However, the average amount

spent per participant in the twenty states that we studied was about $3,400 per household, about twice the amount invested per participant in Connecticut.

There are a number of best practices that have been implemented in other states that Connecticut policymakers and program managers might consider.

- Targeting of Energy Assistance Customers – In a number of states (e.g., New Jersey, Ohio, Pennsylvania), the low-income energy efficiency programs target services to the households who receive ratepayer-funded energy assistance. In that way, the energy savings realized by low-income households who receive benefits from the ratepayer energy assistance program are likely to reduce those households' needs for energy assistance and thereby create a synergy between spending for low-income energy efficiency programs and low-income energy assistance programs.

- Targeting the Highest Usage Customers – The National Weatherization Assistance Program evaluation, as well as other evaluations of weatherization and electric energy efficiency programs consistently demonstrate that programs that target the highest usage homes achieve the highest energy savings and percentage savings per dollar spent on the program. And, since those households with the highest usage are likely to have the highest energy burden and the greatest need for energy assistance, targeting these high usage customers again achieves program synergies. When the data on energy usage become available through the LIHEAP program, there may be an opportunity to identify the highest usage energy assistance customers, provided that client confidentiality restrictions can be addressed.

The ratepayer energy efficiency programs might face both technical and regulatory/statutory challenges in implementing these practices. However, it might be useful for policymakers and program managers to consider these as options for future program design.

5.6 Information Needs

Good policymaking requires good information. In conducting this research, we obtained information on the LIHEAP program from the Department of Social Services, information on the ratepayer-funded energy assistance programs from the LIEAB report and from filings to PURA, information on the WAP program from the Weatherization Assistance Program Technical Assistance Center, and information on the ratepayer funded energy efficiency programs from publications of the Connecticut Energy Efficiency Board. The comprehensiveness of the information available from those sources varied considerably, particularly with respect to details needed to assess the effectiveness of different programs in meeting the needs of different parts of the population of low-income households.

5.6.1 Information on Energy Assistance Programs

The Department of Social Services had extensive information on both CEAP funding and on the households served by CEAP. The funding information allowed us to develop statistics on the share of funding that were used for different purposes, and to estimate how those funds were distributed by income group and main heating fuel type. In addition, the household-level data tracked by DSS allowed us to develop statistics on the share of income-eligible households served by the program by income group. Those data were very valuable in terms of developing information on program targeting.

The only information missing from the DSS data was information on the energy expenditures and burden of low-income households served by the program. For our analysis of gross and net energy burden, we used the self-reported energy expenditures from the ACS as a proxy for the expenditures of recipient

households. Once DSS completes collection of energy expenditure data for recipient households for FY 2016, that information gap will be filled.

One other useful set of information would be to track year-over-year participation in the CEAP program. Some households are expected to participate consistently over time (e.g., elderly and other fixed income households), while other households are likely to use benefits for only one or two years. It would be useful to have a better understanding of these program dynamics.

The information on the ratepayer-energy assistance programs was very limited. The joint filing submitted to PURA furnished comprehensive information on program design and implementation, but very limited information on program funding and program participants. The filing to PURA by CL&P/Eversource did furnish additional information on total program funding and the number of program participants. However it did not furnish details on program participants.

The following information would help policymakers and program managers to better understand who the program is serving and what benefits they are receiving:

- Demographic and Housing Characteristics of Participating and Successful Customers
    - Distribution by Income Group
    - Distribution by Household Size
    - Distribution by Poverty Group
    - Percent with Vulnerable Household Members
    - Distribution by Housing Unit Type
    - Percent that are Renters
    - Distribution by Race/Ethnicity
- Energy, Arrearage, and Benefit Information on Participating and Successful Customers
    - Mean and Distribution of Budget Bill by Demographic and Housing Characteristics
    - Mean and Distribution of Pre-Program Arrearages by Demographic and Housing Characteristics
    - Mean and Distribution of Matching Payments by Demographic and Housing Characteristics
    - Mean and Distribution of Post-Program Arrearages by Demographic and Housing Characteristics

In addition, it would be extremely valuable to have information on year-over-year program participation. For example, in their most recent filing CL&P/Eversource noted that they had changed the New Start program from a three-year arrearage retirement plan to a one-year arrearage retirement plan. It would be useful to track program participants to assess whether that program change was effective in reducing the number of repeat program participants.

5.6.2 Information on Energy Efficiency Programs

We make use of the WAPTAC resource for looking at state WAP programs because it furnishes consistent information on program funding and program production over time. That resource does not furnish information on the types of housing units or the types of households that are served by the program. We expect that the Connecticut WAP program has that type of information. However, since the program serves a small share of the income-eligible population, we did not seek to obtain those data.

The HES-IE program served close to 20,000 low-income households in 2014, which is about 5% of low-income households and about 20% of the number of low-income households that receive energy assistance. Since those programs deliver substantial benefits to individual low-income households, it is important to have more detailed information on the demographic and housing characteristics of those households. In addition, since program effectiveness and program cost-effectiveness is directly related to the pre-program energy usage and energy burden of participating households, those data also would be useful to give Connecticut policymakers a comprehensive account of program benefits. The following information would help policymakers and program managers to assess the performance of the program.

- Distribution of Program Spending and Measures by Income Group
- Distribution of Program Spending and Measures by Poverty Group
- Distribution of Program Spending and Measures by Building Type and Renter Status
- Average and Distribution of Pre-Program Energy Usage
- Average and Distribution of Post-Program Energy Usage
- Average and Distribution of Spending per Household

These data also would help Connecticut policymakers and program mangers to compare and contrast the HES-IE program with those implemented in other jurisdictions.