



LICAP Program Evaluation Final Report

Prepared for Niagara Mohawk

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Executive Summary

The LICAP Program provides services to low-income Niagara Mohawk electric and natural gas customers who are payment-troubled in order to enable them to better manage their energy use, cost, and bill payment. APPRISE was hired by Niagara Mohawk to conduct an evaluation of the LICAP program. This evaluation report provides information on the efficiency and effectiveness of program administration and implementation over the four program years covering July 1998 through June 2002.

Introduction

The objective of the LICAP program is to provide low-income payment-troubled Niagara Mohawk electric and natural gas customers with services that will enable them to better manage their energy use, cost, and bill payment. Payment-troubled customers are defined as customers who are unable to pay the full bill, or who pay the full bill at the expense of other necessities such as food, shelter, or medications. The program promotes participants' continued access to essential services and seeks to avoid disconnection of service for nonpayment. All ratepayers benefit from reduced collection costs and uncollectable expenses when participants improve their bill payment.

In accordance with the National Grid USA and Niagara Mohawk merger Joint Proposal (JP), Case 01-M-0075, the Company will provide services under the LICAP program to eligible households for the duration of the rate plan. Under the merger agreement, the Company will conduct and submit to staff biennial evaluations of the LICAP program. The initial evaluation will be conducted consistent with the requirements of the Commission's July 3, 2001 Order in Case 94-E-0952 regarding the Systems Benefits Charge and will cover program operations through June 30, 2002 and be submitted by September 1, 2002. Subsequent evaluations will be every two years on September 1.

The LICAP program was initiated as the Power Partnerships Pilot in 1990. Since that time, Niagara Mohawk has administered a comprehensive low-income program under a number of different names, including the ULIEEP Power Partnerships Program and the Niagara Mohawk LICAP Program. The LICAP program has continued to evolve under the new program agreement. A number of changes were implemented starting 1/1/2002 whereby LICAP has become an umbrella concept, referring to many low-income customer services that are available. These services include a five dollar discount on the monthly electric service bill. Depending on the needs of the customer, one or more of the following services may be offered:

- **Affordable Payment Plan:** The affordable payment plan is targeted to payment-troubled customers who, while unable to pay their full bill, are capable of paying at least 65% of their current charges. Customers who do not have arrears but who

have affordability problems are offered just the energy services. Customers who cannot pay 65% of their current bill in accordance with the affordable payment plan are offered energy services and are referred to other assistance programs.

- **Arrears Forgiveness:** Customers on the affordable payment plan who make their twelve monthly payments receive a credit of fifty percent of their arrears, up to a maximum of \$250.
- **Energy Use Management (EUM) Education:** All customers receive EUM education in the form of attendance at an energy education workshop or a video education packet. A subsample of customers receives additional in-home energy education.
- **Energy Efficiency Services:** Customers may receive Appliance Efficiency Program (AEP) or Weatherization services. AEP has been expanded to include electric hot water and clothes dryer fuel switching.

LICAP energy services eligibility has been expanded to include elderly HEAP payment-troubled customers and customers who are coming off public assistance direct voucher.

LICAP Energy Services Funding, Operations, and Services

The LICAP energy services are funded by the SBC. Therefore the focus of this report is on the energy services provided by the program.

The LICAP Energy Services Program is complex, serving different populations with various combinations of Energy Use Management Education formats and Energy Efficiency Services. The energy service offerings have evolved over the four program years covered in this report.

Program Funding

The table below displays the program funding over the four program years, and divides the funding into administrative costs, evaluation costs, and service delivery costs. Total program funding has ranged from \$1.7 million in year one to a high of \$2.3 million in year two. Service delivery costs have averaged about 92 percent of program funding, and have never been below 89 percent. Administrative costs are approximately five percent of total program funding. These costs include the program manager, steno, and part of the coordinator time.

Program Funding and Costs

Program Year	Total Program Funding	Administrative Costs	Evaluation Costs	Service Delivery Costs
7/01/98 - 6/30/99	\$1,746,000	\$97,200	\$4,800	\$1,644,400
7/01/99 - 6/30/00	\$2,336,000	\$107,400	\$147,400	\$2,081,000

Program Year	Total Program Funding	Administrative Costs	Evaluation Costs	Service Delivery Costs
7/01/00 - 6/30/01	\$2,244,000	\$108,300	\$78,700	\$2,057,000
7/01/01 - 6/30/02	\$2,175,000	\$113,200	\$31,400	\$2,030,400

Program Operations

Niagara Mohawk uses the On-line Low-Income Database (OLLI), a SAS-based data system especially developed to manage Weatherization and AEP services as well as associated customer data. OLLI is accessed through Niagara Mohawk's mainframe and consists of data tables and a reporting system.

OLLI contains limited data on program services received by each customer. The database includes information on the package of Energy Efficiency Services the customer received, i.e., Weatherization, AEP, or a combination of the two, and the total cost of the job. However, the individual measures within each package received by the customer are not included in the database.

Program Targeting/Outreach/Intake

Under the current LICAP program, three groups of payment-troubled customers are eligible for program services:

- *Arrearage:* From the outset, the group that was targeted by the LICAP program was non public assistance, low-income payment-troubled LIHEAP-recipient customers. Additionally, these customers were required to have negative monthly cash flow, not to exceed \$100. These customers continue to be the majority of those served by the LICAP program.
- *Low-income payment-troubled seniors:* This group has been targeted for LICAP services starting in the 2002 program year. Low-income senior customers who are current on their bill, but at the expense of other necessities, such as food, medicine, health care, or adequate shelter are targeted for services. These customers are served under the LICAP Senior Energy Services Program (S.E.S.P.).
- *Former public assistance direct voucher customers:* This group has been targeted for LICAP services starting in the 2002 program year. These customers, whose energy bills were formerly paid directly by the county, are those customers who have recently left public assistance and who appear to potentially need assistance with energy bills. These customers are served under the LICAP Safety Net Energy Services Program (S.N.E.P.).

All customers must be HEAP recipients. The current standard for HEAP is the greater of 60 percent of state median income or 150 percent of the Federal Poverty Level.

Prior to June 2001, almost all LICAP referrals came through the Inquiry Unit at Collection Services. These customers had arrears and had been directed to contact Collections to make payment arrangements after receiving a Final Termination Notice. Customers who called collections and had received HEAP, had a broken minimum payment agreement and, based on a current financial statement, had a monthly cash flow of less than \$100, were referred by the Inquiry Unit representative to a specially trained LICAP unit for enrollment. A LICAP representative then contacted the customer to complete the enrollment process.

In an effort to streamline the administrative tasks associated with the LICAP program and to further emphasize that LICAP is the appropriate customer service for the low-income "can't pay" customer, the enrollment process became the responsibility of the representatives in the Inquiry Unit at Collections. All Inquiry representatives received training that explained the LICAP program and delineated the eligibility criteria for the program and provided streamlined enrollment protocols.

Program Energy Services

The LICAP Energy Services program offers Energy Use Management Education to all program participants. Energy Use Management Education consists of a workshop for 45 to 60 percent of participants, or an education packet with worksheets and a video tape for participants who live outside the general area where the workshops are conducted.

All program participants receive energy efficiency lighting (three CFL's and one low wattage night light). Based on an analysis of pre-program usage from the Customer Service System and individual household usage data obtained from an energy services questionnaire completed by each participant, approximately thirty to forty percent of program participants are identified as eligible for Energy Efficiency Services. The purpose of these services is to further reduce usage, make utility service more affordable, and enable participants to better manage their bill payment, reduce the arrears and retain service. Contractors who conduct inspections and audits provide additional Energy Use Management Education when performing tests and installing the energy efficiency measures.

There are four types of energy services that a customer may receive:

- *Appliance Efficiency Program (AEP)*: AEP customers may receive refrigerator and/or freezer replacement, waterbed mattress replacement, and fuel switching.
- *Weatherization Program*: Weatherization customers may receive heating system service and repairs, air sealing, duct sealing, and insulation.
- *Combination*: Combination customers receive a combination of AEP and Weatherization services.
- *Modified*: Modified customers receive the initial on-site inspection for AEP services or audit for Weatherization services, but do not receive additional treatment due to one or more of the following reasons:

- No cost-effective retrofits were warranted.
- Landlord permission and co-payment could not be obtained.
- The customer refused services.
- The physical condition of the house prevented installation of other Energy Efficiency Services.

At every audit and inspection, contractors install CFL's that the customer received at the workshop or with the video if not already installed, an average of 2-3 additional CFL's based on a lighting analysis, as well as low wattage night lights.

Customers are targeted for Energy Efficiency Services based upon information in the energy services questionnaire and the customer's usage history. Each coordinator reviews this information when determining whether the customer should be referred for AEP, Weatherization, or combination services.

If the customer is targeted for AEP services, the customer receives an on-site inspection. During the inspection, the contractor meters the customer's refrigerator and freezer, looks for waterbed and fuel switching opportunities, installs CFL's, wraps the hot water tank and/or pipes, provides a waterbed blanket if the customer is going to keep a waterbed, and provides energy education, including adjusting the hot water tank thermostat and the heating system thermostat. Following the inspection, the contractor will provide the coordinator with estimates for recommended measures and fill out forms providing the coordinator with information about the work that they did during the inspection.

The coordinator reviews recommendations, discusses them with the contractor, and decides what work should be done based on the average per unit investment determined by the program. There is an average cost ceiling that was imposed in June 2002 to maximize the number of customers served within the existing SBC funding allocation. While coordinators are permitted to exceed the average in particular units, the cost ceiling must be maintained over all of the coordinators' jobs.

If the customer is targeted for Weatherization services, the customer receives an on-site audit. During the audit, the contractor conducts a blower door test, evaluates the existing insulation level, conducts health and safety tests, does a heating system service and minor heating system repairs, wraps the hot water tank, and provides air sealing and duct sealing work. Contractors install CFL's and provide similar on-site Energy Use Management Education as for AEP customers.

Following the audit, the contractor provides the coordinator with estimates for recommended measures and fills out several forms providing the coordinator with information about the work that they did during the inspection. The coordinator reviews these recommendations, discusses them with the contractor, and decides what work should be done based on the available budget.

Service Delivery Contractors

The energy services coordinators are responsible for managing the service delivery contractors. Many of the contractors have been working for Niagara Mohawk for many years, and coordinators stated that new contractors are carefully screened and trained to provide services. The contractors must be technically skilled, work well with the customers, and provide the coordinators with the detailed information they require in order to determine what work should be performed on the customer's home. The contractors are both small private companies and WAP agencies.

Customers Enrolled and Services Delivered

The table below displays the number of customers attending the workshop and receiving the video in each program year.

Customers Receiving EUM Education

Program Year	Workshop Recipients	Video Recipients
7/01/98 - 6/30/99	2,041	1,342
7/01/99 - 6/30/00	2,203	1,679
7/01/00 - 6/30/01	2,219	1,870
7/01/01 - 6/30/02	2,311	2,893

The table below displays the number of customers receiving each type of energy efficiency service for the time period specified. Each year the majority of customers received AEP services, ranging from 57 to 73 percent. Most of the other customers received Weatherization services. In the fourth program year, a minority of customers received combination or modified services.

Customers Receiving Energy Efficiency Services
By Type

Program Year	AEP	Weatherization	Combination	Modified	Total
7/01/98 - 6/30/99	706	314	0	0	1,020
7/01/99 - 6/30/00	782	340	0	0	1,122
7/01/00 - 6/30/01	875	319	0	0	1,194
7/01/01 - 6/30/02	716	247	94	190	1,247

The table below displays the average investment by type of energy efficiency service. Overall, average investments have increased from \$637 in the first program year to \$991 in the fourth program year. AEP investments increased from \$525 to \$979 and Weatherization investments increased from \$891 to \$1413. This is partly due to the fact that in year four customers who did not receive services beyond the initial audit or inspection were classified as Modified treatment, rather than AEP or Weatherization.

**Average Investment
By Type of Energy Efficiency Service**

Program Year	AEP	Weatherization	Combination	Modified	Total
7/01/98 - 6/30/99	\$524	\$891	NA	NA	\$637
7/01/99 - 6/30/00	\$570	\$908	NA	NA	\$617
7/01/00 - 6/30/01	\$676	\$1093	NA	NA	\$787
7/01/01 - 6/30/02	\$979	\$1413	\$1662	\$153	\$991

Quality Control Procedures

The coordinator in each area is responsible for managing and conducting quality control for Energy Efficiency Services. Therefore, the type of quality control varies by the coordinator, depending on his or her experiences with service delivery contractors.

The principle quality control procedures used by the coordinators include:

- For AEP, one of two methods is used:
 - 1) All customers receive a quality control questionnaire. Response rates vary with customer demographics.
 - 2) Twenty percent of customers receive a phone survey.
- For Weatherization, on-site inspections are conducted for about twenty percent of customers receiving services.

Usage Impacts

Due to the short timeline between the end of the program year and the report deadline, this report utilizes estimates of savings from a previous analysis to estimate savings for all participants over the four program years. Additional estimates are provided for individual retrofits that comprise the overall AEP services.

Usage Impact Methodology

As required under the Commission's order regarding the Systems Benefits Charge, this evaluation report, due to be submitted by September 1, 2002, covers program operations through June 30, 2002. Due to the short time period between the program year ending and the report deadline, and the lack of up front notice of evaluation requirements needed to collect participant usage histories, this report uses modeling and engineering estimates to calculate impacts of the program, rather than actual bill analysis.

In order to estimate usage impacts from the program services delivered between July 1, 1998 and June 30, 2002, we use results from a previous study of actual customer bills conducted with a subset of these program participants. APPRISE conducted a "cohort study" of all households enrolled in the LICAP program between October 26, 1998 and December 31, 1998. There were 704 households enrolled in the program during this time period.

kWh and Therm Impacts by Service Type

Estimates of savings for each type of service and for individual components of the AEP services are reported in this section.

The table below displays savings estimates from the analysis for the 1998 cohort for households receiving AEP or Weatherization services. AEP savings were estimated separately for households receiving the video and the workshop, and Weatherization savings were estimated jointly due to the sample size. A weighted average between the findings from the full and restricted sample is calculated.¹ Over the four program years, an average of 53 percent of participants received the workshop. This statistic is used to calculate a weighted average of AEP and workshop and AEP and video savings to be used in the savings estimates for this report.

Weatherization customers also achieve kWh savings based on attendance at the workshop and receipt of CFL's. Total kWh savings for Weatherization customers are estimated to be 633 kWh per year.

Estimated Annual Savings From the 1998 Cohort

	AEP and Video		AEP and Workshop		Weatherization (Workshop or Video)		
	#	kWh Savings	#	kWh Savings	#	Therm Savings	kWh Savings
Full Sample	89	1191	40	3162	23	203	633
Restricted Sample	14	1355	12	1548	9	121	

¹ The full sample is defined as all customers who had usage data available in the baseline and follow-up years. The restricted sample is defined as customers who had at least 6 non-estimated usage periods and at least 2 non-estimated heating periods in the baseline and follow-up years.

	AEP and Video		AEP and Workshop		Weatherization (Workshop or Video)		
	#	kWh Savings	#	kWh Savings	#	Therm Savings	kWh Savings
Full and Restricted Weighted Average	1213		2790		180		
Workshop and Video Average	2049						

The table below displays estimated annual savings for AEP, Weatherization, and Combination service delivery. Savings estimates from AEP and Weatherization are increased over the program years at the rate that program investments increased.

Estimated Annual Savings from Energy Efficiency Services

Program Year	AEP			WX				
	#	kWh Savings		#	Therm Savings		kWh Savings	
		Per Customer	Total		Per Customer	Total	Per Customer	Total
7/01/98 - 6/30/99	706	2,049	1,446,594	314	180	56,520	633	198,762
7/01/99 - 6/30/00	782	2,229	1,743,078	340	183	62,220	633	215,220
7/01/00 - 6/30/01	875	2,643	2,312,625	319	221	70,499	633	201,927
7/01/01 - 6/30/02	858	3,273	2,808,234	295	246	72,570	633	186,735
TOTAL	3221		8,310,531	1,268		261,809		802,644

Program Year	Combination					TOTAL Annual Savings				
	#	kWh Savings		Therm Savings		#	kWh Savings		Therm Savings	
		Per Customer	Total	Per Customer	Total		Per Customer	Total	Per Customer	Total
7/01/98 - 6/30/99	0	0	0	0	0	1,020	1,613	1,645,356	180	56,520
7/01/99 - 6/30/00	0	0	0	0	0	1,122	1,745	1,958,298	183	62,220
7/01/00 - 6/30/01	0	0	0	0	0	1,194	2,106	2,514,552	221	70,499
7/01/01 - 6/30/02	94	3,273	307,662	246	23,124	1,247	2,648	3,302,631	246	95,694
TOTAL	94	3,273	307,662	246	23,124	4,583	2,056	9,420,837	209	284,933

The next table breaks down AEP savings into savings from the workshop, refrigerators, freezers, CFL's, waterbed replacements, hot water tank fuel switches, and dryer fuel switches. The purpose of this disaggregation is to identify the sources of the AEP savings calculated in the previous section and to validate the projection methodology that was used.

The average savings per participant is calculated. Savings per participant are lower than those calculated based on the analysis of the 1998 cohort. This is due to the fact that savings from some measures are not included here, such as waterbed mattress covers, hot water tank wraps, and hot water temperature turndowns, as well as additional education provided by the contractors when they visit the home.

**Estimated Annual Savings Per Customer
By Measure**

Program Year	Workshop kWh Savings	Refrigerator kWh Savings	Freezer kWh Savings	CFL kWh Savings
7/01/98 - 6/30/99	161,942	623,546	0	284,992
7/01/99 - 6/30/00	179,262	637,228	0	315,652
7/01/00 - 6/30/01	200,912	929,890	78,512	353,247
7/01/01 - 6/30/02	218,665	1,163,186	263,838	384,345
TOTAL	760,781	3,353,850	342,350	1,338,236

Program Year	Waterbed Mattress Replacement kWh Savings	Hot Water Tank kWh Savings	Dryer kWh Savings	Total kWh Savings	# of AEP and Combination Recipients	kWh Savings Per Participant
7/01/98 - 6/30/99	120,900	0	0	1,191,380	706	1,688
7/01/99 - 6/30/00	118,300	0	0	1,250,442	782	1,599
7/01/00 - 6/30/01	140,400	87,600	53,534	1,844,095	875	2,108
7/01/01 - 6/30/02	88,400	296,400	135,894	2,550,728	952	2,679
TOTAL	468,000	384,000	189,428	6,836,645	3315	2,062

Total program energy savings are based upon the estimates from the 1998 cohort that were validated in the previous table. The table below displays total program savings. AEP savings are estimated to last 13.22 years, and Weatherization savings are estimated to last ten years. Additionally, CFL savings and workshop savings for those customers who received these services but who did not receive additional Energy Efficiency Services are included in the table below.

Total Program Savings

Type	Total Annual Savings	Measure Life	Total Lifetime Savings
Weatherization therms	284,933	10	2,849,330
AEP and Weatherization kWh	9,420,837	13.22	124,543,465
Additional CFL kWh savings	3,085,838	5.5	16,972,109
Additional workshop kWh savings	2,747,389	5	13,736,945

kW Savings

Peak reduction estimation is conducted according to NYSERDA's appendix to their Final Report on the Initial Three Year SBC Program. Applying NYSERDA'S methodology, a factor of 6,556 kWh/kW is applied to the energy savings attained from refrigerator installation and a factor of 7,634 kWh/kW is applied to the energy savings attained from CFL's. The total kW saved by the program is calculated to be 796. There are peak reductions resulting from other measures provided by the program, but a methodology for determining the kW savings has not yet been determined.

Calculation of kW Savings

Measure	Total Annual kWh Savings	Total kW savings
Refrigerators and Freezers	4,070,621	621
CFL's	1,338,232	175
TOTAL	5,408,853	796

Customer Bill Savings by Service Type

The table below displays the savings from all Energy Efficiency Services. Savings estimates are based upon usage estimates from the 1998 cohort. Total annual savings are \$1,349,899. Total annual savings per recipient average \$295.

Total Annual Bill Savings
All Energy Efficiency Services Recipients

Program Year	Electric Savings		Gas Savings		Total Dollar Savings	Total Number of Recipients	Total Dollar Savings Per Recipient
	kWh	Dollars	Therms	Dollars			
7/01/98 - 6/30/99	1,645,356	\$197,443	56,520	\$43,520	\$240,963	1,020	\$236
7/01/99 - 6/30/00	1,958,298	\$234,996	62,220	\$47,909	\$282,905	1,122	\$252
7/01/00 - 6/30/01	2,514,552	\$301,746	70,499	\$54,284	\$356,030	1,194	\$298
7/01/01 - 6/30/02	3,302,631	\$396,316	95,694	\$73,684	\$470,000	1,247	\$377
TOTAL	9,420,837	\$1,130,500	284,933	\$219,398	\$1,349,899	4,583	\$295

Other Program Impacts

The Energy Efficiency Services provided by the LICAP program have large impacts on reductions in energy usage and on affordability of customer bills. Additionally, the program benefits the participants by improving their health and safety. Linkage with the Affordable Payment Plan benefits the program by targeting the right customers who have incentive to participate in the program and take advantage of energy education to reduce their energy usage. The program also provides customers with greater control over their energy usage and causes changes in behavior that positively impact the participants.

Health, Safety, and Comfort Impacts

Energy services provided to program participants have many potential impacts on health and safety. Impacts include safer heating systems and hot water heaters, more comfortable homes, reduced use of space heaters and stoves for heating, refrigerators that keep food at the correct temperature, as well as many others.

Impacts from Linkage to Affordable Payment Plan

The Niagara Mohawk LICAP Energy Services program targets payment troubled customers. Most of these customers have been enrolled in the program through the Affordable Payment Plan. These customers have experienced significant difficulty in paying their bills, and have incentive to reduce their energy usage through the energy efficiency services.

Customer Behavior Impacts

Energy Use Management Education and Energy Efficiency Services impact the way that customers use energy in their homes. The qualitative interviews with program participants found some evidence that some of the customers had changed their behaviors to reduce

energy use. This evaluation did not include a quantitative survey of customers to determine the behavioral impacts of the program, but studies of previous programs have included such research. Behavioral impacts that were found include increased awareness of energy usage, and a feeling of greater control over energy usage.

Other Public Benefits from the Program

The LICAP program benefits the program participants by making their energy payments more affordable. The program also benefits the ratepayers and the community in several ways. First, the program reduces customers' bills and therefore their future arrears, therefore lowering the potential burden on other ratepayers. Second, the program lowers the peak energy usage and the cost of adding capacity to the system. Third, the program transforms the market by training WAP agencies and building an infrastructure of private contractors to provide service delivery.

Reduction of Future Arrears

This report estimates that customers who receive Energy Efficiency Services may have a reduction in their annual bills of about \$295. Receipt of these services can make bills more affordable for customers. As a result, the difference between the customers' energy usage and their payments should decline, and future arrearages should be lower than if these services had not been provided.

DSM Benefits

The primary purpose of the LICAP program is to make energy more affordable for low-income households. The analysis in this report showed that the program has the potential make bills more affordable for customers. However, the program has the additional public benefit of reducing peak load. Analysis in this report showed that program services resulted in a 796 kW reduction.

Market Transformation Benefits

Niagara Mohawk contracts with thirteen WAP agencies to provide services under the AEP and Weatherization programs. They also contract with more than eight private contractors for service delivery. These contracts have transformed the market in three important ways:

- Training WAP agencies in baseload measures
- WAP Agencies Developed a Private Division
- Building an infrastructure of private contractors

Summary of Findings and Recommendations

Niagara Mohawk's LICAP program effectively delivers Energy Use Management Education and Energy Efficiency Services to low-income customers, resulting in reduced energy usage and lower bills. These services make bills more affordable for payment-troubled customers and increase the health and safety of customers in their homes. They have additional benefits for the ratepayers and the community through reduced future arrears, lower peak energy usage, and market transformation impacts. The program should be continued in order to provide these benefits to additional low-income payment-troubled customers and to the community. Additional funding could increase the number of customers receiving the efficiency services.

Program Recruitment/Intake

Findings in this section relate to Niagara Mohawk's unique approach to targeting customers for the LICAP program. Both income and expenses are examined for customers targeted for the Affordable Payment Plan. Both energy usage and appliance and housing stock are analyzed for customers targeted for Energy Efficiency Services.

Findings are also related to a change in enrollment procedures. In an effort to streamline the administrative tasks associated with the LICAP program and to further emphasize that LICAP is the appropriate customer service for the low-income "can't pay" customer, the enrollment process became the responsibility of the representatives in the Inquiry Unit at Collections after June 2001.

1. The LICAP Program efficiently and effectively targets payment-troubled high use customers

The LICAP program managers have devised effective procedures for targeting customers for the program. Niagara Mohawk screens customers for a payment troubled status by looking at their income and expenses, as well as a failure to meet previous payment agreements. The program then uses the information from the energy services questionnaire, previously distributed to participants, to target high use customers with other characteristics that make them good candidates for energy use reductions.

2. Change in enrollment process has had impacts on program budget and services

The changes in the enrollment process have had large impacts on the program budget and the level of service provided. Prior to the current program year, enrollment costs ranged from fifteen to twenty-five percent of the total program budget. However, in the most recent program year, enrollment costs were only five percent of the program budget. This change has positively impacted the level of services that can be provided to customers.

There is some evidence that the change in enrollment procedures had additional impacts on the program. Coordinators reported that they believe that customers do not understand

the program they way they did when the LICAP unit at collections handled enrollment. Service delivery contractors also noted that customers who did not attend the workshop did not have a good understanding of the program.

3. Potential barriers to program participation

The Collections Department has the responsibility of determining customer eligibility for the LICAP program and enrolling eligible customers in the program. One potential barrier to participation in the program is if Collections representatives do not identify eligible customers and refer these customers to the LICAP program. The recruitment and enrollment process was not observed as part of the current evaluation, but will be in future research.

RECOMMENDATION: Ongoing training of Collections staff

Prior to their involvement in the enrollment process Niagara Mohawk trained the Collections representatives on enrollment procedures for the LICAP Program, including an explanation of the program. With continued training and experience, these representatives can do a better job of explaining the program to new enrollees.

Program Management

Niagara Mohawk has an experienced program manager and staff that efficiently and effectively run the program. They continue to streamline procedures to increase efficiency. Finding service delivery contractors can be challenging, given the high skill requirements and the competing demands for their services. Niagara Mohawk has continually updated and improved their program, and needs to continue to update program procedures manuals to reflect these changes. Program databases currently do not contain all of the information needed for comprehensive evaluation of services.

1. Experienced staff

The Niagara Mohawk LICAP program is fortunate to have a group of highly experienced, knowledgeable, and qualified coordinators to manage the delivery of the program's energy services. Each has been working as a coordinator for at least ten years and has developed expertise in serving low-income households and managing the delivery of energy services. Contractors and consumer advocates have commented on their knowledge and expertise. Customers are very enthusiastic about the workshops they provide.

RECOMMENDATION: Ongoing training for coordinators

Niagara Mohawk should continue to provide coordinators with training opportunities, such as the annual Affordable Comfort Conference, the National Low Income Energy Conference, and the National Comfort Institute Seminars. Such investment will ensure

that coordinators remain at the forefront of the field and make decisions that result in the greatest savings for low-income customers.

2. Different methods used by staff

The Niagara Mohawk program manager and coordinators meet regularly to discuss service delivery issues and procedures. However, perhaps due to the high level of experience that coordinators have in managing the LICAP program, the staff have some varying methods for managing the service delivery and some may place different emphasis on criteria for determining specific energy services to be delivered. Some of the differences between the coordinators are appropriate, due to differences in the populations and housing stock in the various regions, and some is due to differences in contractor styles and skills. The extent to which the differences result in different program outcomes is unclear.

RECOMMENDATION: Analysis of coordinator procedures

The current evaluation did not include a detailed review of the causes and results of differences in coordinator management. Future evaluations should analyze the extent to which different procedures result in different customer outcomes and determine which procedures appear to be most effective for different populations and housing stocks.

3. Energy services questionnaire

Every participant receives an energy services questionnaire through the mail or when attending the workshop. The energy services questionnaire is an efficient means to target customers with energy savings potential for Energy Efficiency Services.

4. Program paperwork

Coordinators have noted that there is a tremendous amount of paperwork associated with the delivery of the program's energy services. They continue to look for ways to streamline procedures and make program management more efficient.

RECOMMENDATION: Evaluation of paperwork

The program manager and coordinators should continue to evaluate the program delivery system and determine whether there is any room for further streamlining of procedures.

5. Lack of contractors

One of the major challenges in providing program services that was noted by the coordinators was the difficulty in finding new contractors to serve the required number of customers.

RECOMMENDATION: Recruitment of new contractors

Niagara Mohawk should continue to devote resources to infrastructure development to ensure that the program has enough qualified contractors to delivery program services. They should continue to recruit and train contractors in accordance with program needs.

RECOMMENDATION: Encourage long-term commitment to the LICAP program

Niagara Mohawk should encourage a long-term commitment to the LICAP program both within and outside their organization. A long-term commitment to the program would allow for contracts with service delivery contractors that encourage them to invest in training and hiring staff and in purchasing necessary trucks and equipment.

6. Outdated procedures manual

While the LICAP program has gradually evolved over time, the program manager and coordinators have stayed constant, so a need for a detailed program procedures manual has not been felt. Therefore, existing program manuals have not been regularly updated as changes in the program have been made and an up-to-date guide of program procedures and services is not available.

RECOMMENDATION: Update program procedures manual to address program changes

Niagara Mohawk should update program procedures manuals to accurately reflect the program as it is currently run and managed. Manuals should be in a form that can easily be updated to allow for continued changes in the program to be reflected in the documentation.

7. Incomplete program database

OLLI contains limited data on program services received by each customer. The individual measures within each package received by the customer are not included in the database.

RECOMMENDATION: Create a more comprehensive program database

A more comprehensive program database should be created to assist in tracking and evaluating program services. The program database should include data on services received by each customer, as well as certain household characteristics such as metered pre refrigerator or freezer usage and level of existing insulation.

Service Delivery

Findings in this section relate to the contractors providing service delivery for Niagara Mohawk's AEP and Weatherization programs, contractor views on the program and its requirements, and program implementation by the contractors.

1. Contractors providing AEP and Weatherization services

Twenty-one contractors provide services for the programs. Thirteen of these contractors are WAP agencies and eight are private contractors. Some additional subcontractors are used for insulation and other types of work as well.

2. Many contractors are well experienced in Niagara Mohawk's programs

Many of the service delivery contractors have been working with Niagara Mohawk for a long time. They have a good understanding of the requirements of service delivery and the low-income population that they work with.

3. Contractors are satisfied with program procedures and paperwork

Contractors did not feel that requirements for the AEP or Weatherization program placed any barriers on service delivery. They felt that the paperwork for both programs was sufficient.

4. Contractors analyze the customers' usage and identify the sources of the usage

Both contractors who were observed calculated the energy usage of appliances and estimated the contribution of each major use to the customers' total usage.

5. Contractors educate customers about work being performed and energy usage in the home

While providing the audit or the inspection, contractors did a good job of explaining to the customer what they were doing, how appliances should be maintained, and how much energy usage they accounted for.

6. Contractors sometimes review actions that customers agreed to at the workshop

Contractors stated that they do not always review actions that customers committed to at the workshop.

RECOMMENDATION: Niagara Mohawk should supply contractors with a copy of the customer's action form from the workshop

Niagara Mohawk should give the contractors a copy of the customer's action form from the workshop. The contractor could then review these actions with the customers,

discuss whether they had been able to take the actions, determine whether they can help the customers with the actions in any way, and suggest additional or alternative actions.

7. *Bill education is not required by Niagara Mohawk but is offered by some contractors*

One contractor stated that although Niagara Mohawk does not require it, he explains the customer's bill at every visit. Education on the customer's bill was not conducted during our observation of service delivery.

RECOMMENDATION: Niagara Mohawk should require contractors to review and explain customer bills

Niagara Mohawk should require contractors to review and explain customer bills. Customers should understand how to determine if usage is increasing or decreasing. This is especially important for the Affordable Payment Plan customers, whose bills do not vary with usage.

8. *Contractors do not create a plan for the customer to take to reduce energy usage*

During our observation of service delivery, contractors did identify some actions that the customers could take to reduce energy usage. While contractors reported customer actions to coordinators on a required form, contractors did not create a written list of actions for the customer at the end of the visit or review the actions that they had discussed during the visit.

RECOMMENDATION: Niagara Mohawk should review education requirements with contractors

The service delivery contractor's visit to the home is an opportunity for the provider to furnish the customer with additional energy education beyond that received from the workshop or video. The contractor should take advantage of this opportunity to reinforce actions from the workshop or video, to help the customer take actions where he or she was not successful, and to suggest additional energy saving actions.

RECOMMENDATION: Conduct quality control on contractor-delivered education

Niagara Mohawk should ask customers what actions they were taking to save energy as a result of the program during their quality control assessment. While not all customers remember energy education, consistent patterns may show problems with one or more contractors. This would provide Niagara Mohawk with information as to where additional training is needed.

I. Introduction

The LICAP Program provides services to low-income Niagara Mohawk electric and natural gas customers who are payment-troubled in order to enable them to better manage their energy use, cost, and bill payment. APPRISE was hired by Niagara Mohawk to conduct an evaluation of the LICAP program. This evaluation report provides information on the efficiency and effectiveness of program administration and implementation over the four program years covering July 1998 through June 2002.

A. *Program Goals and Objectives*

The objective of the LICAP program is to provide low-income payment-troubled Niagara Mohawk electric and natural gas customers with services that will enable them to better manage their energy use, cost, and bill payment. Payment-troubled customers are defined as customers who are unable to pay the full bill, or who pay the full bill at the expense of other necessities such as food, shelter, or medications. The program promotes participants' continued access to essential services and seeks to avoid disconnection of service for nonpayment. All ratepayers benefit from reduced collection costs and uncollectable expenses when participants improve their bill payment.

B. *Program Background*

The LICAP Program was first initiated as the Power Partnerships Pilot in 1990. Since that time, NMPC has administered a comprehensive low-income program under a number of different names, including the ULIEEP Power Partnerships Program and the NMPC LICAP Program.

1. Program Mandate

In accordance with the National Grid USA and Niagara Mohawk merger Joint Proposal (JP), Case 01-M-0075, the Company will provide services under the LICAP program to eligible households for the duration of the rate plan. Under the merger agreement, the Company will conduct and submit to staff biennial evaluations of the LICAP program. The initial evaluation will be conducted consistent with the requirements of the Commission's July 3, 2001 Order in Case 94-E-0952 regarding the Systems Benefits Charge and will cover program operations through June 30, 2002 and be submitted by September 1, 2002. Subsequent evaluations will be every two years on September 1.

2. Program History

a) *Power Partnerships Pilot*

One of the outcomes of a 1989 rate case was a commitment by the company to develop a comprehensive weatherization program for low-income, payment-troubled customers. The Power Partnerships Pilot was designed by the Alliance to Save Energy during the fall of 1989 and was implemented during 1990, 1991, and 1992.

Participants for the program were recruited from a list of LIHEAP-recipient payment-troubled customers. Random assignment was used to assign customers to one of the three treatment groups – weatherization only, weatherization plus education, and weatherization plus education and a gas usage feedback device. In addition, a part of the recruitment list was “held” to screen a control group a year later.

A full-scale evaluation of the customers served under the Power Partnerships was conducted in 1992. The evaluation concluded that:

- The gas savings for the education groups were about 25% while the savings for the weatherization only group were about 16%.
- The electric savings for the education groups were about 7% while the savings for the weatherization only group were about 4%.
- All three programs passed the cost-effectiveness tests that were applied.

The programs made large investments in the customers’ homes (between \$1,800 and \$2,100). However, the gas savings were also very large (300 to 550 therms). The average preprogram usage for program participants was about 1900 therms. This evaluation included a follow-up survey with program participants. The follow-up survey demonstrated statistically significant differences among the education group, the weatherization group, and the control group in terms of health, safety, and comfort.

b) *Affordable Payment and Arrearage Forgiveness Pilot*

At the same time that Niagara Mohawk was conducting the Power Partnerships Pilot, a second pilot was implemented. Under the Affordable Payment and Arrearage Forgiveness Pilot, a small sample of customers were offered an affordable payment (less than the full retail bill). In return for making their monthly payments, customers’ arrears were forgiven over a two-year period. These customers did not receive any weatherization benefits.

The pilot program evaluation found that customers who stayed on the program increased the number of cash payments and the amount of cash payments compared to a control group. However, customers on the program received fewer public assistance benefits than the control group. Moreover, since it was difficult for the Collections Department to manage the pilot customers under their collections system, pilot customers who did not make their payments were not returned to the collections pool and made fewer payments than either successful program participants or the control group.

This pilot demonstrated that an affordable payment and arrearage forgiveness plan had potential, but that it needed further development before it could be successful with payment troubled customers.

c) *ULIEEP Power Partnership Program*

The Utility Low Income Energy Efficiency Program was initiated in July 1992 in response to NYS PSC order 89-M-124. The Order required the State's regulated electric and gas utilities to invest \$10 million annually in a three-year pilot program to serve low-income customers. Niagara Mohawk's budget was \$2.1 million per year. The pilot ran from July 1992 through June 1995.

A report from Applied Energy Group in 1996 reports the following impacts for ULIEEP Year 2 participants:

- Electric heat participant savings of 5,114 kWh (26%)
- Gas heat participant savings of 312 kWh (7%) and 439 therms (21%)

A follow-up customer survey indicated that:

- Customers were more comfortable and believed that they were using less energy.
- A small number of customers opened up rooms that were previously kept closed during the winter, but a large number of customers lowered their thermostats.
- Among the different ULIEEP components, only the electric heat group had a cost-effectiveness test greater than 1. Most of the other groups had cost-effectiveness ratios of about 0.9.

d) *LICAP Phase I*

Niagara Mohawk implemented the LICAP program in 1995 in response to the Public Service Commission's conditioning its approval of a settlement agreement (Cases 92-E-0108 et al.) on the Company's providing a program for low income

customers who can not pay their bills and therefore are vulnerable to disconnection and whose uncollected bills place burdens on other ratepayers. The program integrated the ULIEEP Power Partnerships comprehensive weatherization program with the Affordable Payment Plan. The enrollment procedures and the usage reduction services offered under LICAP were somewhat different from the ULIEEP model. The program changes included:

- Enrollment – Under LICAP, customers were first enrolled in the affordable payment plan and then began receiving usage reduction services.
- Segmentation – Once enrolled in the payment plan, customers received the usage reduction services that were appropriate to their needs. Customers received weatherization, appliance efficiency measures, and/or energy education depending on their energy usage patterns and geographic location.
- Investment – In order to improve the cost-effectiveness of the program, the average total costs for customers who were weatherized was reduced from as much as \$2,000 to less than \$1,400.

During the implementation of the LICAP program, Response Analysis conducted a number of process evaluation reports that were mainly focused on the program management. In July 1997, Response Analysis prepared an evaluation report on the usage and payment impacts of the LICAP program for the customers enrolled during the first program year (July 1995 to June 1996). The usage impacts measured by the evaluation were:

- Electric heat weatherization energy savings of 4,151 kWh (18%).
- Gas heat weatherization energy savings of 892 kWh (10%) and 260 therms (15%).
- Workshop energy savings of 1193 kWh (12%) for electric non-heating customers and 450 kWh (6%) for combination gas heating customers.

The payment impacts measured by the evaluation were:

- The average bill coverage rate for participating customers increased from 74% to 80% of total bills.
- After factoring in the projected impact of the energy services, the average bill coverage rate for participating customers increased from 74% to 94% of total bills.
- A management analysis compared the cost of collections for payment-troubled customers to the cost of administering the payment plan component of the

LICAP program. It found that regular collections activities cost slightly less during the first year than enrolling the customer in the LICAP program. However, in each subsequent year that the customer stayed on the plan, LICAP costs were less than Collections costs.

The cost-benefit analysis for developing for the 1995 program year showed that the unadjusted cost-benefit ratio was greater than 1.0 for all program components except gas heat weatherization. The cost-benefit ratio for gas heat weatherization was 0.62 without any adjustments, 0.95 when the ratio was adjusted for the carrying cost of debt and avoided collection expenses, and was 1.03 when the ratio was adjusted for societal benefits.

e) *LICAP Phase II*

In response to the continued concern that the LICAP program did not focus enough on electric DSM goals, the program design was altered to place a greater emphasis on reduction in electric usage. In the 1998 program year, the share of resources devoted to the Appliance Efficiency Program (AEP) component was significantly increased.

In order to track the impacts of this program change, NMPC tracked a cohort of program participants enrolled in the program during October, November, and December of 1998. APPRISE conducted an evaluation of the usage and payment impacts for this cohort. The usage impact findings were:

- Workshop energy savings of 513 kWh (7%) for electric non-heating customers and combination gas heating customers.
- Gas heat weatherization energy savings of 301 therms (20%).
- AEP only savings of 2525 kWh (23%) and AEP/Workshop energy savings of 3242 kWh (33%).

The payment impacts measured by the evaluation were:

- The average bill coverage rate for participating customers increased from 77% to 85% of total bills.
- The average bill coverage rate for all participating customers rose from 75% to 87% and the rate for AEP customers rose from 77% to 97%.

The results from the evaluation for the 1998 cohort are similar to those for the 1995 program year. The AEP energy savings are significant given the comparatively modest investment. (The average cost of AEP services was about \$800 compared to about \$1,500 for weatherization services.)

3. Program Evolution

The LICAP program has continued to evolve under the new program agreement. A number of changes were implemented starting 1/1/2002 whereby LICAP has become an umbrella concept, referring to many low-income customer services that are available. These services include a five dollar discount on the monthly electric service bill. Depending on the needs of the customer, one or more of the following services may be offered:

- **Affordable Payment Plan:** The affordable payment plan is targeted to payment-troubled customers who, while unable to pay their full bill, are capable of paying at least 65% of their current charges. Customers who do not have arrears but who have affordability problems are offered just the energy services. Customers who cannot pay 65% of their current bill in accordance with the affordable payment plan are offered energy services and are referred to other assistance programs.
- **Arrears Forgiveness:** Customers on the affordable payment plan who make their twelve monthly payments receive a credit of fifty percent of their arrears, up to a maximum of \$250.
- **Energy Use Management (EUM) Education:** All customers receive EUM education in the form of attendance at an energy education workshop or a video education packet. A subsample of customers receives additional in-home energy education.
- **Energy Efficiency Services:** Customers may receive Appliance Efficiency Program (AEP) or Weatherization services. AEP has been expanded to include electric hot water and clothes dryer fuel switching.

LICAP energy services eligibility has been expanded to include elderly HEAP payment-troubled customers and customers who are coming off public assistance direct voucher.

The changes will affect the program performance in important ways. Assessment of these new program elements is an important part of the ongoing program evaluation plan.

C. Energy Services Program Implementation

The LICAP energy services are funded by the SBC. Therefore, the focus of this report is on the energy services provided by the program. The energy services provided by the current LICAP program target three different groups with two types of education and four types of energy services. This section provides an overview of the groups served and services provided.

1. Overview of Services

Eligibility

Under the current LICAP program, three groups are eligible for program services:

- *Arrearage*: The group that was previously targeted by the LICAP program was non public assistance, low-income payment-troubled LIHEAP-recipient customers. Additionally, these customers were required to have a negative monthly cash flow, not to exceed \$100. These customers continue to be the majority of those served by the LICAP program.
- *Low-income payment-troubled seniors*: This group has been targeted for LICAP services starting in the 2002 program year. Low-income senior customers who are current on their bill, but at the expense of other necessities, such as food, medicine, health care, or adequate shelter are targeted for services. These customers are served under the LICAP Senior Energy Services Program (S.E.S.P.).
- *Former public assistance, direct voucher customers*: This group has been targeted for LICAP services starting in the 2002 program year. Direct Voucher customers are those customers who have recently left public assistance and who appear to potentially need assistance with energy bills. These customers are served under the LICAP Safety Net Energy Services Program (S.N.E.P.).

All customers must be HEAP recipients. The current standard for HEAP is the greater of 60 percent of state median income or 150 percent of the Federal Poverty Level.

Services Provided

Customers participating in the LICAP program receive a combination of Energy Use Management Education and Energy Efficiency Services.

a) Energy Use Management Education

All customers who participate in LICAP receive Energy Use Management Education. Customers who live in a workshop area are assigned to attend an energy services workshop. Customers who live outside a workshop area receive an energy use management video and an energy education packet. Between forty-five and sixty percent of the customers receive the workshop and the balance receives the video.

b) Energy Efficiency Services

All customers receive three compact fluorescent light bulbs and a low wattage night light. All customers are also requested to fill out an energy services questionnaire, either at the workshop or with the video packet. Based on the energy usage information provided in the energy services questionnaire and their

preprogram usage from the customer information system, customers are evaluated for additional Energy Efficiency Services. There are four types of energy services that a customer may receive:

- *Appliance Efficiency Program (AEP)*: AEP customers may receive refrigerator and/or freezer replacement, waterbed mattress replacement, and electric hot water tank or electric clothes dryer fuel switching.
- *Weatherization Program*: Weatherization customers may receive heating system service and repairs, air sealing, duct sealing, and insulation.
- *Combination*: Combination customers receive a combination of AEP and Weatherization services.
- *Modified*: Modified customers received the initial on-site inspection for AEP services or audit for weatherization services, but do not receive additional treatment due to one or more of the following reasons:
 - No cost-effective retrofits were warranted.
 - Landlord permission and co-payment could not be obtained.
 - The customer refused services.
 - The physical condition of the house prevented installation of other Energy Efficiency Services.

When contractors are on site, they provide some EUM education and install CFL's.

2. Overview of Service Delivery Procedures

There are two main ways the customers are enrolled in the LICAP program. Payment-troubled customers who received HEAP, have broken a minimum payment agreement, and have negative monthly cash flow come into the program through the Collections Department. There is one LICAP representative at collections who schedules the customer for a workshop if the customer lives in an area where workshops are provided, or orders a video packet if the customer does not live in an area where workshops are provided. Seniors customers are referred to the program by their local County Office for the Aging. Safety Net customers are referred by the Department of Social Services unit at Collections.

There are four energy service coordinators assigned by geographic territory. The coordinator reviews the energy questionnaires for the customers in his/her service territory, as well as the customers' usage histories, in order to determine whether they should be targeted for AEP or Weatherization services.

If the customer is targeted for AEP services, the customer will receive an on-site inspection. During the inspection, the contractor will meter the customer's refrigerator

and freezer, look for waterbed and fuel switching opportunities, install CFL's, wrap the hot water tank and/or pipes, provide a waterbed blanket if the customer is going to keep the waterbed, and provide energy education.

If the customer is targeted for Weatherization services, the customer will receive an on-site audit. During the audit, the contractor will do a blower door test, evaluate the existing insulation level, conduct health and safety tests, do a heating system service and minor heating system repairs, wrap the hot water tank, provide air sealing and duct sealing work, and conduct on-site energy education.

Following the inspection or audit, the contractor will provide the coordinator with estimates for recommended measures. The coordinator will review these recommendations, discuss them with the contractor, and decide what work should be done based on the available budget. Additional services that AEP customers may receive include refrigerator and freezer replacement and fuel switches for electric dryers and hot water heaters. Additional services that Weatherization customers may receive include insulation and heating system repairs.

II. LICAP Energy Services Funding, Operations, and Services

The LICAP energy services are funded by the SBC. Therefore the focus of this report will be on the energy services provided by the program.

LICAP is a complex program, serving different populations with various combinations of payment plans, Energy Use Management Education formats, and Energy Efficiency Services. Furthermore, the service offerings have evolved over the four program years covered in this report. This section of the report provides data on the program funding and resource allocation, provides a detailed description of program operations, and analyzes the number of customers enrolled and the number of program services delivered by program year.

A. Program Funding and Resource Allocation by Year

Table II-1 displays the program funding over the four program years, and divides the funding into administrative costs, evaluation costs, and service delivery costs. Total program funding has ranged from \$1.7 million in year one to a high of \$2.3 million in year two. Service delivery costs have averaged about 92 percent of program funding, and have never been below 89 percent. Administrative costs are approximately five percent of total program funding. These costs include the program manager, steno, and part of the coordinator time.

Table II-1
Program Funding and Costs

Program Year	Total Program Funding	Administrative Costs	Evaluation Costs	Service Delivery Costs
7/01/98 - 6/30/99	\$1,746,000	\$97,200	\$4,800	\$1,644,400
7/01/99 - 6/30/00	\$2,336,000	\$107,400	\$147,400	\$2,081,000
7/01/00 - 6/30/01	\$2,244,000	\$108,300	\$78,700	\$2,057,000
7/01/01 - 6/30/02	\$2,175,000	\$113,200	\$31,400	\$2,030,400

Table II-2 displays the breakdown of the service delivery costs, by program year. These costs are broken down into enrollment, coordinator customer service, workshops, video packets, AEP and Weatherization services, outreach, contractor training, and education materials and newsletter. AEP and Weatherization services make up between 51 and 82 percent of service delivery costs (including contracted services and coordinator customer service). The other major components of service delivery costs are enrollment, customer service, workshops, and outreach. Enrollment costs declined dramatically in year four of the program, when enrollment was moved from a dedicated LICAP unit to the general collections team. Outreach costs also declined significantly in the last program year. The

reallocation of expenditures from enrollment and outreach to AEP and Weatherization services increased the average investment per customer. These findings are described later in the report.

Table II-2
Service Delivery Cost Breakdown

Program Year	Enrollment	Coordinator Customer Service	Workshops	Video Packets	Contracted AEP and Weatherization Services	Outreach	Contractor Training	Education Materials and Newsletter
7/01/98 - 6/30/99	\$407,800	\$128,200	\$112,500	\$12,600	\$792,900	\$190,000	\$0	\$0
7/01/99 - 6/30/00	\$496,300	\$217,000	\$159,000	\$16,200	\$854,400	\$258,900	\$9,800	\$69,600
7/01/00 - 6/30/01	\$301,300	\$185,200	\$173,600	\$18,000	\$1,094,100	\$256,600	\$11,400	\$16,800
7/01/01 - 6/30/02	\$101,200	\$209,000	\$144,500	\$27,700	\$1,451,600	\$72,000	\$10,200	\$14,200

Table II-3 breaks down AEP, Weatherization, and Combination service delivery costs. This table shows that the majority of funds are spent on AEP services. In program year four, customers could receive a combination of AEP and Weatherization services.

Table II-3
AEP and Weatherization Cost Breakdown

Program Year	AEP Services	Weatherization Services	Combination Services	Total
7/01/98 - 6/30/99	\$513,100	\$279,800	\$0	\$792,900
7/01/99 - 6/30/00	\$545,700	\$308,700	\$0	\$854,400
7/01/00 - 6/30/01	\$745,400	\$348,700	\$0	\$1,094,100
7/01/01 - 6/30/02	\$951,600	\$347,000	\$153,000	\$1,451,600

B. Program Operations

Niagara Mohawk uses the On-line Low-Income Database (OLLI), a SAS-based data system, to manage Weatherization and AEP services as well as associated customer data. OLLI is accessed through Niagara Mohawk's mainframe and consists of data tables and a reporting system.

When enrolling a customer in the LICAP program, the Collections Department enters Energy Use Management (EUM) assignment into OLLI for all participants. Customers are assigned to a workshop or to receive a video packet. Coordinators enter energy services related data into OLLI for all participants over time, as the customers receive program services.

If the customer is an Affordability payment plan customer, there is a direct download from the Customer Service System (CSS) into OLLI. Information that is downloaded includes customer payment, current monthly budget amount, service address, and other account information. OLLI also analyzes a year of usage data and conducts a baseload and heating season estimation. The usage data are not stored in OLLI, but the baseload and heating usage are, and these data are used for the workshop preparation.

OLLI contains limited data on program services received by each customer. The database includes information on the package of Energy Efficiency Services the customer received, i.e., Weatherization, AEP, or a combination of the two, and the total cost of the job. However, the individual measures within each package received by the customer are not included in the database.

Reports that are currently available through the OLLI system include:

- All customers that are currently in process of receiving energy services
- Customers receiving the EUM video packet
- Workshop schedules, assignment, preparation sheet, and attendees
- Active enrollments
- Energy services completion
- Contractor assignment
- Customer records-account number and payment address

C. Program Targeting/Outreach/Intake

Under the current LICAP program, three groups of payment-troubled customers are eligible for program services:

- *Arrearage:* The group that was previously targeted by the LICAP program were non public assistance, low-income payment-troubled LIHEAP-recipient customers. Additionally, these customers were required to have negative monthly cash flow, not to exceed \$100. These customers continue to be the majority of those served by the LICAP program.
- *Low-income payment-troubled seniors:* This group has been targeted for LICAP services starting in the 2002 program year. Low-income senior customers who are current on their bill, but at the expense of other necessities, such as food, medicine, health care, or adequate shelter are targeted for services. These customers are served under the LICAP Senior Energy Services Program (S.E.S.P.).
- *Former public assistance direct voucher customers:* This group has been targeted for LICAP services starting in the 2002 program year. Direct Voucher customers are those customers who have recently left public assistance and who appear to potentially need assistance with energy bills. These customers are served under the LICAP Safety Net Energy Services Program (S.N.E.P.).

All customers must be HEAP recipients. The current standard for HEAP is the greater of 60 percent of state median income or 150 percent of the Federal Poverty Level.

There are four main methods for recruiting customers into the LICAP program.

- Customers who are in arrears and who are directed to call the Collections Department to make a payment arrangement and who meet program eligibility criteria are referred to the program.
- Customers talk to consumer advocates and are directed to the program (not many through this source). Most of these are LICAP Senior Energy Services Program (S.E.S.P.) customers.
- The County Offices for the Aging refer senior customers who are not in arrears but who are payment-troubled.
- The Department of Social Services unit of the Collections Department refers customers who are leaving public assistance and going off a voucher payment agreement.

The last two methods for program recruitment are recent additions.

Prior to June 2001, almost all LICAP referrals came through the Inquiry Unit at Collection Services. These customers had arrears and had been directed to contact Collections to make payment arrangements after receiving a Final Termination Notice. Customers who called collections and had received HEAP, had a broken minimum payment agreement and, based on a current financial statement, had a monthly cash flow of less than \$100, were referred by the Inquiry Unit representative to the LICAP unit for enrollment. A LICAP representative then contacted the customer to complete the enrollment process.

In an effort to streamline the administrative tasks associated with the LICAP program and to further emphasize that LICAP is the appropriate customer service for the low-income "can't pay" customer, the enrollment process became the responsibility of the representatives in the Inquiry Unit at Collections. All Inquiry representatives received training that explained the LICAP program and delineated the eligibility criteria for the program and provided streamlined enrollment protocols.

The way the LICAP enrollment procedures currently work are that when a customer calls Collections, the representative automatically checks to see if the customer has received HEAP and has had at least one broken minimum payment agreement. If, according to a current financial statement, the customer has a negative monthly cash flow, the representative offers the customer the opportunity to participate in the LICAP program.

If the customer agrees to enroll in the payment plan, the system calculates the customer's monthly payment. The affordable monthly deferrals range from ten to thirty-five percent. The formula for calculating the deferral is based on the customer's current average budget amount and the negative monthly cash flow. These formulas were determined based upon

actual program data for customers who had their payments individually negotiated. The intent is to obtain the maximum partial payment affordable without individually negotiating customer payments.

The collections representative is responsible for explaining the program and the customer's responsibility in the program. The collections staff have a script they are supposed to follow. They tell the customer his/her percent discount, that he/she has to make payments, that there are energy services available, and that the workshop is mandatory if he/she is in the geographic area where the workshop is offered. Since the cost-effective provision of Energy Efficiency Services is dependent on a number of factors, and they are not provided to all participants, information about specific services is kept vague in order to avoid inappropriate customer expectation.

While the majority of Niagara Mohawk's low-income "can't pay" customers are arrears customers with broken payment agreements who can be readily identified through Collection Services, it is also true that many low-income "can't pay" customers may not be in arrears. In most of these cases, these payment troubled customers are current on their account at the expense of some other life necessity such as adequate nutrition or necessary medication. This is especially true of payment troubled senior customers. The Senior Energy Services Program works in conjunction with the County Offices for the Aging.

Other payment troubled low-income customers may be those who previously were public assistance direct voucher customers who recently have had their public assistance cases closed. While they are no longer responsible for the arrears accumulated prior to going on public assistance, they may now find themselves underemployed with inadequate resources to pay all their monthly expenses including their full monthly Niagara Mohawk bill. Even though not in arrears, these customers would still be considered "payment troubled" and, absent the services of LICAP, may soon become arrears customers. The Safety Net Energy Services Program is targeted to customers whose public assistance cases have been recently closed. These customers are referred by the Department of Social Services unit at Collections.

D. Program Energy Services

The LICAP program offers Energy Use Management Education to all program participants. Energy Use Management Education consists of a workshop for 45 to 60 percent of participants, or an education packet with worksheets and a video tape for participants who live outside the general area where the workshops are conducted.

All program participants receive energy efficiency lighting (three CFL's and one low wattage night light). Based on an analysis of pre-program usage from the Customer Service System and individual household usage data obtained from an energy services questionnaire completed by each participant, approximately thirty to forty percent of program participants are identified as eligible for Energy Efficiency Services. The purpose of these services is to further reduce usage, make utility service more affordable, and enable participants to better

manage their bill payment, reduce the arrears and retain service. Contractors who conduct inspections and audits provide additional Energy Use Management Education when performing tests and installing the energy efficiency measures.

1. Energy Use Management Education

All LICAP customers receive Energy Use Management Education. Customers who are in a workshop area are assigned to attend an energy services workshop. Customers who live outside a workshop area receive an energy use management video and energy education packet. Over the four year period, about forty-five to sixty percent of the customers receive the workshop and the rest receive the video.

Energy Services Workshop

Each month eighteen to twenty workshops are conducted throughout the Niagara Mohawk system with an average of eight to twelve customers per workshop. Workshops are conducted by the energy services coordinators and by one private contractor. Each provider has a slightly different method for providing the workshop, but the general information provided includes:

- **Energy Services Questionnaire:** Customers are asked to fill out an energy services questionnaire that provides information on energy use and home conditions. These forms assist the coordinators in determining what services the customer will receive.
- **Affordable Payment Plan:** The provider responds to any questions customers have about the payment plan.
- **Space heating:** Recommendations for reducing space heating usage include tightening up the home, turning down the thermostat, dressing in layers, keeping room heat sources unblocked, and applying for WAP.
- **Hot water use:** Recommendations for reducing hot water usage include fixing leaks, reducing the hot water temperature, taking shorter showers, using faucet aerators, and doing laundry in cold water.
- **Appliances:** Recommendations for reducing appliance usage include checking on appropriate temperature ranges for refrigerators, replacing waterbeds with standard mattresses, turning off appliances when not in use- in particular multiple televisions, unplugging the second refrigerator or freezer, letting dishes air dry, and using fans instead of air conditioning as much as possible.
- **Lights:** Recommendations for reducing light usage include replacing incandescent bulbs with CFL's, turning off lights when not in use, matching wattage to use, using task lighting, and using natural light when possible.

- **Materials order form:** Customers are asked to fill out a materials order form. On the form they can request up to three CFL's (15 or 20 watt) and up to three 4-watt nightlights. They can also request a copy of a video entitled "Save Energy , Save Money".
- **Action plan:** Customers are given an action plan listing several actions that they can take in each area to save energy. They are encouraged to check off the actions that they plan to take at home. During the workshop, each customer is expected to identify actions that will bring usage to the level at which they are currently paying or can better afford.

Energy Use Management Packets

Customers who do not live in an area where workshops are provided or who are homebound are sent an Energy Use Management (EUM) packet. The EUM packet includes an energy education video that discusses the same material treated in the workshop, the energy services questionnaire, an EUM information sheet, and 4 CFL's. Customers are asked to fill out and return the energy services questionnaire so that the coordinators can determine what Energy Efficiency Services they may be eligible for.

On-Site Contractor Energy Use Education

In addition to the education provided during the workshop or in the video packet, contractors are required to educate customers when providing on-site Energy Efficiency Services. While education is a site by site process, driven by the flow of the audit and the customer's willingness to be involved in the process, education guidelines have been forwarded to contractors for the education to be done in the home.

The focus of the contractor EUM education includes

- Domestic water usage and turning down the domestic hot water thermostat
- Setting back the heating thermostat
- Multiple television usage
- Discontinued usage of the second refrigerator
- Lighting analysis and installation of CFL's

The contractor will note on a form to be submitted to the coordinator several key energy use management actions the customer has agreed to take.

2. Energy Efficiency Services

There are four types of energy services that a customer may receive:

- *Appliance Efficiency Program (AEP):* AEP customers may receive refrigerator and/or freezer replacement, waterbed mattress replacement, and fuel switching.

- *Weatherization Program:* Weatherization customers may receive heating system service and repairs, air sealing, duct sealing, and insulation.
- *Combination:* Combination customers receive a combination of AEP and Weatherization services.
- *Modified:* Modified customers receive the initial on-site inspection for AEP services or audit for Weatherization services, but do not receive additional treatment due to one or more of the following reasons:
 - No cost-effective retrofits were warranted.
 - Landlord permission and co-payment could not be obtained.
 - The customer refused services.
 - The physical condition of the house prevented installation of other Energy Efficiency Services.

At every audit and inspection, contractors install CFL's that the customer received at the workshop or with the video if not already installed, an average of 2-3 additional CFL's based on a lighting analysis, as well as low wattage night lights.

Customers are targeted for Energy Efficiency Services based upon information in the energy services questionnaire and the customer's usage history. Each coordinator reviews this information when determining whether the customer should be referred for AEP, Weatherization, or combination services.

a) *AEP services*

The criterion used to target customers for AEP services varies somewhat by coordinator, but the general guidelines are described below.

- *Usage threshold:* The average annual usage threshold is generally 6,000 kWh. Coordinators may use a higher or lower threshold depending on whether the customer has big energy users in the household.
- *Age of refrigerator:* Refrigerators that are ten to twelve years or older may be considered for on-site metering to determine whether they should be replaced.
- *Second refrigerator or freezer:* A second refrigerator or freezer poses additional opportunity for energy savings because it makes possible a two for one swap, i.e., replacing two refrigerators or freezers with a larger, more efficient refrigerator.
- *Electric hot water or electric dryers:* For customers with electric hot water tanks or clothes dryers who have natural gas or propane, coordinators will consider the possibility of a fuel switch. Coordinators look for the presence of natural gas or propane.

If the customer is targeted for AEP services, the customer receives an on-site inspection. The coordinators send the contractor the customer's energy services questionnaire and monthly usage data. The energy coordinator sends the customer a letter stating that the customer will be contacted by a particular contractor to determine whether they may be eligible for Energy Efficiency Services.

During the inspection, the contractor meters the customer's refrigerator and freezer, looks for waterbed and fuel switching opportunities, installs CFL's, wraps the hot water tank and/or pipes, provides a waterbed blanket if the customer is going to keep the waterbed, and provides energy education, including adjusting the hot water tank thermostat and the heating system thermostat.

Following the inspection, the contractor will provide the coordinator with estimates for recommended measures and fill out forms providing the coordinator with information about the work that they did during the inspection. These forms include:

- *AEP diagnostics and cost summary sheet:* This form contains results from refrigerator and freezer monitoring, two to five customer energy actions, hot water measures, lighting installations, waterbed pads and replacement mattresses recommended, and job costs.
- *Appliance application sheet:* This form lists the recommended refrigerator and waterbed replacements, and customer authorization for the replacement.

The coordinator reviews recommendations, discusses them with the contractor, and decides what work should be done based on the average per unit investment determined by the program. There is an average cost ceiling that was imposed in June 2002 to maximize the number of customers served within the existing SBC funding allocation. While coordinators are permitted to exceed the average in particular units, the cost ceiling must be maintained over all of the coordinators' jobs.

b) *Weatherization services*

The criterion used to target customers for Weatherization services varies somewhat by coordinator, but the general guidelines are described below.

- *Usage threshold:* Coordinators look for annual energy usage of 1,000 therms or more. This threshold may vary depending on whether the previous winter was warmer than normal and any other characteristic unique to the particular household. Therefore, customers with 850 or 890 therms and above may have potential for energy usage reductions. The threshold for electric heat is normally 1,000 or 2,000 kWh in the heating months or approximately 12,000 kWh over the year.

- *Existing insulation levels:* Coordinators look at the customer provided information on current insulation levels in the home. However, these data may not be helpful because the customer often does not have accurate information about insulation levels.

If the customer is targeted for Weatherization services, the customer receives an on-site audit. The energy coordinators send the contractor the customer's energy services questionnaire and monthly usage data. The energy coordinators send the customer a letter stating that the customer will be contacted by a particular contractor for Energy Efficiency Services. During the audit, the contractor conducts a blower door test, evaluates the existing insulation level, conducts health and safety tests, does a heating system service and minor heating system repairs, wraps the hot water tank, and provides air sealing and duct sealing work. Contractors provide similar on-site Energy Use Management Education as for AEP customers.

Following the audit, the contractor provides the coordinator with estimates for recommended measures and fills out several forms providing the coordinator with information about the work that they did during the inspection. These forms include:

- *Work scope description:* This sheet lists the inspection costs, describes the heating system and recommended repairs, lists the insulation costs, diagnostics and air sealing costs, miscellaneous repairs, the landlord in-kind contribution, and includes a job authorization.
- *House diagnostics worksheet:* This form describes the existing R-value throughout the home, the added R-value that is recommended, and the cost for the additional insulation. The form also includes a diagram of the home and pre and post air sealing blower door readings.
- *Heating system inspection sheet:* This form lists the heating system tests that were completed and recommendations for primary heating system repairs and replacements.
- *Water heating sheet/Secondary Heating Inspection sheet:* This form describes checks on the water heater and space heater, and recommendations for water heater and secondary heating system repairs or replacement.

The coordinator reviews these recommendations, discusses them with the contractor, and decides what work should be done based on the available budget. Weatherization customers may receive any or all of the following:

- *Heating system:* The contractors first examine the heating system to determine if there are any health and safety issues. Contractors may also do minor repairs, balance the system, put in cold air returns, or make other modifications to get the heating system to work better. They evaluate the necessity for any further modification to improve the efficiency of the system.
- *Insulation:* Both the attic insulation and the sidewall insulation may be installed, although at times one or the other will be done, depending on the situation and cost projections.
- *WAP referral:* Niagara Mohawk can sometimes do some of the work and then make a referral to the WAP program for the balance of the Weatherization work.

3. Service Delivery Contractors

The energy coordinators are responsible for hiring and managing the service delivery contractors. Many of the contractors have been working for Niagara Mohawk for many years, and coordinators stated that new contractors are carefully screened and trained to provide services. The contractors must be technically skilled, work well with the customers, and provide the coordinators with the detailed information they require in order to determine what work should be performed on the customer's home.

The contractors are both small private companies and WAP agencies. The contractors do not compete for work based on price, as Niagara Mohawk has established a fixed set of prices for services that all of the contractors receive.

Contractors are assigned jobs based on the areas where they provide services, and their particular strengths. They are also assigned jobs in a way to even out the workflow among contractors. Some of the contractors provide their own insulation work, and some of the contractors use insulation subcontractors.

E. Customers Enrolled and Services Delivered by Type by Year

Table II-4 displays the number of customers attending the workshop and receiving the video in each program year.

Table II-4
Customers Receiving EUM Education

Program Year	Workshop Recipients	Video Recipients
7/01/98 - 6/30/99	2,041	1,342
7/01/99 - 6/30/00	2,203	1,679
7/01/00 - 6/30/01	2,219	1,870

Program Year	Workshop Recipients	Video Recipients
7/01/01 - 6/30/02	2,311	2,893

Table II-5 displays the number of customers receiving Energy Efficiency Services each program year. In year four, in addition to the Affordability payment plan customers, seniors and safety net customers received Energy Efficiency Services. However, payment plan customers continued to be the majority of customers receiving Energy Efficiency Services.

Table II-5
Customers Receiving Energy Efficiency Services
By Category

Program Year	Affordability Payment Plan	Seniors	Safety Net	Total
7/01/98 - 6/30/99	1,020	0	0	1,020
7/01/99 - 6/30/00	1,122	0	0	1,122
7/01/00 - 6/30/01	1,194	0	0	1,194
7/01/01 - 6/30/02	1,141	40	66	1,247

Table II-6 displays the number of customers receiving Energy Efficiency Services by region. The shares between the regions are fairly consistent over time. Most of the customers receiving services in the Western region receive AEP or modified services because Niagara Mohawk provides only electric service in this territory. In the other five regions, customers receive AEP, Weatherization, or combination services.

Table II-6
Customers Receiving Energy Efficiency Services
By Region

Program Year	Central	Capital	Mohawk	Northeast	Northern	Western	Total
7/01/98 - 6/30/99	181	122	129	180	152	256	1,020
7/01/99 - 6/30/00	161	133	146	191	217	274	1,122
7/01/00 - 6/30/01	191	106	139	174	247	337	1,194
7/01/01 - 6/30/02	279	82	170	151	216	349	1,247

Table II-7 displays the number of customers receiving each type of energy efficiency service. Each year the majority of customers received AEP services, ranging from 57 to 73

percent. Most of the other customers received weatherization services. In the fourth program year, a minority of customers received combination or modified services.

Table II-7
Customers Receiving Energy Efficiency Services
By Type

Program Year	AEP	Weatherization	Combination	Modified	Total
7/01/98 - 6/30/99	706	314	0	0	1,020
7/01/99 - 6/30/00	782	340	0	0	1,122
7/01/00 - 6/30/01	875	319	0	0	1,194
7/01/01 - 6/30/02	716	247	94	190	1,247

Table II-8 displays the average investment by type of energy efficiency service. Overall, average investments have increased from \$637 in the first program year to \$991 in the fourth program year. AEP investments increased from \$525 to \$979 and Weatherization investments increased from \$891 to \$1413. This is partly due to the fact that in year four customers who did not receive services beyond the initial audit or inspection were classified as Modified treatment, rather than AEP or Weatherization.

Table II-8
Average Investment
By Type of Energy Efficiency Service

Program Year	AEP	Weatherization	Combination	Modified	Total
7/01/98 - 6/30/99	\$524	\$891	NA	NA	\$637
7/01/99 - 6/30/00	\$570	\$908	NA	NA	\$617
7/01/00 - 6/30/01	\$676	\$1093	NA	NA	\$787
7/01/01 - 6/30/02	\$979	\$1413	\$1662	\$153	\$991

Table II-9 displays the number of refrigerators, freezers, and waterbed mattress replacements distributed in each program year. The number of refrigerators has increased over time, and freezers began being offered in program year three and increased in program year four. The number of waterbed mattress replacements distributed has fluctuated.

Table II-9
Refrigerators, Freezers, and Waterbed Mattress Replacements Distributed

Program Year	Refrigerators	Freezers	Waterbed Mattress Replacements
7/01/98 - 6/30/99	439	0	93
7/01/99 - 6/30/00	449	0	91
7/01/00 - 6/30/01	639	56	108
7/01/01 - 6/30/02	803	192	68

Table II-10 displays the number of CFL's and nightlights distributed in each program year. Customers who attended the workshop received an average of 4 CFL's, customers who received the video received 3 CFL's, and customers who received Energy Efficiency Services received an additional 2 CFL's. On average, customers received about 4 CFL's in each program year. Customers received an average of one nightlight in each year of the program.

Table II-10
CFL's and Nightlights Distributed

Program Year	CFL's	Nightlights
7/01/98 - 6/30/99	14,230	3,383
7/01/99 - 6/30/00	16,093	3,882
7/01/00 - 6/30/01	16,874	4,089
7/01/01 - 6/30/02	20,417	5,150

Table II-11 displays the number of hot water heater fuel switches. This work began in the third program year. Twenty hot water heaters were replaced in the third program year and seventy-four were replaced in the fourth program year.

Electric hot water tanks were replaced with new electric hot water tanks where they were found to have leaks that resulted in high usage and a fuel switch was not possible.

Table II-11
Electric Hot Water Tank Fuel Switches

Program Year	To Natural Gas	To Propane	To Oil	To Electric	Total
7/01/98 - 6/30/99	0	0	0	0	0
7/01/99 - 6/30/00	0	0	0	0	0

Program Year	To Natural Gas	To Propane	To Oil	To Electric	Total
7/01/00 - 6/30/01	13	3	1	3	20
7/01/01 - 6/30/02	19	29	5	21	74

Table II-12 displays the number of electric dryer fuel switches provided in each program year. There were twenty-six in the third program year and sixty-six in the fourth program year.

Table II-12
Electric Dryer Fuel Switches

Program Year	To Natural Gas	To Propane	Total
7/01/98 - 6/30/99	0	0	0
7/01/99 - 6/30/00	0	0	0
7/01/00 - 6/30/01	20	6	26
7/01/01 - 6/30/02	36	30	66

F. Quality Control Procedures

The coordinator in each area is responsible for managing and conducting quality control for Energy Efficiency Services. Therefore, the type of quality control varies by the coordinator, depending on his or her experiences with service delivery contractors.

The principle quality control procedures used by the coordinators include:

- For AEP, one of two methods is used:
 - 3) All customers receive a quality control questionnaire. Response rates vary with customer demographics.
 - 4) Twenty percent of customers receive a phone survey.
- For Weatherization, on-site inspections are conducted for about twenty percent of customers receiving services.

Whenever quality control identifies a problem with the services provided, the coordinator arranges to have the problem corrected, and normally follows up with an on-site visit to verify that the problem has been corrected. Weatherization jobs are failed for insulation that leaks through the floor or through the walls or for inadequate insulation. There are very few problems and callbacks with the Weatherization and AEP programs.

In addition to the quality control that is conducted by Niagara Mohawk, some of the small contractors who subcontract their insulation work return to the home and conduct a blower door test. These smaller contractors take responsibility for the work done by the subcontractors. If they are not satisfied, they send their subcontractors back to the home.

III. LICAP Process Evaluation

The LICAP Process Evaluation examined all aspects of the program. Interviews were conducted with key program staff and managers, interviews were conducted with program participants, program data were analyzed, and service delivery was observed. Findings relate to recruitment and intake, program management, and service delivery. Recommendations based on these findings are made in Section VII.

A. Program Performance Compared to Objectives

For the period approximating the first three years covered by this report, the program reported and measures its performance according to goals established in Section 6.1.3 of the POWERCHOICE Settlement Agreement.

According to this agreement, cumulative goals were established for each program area. The cumulative enrollment goal included all customers enrolled since the inception of the LICAP program 4/01/94 and represented the current enrollment status as of the beginning of year one of the rate plan. The energy services cumulative goal began with year one of the rate plan.

With the National Grid USA and Niagara Mohawk merger Joint Proposal, Case 01-M-0075, annual goals were established and performance is measured as of the first joint proposal rate year.

Table III-1 indicates the time period, respective cumulative goals and performance for the four year time period addressed in this report. This table shows that performance exceeded goals in all program years.

Table III-1
Customers Receiving LICAP Services
Compared to Goals

Program Year	Enrollment		Energy Efficiency Services	
	Goal	Actual	Goal	Actual
9/1/98-8/31/99	12,200	13,441	1,130	1,179
9/1/99-8/31/00	16,400	17,471	2,260	2,347
9/1/00-8/31/01	20,600	21,649	3,390	3,573
9/1/01-12/31/01	22,000	22,471	3,768	3,933
1/102-6/30/02*	2,100	3,643	565	690

The other program goal was to conduct 210 workshops each year. Niagara Mohawk completed an average of 19 workshops each month, for a total of 228 workshops each year, significantly exceeding this goal.

B. Recruitment/Intake

Strategies used for program recruitment and intake are important for the success of the program because they determine whether the desired customers will be targeted by the program and form the customer's original expectations for program benefits and requirements. Most of the recruitment and enrollment for the LICAP program is done through the Collections Department, when customers in arrears call for a payment arrangement. However, during the period of analysis, customers were also referred to the Collections Department by Niagara Mohawk's consumer advocates, by the County Offices for the Aging, and by other community agencies. The two new targeted groups of targeted customers, potential Senior Energy Services Program and Safety Net Energy Services Program participants, are directed to mail in applications that are sent to them by consumer advocates, the County Offices for the Aging, or the program based on referral lists submitted by the Department of Social Services unit of Collections. This section of the report discusses the evaluation research, findings, and recommendations relating to these methods of recruitment and intake.

1. Evaluation Activities

Five different evaluation activities provided information on recruitment and enrollment.

- *Interviews with coordinators:* Interviews with Niagara Mohawk's coordinators provided information on the methods of recruitment that are used, how the recruitment process has changed in the past year, and customer knowledge of the program through the enrollment process.
- *Interviews with Collections staff:* Interviews with Niagara Mohawk's Collections staff provided information on how customers are targeted for the program, the procedures used for enrolling customers in the program, information provided to customers at the time of enrollment, and barriers to enrolling customers in the program.
- *Interviews with Niagara Mohawk consumer advocates:* Interviews with Niagara Mohawk's consumer advocates provided information on the role that consumer advocates played in program recruitment, alternative methods for customers to be referred to the program, and barriers to enrolling customers in the program.
- *Interviews with service delivery contractors:* Interviews with service delivery contractors provided information on the level of understanding customers had about the program through the enrollment staff.

- *Interviews with customers:* Interviews with customers provided information about their view of the enrollment process, and their understanding of the program at the time of enrollment.

2. Findings

Findings in this section relate to Niagara Mohawk's unique approach to targeting customers for the LICAP program. Both income and expenses are examined for customers targeted for the payment plan. Both energy usage and appliance and housing stock are analyzed for customers targeted for Energy Efficiency Services.

Findings in this section are also related to a change in enrollment procedures. In an effort to streamline the administrative tasks associated with the LICAP program and to further emphasize that LICAP is the appropriate customer service for the low-income can't pay customer, the enrollment process became the responsibility of the representatives in the Inquiry Unit at Collections after June 2001.

a) The LICAP Program efficiently and effectively targets payment-troubled high use customers

The LICAP program managers have devised effective procedures for targeting customers for the program. Niagara Mohawk screens customers for a payment troubled status by looking at their income and expenses, as well as a failure to meet previous payment agreements. The program then uses the information from the energy services questionnaire, previously distributed to participants, to target high use customers with other characteristics that make them good candidates for energy use reductions.

b) Change in enrollment process has had impacts on program budget and services

The changes in the enrollment process have had large impacts on the program budget and the level of service provided. Prior to the current program year, enrollment costs ranged from fifteen to twenty-five percent of the total program budget. However, in the most recent program year, enrollment costs were only five percent of the program budget. This change has positively impacted the level of services that can be provided to customers. In the most recent program year, about twenty-five percent more customers were enrolled in the program all of whom received EUM education and CFL's. Approximately thirty percent of these additional customers also received Energy Efficiency Services. The general level of investment in Energy Efficiency Services was also increased. Such a shift has produced tangible benefits for the program.

There is some evidence that the change in enrollment procedures had additional impacts on the program. Prior to the change in procedures, program representatives created a partnership agreement with the customer and the customer was required to send the partnership agreement back. This is no longer part of the

program. Coordinators reported that they believe that customers do not understand the program the way they did when the LICAP unit at collections handled enrollment. They stated that customers now view the LICAP payment agreement as just another payment plan, that they have more questions about the program when attending the workshop, and that attendance rates at the workshops have declined. Service delivery contractors also noted that customers who did not attend the workshop did not have a good understanding of the program. Customer interviews found that customers had a good understanding of the program, but were focused on the Affordable Payment Plan as the primary benefit of the program, rather than the Energy Efficiency Services.

c) *Potential barriers to program participation*

The Collections Department has the responsibility for determining customer eligibility for the LICAP program and enrolling eligible customers in the program. One potential barrier to participation in the program is if Collections representatives do not identify eligible customers and refer these customers to the LICAP program. The recruitment and enrollment process was not observed as part of the current evaluation, but will be in future research.

C. *Program Management*

In addition to the department manager, there are five program staff responsible for the day to day management of the LICAP energy services. Each program coordinator is assigned to a particular geographic territory, and is responsible for all aspects of energy services delivery. The responsibilities include providing EUM workshops, reviewing energy services questionnaires and customer usage histories to determine which customers should receive AEP inspections or Weatherization audits, reviewing contractor recommendations and estimates for service delivery and determine what work should be done on the home, recruiting and training contractors, and conducting quality control on completed work. This section of the report discusses the evaluation research, findings, and recommendations relating to program management.

1. *Evaluation Activities*

Four different evaluation activities provided information on program management.

- *Interviews with the program manager:* Interviews with the program manager provided information on the program management structure, responsibilities of the coordinators, and challenges in managing the complex LICAP program.
- *Interviews with program staff:* Interviews with the staff provided information on their areas of responsibility for the program, their approach to all of their responsibilities, and challenges in providing program services.

- *Interviews with service delivery contractors:* Interviews with service delivery contractors provided information on how the coordinators manage and direct their work.
- *Review of program data:* Review of program data provided information on the units completed in the different regions of Niagara Mohawk's territory, costs of those units, and the types of jobs done.

2. Findings

Niagara Mohawk has experienced program managers and staff that efficiently and effectively run the program. They continue to streamline procedures to increase efficiency. Finding service delivery contractors can be challenging, given the high skill requirements and the competing demands for their services. Niagara Mohawk has continually updated and improved their program, and needs to continue to update program documentation to reflect these changes. Program databases currently do not contain information need for comprehensive evaluation of services.

a) *Experienced staff*

The Niagara Mohawk LICAP program is fortunate to have a group of highly experienced, knowledgeable, and qualified coordinators to manage the program. Each has been working as a coordinator for at least ten years and has developed expertise in serving low-income households and managing the delivery of energy services. Contractors and consumer advocates have commented on their knowledge and expertise. Customers are very enthusiastic about the workshops they provide.

b) *Different methods used by staff*

The Niagara Mohawk program manager and coordinators meet regularly to discuss service delivery issues and procedures. However, perhaps due to the high level of experience that coordinators have in managing the LICAP program, the staff have some varying methods for managing the program and some may place different emphasis on criteria for determining energy services delivery. Some of the differences between the coordinators are appropriate, due to differences in the populations and housing stock in the various regions, and some is due to differences in contractor styles and skills. The extent to which the differences result in different program outcomes is unclear. This matter will be studied in detail in future evaluation activities and reports.

c) *Energy services questionnaire*

Every participant receives an energy services questionnaire through the mail or when attending the workshop. Program staff report that approximately seventy-five percent of mailed questionnaires are completed and returned. The energy

services questionnaire is an efficient means to target customers with energy savings potential for Energy Efficiency Services. This questionnaire provides valuable information about the customer's energy usage, appliance stock, and housing stock to target customers who will most benefit from Energy Efficiency Services.

d) *Program paperwork*

Coordinators have noted that there is a tremendous amount of paperwork associated with the delivery of the program's energy services. They continue to look for ways to streamline procedures and make program management more efficient.

e) *Lack of contractors*

One of the major challenges in providing program services that was noted by the coordinators was the difficulty in finding new contractors to serve the required number of customers. WAP agencies are sometimes qualified and interested in providing services under the LICAP program, but they are often overwhelmed with their WAP work and other priorities. Some private contractors have focused on Niagara Mohawk's work, but others are drawn towards more lucrative private sector work. NYSERDA's large volume of work is another source of competition for the contractors.

f) *Outdated procedures manual*

While the LICAP program has gradually evolved over time, the program manager and coordinators have stayed constant, so a need for a detailed program procedures manual has not been felt. Therefore, existing program manuals have not been regularly updated as changes in the program have been made and an up-to-date guide of program procedures and services is not available.

g) *Incomplete program database*

OLLI contains limited data on program services received by each customer. The database includes information on the package of Energy Efficiency Services the customer received, i.e., Weatherization, AEP, or a combination of the two, and the total cost of the job. However, the individual measures within each package received by the customer are not included in the database.

D. *Service Delivery*

Service delivery is furnished by over twenty service delivery contractors. These contractors provide AEP and Weatherization services. Additional contractors are used for refrigerator delivery and are sometimes subcontracted for insulation or other types of work. This section discusses evaluation activities, findings, and recommendations relating to service delivery.

1. Evaluation Activities

Three different evaluation activities provided information on service delivery:

- *Interviews with Niagara Mohawk staff:* Interviews with Niagara Mohawk staff provided information on the service delivery contractors, the work that is done on the AEP and Weatherization jobs, and the challenges of service delivery.
- *Interviews with service delivery contractors:* Interviews with service delivery contractors provided information on their experience, how they implement Niagara Mohawk's AEP and Weatherization programs, their satisfaction with program procedures and requirements, and their communication with Niagara Mohawk staff.
- *On-site observation of service delivery:* On-site observation of service delivery provided information on how the contractors implement the program, the skill of the contractors in working with the customers, and the level of education provided during the visit. Observation was only conducted for two service delivery contractors for two jobs each. Future research will include observation of a greater number of service delivery contractors.

2. Findings

Findings in this section relate to the contractors providing service delivery for Niagara Mohawk's AEP and Weatherization programs, contractor views on the program and its requirements, and program implementation by the contractors.

a) *Contractors providing AEP and Weatherization services*

Table III-2 displays the service delivery contractors used by the AEP and Weatherization programs. Twenty-one contractors provide services for the programs. Thirteen of these contractors are WAP agencies and eight are private contractors. Some additional subcontractors are used for insulation and other types of work as well.

Table III-2
Service Delivery Contractors

Service Delivery Contractor	Coordinators	AEP	Weatherization	Type	Notes
Affordable Energy	Keraga	No	Yes	Private	
AHEIS	Keraga Patten Maylone	Yes	Yes	WAP	Primarily do Weatherization work
CAPCO	Kloepfer	Yes	No	WAP	Work in Cortland County

Service Delivery Contractor	Coordinators	AEP	Weatherization	Type	Notes
Cattaraugus Community Action Associates	Kloepfer Maylone	Yes	No	WAP	Provide AEP work in Work in southwest region
Community Action Planning Council	Sweeney	Yes	Yes	WAP	
Energy Construction	Patten Maylone	No	Yes	Private	Very talented
Energy Doctors	Kloepfer Sweeney Maylone	Yes	Yes	Private	Primarily do Weatherization jobs
Energy Guard Insulation	Keraga	No	Yes	Private	
Energy Management Technical Service	Kloepfer Patten Maylone	Yes	No	Private	One of Kloepfer's biggest producers; subcontract insulation work
Entherm	Kloepfer	Yes	Yes	WAP	Provide excellent work, but turnaround time is slow
Franklin County Community Action	Sweeney Maylone	Yes	Yes	WAP	Provide primarily AEP services
Fullmont Weatherization	Keraga	No	Yes	WAP	
Home Performance Professionals	Keraga	Yes	Yes	Private	Provide primarily AEP services
K&R Insulation	Kloepfer	Yes	Yes	Private	
Lewis County Opportunity	Sweeney	Yes	Yes	WAP	Provide primarily AEP services
Neighborhood Housing Services of South Buffalo	Keraga Sweeney	Yes	Yes	WAP	
Peace Inc.	Kloepfer Maylone	Yes	Yes	WAP	Work in central region
Schoharie County	Keraga	Yes	Yes	WAP	
Snell's Home Energy	Sweeney Maylone	Yes	Yes	Private	Provide primarily AEP services; high producer for Sweeney
Supportive Services	Keraga Kloepfer	Yes	No	WAP	High producers for Keraga and Sweeney

Service Delivery Contractor	Coordinators	AEP	Weatherization	Type	Notes
	Sweeney Maylone				
Washington County	Keraga	Yes	Yes	WAP	Provide primarily Weatherization services

b) Many contractors are well experienced in Niagara Mohawk's programs

Many of the service delivery contractors have been working with Niagara Mohawk for a long time. They have a good understanding of the requirements of service delivery and the low-income population that they work with.

c) Contractors are satisfied with program procedures and paperwork

Contractors did not feel that requirements for the AEP or Weatherization program placed any barriers on service delivery. They felt that the paperwork for both programs was sufficient. One contractor stated that the paperwork for the Weatherization program was cumbersome, and that electronic files would be more convenient.

d) Contractors analyze the customers' usage and identify the sources of the usage

Both contractors who were observed calculated the energy usage of appliances and estimated the contribution of each major use to the customers' total usage.

e) Contractors educate customers about work being performed and energy usage in the home

While providing the audit or the inspection, contractors did a good job of explaining to the customer what they were doing, how appliances should be maintained, and how much energy usage they accounted for.

f) Contractors sometimes review actions that customers agreed to at the workshop

Contractors stated that they do not always review actions that customers committed to at the workshop. One contractor stated that not all customers have their action sheet readily available. Another stated that he does not ask customers if they have their action sheet. However, during observation of service delivery, review of actions was observed during one of the visits.

g) Bill education not required by Niagara Mohawk, but offered by some contractors

One contractor stated that although Niagara Mohawk does not require it, he explains the customer's bill at every visit. He explains to the customer how to read the graphs on the bill, how to read the meter if there are estimated reads, and how to report the readings to Niagara Mohawk. He recommended that Niagara Mohawk

should include a bill review in their program requirements. Education on the customer's bill was not conducted during our observation of service delivery.

h) Contractors do not create a plan for the customer to take to reduce energy usage

During our observation of service delivery, contractors did identify some actions that the customers could take to reduce energy usage. However, contractors did not talk to the customers about reducing usage of some of the high users in the home, even where the customers were seen to be very enthusiastic about reducing energy usage. While contractors reported customer actions to coordinators on a required form, contractors did not create a written list of actions for the customer at the end of the visit or review the actions that they had discussed during the visit.

E. Qualitative Feedback from Customers

In order to obtain an understanding of how customers view the program and how well the contractors relate to the customers, we conducted in-depth interviews with twenty-three program participants and observed service delivery in four customer homes. We conducted additional in-depth interviews with these customers following observation of service delivery.

Customers were selected for the in-depth interviews in order to develop an understanding of the range of experiences that customers have in the program. Customers were selected to represent the different geographic regions that Niagara Mohawk serves; Affordable Payment Plan customers, Senior Energy Services Program customers, and Safety Net Energy Services Program customers; AEP, Weatherization, Combination, and Modified services; and a variety of service delivery contractors.

1. Evaluation Activities

We obtained qualitative feedback from customers through three different evaluation activities:

- *In-depth interviews with customers:* In-depth interviews with twenty-three program participants provided information on customer understanding of the program and the services received, effectiveness of energy education, and customer satisfaction with program services. Future research will include quantitative interviews with a representative sample of customers so that we can conduct statistical analysis of the results.
- *On-site observation of service delivery:* On-site observation of service delivery provided information on the customer's response to the program offerings and the customer's understanding of program services and requirements.
- *Post-observation interviews with customers:* Post-observation interviews with customers provided information on customer understanding and retaining of the information presented during the visit.

2. Findings

Customers generally have a good understanding of the LICAP program and the energy services component, probably due to the repeated program contacts with the customer. While most customers focused on the benefits of the Affordable Payment Plan as the primary benefit of the program, customers were also appreciative of the energy education and energy services received. The workshop and the video provided customers with energy saving ideas and customers appeared to change behaviors as a result of the education. About half of the customers received additional energy-saving actions as a result of the education provided by the contractor. Customers had high levels of satisfaction with the energy services provided, the service delivery contractors, and the program.

a) *Customers feel they have a good understanding of the program*

Almost all of the customers interviewed felt that they had a good understanding of the program. This is probably a result of the multiple instances in which program information is presented. The Collections representatives present information at the time of enrollment, customers receive more information on the program when attending the workshop or video, and contractors present additional information on the program.

In addition to stating that they understood the program, customers demonstrated their understanding through their responses to the question "What is your responsibility under the program". In other low-income energy efficiency programs studied, many customers stated that they did not have a responsibility, or that they did not know what their responsibility was. However, in these interviews with LICAP program recipients, all customers provided a response, and most of the responses related to paying the bill on time or to reducing energy usage. Table III-3 displays the responses to this question.

Table III-3
Customers' Understanding of Their Responsibility in the Program

Customer's Responsibility	Number of Responses
Pay bills on time	12
Reduce energy usage	9
Keep agreement/do what service providers say	3
Call Niagara Mohawk if have trouble paying bills	1
Send in the warranty for the refrigerator	1
Share the cost of electricity	1

b) Most customers focused on the benefits of the Affordable Payment Plan

When asked about the benefits of participating in the program, most customers stated that their bills were lower or that they had a reduced payment arrangement. However, some customers noted the services received or the education on saving energy. One customer stated that she "learned a lot about things she was doing wrong in terms of energy use and how to save energy." Table III-4 displays the answers to this question.

Table III-4
Customers Statements About Benefits of Participating in the Program

Benefit	Number of Responses
Bills are lower/more affordable	15
Helps keep electricity on	3
New refrigerator	3
Weatherization services	2
Education on how to save energy	2

c) Customers were very satisfied with the workshop

Customers stated that they were very satisfied with the workshop. Responses ranged from "good" to "great" to "extremely satisfied". Customers stated that they got many ideas about saving energy. None of those surveyed stated that they were not satisfied with the workshop. This is notable, given that customers were required to attend the workshop in order to obtain their arrears forgiveness.

d) Customers remembered energy-saving actions from the workshop

Despite the fact that many of the customers may have attended the workshop some time ago, all but one of the eight customers interviewed who attended the workshop remembered at least one energy-saving action. These actions included keeping windows closed in the winter, turning off lights and appliances when not in use, lowering heat when leaving the home, using the CFL's, and urging children not to leave lights and televisions on when not in use.

e) Customers who received the video learned energy conservation actions

Eight of the ten customers interviewed who watched the video said that they learned how to conserve energy from watching the video. Actions that were noted by this group included closing curtains to keep the sun out, using the microwave

more, putting plastic over the windows to keep the heat in, turning down the hot water heater, using fans as much as possible, not opening the refrigerator more than necessary, turning off lights and appliances when not in use, and using the CFL's that were sent.

f) Niagara Mohawk appears to be successful in reaching renters

Seven of the twenty-three customers interviewed stated that they were renters. Many low-income utility programs are not successful in reaching renters, so this is a laudable accomplishment for the program.

g) Customer expectations were fulfilled by the program

For the most part, customer expectations were fulfilled by the energy services provided. Twenty of the twenty-three customers interviewed stated that they were not waiting for additional work and that they received all the services they expected to receive. One customer was expecting a new freezer and insulation, one was waiting for lights, and one hoped to have the windows replaced.

h) Education on the customer's bill is mixed

About half of the customers interviewed said that the auditor reviewed and explained the energy bill. However, when asked what the auditor explained, only three of the eleven customers that stated they received education on the bill noted something related to understanding the bill. Other customers stated something relating to how much energy different appliances used or how to reduce energy usage.

i) About half of the customers remembered energy-saving actions

Five of the eight customers who attended the workshop stated that the contractor reviewed the actions that they had agreed to during the workshop. About half of the customers interviewed stated that the contractor gave them a written list of actions. Table III-5 displays the actions that customers stated they committed to take.

Table III-5
Actions that Customers Remembered

Action	Number of Responses
Turn of lights when not in use	5
Use CFL's	5
Turn thermostat down	3
Turn hot water temperature down	2

Action	Number of Responses
Use microwave more than oven	1
Dress warmer in the winter	1
Get kids to play video games less	1
Lower refrigerator setting	1

j) Customers were very satisfied with services received

Customers were very satisfied with refrigerators, insulation, air sealing, and the program in general. Almost without exception, the customers stated that the providers were on time for the appointment, knowledgeable about the program and energy usage, responsive to their questions, and courteous and professional. Most customers stated that they were very satisfied with the work and that there were no problems with the measures.

IV. LICAP Energy Usage Impacts

This section of the report estimates the effect of the energy services delivered on the customers' energy usage and energy bills. Due to the short timeline between the end of the program year and the report deadline, this report utilizes estimates of savings from a previous analysis to estimate savings for all participants over the four program years. Additional estimates are provided for individual retrofits that comprise the overall AEP services.

A. Usage Impact Methodology

As required under the Commission's order regarding the Systems Benefits Charge, this evaluation report, due to be submitted by September 1, 2002, covers program operations through June 30, 2002. Due to the short time period between the program year ending and the report deadline, and the lack of up front notice of evaluation requirements needed to collect participant usage histories, this report uses modeling and engineering estimates to calculate impacts of the program, rather than actual bill analysis.

In order to estimate usage impacts from the program services delivered between July 1, 1998 and June 30, 2002, we use results from a previous study of actual customer bills conducted with a subset of these program participants. APPRISE conducted a "cohort study" of all households enrolled in the LICAP program between October 26, 1998 and December 31, 1998. There were 704 households enrolled in the program during this time period.

APPRISE analyzed actual usage and billing data for these households. The baseline period for data analysis was January 1, 1998 through December 31, 1998. The follow-up period for data analysis was June 1, 1999 through June 30, 2000. Due to conversion to a new billing system in February 1999, problems with billing and payment data were experienced during this time period.

Of the 704 households that enrolled in the LICAP program in the fall of 1998, 687 were found in the follow-up data, and 447 had usage data available in the follow-up year. However, only 120 of these households had baseline and follow-up usage data with at least 6 non-estimated bills and at least 2 non-estimated heating bills.

The usage estimation that was done used PRISM in order to weather-normalize the energy usage for heating customers. We also used a baseload weather normalization process for electric non-heating and combination customers. These savings estimates are used to estimate savings for program participants in the four program years. Additionally, engineering estimates are used to project savings for individual energy services.

B. kWh and Therm Impacts by Service Type

Estimates of savings for each type of service and for individual components of the AEP services are reported in this section.

1. Annual Energy Services Savings

Table IV-1 displays savings estimates from the analysis for the 1998 cohort for households receiving AEP or Weatherization services. AEP savings were estimated separately for households receiving the video and the workshop, and Weatherization savings were estimated jointly due to the sample size. A weighted average between the findings from the full and restricted sample is calculated.² Over the four program years, an average of 53 percent of participants received the workshop. This statistic is used to calculate a weighted average of AEP and workshop and AEP and video savings to be used in the savings estimates for this report.

Weatherization customers achieve kWh savings based on attendance at the workshop and receipt of CFL's. The 1998 report estimated that customers saved 513 kWh or 184 kWh as a result of attending the workshop, depending on whether the full sample or the restricted sample is used. The weighted average of these estimates is 433 kWh, and this is the estimate of savings used in this report. On average fifty-three percent of customers attended the workshop, resulting in an average workshop savings of 229 kWh for Weatherization customers.

Customers who receive Weatherization are calculated to receive an average of 5.53 bulbs.³ Each bulb is estimated to save 50 watts and be used for four hours per day, saving 73 kWh per year. Therefore, the total CFL savings per Weatherization customer is calculated to be 404 kWh per year. Total kWh savings for Weatherization customers are estimated to be 633 kWh per year.

Table IV-1
Estimated Annual Savings From the 1998 Cohort

	AEP and Video		AEP and Workshop		Weatherization (Workshop or Video)		
	#	kWh Savings	#	kWh Savings	#	Therm Savings	kWh Savings
Full Sample	89	1191	40	3162	23	203	633
Restricted Sample	14	1355	12	1548	9	121	
Full and Restricted Weighted Average	1213		2790		180		
Workshop and Video Average			2049				

² The full sample is defined as all customers who had usage data available in the baseline and follow-up years. The restricted sample is defined as customers who had at least 6 non-estimated usage periods and at least 2 non-estimated heating periods in the baseline and follow-up years.

³ This calculation is based upon the fact that workshop customers receive 4 bulbs on average, video customers receive 3 bulbs on average, and Weatherization customers receive an additional 2 bulbs. Fifty-three percent of customers attend the workshop.

Table IV-2 displays the adjustment in estimated savings for AEP and Weatherization services based on increases in investments since the first year cohort was served. The increase in investment in program year four is lower than that reflected in Table II-8 to adjust for the modified customers who are not included in the overall average, as in previous years.

Table IV-2
Increases in Expenditures on Efficiency Services and Estimated Savings

Program Year	AEP			Weatherization		
	Average Investment per Recipient	Increased Investment Over Program Year One	Annual kWh Savings Per Participant	Average Investment per Recipient	Increased Investment Over Program Year One	Annual Therm Savings Per Participant
7/01/98 - 6/30/99	\$524		2,049	\$891		180
7/01/99 - 6/30/00	\$570	8.78%	2,229	\$908	1.91%	183
7/01/00 - 6/30/01	\$676	29.01%	2,643	\$1,093	22.67%	221
7/01/01 - 6/30/02	\$837	59.73%	3,273	\$1,219	36.81%	246

Table IV-3 displays estimated annual savings for AEP, Weatherization, and Combination service delivery. In program years one through three, customers were not classified as modified. In order to make the results comparable over time, we have classified twenty-five percent of the year four modified customers as Weatherization customers and seventy-five percent of the year four modified customers as AEP customers.⁴ An analysis of low investment customers over the previous three years is the basis for this division.

Modified customers received the initial on-site inspection for AEP services or audit for Weatherization services, but do not receive additional treatment due to one or more of the following reasons:

- No cost-effective retrofits were warranted.
- Landlord permission and co-payment could not be obtained.
- The customer refused services.
- The physical condition of the house prevented installation of other Energy Efficiency Services.

At every audit and inspection, contractors install CFL's that the customer received at the workshop or with the video if not already installed, an average of 2-3 additional CFL's based on a lighting analysis, as well as low wattage night lights.

⁴ In program years one through three, 30 percent, 33 percent, and 27 percent of Energy Efficiency Services were modified.

Table IV-3
Estimated Annual Savings from Energy Efficiency Services

Program Year	AEP			WX				
	#	kWh Savings		#	Therm Savings		kWh Savings	
		Per Customer	Total		Per Customer	Total	Per Customer	Total
7/01/98 - 6/30/99	706	2,049	1,446,594	314	180	56,520	633	198,762
7/01/99 - 6/30/00	782	2,229	1,743,078	340	183	62,220	633	215,220
7/01/00 - 6/30/01	875	2,643	2,312,625	319	221	70,499	633	201,927
7/01/01 - 6/30/02	858	3,273	2,808,234	295	246	72,570	633	186,735
TOTAL	3221		8,310,531	1,268		261,809		802,644

Program Year	Combination					TOTAL Annual Savings				
	#	kWh Savings		Therm Savings		#	kWh Savings		Therm Savings	
		Per Customer	Total	Per Customer	Total		Per Customer	Total	Per Customer	Total
7/01/98 - 6/30/99	0	0	0	0	0	1,020	1,613	1,645,356	180	56,520
7/01/99 - 6/30/00	0	0	0	0	0	1,122	1,745	1,958,298	183	62,220
7/01/00 - 6/30/01	0	0	0	0	0	1,194	2,106	2,514,552	221	70,499
7/01/01 - 6/30/02	94	3,273	307,662	246	23,124	1,247	2,648	3,302,631	246	95,694
TOTAL	94	3,273	307,662	246	23,124	4,583	2,056	9,420,837	209	284,933

2. Disaggregated Annual AEP Savings

The next set of tables breaks down AEP savings into savings from the workshop, refrigerators, freezers, CFL's, waterbed replacements, hot water tank fuel switches, and dryer fuel switches. The purpose of this disaggregation is to identify the sources of the AEP savings calculated in the previous section and to validate the projection methodology that was used.

The 1998 report estimated that customers saved 513 kWh or 184 kWh as a result of attending the workshop, depending on whether the full sample or the restricted sample is used. The weighted average of these estimates is 433 kWh, and this is the estimate of savings used in this report. These savings were not statistically significant given the wide variation in savings. Future research will examine savings from workshops for a larger number of participants in order to obtain a statistically significant estimate of workshop results. Table IV-4 displays the number of customers attending the workshop and the estimated savings. Based on the percentage of customers who received workshop education each year, we estimate the number of customers who received workshops and AEP or Combination services, and we calculate the savings for this group of customers.

Table IV-4
Estimated Annual Savings from Workshops

Program Year	All Workshop Recipients		Workshop Recipients who Received AEP or Combination Services	
	Number	kWh Savings	Number	kWh Savings
7/01/98 - 6/30/99	2,041	883,753	374	161,942
7/01/99 - 6/30/00	2,203	953,899	414	179,262
7/01/00 - 6/30/01	2,219	960,827	464	200,912
7/01/01 - 6/30/02	2,311	1,000,663	505	218,665
TOTAL	8,774	3,799,142	1,757	760,781

Table IV-5 displays savings calculations for refrigerators. Average pre-usage is based upon analysis of a sample of Niagara Mohawk's replacements. The pre-usage statistics are high because they factor in some two for one switching that Niagara Mohawk has been able to achieve.⁵ Average post usage is based upon the standard DOE test.⁶

⁵ Pre-usage of old refrigerators is based on two random samplings, one of 153 pre-installation meterings for program years one and two, and the other of 221 units for program years three and four.

⁶ Niagara Mohawk switched from a 16 cubic foot model to a 15 cubic foot model in the second and third program years due to a lower DOE usage rating and a lower appliance cost. In the fourth program year they no longer offered the 16 cubic foot model. Niagara Mohawk switched from an 18 cubic foot model to a 19 cubic foot model in program year one due to a lower DOE usage rating and a lower appliance cost. Niagara Mohawk switched to a different 21 cubic foot make and model in the second program year due to a lower DOE usage rating and a lower appliance cost. The post kWh usage is a weighted average of the different models used over the four program years.

Table IV-5
Refrigerator Energy Saving Analysis
Annual kWh Saving Estimates

	15 or 16 Cubic Feet	18 or 19 Cubic Feet	21 Cubic Feet
Average kWh Pre-usage - Years 1 and 2	1,608	2,166	2,388
Average kWh Pre-usage - Years 1 and 2	1,892	1,785	1,956
Pre usage weighted average	1,737	1,911	2,107
Post kWh rating	487	489	523
Estimated kWh savings	1,250	1,422	1,584

Table IV-6 displays the estimated savings from refrigerator replacements. Total annual savings from refrigerators is estimated to be 3,353,850.

Table IV-6
Estimated Annual Savings from Refrigerators

Program Year	15 or 16 Cubic Feet		18 or 19 Cubic Feet		21 Cubic Feet		TOTAL	
	#	kWh Savings	#	kWh Savings	#	kWh Savings	#	kWh Savings
7/01/98 - 6/30/99	136	170,000	163	231,786	140	221,760	439	623,546
7/01/99 - 6/30/00	125	156,250	199	282,978	125	198,000	449	637,228
7/01/00 - 6/30/01	80	100,000	343	487,746	216	342,144	639	929,890
7/01/01 - 6/30/02	136	170,000	391	556,002	276	437,184	803	1,163,186
TOTAL	477	596,250	1,096	1,558,512	757	1,199,088	2330	3,353,850

Table IV-7 displays annual kWh savings estimates for freezers. The estimated savings from a 9 cubic foot replacement is 938 kWh, and the estimated savings from a 14 cubic foot replacement is 1176.⁷

⁷ Pre-usage of old freezers is based on a random sampling of data collected from in-home metering of 40 units. Post kWh ratings of new freezers is based on the standard DOE test.

Table IV-7
Freezer Savings Analysis
Annual kWh Savings Estimates

	9 Cubic Feet	14 Cubic Feet
Average kWh Pre-usage	1453	1911
Post kWh rating	294	509
Estimated kWh savings	1159	1402

Table IV-8 displays estimated savings from freezer replacements. The total estimated savings from freezer replacements is 342,350 kWh.

Table IV-8
Estimated Annual Savings From Freezers

Program Year	9 Cubic Feet		14 Cubic Feet		TOTAL	
	#	kWh Savings	#	kWh Savings	#	kWh Savings
7/01/98 - 6/30/99	0	0	0	0	0	0
7/01/99 - 6/30/00	0	0	0	0	0	0
7/01/00 - 6/30/01	0	0	56	78,512	56	78,512
7/01/01 - 6/30/02	22	25,498	170	238,340	192	263,838
TOTAL	22	25,498	226	316,852	248	342,350

Table IV-9 displays the number of CFL's provided to AEP or Combination recipients in each program year and the estimated savings from these CFL's. This analysis assumes that each CFL reduces the watts used by 50 and that each CFL is used four hours per day. This yields an average savings of 73 kWh per CFL per year. Total annual savings from CFL's are 1,338,236 kWh.⁸

Table IV-9
Estimated Annual Savings from CFL's

Program Year	CFL's	kWh Savings
7/01/98 - 6/30/99	3,904	284,992
7/01/99 - 6/30/00	4,324	315,652

⁸ Niagara Mohawk uses a 15 watt CFL replacement for a 60 watt incandescent and a 20 watt CFL replacement for a 75 watt incandescent.

Program Year	CFL's	kWh Savings
7/01/00 - 6/30/01	4,839	353,247
7/01/01 - 6/30/02	5,265	384,345
TOTAL	18,332	1,338,236

Table IV-10 displays estimated annual savings from waterbed mattress replacements. Savings are estimated to be 1300 kWh per year per replacement. Total annual savings from waterbed replacements are 468,000 kWh.⁹

Table IV-10
Estimated Annual Savings from Waterbed Mattress Replacements

Program Year	Mattress Replacements	kWh Savings
7/01/98 - 6/30/99	93	120,900
7/01/99 - 6/30/00	91	118,300
7/01/00 - 6/30/01	108	140,400
7/01/01 - 6/30/02	68	88,400
TOTAL	360	468,000

Table IV-11 displays the annual savings from electric hot water tank fuel switches. Savings from switches to natural gas, propane, or oil are estimated to be 4,800 kWh per year. Natural gas, propane, or oil usage will have to be factored in to arrive at net bill savings. Switches to new electric hot water heaters are due to significant leaks. These new tanks are estimated to save 2,000 kWh per year.¹⁰

⁹ Waterbed mattress replacement savings are based on a study done by Duquense Light Co. in Pittsburgh, Pennsylvania, cited in Home Energy Magazine, September/October 1994.

¹⁰ Pre-usage Estimates for electric hot water are based on the American Council for an Energy-Efficient Economy which states that the most efficient electric hot water heaters are rated between 4,624 kWh and 4,671 kWh per year (Consumer Guide to Energy Savings, 7th Edition). Since almost all hot water tanks replaced in the program are considerably older, some loss of efficiency was factored in and an estimate of 4,800 kWh per year was used. A leaking hot water tank was metered before and after replacement. The metering showed an estimated savings of 3,674 kWh per year. However, since hot water tank leaks have such a wide range of volume, a more conservative estimate of 2,000 kWh per year was used.

Table IV-11
Estimated Annual Savings from Electric Hot Water Tank Fuel Switches

Program Year	To Natural Gas, Propane, or Oil		To Electric		TOTAL	
	Number	kWh Savings	Number	kWh Savings	Number	kWh Savings
7/01/98 - 6/30/99	0	0	0	0	0	0
7/01/99 - 6/30/00	0	0	0	0	0	0
7/01/00 - 6/30/01	17	81,600	3	6,000	20	87,600
7/01/01 - 6/30/02	53	254,400	21	42,000	74	296,400
TOTAL	70	336,000	24	48,000	94	384,000

Table IV-12 displays estimated savings from electric dryer fuel switches. Niagara Mohawk only replaces dryers if the customer does at least 7 loads of laundry per week. Therefore, the average number of loads per week is assumed to be 9 for the dryer fuel switches completed. Savings are estimated as 4.4 kWh per load, or 2059 kWh per year. Natural gas or propane costs will need to be added in to arrive at net bill savings.¹¹

Table IV-12
Estimated Annual Savings from Electric Dryer Fuel Switches

Program Year	Fuel Switches	kWh Savings
7/01/98 - 6/30/99	0	0
7/01/99 - 6/30/00	0	0
7/01/00 - 6/30/01	26	53,534
7/01/01 - 6/30/02	66	135,894
TOTAL	92	189,428

Table IV-13 displays the breakdown of savings from the measures provided to AEP customers. The average savings per participant is also calculated. Savings per participant are lower than those calculated based on the analysis of the 1998 cohort. This is due to the fact that savings from some measures are not included here, such as

¹¹ According to Department of Energy Data, Electric Dryer Wattage ranges from 1800 to 5000 Watts, from apartment size dryers to larger family size. Since our dryer replacements occur in homes with average to large family sizes, an average of 4400 Watts was used and an average hour of drying time, resulting in an estimate of 4.4 kWh per load.

waterbed mattress covers, hot water tank wraps, and hot water temperature turndowns, as well as additional education provided by the contractors when they visit the home.

Table IV-13
Estimated Annual Savings Per Customer
By Measure

Program Year	Workshop kWh Savings	Refrigerator kWh Savings	Freezer kWh Savings	CFL kWh Savings
7/01/98 - 6/30/99	161,942	623,546	0	284,992
7/01/99 - 6/30/00	179,262	637,228	0	315,652
7/01/00 - 6/30/01	200,912	929,890	78,512	353,247
7/01/01 - 6/30/02	218,665	1,163,186	263,838	384,345
TOTAL	760,781	3,353,850	342,350	1,338,236

Program Year	Waterbed Mattress Replacement kWh Savings	Hot Water Tank kWh Savings	Dryer kWh Savings	Total kWh Savings	# of AEP and Combination Recipients	kWh Savings Per Participant
7/01/98 - 6/30/99	120,900	0	0	1,191,380	706	1,688
7/01/99 - 6/30/00	118,300	0	0	1,250,442	782	1,599
7/01/00 - 6/30/01	140,400	87,600	53,534	1,844,095	875	2,108
7/01/01 - 6/30/02	88,400	296,400	135,894	2,550,728	952	2,679
TOTAL	468,000	384,000	189,428	6,836,645	3315	2,062

3. Total Program Energy Savings

This section calculated total program energy savings. These savings are based upon the estimates from Table IV-3 that were validated in the previous section.

Table IV-14 displays the calculation of measure life for AEP savings. The weighted average is 13.52 years.

Table IV-14
Calculation of AEP Savings Life

Measure	Percent of Total Annual AEP Savings	Measure Life
Workshop	11%	5
Refrigerator	49%	19

Measure	Percent of Total Annual AEP Savings	Measure Life
Freezer	4%	19
CFL	20%	5.5
Waterbed mattress replacement	7%	7
Hot water heater fuel switch	6%	10
Dryer fuel switch	3%	10
Weighted AEP Measure Life		13.22

Table IV-15 displays total program savings. AEP savings are estimated to last 13.22 as calculated in the above table, and Weatherization savings are estimated to last ten years. Additionally, CFL savings and workshop savings for those customers who received these services but who did not receive additional Energy Efficiency Services are included in the table below.

Table IV-15
Total Program Savings

Type	Total Annual Savings	Measure Life	Total Lifetime Savings
Weatherization therms	284,933	10	2,849,330
AEP and Weatherization kWh	9,420,837	13.22	124,543,465
Additional CFL kWh savings	3,085,838	5.5	16,972,109
Additional workshop kWh savings	2,747,389	5	13,736,945

C. kW Savings

Peak reduction estimation is conducted according to NYSERDA's appendix to their Final Report on the Initial Three Year SBC Program. Applying NYSERDA'S methodology, a factor of 6,556 kWh/kW is applied to the energy savings attained from refrigerator installation and a factor of 7,634 kWh/kW is applied to the energy savings attained from CFL's. The total kW saved by the program is calculated to be 796. There are peak reductions resulting from other measures provided by the program, but a methodology for determining the kW savings has not yet been determined.

Table IV-16
Calculation of kW Savings

Measure	Total Annual kWh Savings	Total kW savings
Refrigerators and Freezers	4,070,621	621
CFL's	1,338,232	175
TOTAL	5,408,853	796

D. Customer Bill Savings by Service Type

All savings in this section are calculated based upon estimated savings from the 1998 cohort, as shown in Table IV-3.

Table IV-17 calculates bill savings from AEP services. Electric savings are calculated at a cost of .12 per kWh. However, the costs of the alternate fuels must be subtracted from the savings. Natural gas hot water tanks are estimated to cost \$240 per year, propane hot water tanks are estimated to cost \$392 per year, and oil hot water heaters are estimated to cost \$258 per year. At 9 loads per week, natural gas dryers are estimated to cost \$79 per year and propane dryers are estimated to cost \$134 per year. Total annual savings from AEP are \$966,244. Annual savings per participant average \$300.¹²

Table IV-17
AEP Annual Bill Savings

Program Year	Annual kWh Savings from AEP	Costs Savings from AEP	Costs of Alternate Hot Water Tanks	Costs of Alternate Dryers	Annual AEP Savings	Number of AEP Recipients	Annual AEP Savings per Participant
7/01/98 - 6/30/99	1,446,594	\$173,591	\$0	\$0	\$173,591	706	\$246
7/01/99 - 6/30/00	1,743,078	\$209,169	\$0	\$0	\$209,169	782	\$267
7/01/00 - 6/30/01	2,312,625	\$277,515	\$4,554	\$2,384	\$270,577	875	\$309
7/01/01 - 6/30/02	2,808,234	\$336,988	\$17,218	\$6,864	\$312,906	858	\$365
TOTAL	8,310,531	\$997,264	\$21,772	\$9,248	\$966,244	3221	\$300

¹² An estimate of 26 therms a month was used for hot water tank natural gas consumption, based on random samplings of customer bills. Propane estimates were extrapolated from natural gas estimates, as above, assuming the same amount of therm usage, but adjusted for the variance in propane heat content and cost. Oil estimates were extrapolated from natural gas estimates assuming the same amount of therm usage, and then adjusting for the variance in propane heat content and cost.

Table IV-18 calculates savings from Weatherization services. Gas savings are calculated at the retail cost of .77 per therm. Total annual savings from Weatherization services are \$297,910. Average annual Weatherization savings per participant are \$235.

Table IV-18
Weatherization Annual Bill Savings

Program Year	Gas Savings		Electric Savings		Total Dollar Savings	Number of Weatherization Recipients	Annual Weatherization Savings Per Recipient
	Therms	Dollars	kWh	Dollars			
7/01/98 - 6/30/99	56,520	\$43,520	198,762	\$23,851	\$67,372	314	\$215
7/01/99 - 6/30/00	62,220	\$47,909	215,220	\$25,826	\$73,736	340	\$217
7/01/00 - 6/30/01	70,499	\$54,284	201,927	\$24,231	\$78,515	319	\$246
7/01/01 - 6/30/02	72,570	\$55,879	186,735	\$22,408	\$78,287	295	\$265
TOTAL	261,809	\$201,593	802,644	\$96,317	\$297,910	1,268	\$235

Table IV-19 displays annual bill savings from Combination services. Total annual savings from Combination services are \$54,725. Average annual savings per participant are \$582.

Table IV-19
Combination Annual Bill Savings

Program Year	Electric Savings		Gas Savings		Total Dollar Savings	Number of Combination Recipients	Annual Combination Savings Per Participant
	kWh	Dollars	Therms	Dollars			
7/01/98 - 6/30/99	0	\$0	0	\$0	\$0	0	\$0
7/01/99 - 6/30/00	0	\$0	0	\$0	\$0	0	\$0
7/01/00 - 6/30/01	0	\$0	0	\$0	\$0	0	\$0
7/01/01 - 6/30/02	307,662	\$36,919	23,124	\$17,805	\$54,725	94	\$582
TOTAL	307,662	\$36,919	23,124	\$17,805	\$54,725	94	\$582

Table IV-20 displays the savings from all Energy Efficiency Services. Total annual savings are \$1,349,899. Total annual savings per recipient average \$295.

Table IV-20
Total Annual Bill Savings
All Energy Efficiency Services Recipients

Program Year	Electric Savings		Gas Savings		Total Dollar Savings	Total Number of Recipients	Total Dollar Savings Per Recipient
	kWh	Dollars	Therms	Dollars			
7/01/98 - 6/30/99	1,645,356	\$197,443	56,520	\$43,520	\$240,963	1,020	\$236
7/01/99 - 6/30/00	1,958,298	\$234,996	62,220	\$47,909	\$282,905	1,122	\$252
7/01/00 - 6/30/01	2,514,552	\$301,746	70,499	\$54,284	\$356,030	1,194	\$298
7/01/01 - 6/30/02	3,302,631	\$396,316	95,694	\$73,684	\$470,000	1,247	\$377
TOTAL	9,420,837	\$1,130,500	284,933	\$219,398	\$1,349,899	4,583	\$295

V. Other Program Impacts

The Energy Efficiency Services provided by the LICAP program have large impacts on reductions in energy usage and on affordability of customer bills. Additionally, the program benefits the participants by improving their health and safety. Linkage with the Affordable Payment Plan benefits the program by targeting the right customers who have incentive to participate in the program and take advantage of energy education to reduce their energy usage. The program also provides customers with greater control over their energy usage and causes changes in behavior that positively impact the participants.

A. *Health, Safety, and Comfort Impacts*

Energy services provided to program participants have many potential impacts on health and safety. Impacts include safer heating systems and hot water heaters, more comfortable homes, reduced use of space heaters and stoves for heating, refrigerators that keep food at the correct temperature, as well as many others.

A quantitative survey of participants to measure the health and safety benefits of the program was beyond the scope of this evaluation. However, previous research on Niagara Mohawk's prior programs did measure such benefits. These benefits are summarized below.

Power Partnerships Pilot

An evaluation of this program found the following health and safety impacts:

- Weatherization measures reduced the draftiness of homes.
- Weatherization customers were more satisfied with the comfort of their homes than a control group.
- Weatherization customers were less likely to perceive that they had health problems caused by home problems or by the house being too cold during the winter than the control group customers.
- Weatherization customers reported having lower rates of colds, flu, bronchitis, allergies, and asthma than the control group.
- Weatherization customers reported a much lower rate of heating with the stove or oven than the control group.

Additionally, there was a negative health and safety impact that some weatherized customers reported that their homes got too little fresh air.

ULIEEP Power Partnership Program

An evaluation of this program found the following health and safety impacts:

- Program participants reported an increase in the comfort level of their homes.

B. Impacts from Linkage to Affordable Payment Plan

The Niagara Mohawk LICAP program targets payment troubled customers. Most of these customers have been enrolled in the program through the Affordable Payment Plan. These customers have experienced significant difficulty in paying their bills, and have incentive to reduce their energy usage. The benefits from linking the Energy Efficiency Services with the Affordable payment plan are that the program is targeting customers who are in need of the Energy Efficiency Services, and that the targeted customers have an incentive to participate in the program and to reduce energy usage.

- *Targeting appropriate customers:* Affordable Payment Plan customers receive HEAP, have a negative cash flow, and have defaulted on a minimum payment agreement. These customers need to reduce their energy usage in order to afford their utility bills.
- *Incentive for customers to participate in program:* In order to receive arrearage forgiveness, customers must attend the workshop, if assigned. They are also asked to fill out an energy services questionnaire that allows the coordinators to determine if there are cost-effective opportunities for energy savings in their homes. Customers are more willing to participate in these activities in order to receive the arrearage forgiveness. Although not strictly required for receipt of the Affordable Payment Plan, it is likely that these program aspects are connected to the discount in the customer's mind, and therefore the customer had an additional incentive to participate.
- *Incentive for customers to reduce energy usage:* Although customers have a percentage of the current bill deferred as a result of participating in the Affordable Payment Plan, the resulting difference between the customer's full bill and the monthly payment is added to the customer's arrears. Customers have an incentive to reduce their energy usage so that they can afford their entire bill and so that their arrears do not continue to grow.

C. Customer Behavior Impacts

Energy Use Management Education and Energy Efficiency Services impact the way that customers use energy in their homes. The qualitative interviews with program participants found some evidence that some of the customers had changed their behaviors to reduce energy use. This evaluation did not include a quantitative survey of customers to determine the behavioral impacts of the program, but studies of previous programs have included such research. Findings from these studies are summarized below.

Power Partnerships Pilot

An evaluation of this program found the following customer behavior impacts:

- Customers show increased awareness of what may cause increases in energy usage.
- Customers are more likely to feel that they have the ability to control their energy usage.

ULIEEP Power Partnership Program

An evaluation of this program found the following customer behavior impacts:

- Customers lowered their thermostats.
- Customers opened up some rooms that were previously closed. This negative impact will increase customer's energy usage.

VI. Other Public Benefits from Program

The LICAP program benefits the program participants by making their energy payments more affordable. The program also benefits the ratepayers and the community in several ways. First, the program reduces customers' bills and therefore their future arrears, therefore lowering the burden on other ratepayers. Second, the program lowers the peak energy usage and the cost of adding capacity to the system. Third, the program transforms the market by training WAP agencies and building an infrastructure of private contractors to provide service delivery.

A. *Reduction of Future Arrears*

Section IV of this report estimates that customers who receive Energy Efficiency Services may have a reduction in their annual bills of about \$295. Receipt of these services can make bills more affordable for customers. As a result, the difference between the customers' energy usage and their payments should decline, and future arrearages should be lower than if these services had not been provided.

B. *DSM Benefits*

The primary purpose of the LICAP program is to make energy more affordable for low-income households. The analysis in Section IV of the report showed that the program has the potential to make bills more affordable for customers. However, the program has the additional public benefit of reducing peak load. Analysis in Section IV showed that program services resulted in a 796 kW reduction.

C. *Market Transformation Benefits*

Niagara Mohawk contracts with thirteen WAP agencies to provide services under the AEP and Weatherization programs. They also contract with more than eight private contractors for service delivery. These contracts have transformed the market in three important ways:

- *Training WAP agencies in baseload measures:* Niagara Mohawk has been working with WAP agencies to provide AEP services for several years. They trained these agencies to provide the baseload measures as well as the education around these measures. As WAP rules have changed to allow inclusion of baseload measures, this training has benefited the agencies in preparing them for the expanded scope of WAP services.
- *WAP Agencies Developed a Private Division:* Another result of Niagara Mohawk's efforts to collaborate with the Weatherization Assistance Program sub-grantee network is that five of these agencies developed a "for profit" arm in order to better manage some of Niagara Mohawk's program's energy services delivery. These agencies include P.E.A.C.E., Inc., New Buffalo Impact (organized by Neighborhood Housing Services of

South Buffalo). C.A.P.C. of Jefferson County, Supportive Services and Washington Co. Community Action Agency.

- *Building an infrastructure of private contractors:* Niagara Mohawk has built an infrastructure of contractors who can provide Energy Efficiency Services. Niagara Mohawk has been working with more than eight private contractors to provide Energy Efficiency Services to its customers. Some of these contractors work almost exclusively for Niagara Mohawk, and some have expanded to serve private customers and NYSERDA. There are four private contractors who incorporated specifically so that they could do LICAP energy services work. These include Snell's Home Energy, Adirondack Home Energy Inspection Services, Adirondack Energy Services, and Energy Management Technical Services. While each of these operations perform a significant portion of LICAP work, they also do work for other customers.

VII. Findings and Recommendations

Niagara Mohawk's LICAP program effectively delivers Energy Use Management Education and Energy Efficiency Services to low-income customers, resulting in reduced energy usage and lower bills. These services make bills more affordable for payment-troubled customers and increase the health and safety of customers in their homes. They have additional benefits for the ratepayers and the community through reduced future arrears, lower peak energy usage, and market transformation impacts. The program should be continued in order to provide these benefits to additional low-income payment-troubled customers and to the community. Additional funding could increase the number of customers receiving the efficiency services.

This section of the report summarizes the findings from the evaluation and makes a number of recommendations for program refinement and improvement.

A. *Lessons Learned*

1. **Program Recruitment/Intake**

Findings in this section relate to Niagara Mohawk's unique approach to targeting customers for the LICAP program. Both income and expenses are examined for customers targeted for the Affordable Payment Plan. Both energy usage and appliance and housing stock are analyzed for customers targeted for Energy Efficiency Services.

Findings in this section are also related to a change in enrollment procedures. In an effort to streamline the administrative tasks associated with the LICAP program and to further emphasize that LICAP is the appropriate customer service for the low-income "can't pay" customer, the enrollment process became the responsibility of the representatives in the Inquiry Unit at Collections after June 2001.

a) ***The LICAP Program efficiently and effectively targets payment-troubled high use customers***

The LICAP program managers have devised effective procedures for targeting customers for the program. Niagara Mohawk screens customers for a payment troubled status by looking at their income and expenses, as well as a failure to meet previous payment agreements. The program then uses the information from the energy services questionnaire, previously distributed to participants, to target high use customers with other characteristics that make them good candidates for energy use reductions.

b) ***Change in enrollment process has had impacts on program budget and services***

The changes in the enrollment process has had large impacts on the program budget and the level of service provided. Prior to the current program year, enrollment

costs ranged from fifteen to twenty-five percent of the total program budget. However, in the most recent program year, enrollment costs were only five percent of the program budget. This change has positively impacted the level of services that can be provided to customers. In the most recent program year, about twenty-five percent more customers were enrolled in the program all of whom received EUM education and CFL's. Approximately thirty percent of these additional customers also received Energy Efficiency Services. The general level of investment in Energy Efficiency Services was also increased. Such a shift has produced tangible benefits for the program.

There is some evidence that the change in enrollment procedures had additional impacts on the program. Prior to the change in procedures, program representatives created a partnership agreement with the customer and the customer was required to send the partnership agreement back. This is no longer part of the program. Coordinators reported that they believe that customers do not understand the program the way they did when the LICAP unit at collections handled enrollment. They stated that customers now view the LICAP Affordable Payment Plan as just another payment agreement, that they have more questions about the program when attending the workshop, and that attendance rates at the workshops have declined. Service delivery contractors also noted that customers who did not attend the workshop did not have a good understanding of the program. Customer interviews found that customers had a good understanding of the program, but were focused on the Affordable Payment Plan as the primary benefit of the program, rather than the Energy Efficiency Services.

c) *Potential barriers to program participation*

The Collections Department has the responsibility of determining customer eligibility for the LICAP program and enrolling eligible customers in the program. One potential barrier to participation in the program is if Collections representatives do not identify eligible customers and refer these customers to the LICAP program. The recruitment and enrollment process was not observed as part of the current evaluation, but will be in future research.

2. Program Management

Niagara Mohawk has an experienced program manager and staff that efficiently and effectively run the program. They continue to streamline procedures to increase efficiency. Finding service delivery contractors can be challenging, given the high skill requirements and the competing demands for their services. Niagara Mohawk has continually updated and improved their program, and needs to continue to update program procedures manuals to reflect these changes. Program databases currently do not contain all of the information needed for comprehensive evaluation of services.

a) *Experienced staff*

The Niagara Mohawk LICAP program is fortunate to have a group of highly experienced, knowledgeable, and qualified coordinators to manage the program. Each has been working as a coordinator for at least ten years and has developed expertise in serving low-income households and managing the delivery of energy services. Contractors and consumer advocates have commented on their knowledge and expertise. Customers are very enthusiastic about the workshops they provide.

b) *Different methods used by staff*

The Niagara Mohawk program manager and coordinators meet regularly to discuss service delivery issues and procedures. However, perhaps due to the high level of experience that coordinators have in managing the delivery of program services, the staff have some varying methods for managing the program and some may place different emphasis on criteria for determining specific energy services to be delivered. Some of the differences between the coordinators is appropriate, due to differences in the populations and housing stock in the various regions, and some is due to differences in contractor styles and skills. The extent to which the differences result in different program outcomes is unclear. This matter will be studied in detail in future evaluation activities and reports.

c) *Energy services questionnaire*

Every participant receives an energy services questionnaire through the mail or when attending the workshop. Program staff report that approximately seventy-five percent of mailed questionnaires are completed and returned. The energy services questionnaire is an efficient means to target customers with energy savings potential for Energy Efficiency Services. This questionnaire provides valuable information about the customer's energy usage, appliance stock, and housing stock to target customers who will most benefit from Energy Efficiency Services.

d) *Program paperwork*

Coordinators have noted that there is a tremendous amount of paperwork associated with the delivery of the program's energy services. They continue to look for ways to streamline procedures and make program management more efficient.

e) *Lack of contractors*

One of the major challenges in providing program services that was noted by the coordinators was the difficulty in finding new contractors to serve the required number of customers. WAP agencies are sometimes qualified and interested in providing services under the LICAP program, but they are often overwhelmed with their WAP work and other priorities. Some private contractors have focused on Niagara Mohawk's work, but others are drawn towards more lucrative private

sector work. NYSERDA's large volume of work is another source of competition for the contractors.

f) *Outdated procedures manual*

While the LICAP program has gradually evolved over time, the program manager and coordinators have stayed constant, so a need for a detailed program procedures manual has not been felt. Therefore, existing program manuals have not been regularly updated as changes in the program have been made and an up-to-date guide of program procedures and services is not available.

g) *Incomplete program database*

OLLI contains limited data on program services received by each customer. The database includes information on the package of Energy Efficiency Services the customer received, i.e., Weatherization, AEP, or a combination of the two, and the total cost of the job. However, the individual measures within each package received by the customer are not included in the database.

3. Service Delivery

Findings in this section relate to the contractors providing service delivery for Niagara Mohawk's AEP and Weatherization programs, contractor views on the program and its requirements, and program implementation by the contractors.

a) *Contractors providing AEP and Weatherization services*

Twenty-one contractors provide services for the programs. Thirteen of these contractors are WAP agencies and eight are private contractors. Some additional subcontractors are used for insulation and other types of work as well.

b) *Many contractors are well experienced in Niagara Mohawk's programs*

Many of the service delivery contractors have been working with Niagara Mohawk for a long time. They have a good understanding of the requirements of service delivery and the low-income population that they work with.

c) *Contractors are satisfied with program procedures and paperwork*

Contractors did not feel that requirements for the AEP or Weatherization program placed any barriers on service delivery. They felt that the paperwork for both programs was sufficient. One contractor stated that the paperwork for the Weatherization program was cumbersome, and that electronic files would be more convenient.

d) Contractors analyze the customers' usage and identify the sources of the usage

Both contractors who were observed calculated the energy usage of appliances and estimated the contribution of each major use to the customers' total usage.

e) Contractors educate customers about work being performed and energy usage in the home

While providing the audit or the inspection, contractors did a good job of explaining to the customer what they were doing, how appliances should be maintained, and how much energy usage they accounted for.

f) Contractors sometimes review actions that customers agreed to at the workshop

Contractors stated that they do not always review actions that customers committed to at the workshop. One contractor stated that not all customers have their action sheet readily available. Another stated that he does not ask customers if they have their action sheet. However, during observation of service delivery, review of actions was observed during one of the visits.

g) Bill education not required by Niagara Mohawk, but offered by some contractors

One contractor stated that although Niagara Mohawk does not require it, he explains the customer's bill at every visit. He explains to the customer how to read the graphs on the bill, how to read the meter if there are estimated reads, and how to report the readings to Niagara Mohawk. He recommended that Niagara Mohawk should include a bill review in their program requirements. Education on the customer's bill was not conducted during our observation of service delivery.

h) Contractors do not create a plan for the customer to take to reduce energy usage

During our observation of service delivery, contractors did identify some actions that the customers could take to reduce energy usage. However, contractors did not talk to the customers about reducing usage of some of the high users in the home, even where the customers were seen to be very enthusiastic about reducing energy usage. While contractors reported customer actions to coordinators on a required form, contractors did not create a written list of actions for the customer at the end of the visit or review the actions that they had discussed during the visit.

B. Recommendations

Based on the findings above, this study makes the following recommendations for program refinement and improvement.

1. Program Recruitment/Intake

Ongoing training of Collections staff, now responsible for program enrollment, could improve program enrollment procedures.

a) Ongoing training of Collections staff

Prior to June 2001, customers who met the eligibility criteria were referred to the LICAP unit for enrollment in the program. The LICAP representative then contacted the customer to complete the enrollment process. One cannot expect Collections staff who must deal with many other programs and customer issues to be as knowledgeable about the LICAP program as the former group of representatives whose primary responsibility was LICAP enrollments. Prior to their involvement in the enrollment process Niagara Mohawk trained the Collections representatives on enrollment procedures for the LICAP Program, including an explanation of the program. With continued training and experience, these representatives can do a better job of explaining the program to new enrollees. A customer advocate noted that she had already seen an improvement in the ability of Collections staff to identify eligible customers for the program.

2. Program Management

While the LICAP program is efficiently and effectively managed, Niagara Mohawk should continue to make investments to improve and enhance service delivery. The investments include ongoing training for coordinators, analysis of coordinator procedures, evaluation of paperwork, recruitment and training of new contractors, quality control for contractor education, a long-run commitment to the program, updating program documentation, and improving the program database.

a) Ongoing training for coordinators

Niagara Mohawk's coordinators are experienced and knowledgeable about program procedures and effective energy services. In order to remain at the forefront of the energy conservation field, Niagara Mohawk should continue to provide coordinators with training opportunities, such as the annual Affordable Comfort Conference, the National Low Income Energy Conference, and the National Comfort Institute Seminars. Such investment will ensure that coordinators remain at the forefront of the field and make decisions that result in the greatest savings for low-income customers.

b) Analysis of coordinator procedures

The current evaluation did not include a detailed review of the causes and results of differences in coordinator management. Future evaluations should analyze the extent to which different procedures result in different customer outcomes and determine which procedures appear to be most effective for different populations and housing stocks.

c) Evaluation of paperwork

The program manager and coordinators should continue to evaluate the program delivery system and determine whether there is any room for further streamlining of procedures.

d) Recruitment of new contractors

Niagara Mohawk should continue to devote resources to infrastructure development to ensure that the program has enough qualified contractors to delivery program services. They should continue to recruit and train contractors in accordance with program needs.

e) Conduct quality control on contractor-delivered education

Niagara Mohawk should ask customers what actions they were taking to save energy as a result of the program during their quality control assessment. While not all customers remember energy education, consistent patterns may show problems with one or more contractors. This would provide Niagara Mohawk with information as to where additional training is needed.

f) Encourage long-term commitment to the LCIAP program

Niagara Mohawk should encourage a long-term commitment to the LICAP program both within and outside their organization. A long-term commitment to the program would allow for contracts with service delivery contractors that encourage them to invest in training and hiring staff and in purchasing necessary trucks and equipment.

g) Update program procedures manual to address program changes

Niagara Mohawk should update program procedures manuals to accurately reflect the program as it is currently run and managed. Manuals should be in a form that can easily be updated to allow for continued changes in the program to be reflected in the documentation.

h) Create a more comprehensive program database

A more comprehensive program database should be created to assist in tracking and evaluating program services. The program database should include data on services received by each customer, as well as certain household characteristics such as metered pre refrigerator or freezer usage and level of existing insulation.

3. Service Delivery

Niagara Mohawk may improve the education that service delivery contractors provide to customers by providing the contractors with additional information on the customer's action plan, by requiring that contractors review the customer's bill, and by reviewing education requirements with the contractors.

a) Niagara Mohawk should supply contractors with a copy of the customer's action form from the workshop

Niagara Mohawk should give the contractors a copy of the customer's action form from the workshop. The contractor could then review these actions with the customers, discuss whether they had been able to take the actions, determine whether they can help the customers with the actions in any way, and suggest additional or alternative actions.

b) Niagara Mohawk should require contractors to review and explain customer bills

Niagara Mohawk should require contractors to review and explain customer bills. Customers should understand how to determine if usage is increasing or decreasing. This is especially important for the Affordable Payment Plan customers, whose bills do not vary with usage.

c) Niagara Mohawk should review education requirements with contractors

Niagara Mohawk provides customers with effective education during the workshop and with the video. However, the service delivery contractor's visit to the home is an opportunity for the provider to furnish the customer with additional energy education. The contractor should take advantage of this opportunity to reinforce actions from the workshop or video, to help the customer take actions where he or she was not successful, and to suggest additional energy saving actions.

4. Recommendations based upon findings from qualitative interviews with customers

The workshop and video appear to contribute to the effectiveness of program education. Niagara Mohawk should continue to make these tools available to Affordable Payment Plan participants, and additionally make them available to Senior and Safety Net customers. In order to improve customer understanding of energy usage, Niagara Mohawk should require contractors to educate customers on how to read their bill, should review education requirements with contractors, and should conduct quality control on the education that is provided by the contractors.

a) Continue to make the workshop and video available

The workshop and video provide another opportunity (in addition to contractor visits) to reinforce the importance of taking steps to save energy. They also provide information on the payment plan for customers participating in this aspect of the program. Niagara Mohawk should continue to provide the workshops and videos to all payment plan participants. They should begin to offer these EUM opportunities to senior and safety net customers as well.

b) Require contractors to educate customers about the bill

Niagara Mohawk currently does not require auditors to educate customers about their energy bill and how to understand how much energy they are currently using.

One of the contractors stated that he regularly reviews this information and a few of the customers remembered specific information relating to understanding the bill. Niagara Mohawk should require contractors to include bill education as part of the education provided during the visit so that customers can understand when their usage is declining or increasing. This is particularly important for Affordable Payment Plan customers who received a fixed bill every month.

c) Review education requirements with contractors

As in the past, Niagara Mohawk should review education guidelines with contractors at their annual contractor meeting. They should specify that a written action plan is required for every customer.

d) Conduct quality control on contractor-delivered education

Niagara Mohawk should ask customers what actions they were taking to save energy as a result of the program during their quality control assessment. While not all customers remember energy education, consistent patterns may show problems with one or more contractors. This would provide Niagara Mohawk with information as to where additional training is needed.

Appendix

Implementation Plan for LICAP Energy Services Program 2003-2004

I. Introduction

In accordance with Attachment 19, “Low Income Customer Services” of the National Grid USA and Niagara Mohawk merger Joint Proposal (JP), Case 01-M-0075 filed on October 11, 2001, the Company proposes the following program plan and budget for rate years 2003 and 2004.

According to the Joint Proposal, the Company agreed to provide the services of the Low Income Customer Assistance Program (LICAP) to eligible low income customers for the duration of the rate plan. Attachment 19 of the Joint Proposal expanded program eligibility to include customers “...current on their account but unable to afford necessary medication, proper nutrition, or some other life necessity.” Sec. 1.2. For Program Years 2003 and 2004, the Company proposes to provide the LICAP energy efficiency services to an additional 10% of eligible customers beyond the performance target indicated in JP Attachment 9, “Service Quality Assurance Program”, Sec. 9.4.8 “Low income program Incentive Mechanism”. These additional services will be targeted to those non-arrears payment-troubled customers in accordance with the expanded program eligibility.

This expansion of services, described in this implementation plan, will be provided within existing staff resources. Total program budgets for the LICAP Energy Services for each of the two years are included.

II. Eligibility

The LICAP Program provides services to those low income Niagara Mohawk payment troubled electric and natural gas customers to enable them to better manage their energy use, cost and bill payment. Specifically, the LICAP Energy Services lower program participants’ overall usage and costs thereby making their energy bills more affordable. Consequently, these services are targeted to those low income customers who are most vulnerable to loss of utility service. Within the scope of the resources available for the LICAP program, the priority of service is as follows:

- Payment-troubled customers who are in arrears on their utility bills;
- Non-arrears payment troubled customers for whom full bill payment may be at the expense of some other life necessity such as food and/or medication;

- Public assistance customers coming off direct voucher.

In expanding the LICAP Energy Services, the Company intends to target the non-arrears payment-troubled customers.

III. Enrollment

To reflect the increase in number of customers receiving the LICAP Energy Services, the program enrollment target will be increased from 4,200 as noted in the “Service Quality Assurance Program”, JP Attachment 9, Sec. 9.4.8 to 4,350.

The enrollment of payment- troubled arrears customer will continue to be through collections operations. Collections personnel will screen customers calling for a payment arrangement to see if customer is eligible for a LICAP Affordable Payment Plan whereby 10-35% of their current monthly budget is deferred. Customers put on an Affordable Payment Plan are thereby enrolled into the LICAP Program and become eligible for LICAP Energy Services.

Since low income non-arrears payment-troubled customers tend most often to be senior customers, a referral procedure has been established with the local County Offices for the Aging who identify those senior customers whose utility bill payment may occur at the expense of some other life necessity such as food and/or medication.

Referral procedures have also been developed whereby public assistance customers who come off of direct voucher are referred for LICAP Energy Services by the DSS Unit at Collections.

IV. LICAP Energy Services

a. Energy use Management Education

Every customer enrolled into the LICAP Program will be offered energy use management education. The energy use management education is designed to enable participants to focus on energy usage patterns in their household and to discover specific actions whereby usage and overall cost can be reduced.

Those who live in proximity to where energy services workshops are conducted throughout Niagara Mohawk’s service territory will be assigned to attend a workshop. The LICAP Energy Services Program will conduct an additional five workshops to accommodate the increase in number of customers receiving energy efficiency services. Therefore the Company proposes to increase the number of workshops conducted from 210 as noted in JP Attachment 9, Sec. 9.4.8 to a total of 215.

Those participants unable to attend a workshop will receive an education packet through the mail which contains a video tape that provides the same energy saving materials discussed in the workshops. Information sheets are also provided which assist participants in developing an energy saving action plan for their household.

b. Energy Efficiency Services

Every participant will receive at no cost to them three energy efficient compact fluorescent (CFL) bulbs. Included in the energy use management education is a lighting analysis which participants can complete for their household which will assist them in determining where to install the CFL's in order to achieve maximum savings.

Based on an analysis of pre-program usage together with information obtained from an energy services questionnaire completed by each participant, LICAP participants may also be eligible for additional energy efficiency services. Eligible participants receive an onsite inspection which determines the specific appropriate measures to be installed.

The energy efficiency services include any or all of the following:

- Weatherization
- Energy efficient refrigerator replacement
- Replacement of waterbed heater and bladder with a specially designed mattress
- Fuel switch from electric to available natural gas or propane domestic hot water appliance and/or clothes dryer
- Installation of two-three additional CFL's.

The program attempts to provide each participant eligible for energy efficiency services with the most comprehensive treatment within program budget limits.

The Company proposes to increase the number of participants receiving energy efficiency services from 1,130 as noted in JP Attachment 9, Sec. 9.4.8 to a total of 1,250.

IV. Outreach

The LICAP Energy Services Program will conduct outreach to: a) promote LICAP Program services; b) inform potentially eligible customers of the availability of the federal Home Energy Assistance Program (HEAP); and c) explain to LICAP customers the circumstances under which strategies to use alternative energy suppliers may lead to energy cost savings. Outreach initiatives will include direct mailings, information packets for agency networks, meetings with human service agency personnel, and "train the trainer" sessions.

V. LICAP Energy Services Budget for Years 2003 and 2004 (\$000)¹³

	Program Yr.	Program Yr.
	<u>2003</u>	<u>2004</u>
Labor (Salaries & Fringes)	603.6	621.6
Energy Services		
a. Energy Use Management Education		
- Workshops	57.0	58.7
- EUM Packets	33.0	33.9
b. Energy Efficiency Services		
- Lighting	147.3	151.6
- Weatherization Services	806.4	830.7
- Appliance Efficiency Services	1,015.5	1,046.1
	2,059.2¹⁴	2,121.0
Outreach ¹⁵	126.1	130.4
Evaluation	113.0	116.0
Total:	<u>2,901.9</u>	<u>2,989.0</u>

¹³ The order in effect July 3, 2001 in Case No. 94-E-0952 clarified that for the year 2003, Niagara Mohawk will retain \$1,790,140 of SBC funds collected to fund the LICAP Program from January 1, 2003 through August 31, 2003 so that PowerChoice LICAP performance targets for PowerChoice Year 5 can be accomplished. Based on the LICAP program evaluation submitted 09/01/02, the Commission will consider whether to continue, increase or decrease the level of SBC funding for the LICAP program after 08/31/03. Any changes in SBC funding resulting in modifications to program goals may require modifications to the performance targets of the Service Quality Assurance Program.

¹⁴ The costs for the direct installation of energy efficiency services for year 2003 have been increased by 10% over those indicated for the same year in the Implementation Plan submitted 01/11/02 to reflect the proposed increase in number of participants receiving energy efficiency services.

¹⁵ The budgets for outreach and evaluation activities in 2003 differ from the budget submitted in the 01/11/02 Implementation Plan because of the decision to eliminate media promotions from the outreach plan as well as a revised evaluation plan submitted by the contractor based on revised evaluation requirements from PSC Staff.