MERAC and ECOS

Presented to

MaineHousing
Maine State Housing Authority

COHN REZNICK

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July 9, 2013

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EXECUTIVE SUMMARY

CohnReznick LLP was engaged by Maine State Housing Authority ("MaineHousing") to perform a review of the MERAC and ECOS projects. CohnReznick performed inquiries with MaineHousing management and staff, as well as program developers and consultants who provided services in connection with the MERAC and ECOS projects. Feedback was also collected through conversations with direct users at a representative sample of Community Action Agencies (CAAs).

MERAC

MERAC is a proven solution that is used to administer $35 million(2013) in LIHEAP funds at an average annual cost for development and maintenance of approximately $200,000 (.6% of funds administered). The system was developed using industry standard technology with structured programming techniques. MERAC appears to meet most needs of MaineHousing and the CAAs. MaineHousing should continue to use MERAC and critique opportunities to improve the solution using a return on investment (ROI) approach.

The following observations were noted during the engagement:

- Costs appeared to be reasonable.
- The system has been stabilized, with predictable annual maintenance costs.
- The system has enabled better data and vendor management, and brought cost savings as well as other benefits.

EXECUTIVE SUMMARY

ECOS

The Energy Conservation Online System (ECOS) was initially designed and developed to meet both the needs of the DOE weatherization program and an anticipated nationwide consumer market. A significant expenditure primarily with DOE funds was made to develop ECOS. MaineHousing should continue to used ECOS, as other alternatives either do not meet DOE requirements or are not economically feasible. The following observations were noted during the engagement:

- ECOS has been developed over time with a changing scope.
- Costs of ECOS from 2005 to 2012 totaled $3.31 million.
- ECOS is expected to be used to administer approximately $6.8 million in funds per year.
- The system has more detailed functionalities than MEAFF and MEADOW.
- The system has been approved by DOE.
- Work performed by project developers and their hourly rates are reasonable.

RECOMMENDATIONS

1. MaineHousing should continue to use MERAC and critique opportunities to improve the solution using a return on investment (ROI) approach, including compliance requirements by LIHEAP.
2. MaineHousing should continue to use ECOS, as other alternatives either do not meet DOE requirements or are not economically feasible.
3. After completion of contracted ECOS Phase I and Phase II, an ROI approach, with consideration of DOE requirements, should be used for future ECOS development.
4. A project management methodology should be established.
5. Separation of duties of system support/maintenance from development may be considered.
6. RFP approach should be used for IT vendor selection.
7. IT vendor contract management should be reviewed for improvement.

continued

RECOMMENDATIONS (CONTINUED)

8. The efficiency of LIHEAP and weatherization program administration can be improved through non-system process enhancement:
   - Process boot camp approach to identify opportunities for streamlining.
   - CAA user training, user performance monitoring, user incentive management.
   - Continued development of standardized procedures and documentation.
9. MaineHousing should communicate with DOE regarding program ownership and future direction of ECOS.

ENGAGEMENT APPROACH

- Performed inquiries with MaineHousing management and staff regarding MERAC and ECOS.
- Obtained an understanding of the background, development, and current status of both projects.
- Analyzed MERAC- and ECOS-related charges from 2005 to 2012.
- Reviewed all JAI contracts and invoices from 2005 to 2012.
- Performed walk-through demonstrations of both systems.
- Joined an on-site visit to a weatherized house.
- Contacted direct users at CAAs for MERAC and ECOS feedback.
- Evaluated the functionality of the two systems.
- Researched alternative solutions.
- Performed comparison among alternative solutions.

MERAC –
Maine Energy Assistance and Conservation

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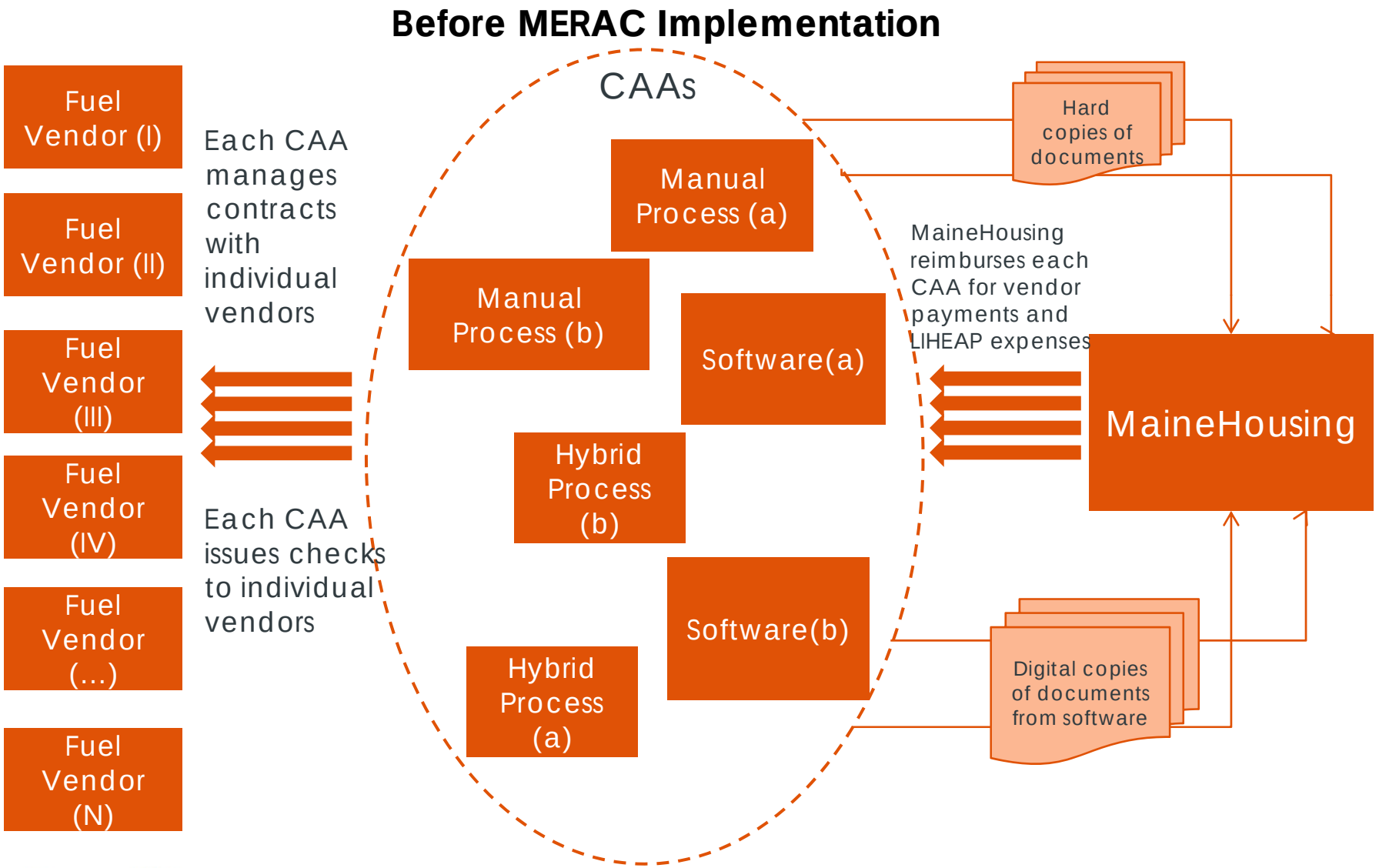
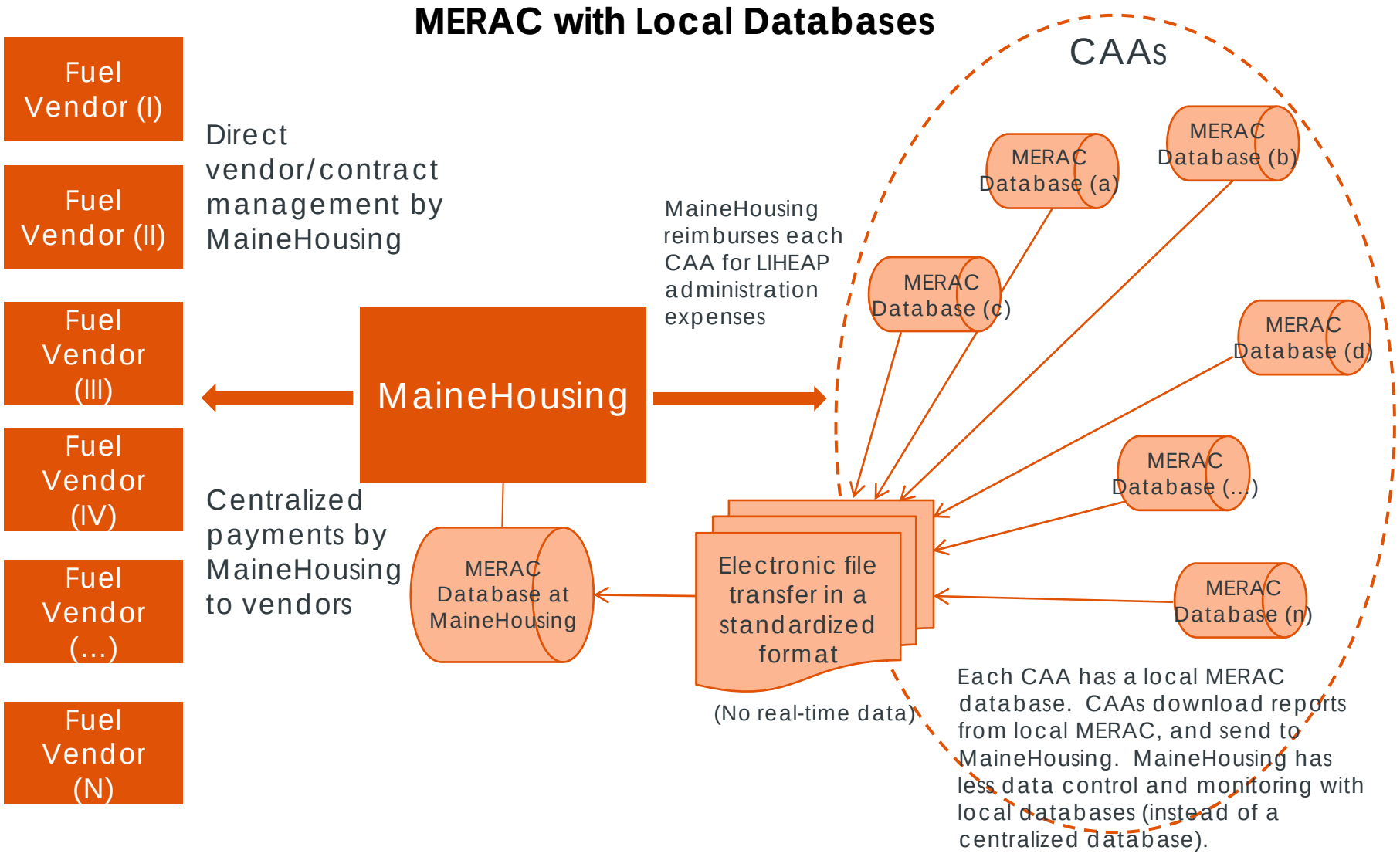
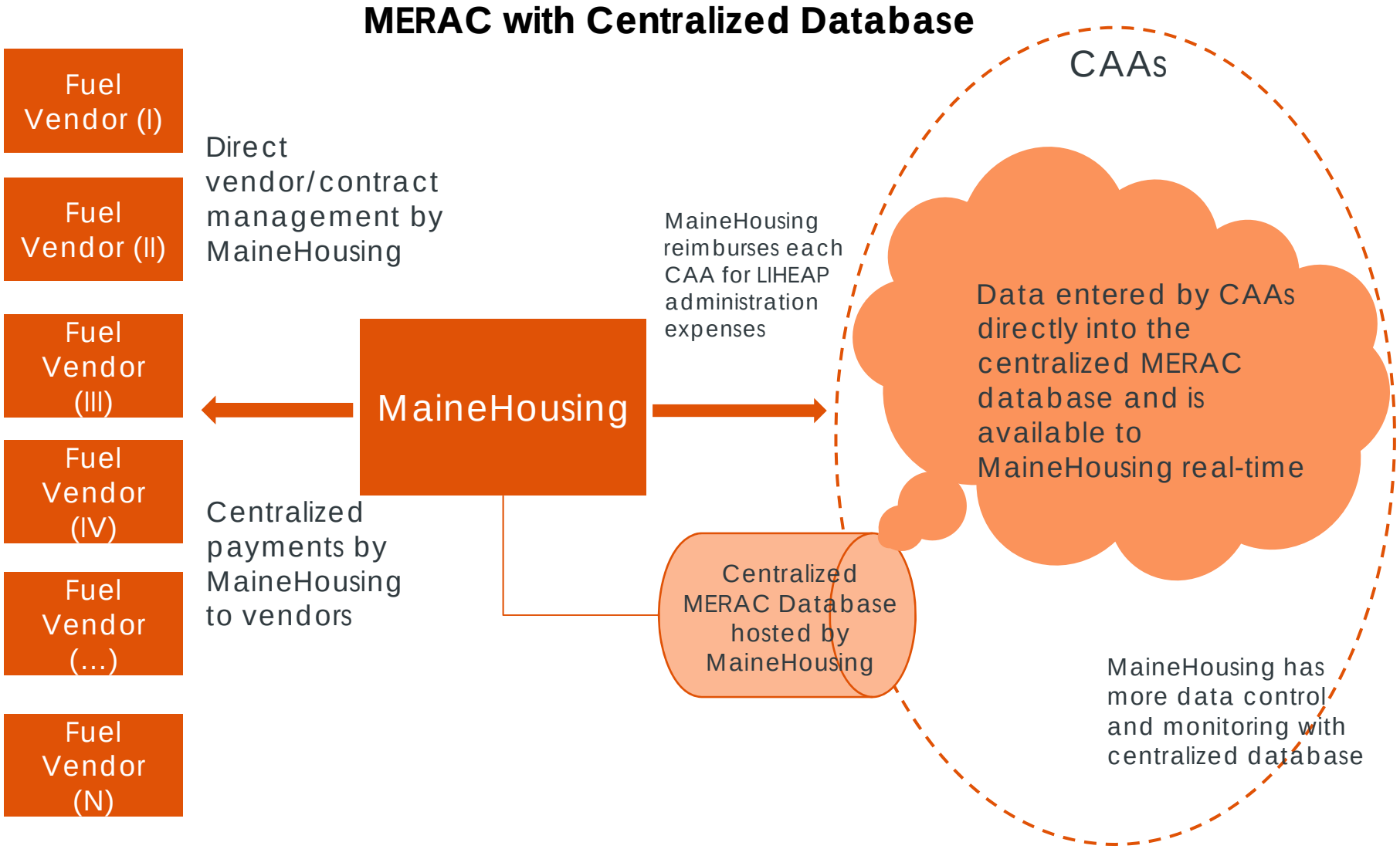
MERAC – HISTORY AND DEVELOPMENT



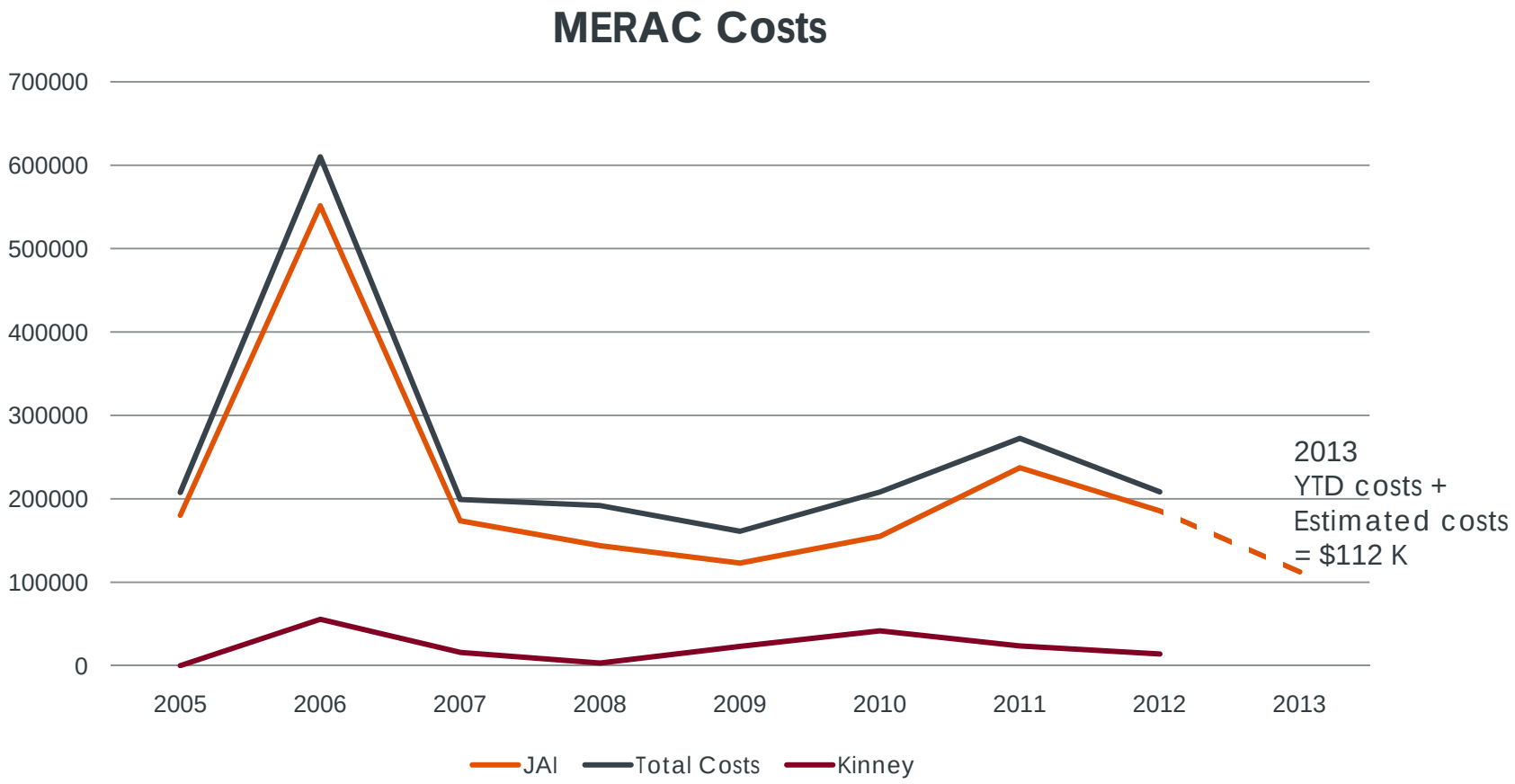
MERAC – HISTORY AND DEVELOPMENT (CONTINUED)



MERAC – HISTORY AND DEVELOPMENT (CONTINUED)



COST ANALYSIS



COST ANALYSIS (CONTINUED)

- Costs of MERAC from 2005 to 2012 totaled $2.06 million.
- Charges by Joseph Associates, Inc. (JAI) totaled $1.75 million, about 85% of the total MERAC costs from 2005 to 2012.
- Charges by Kinney Consulting & Associates (Kinney) totaled $180K, about 9% of the total MERAC costs from 2005 to 2012.
- Therefore, CohnReznick focused the cost analysis on JAI charges, and reviewed all JAI contracts and invoices related to the MERAC project. The following were noted during the cost analysis:
  - JAI services in 2005 and 2006 were mainly based on fixed price contracts.
  - JAI charges from 2007 to 2012 were based on hourly rates.
  - Time spent on the project and the hourly rates appeared to be reasonable.
  - Annual costs were higher prior to 2007 where the project was in its early development stage, while the costs returned to an average of $200,000 per year after 2007.
  - Effective January 2013, JAI provides development based on fixed-price work orders, and support and maintenance at an hourly rate of $85 per hour capped at 40 hours per month.

COST ANALYSIS (CONTINUED)

Development vs. Maintenance

	MERAC (JAI) *	
	Development	Maint. And Support
2005	$ 161,540	$ 18,750
2006	462,474	88,904
2007	61,104	112,536
2008	118,687	25,071
2009	121,134	1,771
2010	133,880	21,095
2011	131,762	105,532
2012	52,621	132,959
2013	77,053	35,339
Totals	$ 1,320,255	$ 541,958
Average (per year) (2005 - 2012)	$ 155,400	$ 63,327
Average (per year) (2005 - 2013)	$ 146,695	$ 60,218
2013 YTD (Jan - May)	$ 9,733	$ 11,539
Estimated (Jun - Dec)	67,320	23,800
2013 Total (YTD + Estimated)	$ 77,053	$ 35,339
2013 Total (YTD + Estimated)	**$ 112,392**	

** These costs include JAI costs only. The allocations between "Development" and "Maintenance and Support" are based on invoice descriptions.*

USER FEEDBACK

- Four CAAs were contacted – ACAP, KVCAP, WCAP, and WMCA.
- These CAAs were selected to represent agencies of different sizes and with different available in-house technology.

USER FEEDBACK (CONTINUED)

MERAC

Pros	Cons
1. MaineHousing's support team is very helpful and is good at keeping CAAs in touch.	1. There were a lot of system crashes in 2009. MERAC has been through a lot of updates since 2009. The system still has some bugs that are not resolved.
2. Some CAAs formerly had all-paper intake and a separate staff to enter data. All CAAs can now enter information directly into MERAC during interview (if held in a CAA office or if laptops are used in field).	2. Some information cannot be changed once certified in MERAC. For example, CAAs need to request through MaineHousing to reopen an application if it was previously denied. Another example is that CAAs used to be able to run reports and pull data for their own analysis and planning. Now certain data needs to be requested before it can be downloaded by CAAs.
3. The existing application alert function is available to all CAAs.	3. MERAC offers some reports but sometimes the reports are not easy to get to.
4. CAAs no longer have to manage vendor contracts.	4. CAAs feel that their feedback provided to MaineHousing is not always reflected in the releases.
5. MERAC enables centralized fuel vendor management and information management. Centralized information management assists program planning.	5. Since major improvements to MERAC are brought to production through service releases and updates, turn-around time on some system issues is longer compared to when CAAs had their own system and support.

USER FEEDBACK (CONTINUED)

MERAC

Pros	Cons
6. Payments to fuel vendors are now centralized and made directly by MaineHousing. Centralized payments result in savings on paper checks as well as employee time on bookkeeping and payment handling.	
7. The application and payment process is expedited since MaineHousing can access the information entered into MERAC real-time.	
8. CAAs no longer need to file hard copy of files to MaineHousing, though hard copy is still maintained at CAAs for MaineHousing audit/review.	
9. CAAs do not have to pay for their own system support as support for MERAC is centrally provided by MaineHousing.	

MERAC SAVINGS

Maine LIHEAP Savings

	Annual LIHEAP Fuel Assistance Dollars Distributed *	Number of Households Receiving Fuel Assistance *
2010	$ 52,838,017	62,131
2011	$ 49,662,888	62,363
2012	$ 24,975,092	50,682
2013 (as of 6/27/2013)	$ 25,917,115	44,458

**** Data provided by MaineHousing***

MaineHousing centralized vendor contract management and required a $0.07 reduction in the per gallon price of oil/kerosene. This resulted in an estimated amount of $28 savings per household per year, assuming 400 gallon per household usage. Approximately 79% of the LIHEAP population uses oil/kerosene as the primary fuel type. The total saving for the Maine LIHEAP program per year is therefore **$1.1 million**, assuming an annual average of 50K LIHEAP certified households.

$0.07 saving × 400 gallon usage × 79% × 50,000 LIHEAP certified households = $1.1million

MERAC SAVINGS (CONTINUED)

Other Savings and Considerations

The CohnReznick engagement team was not able to identify efficiency savings for either MaineHousing or the CAAs due to the implementation of MERAC. However, the following benefits, although difficult to quantify, have been achieved:

- **Centralized data management, reporting, and vendor management** – Improved data visibility to administer the LIHEAP program.
- **Clear segregation of duties between MaineHousing and CAAs** – Improved internal controls to separate transaction authorization, execution, and accounting.
- **Enhanced cash management** – Administration cost reduction through streamlined cash flow from MaineHousing to vendors.
- **Automated data flow** – Administration cost reduction through digital data transfer.
- **Improved data integrity** – Consistent payment calculation, restricted data modification, and standardized dropdown list.
- **Accelerated federal reporting** – Increased efficiency with reliable information and standardized format.

Appendix I:
LIHEAP System Comparison

ECOS –
Energy Conservation Online System

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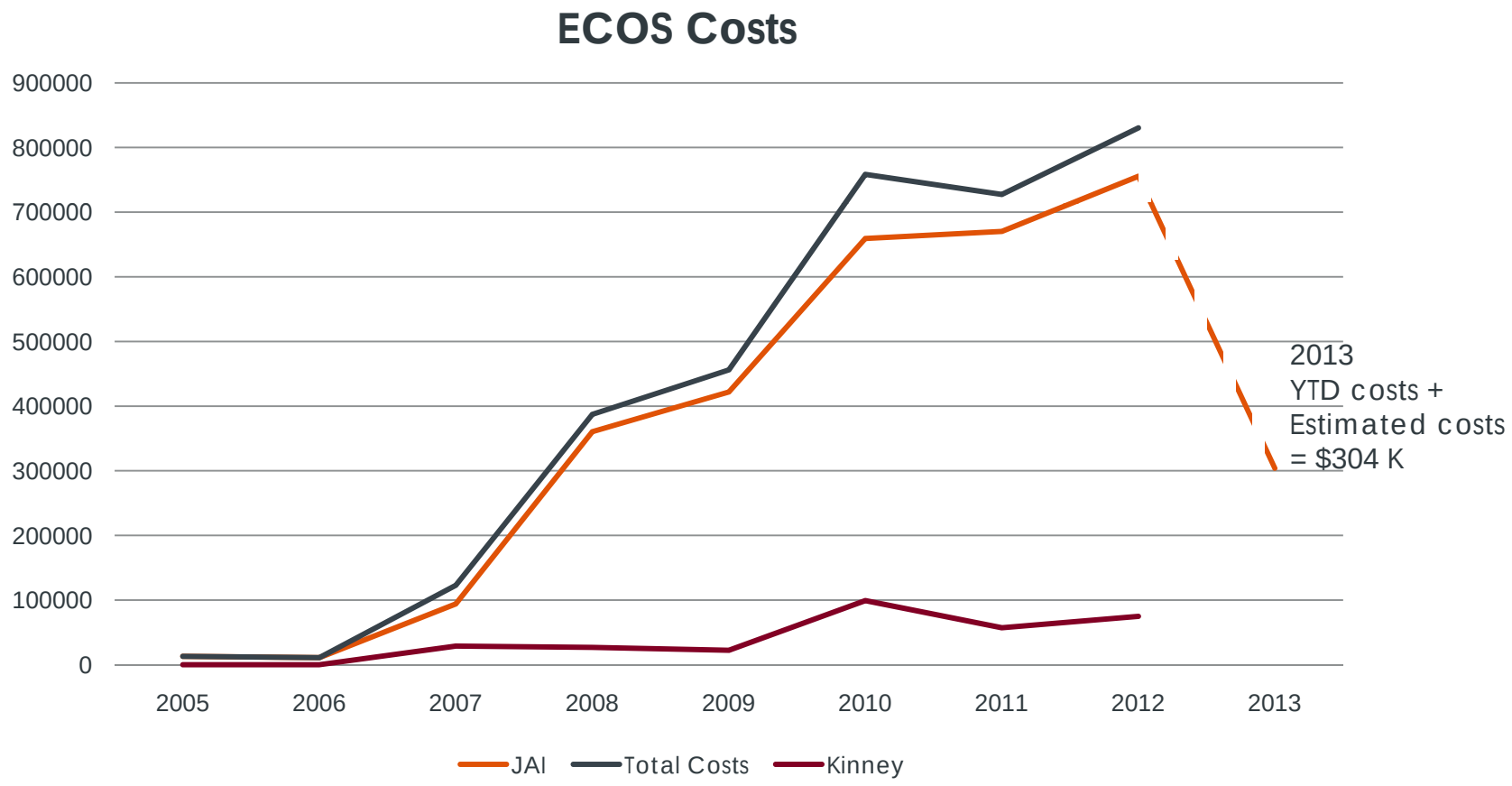
COST ANALYSIS



COST ANALYSIS (CONTINUED)

- Costs of ECOS from 2005 to 2012 totaled $3.31 million.
- Charges by Joseph Associates, Inc. (JAI) totaled $2.99 million, about 90% of the total ECOS costs from 2005 to 2012.
- Charges by Kinney Consulting & Associates (Kinney) totaled $310K, about 9% of the total ECOS costs from 2005 to 2012.
- Therefore, CohnReznick focused the cost analysis on JAI charges, and reviewed all JAI contracts and invoices related to the ECOS project. The following were noted during the cost analysis:
  - Annual ECOS costs have been increasing since 2006.
  - Before 2012, JAI charges were based on hourly rates.
  - Time spent on the project and the hourly rates appeared to be reasonable.
  - Costs incurred were mainly development costs.

continued

COST ANALYSIS (CONTINUED)

- Effective October 2012, JAI provides support and maintenance at an hourly rate of $85 per hour capped at 140 hours per month.
- JAI is contracted to complete Phase I and Phase II of ECOS for a fixed price of $363K. Payment of $202K was made in 2012, while year-to-date payments in 2013 totaled $88K. MaineHousing management expects completion of Phase I and Phase II to occur in 2013 with the remaining cost of $73K to be paid.
- MaineHousing management expects development to be provided based on fixed-price work orders starting in 2014.

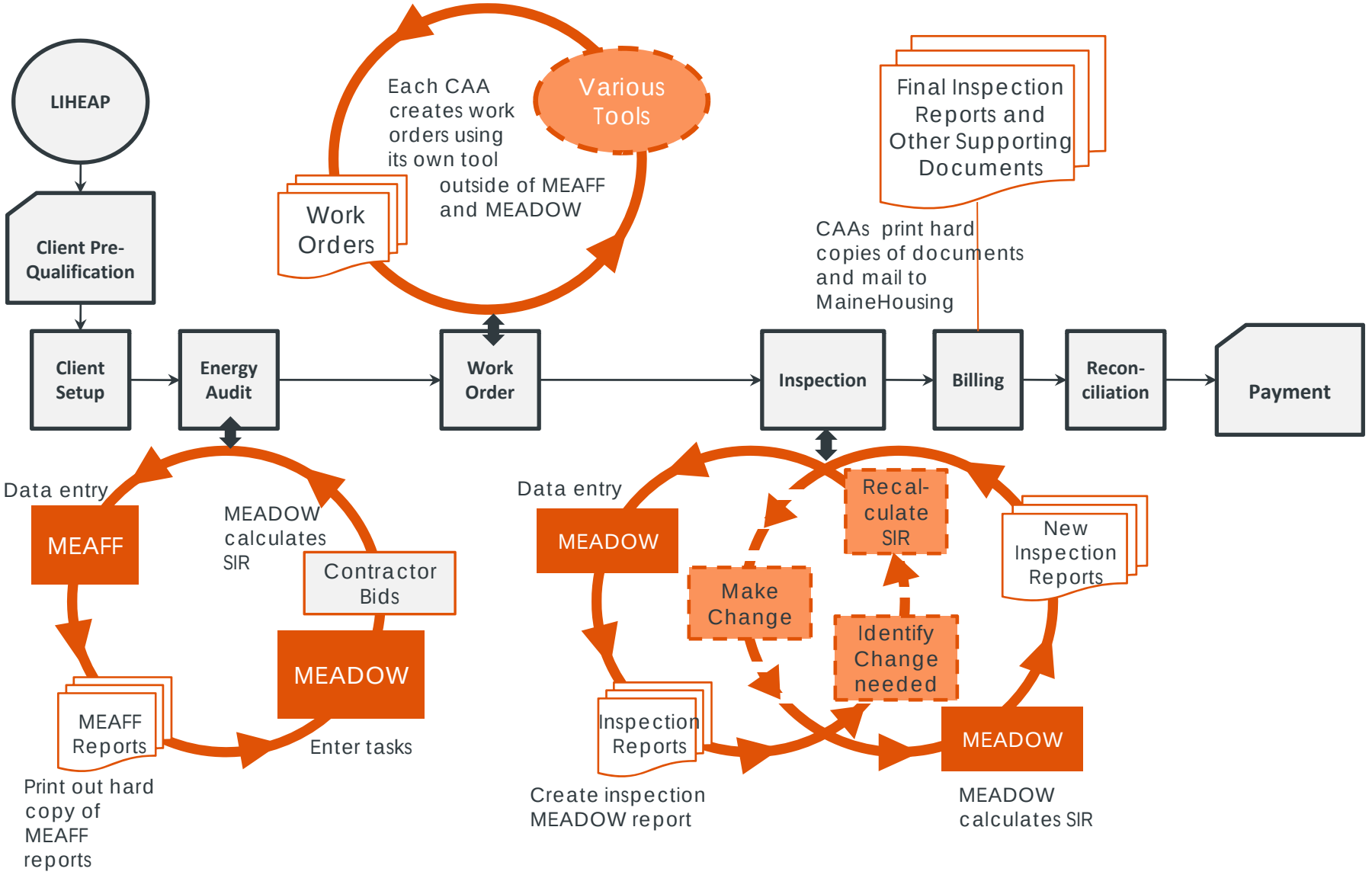
COST ANALYSIS (CONTINUED)

Development vs. Maintenance

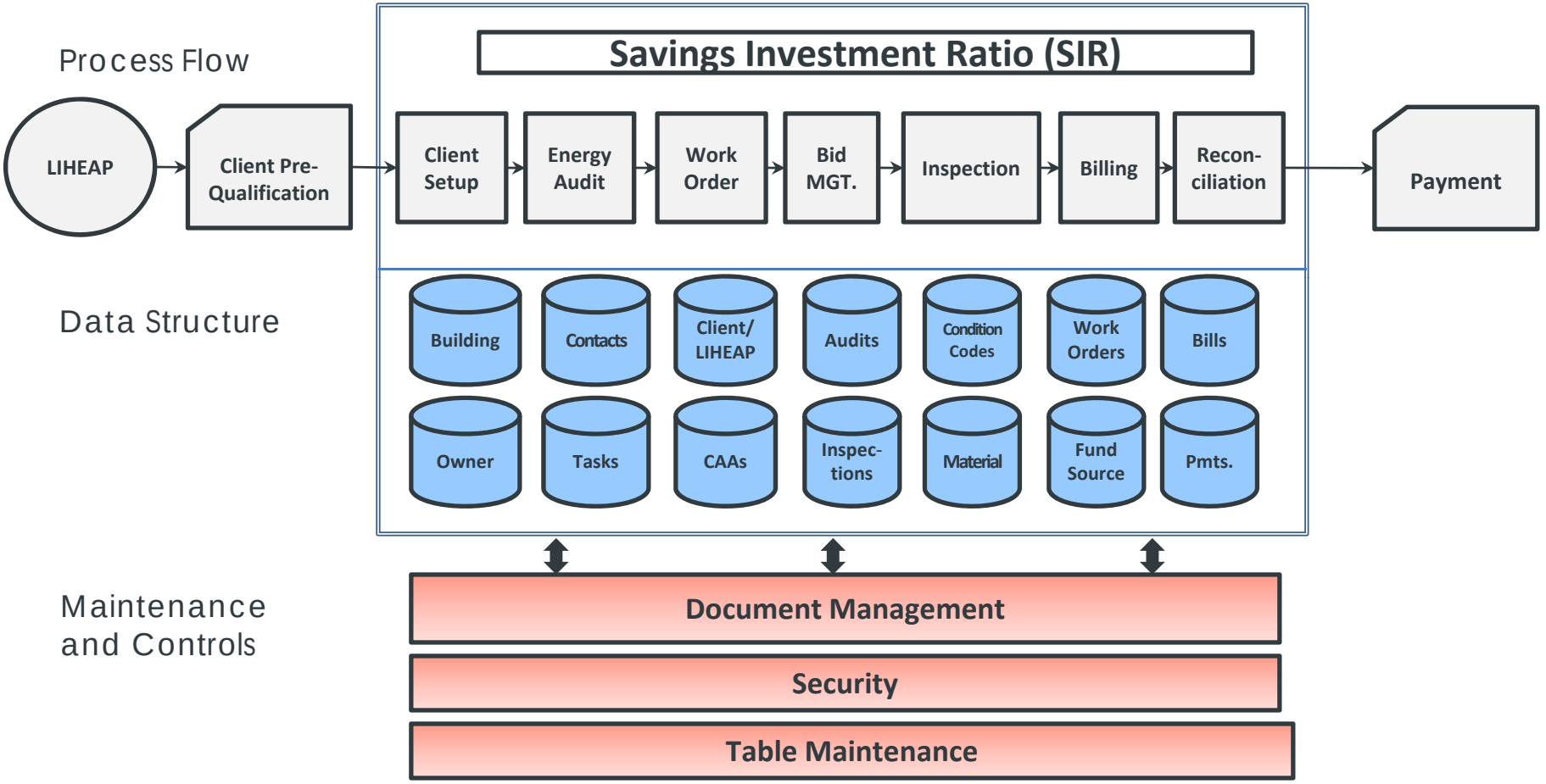
	ECOS (JAI) *	
	Development	Maint. And Support
2005	$ 13,030	$ -
2006	10,925	-
2007	93,975	-
2008	360,449	-
2009	421,964	-
2010	659,222	-
2011	670,144	-
2012	719,808	35,700 *
2013	161,262	142,800
Totals	$ 3,110,778	$ 178,500
Average (per year) (2005 - 2012)	$ 368,690	N/A *
Average (per year) (2005 - 2013)	$ 345,642	$ 89,250 *
2013 YTD (Jan - May)	$ 87,962	$ 59,500
Estimated (Jun - Dec)	73,300	83,300
2013 Total (YTD + Estimated)	$ 161,262	$ 142,800
2013 Total (YTD + Estimated)	**$ 304,062**	

** These costs include JAI costs only. The allocations between "Development" and "Maintenance and Support" are based on invoice descriptions. The maintenance cost of $35,700 incurred from October to December 2012 was paid in 2013. The annual averages of maintenance costs may not be representative as the cost in 2012 was a partial year cost.*

MEAFF AND MEADOW



ECOS


Process Flow
Savings Investment Ratio (SIR)
LIHEAP
Client Pre-Qualification
Client Setup
Energy Audit
Work Order
Bid MGT.
Inspection
Billing
Recon-ciliation
Payment
Data Structure
Building
Contacts
Client/ LIHEAP
Audits
Condition Codes
Work Orders
Bills
Owner
Tasks
CAAs
Inspec-tions
Material
Fund Source
Pmts.
Maintenance and Controls
Document Management
Security
Table Maintenance

ECOS OBSERVATIONS

- CohnReznick observed the use of ECOS and noted the following:
  - ECOS has an intuitive, easy-to-use menu interface that provides for simplified navigation.
  - Data entry controls enforce data integrity.
- CohnReznick evaluated program code and database architecture and noted the following:
  - ECOS was developed with structured programming techniques, including meaningful field and variable names, commented code.
  - A systems analyst or developer knowledgeable in Microsoft .NET development and the Microsoft SQL database platform should be able to maintain and enhance the application.
  - MaineHousing does not maintain separate technical documentation, including program listings, application architecture diagrams, or database definitions that would assist a system analyst or developer gain an understanding of the application.

USER FEEDBACK

- Four CAAs were contacted – ACAP, KVCAP, WCAP, and WMCA.
- These CAAs were selected to represent agencies of different sizes and with different available in-house technology.

USER FEEDBACK

ECOS

Pros	Cons
1. MaineHousing's support team is very helpful and professional in providing ECOS support.	1. ECOS is not user friendly. The design of the program is not logical for users inputting the data. The developer did not design the program from a CAA users' perspective.
2. File organization is improved by implementation of ECOS.	2. CAAs are aware that new DOE requirements resulted in more data collection. However, collection of all required information and data entry with ECOS is time consuming. CAAs claim that the field audit and data entry time with ECOS takes 2-3 times longer than with MEAFF/MEADOW.
3. CAAs no longer need to file hard copy of files to MaineHousing, though hard copy is still maintained at CAAs for MaineHousing audit/review.	3. Locating the proper tasks from the ECOS task selection list is difficult as the selection list is not sorted.
4. ECOS may be a more accurate model in calculating SIR and energy savings.	4. The turn-around time to add a new condition code may take 1-2 days, which slows down the weatherization process.

USER FEEDBACK (CONTINUED)

ECOS

Pros	Cons
	5. CAAs cannot have ad hoc download of data with ECOS. Only data look-ups can be performed. (MEAFF and MEADOW allows ad hoc download.) With ECOS, it is not as easy for CAAs to analyze local data as before.
	6. Crew Weatherization cannot use ECOS.
	7. CAAs may need to spend extra time to walk contractors through work orders since the work orders generated by ECOS are complicated. CAAs also try to minimize change orders needed by going through the details with contractors.
	8. Inspection takes longer time. If any deviation is noted during inspection, CAAs need to create a new inspection in ECOS.

USER FEEDBACK (CONTINUED)

ECOS

Pros	Cons
	9. Processing change order /re-work/add-work with ECOS is time consuming. It requires auditors to re-open the project, remove old tasks and select new tasks, and approve each of the new tasks. If multiple tasks or segments are involved, each change needs to be processed and approved separately, which is redundant and inefficient.
	10. Once an invoice is entered into ECOS and finalized, CAAs cannot review it. If any discrepancy (price and/or quantity) is noted afterward, all information needs to be re-entered.
	11. Special request to MaineHousing is needed to extract certain data from ECOS.
	12. Some CAAs experienced unexpected data loss.

OTHER CONSIDERATIONS

The CohnReznick engagement team was not able to identify per project efficiency savings for either MaineHousing or the CAAs due to the implementation of ECOS. However, MaineHousing management expects the following benefits to be achieved:

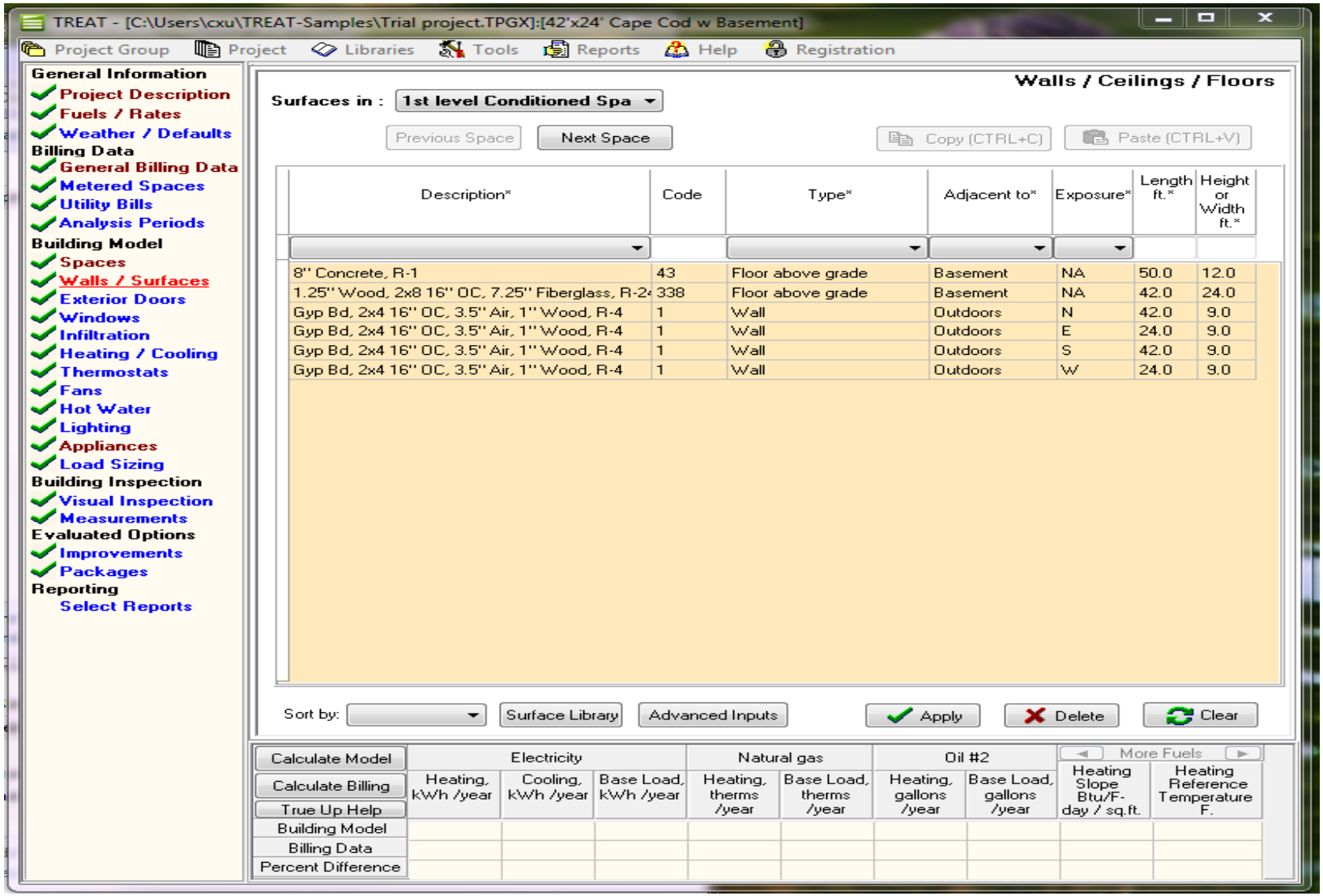
- **Compliance with DOE regulations** – Replaced MEAFF and MEADOW which are no longer in compliance with DOE.
- **Centralized data management and reporting** – Organized weatherization project files, provided real-time access to information in centralized database, and improved data visibility to administer the weatherization program.
- **Project monitoring** – Standardized work order changes and enabled work order modification tracking.
- **Enhanced energy savings accuracy** – Assisted to maximize energy savings.

OTHER CONSIDERATIONS
(CONTINUED)

The following are potential benefits that may be realized through ECOS in the long term:

- **Anticipated nationwide implementation** – Arkansas and Washington, D.C are planning to implement ECOS. Costs of support and continuous system improvement may be shared with a larger population of users, while turn-around time may be reduced as user feedback accumulates.
- **Vendor performance monitoring** – Vendor performance can be evaluated through analysis of project statistics to enhance vendor management and identify potential cost savings.
- **Process improvement opportunity** – Centralized information analysis provides data for better project planning, tracking, and resource allocation.
- **Improved cash management and streamlined payment process** – Potential integrated bidding, billing, and payment process.
- **Reduced travel time and expense** – The web-based access to ECOS provides potential to reduce travel costs.

ALTERNATIVE TRIAL – TREAT



ALTERNATIVE TRIAL – TREAT
(CONTINUED)

Observations:

Pros

- DOE approved.
- Capability of billing data import (from spreadsheet) and report export (to Word).
- Online training video.
- Editable libraries to reduce data entry redundancy.
- Help desk, ticket system, and FAQ supported.

continued

ALTERNATIVE TRIAL – TREAT
(CONTINUED)

Observations:

Cons

- Little data integrity control (e.g., future dates can be saved for report date, incorrect zip code can be used).
- Decentralized database.
- The program may not follow the same logic of typical weatherization projects performed by Maine agencies.
- Information not available on how a change order is handled.
- Conversion to TREAT would require extra costs on data conversion and training.

Appendix II:
Weatherization Process Comparison

Appendix III:
Summary of Alternative Comparison

RECOMMENDATIONS

1. MaineHousing should continue to use MERAC and critique opportunities to improve the solution using a return on investment (ROI) approach, including compliance requirements by LIHEAP.
2. MaineHousing should continue to use ECOS, as other alternatives either do not meet DOE requirements or are not economically feasible.
3. After completion of contracted ECOS Phase I and Phase II, an ROI approach, with consideration of DOE requirements, should be used for future ECOS development.
4. A project management methodology should be established.
5. Separation of duties of system support/maintenance from development may be considered.
6. RFP approach should be used for IT vendor selection.
7. IT vendor contract management should be reviewed for improvement.

continued

RECOMMENDATIONS (CONTINUED)

8. The efficiency of LIHEAP and weatherization program administration can be improved through non-system process enhancement:
   - Process boot camp approach to identify opportunities for streamlining.
   - CAA user training, user performance monitoring, user incentive management.
   - Continued development of standardized procedures and documentation.
9. MaineHousing should communicate with DOE regarding program ownership and future direction of ECOS.

DESCRIPTIONS OF KEY TERMS

Term	Description
CAA	Community Action Agency
ECOS	Energy Conservation Online System
MERAC	Maine Energy Assistance and Conservation
MEAFF	Maine Energy Audit Field Form
MEADOW	Computerized Energy Audit
ROI	Return on Investment
SIR	Savings-to-Investment Ratio

SIR – Savings-to-Investment Ratio. The SIR value of an energy-saving measure should be at least one for it to be installed. The equation used for SIR is below. The Life of a measure is discounted with factors published by the Department of Energy every April.

$$SIR \quad \frac{\text{Annual Savings from Measure}}{\text{Cost of Measure}} x \text{ Discounted Life of Measure}$$