COMMONWEALTH OF KENTUCKY
BEFORE THE PUBLIC SERVICE COMMISSION

In the Matter of:

JOINT APPLICATION OF LOUISVILLE GAS AND ELECTRIC COMPANY AND KENTUCKY UTILITIES COMPANY FOR REVIEW, MODIFICATION, AND CONTINUATION OF EXISTING, AND ADDITION OF NEW, DEMAND-SIDE MANAGEMENT AND ENERGY EFFICIENCY PROGRAMS	**)** **)** **)** **)** **)** **)**	**CASE NO. 2014-00003**

RESPONSE OF
LOUISVILLE GAS AND ELECTRIC COMPANY
AND KENTUCKY UTILITIES COMPANY
TO THE COMMISSION STAFF'S FIRST INFORMATION REQUEST
DATED FEBRUARY 17, 2014

FILED: MARCH 3, 2014

VERIFICATION

COMMONWEALTH OF KENTUCKY)
) SS:
COUNTY OF JEFFERSON)

The undersigned, **Robert M. Conroy**, being duly sworn, deposes and says that he is Director - Rates for LG&E and KU Services Company, and that he has personal knowledge of the matters set forth in the responses for which he is identified as the witness, and the answers contained therein are true and correct to the best of his information, knowledge and belief.

Robert M. Conroy

Subscribed and sworn to before me, a Notary Public in and before said County and State, this 3rd day of March 2014.

(SEAL)
Notary Public

My Commission Expires:

SUSAN M. WATKINS
Notary Public, State at Large, KY
My Commission Expires Mar. 19, 2017
Notary ID # 485723

VERIFICATION

COMMONWEALTH OF KENTUCKY)
) **SS:**
COUNTY OF JEFFERSON)

The undersigned, **David E. Huff**, being duly sworn, deposes and says that he is Director of Customer Energy Efficiency & Smart Grid Strategy for LG&E and KU Services Company, and that he has personal knowledge of the matters set forth in the responses for which he is identified as the witness, and that the answers contained therein are true and correct to the best of his information, knowledge and belief.

David E. Huff

Subscribed and sworn to before me, a Notary Public in and before said County and State, this 3rd day of March 2014.

Notary Public (SEAL)

My Commission Expires:

SUSAN M. WATKINS
Notary Public, State at Large, KY
My Commission Expires Mar. 19, 2017
Notary ID # 485723

VERIFICATION

COMMONWEALTH OF KENTUCKY)
) SS:
COUNTY OF JEFFERSON)

The undersigned, **Michael E. Hornung**, being duly sworn, deposes and says that he is Manager of Energy Efficiency Planning & Development for LG&E and KU Services Company, and that he has personal knowledge of the matters set forth in the responses for which he is identified as the witness, and the answers contained therein are true and correct to the best of his information, knowledge and belief.

Michael E. Hornung

Subscribed and sworn to before me, a Notary Public in and before said County and State, this 3rd day of March 2014.

Susan M. Watkins (SEAL)
Notary Public

My Commission Expires:

SUSAN M. WATKINS
Notary Public, State at Large, KY
My Commission Expires Mar. 19, 2017
Notary ID # 485723

LOUISVILLE GAS AND ELECTRIC COMPANY
KENTUCKY UTILITIES COMPANY

Response to the Commission Staff's First Information Request
Dated February 17, 2014

Case No. 2014-00003

Question No. 1

Witness: Michael E. Hornung

Q-1. Refer to paragraph 11, pages 6-7, of the cover letter ("Cover Letter") of the joint application ("Joint Application"). Provide the cost of the Energy Efficiency Potential Study ("EE Potential Study"), the Louisville Gas and Electric/Kentucky Utility Company DSM Program Review ("Program Review"), and any other third-party studies or reports, and explain how those costs were allocated to the Companies and by demand-side management ("DSM") program.

A-1. LG&E and KU have spent $441,131.50 to complete the EE Potential Study and $44,000 to complete the Program Review. All costs associated with the studies were allocated to the DSM Administration Program budget and split equally between LG&E and KU.

LOUISVILLE GAS AND ELECTRIC COMPANY
KENTUCKY UTILITIES COMPANY

Response to the Commission Staff's First Information Request
Dated February 17, 2014

Case No. 2014-00003

Question No. 2

Witness: Michael E. Hornung

Q-2. Refer to paragraph 18, pages 9-10, of the Cover Letter of the Joint Application, which states:

> The Companies are requesting an additional $24 million in this proposal to support modifications to the Commercial Load Management Program/Demand Conservation Program, Residential Incentives Program, Commercial Conservation/Commercial Incentive Program, and Residential Conservation Program/Home Energy Performance Program. These funds will also support the continuation of the Companies' Customer Education and Public Information Program through the end of 2018, as well as the implementation of Advanced Metering Systems.

a. By program and year, provide the proposed $24 million incremental cost for years 2015-2018 for both electric and gas DSM programs.

b. By program and year, provide the incremental lost sale component, incentive component, and capital-cost recovery component for years 2015-2018 for both electric and gas DSM programs.

c. By program and year provide the incremental impacts (i.e., MWh, MW, and Ccf) for years 2015-2018.

A-2.

a. The $24M referenced in the application as the incremental cost is not correct. The correct incremental cost associated with this filing is $33M. The table below provides a breakout of the incremental costs:

2011 Filing ($'000s)	Year 4 2015	Year 5 2016	Year 6 2017	Year 7 2018	Total
Residential Audit	$2,255	$2,250	$2,289	$2,361	**$9,156**
Residential WeCare	$4,947	$5,887	$6,862	$7,843	**$25,539**
Residential Demand	$13,821	$13,601	$14,040	$14,545	**$56,008**
Residential Incentives	$2,683	$2,661	$2,669	$2,707	**$10,721**
Residential Refrigerator Removal	$2,037	$2,068	$2,150	$2,211	**$8,466**
Smart Energy Profile	$3,311	$3,344	$3,433	$3,468	**$13,555**
Commercial Audit	$3,339	$3,369	$3,400	$3,431	**$13,538**
Commerical Demand	$647	$606	$625	$647	**$2,526**
Education & Information	$0	$0	$0	$0	**$0**
Development & Administration	$1,373	$1,421	$1,471	$1,522	**$5,788**
Total	**$34,413**	**$35,209**	**$36,939**	**$38,736**	**$145,296**
Occuring in 2014 see table below					***$10,024***
					$155,321

2013 Filing ($'000s)	2015	2016	2017	2018	Total
Residential Audit	$2,255	$2,250	$2,289	$2,361	**$9,156**
Residential WeCare	$4,947	$5,887	$6,862	$7,843	**$25,539**
Residential Demand	$13,821	$13,601	$14,040	$14,545	**$56,008**
Residential Incentives	$4,108	$4,086	$4,094	$4,133	**$16,422**
Residential Refrigerator Removal	$2,037	$2,068	$2,150	$2,211	**$8,466**
Smart Energy Profile	$3,311	$3,344	$3,433	$3,468	**$13,555**
Commercial Audit	$3,339	$3,369	$3,400	$3,431	**$13,538**
Commerical Demand	$1,577	$1,895	$2,220	$2,552	**$8,244**
Education & Information	$4,043	$4,110	$4,194	$4,295	**$16,643**
Development & Administration	$1,373	$1,421	$1,471	$1,522	**$5,788**
AMI Smart Grid	$825	$1,698	$1,705	$1,482	**$5,709**
Total	**$41,636**	**$43,731**	**$45,858**	**$47,842**	**$179,067**

Incremental Cost Increase ($'000s)	2015	2016	2017	2018	Total
Residential Audit	$0	$0	$0	$0	**$0**
Residential WeCare	$0	$0	$0	$0	**$0**
Residential Demand	$0	$0	$0	$0	**$0**
Residential Incentives	$1,425	$1,425	$1,425	$1,425	**$5,701**
Residential Refrigerator Removal	$0	$0	$0	$0	**$0**
Smart Energy Profile	$0	$0	$0	$0	**$0**
Commercial Audit	$0	$0	$0	$0	**$0**
Commerical Demand	$929	$1,289	$1,595	$1,904	**$5,718**
Education & Information	$4,043	$4,110	$4,194	$4,295	**$16,643**
Development & Administration	$0	$0	($0)	($0)	**($0)**
AMI Smart Grid	$825	$1,698	$1,705	$1,482	**$5,709**
Total	**$7,223**	**$8,523**	**$8,919**	**$9,107**	**$33,771**

2011 Filing Year 4 Occuring in 2014 ($'000s)	2014
Residential High Efficiency Lighting	$3,543
Residential New Construction	$1,402
Residential HVAC Tune Up	$538
Commercial HVAC Tune Up	$512
Customer Education & Public Information	$3,866
Dealer Referral Network	$163
Total	**$10,024**

b. Please see the table below. In response to the incremental lost sales component by year, program, and rate class, the Companies have provided the incremental value by rate class as the calculation is not performed on an individual program. Response to Question No. 4 addresses the details of this calculation further.

Incremental Lost Sales

	2015	2016	2017	2018
LG&E RS	$6,969,001	$6,293,173	$5,485,087	$5,532,917
LG&E GS	$2,850,104	$2,508,713	$2,190,264	$2,213,813
LG&E PS	$1,361,952	$1,199,665	$1,048,359	$1,059,630
LG&E LTOD	$386,553	$340,512	$297,589	$300,789
KU RS	$7,368,186	$6,838,565	$6,179,368	$6,287,138
KU GS	$2,921,848	$2,460,944	$2,020,518	$2,042,242
KU AES	$71,874	$60,567	$49,765	$50,300
KU PS	$1,669,940	$1,407,367	$1,156,513	$1,168,948
LG&E RGS	$935,777	$986,905	$1,032,903	$1,100,905
LG&E CGS	$0	$0	$0	$0
Total	**$24,535,234**	**$22,096,411**	**$19,460,365**	**$19,756,681**

Incremental Incentives - By Rate Category

	2015	2016	2017	2018
LG&E RS	$343,703	$354,379	$369,224	$384,101
LG&E GS	$51,307	$51,813	$52,355	$52,933
LG&E PS	$29,286	$29,552	$29,825	$30,108
LG&E LTOD	$9,349	$9,433	$9,519	$9,607
KU RS	$499,927	$525,789	$557,312	$589,081
KU GS	$60,747	$61,416	$62,161	$62,984
KU AES	$1,705	$1,722	$1,740	$1,759
KU PS	$38,609	$38,964	$39,333	$39,716
LG&E RGS	$163,906	$179,220	$196,058	$213,140
LG&E CGS	$0	$0	$0	$0
Total	**$1,198,538**	**$1,252,286**	**$1,317,528**	**$1,383,429**

Incremental Capital-Cost Recovery - By Rate Category

	2015	2016	2017	2018
LG&E RS	$5,847,006	$6,216,652	$6,611,363	$6,923,226
LG&E GS	$159,233	$217,325	$270,203	$310,303
LG&E PS	$494,099	$658,876	$823,542	$988,296
LG&E LTOD	$23,780	$31,711	$39,636	$47,565
KU RS	$5,693,092	$6,024,244	$6,386,460	$6,675,662
KU GS	$161,608	$222,091	$275,148	$1,331,925
KU AES	$45,296	$60,427	$75,629	$469,076
KU PS	$444,394	$592,833	$741,984	$4,602,019
LG&E RGS	$0	$0	$0	$0
LG&E CGS	$0	$0	$0	$0
Total	**$12,868,509**	**$14,024,158**	**$15,223,966**	**$21,348,073**

Incremental Capital-Cost Recovery - By Program

	2015	2016	2017	2018
Residential Demand Conservation	$11,114,942	$11,599,348	$12,221,828	$12,889,490
Commercial Demand Conservation	$1,262,104	$1,683,332	$2,105,393	$7,638,981
Automated Metering Systems	$491,463	$741,478	$896,745	$819,601
Total	**$12,868,509**	**$14,024,158**	**$15,223,966**	**$21,348,073**

c.

Incremental Energy Savings (MWh)	**2015**	**2016**	**2017**	**2018**
Smart Energy Profile	106,475	106,475	106,475	106,475
Residential Load Management/Demand Conservation	3,202	2,668	2,668	2,668
Residential Refrigerator Removal	7,500	7,500	7,500	7,500
Residential Low Income Weatherization	5,922	7,019	8,115	9,212
Residential Incentives	25,221	25,221	25,221	25,221
Residential Conservation/Home Energy Performance	5,165	5,165	5,165	5,165
Commercial Conservation/Commercial Incentives Program	42,631	42,631	44,021	44,021
	196,115	**196,678**	**199,165**	**200,261**

Incremental Demand Savings (MW)	**2015**	**2016**	**2017**	**2018**
Smart Energy Profile	20.3	20.3	20.3	20.3
Residential Load Management/Demand Conservation	11.2	9.3	9.3	9.3
Residential Refrigerator Removal	0.9	0.9	0.9	0.9
Residential Low Income Weatherization	0.6	0.7	0.8	0.9
Residential Incentives	4.1	4.1	4.1	4.1
Residential Conservation/Home Energy Performance	1.3	1.3	1.3	1.3
Commercial Conservation/Commercial Incentives Program	15.7	15.7	16.0	16.0
Commercial Load Management	5.1	5.1	5.1	5.1
	59.2	**57.5**	**57.8**	**57.9**

Incremental Gas Savings (CCF)	**2015**	**2016**	**2017**	**2018**
Smart Energy Profile	1,767,178	1,767,178	1,767,178	1,767,178
Residential Load Management/Demand Conservation	189,014	157,511	157,511	157,511
Residential Low Income Weatherization	463,298	549,094	634,889	720,685
Residential Conservation/Home Energy Performance	165,031	165,031	165,031	165,031
Commercial Conservation/Commercial Incentives Program	(103,534)	(103,534)	(92,407)	(92,407)
	2,480,986	**2,535,279**	**2,632,202**	**2,717,998**

LOUISVILLE GAS AND ELECTRIC COMPANY
KENTUCKY UTILITIES COMPANY

Response to the Commission Staff's First Information Request
Dated February 17, 2014

Case No. 2014-00003

Question No. 3

Witness: David E. Huff

Q-3. Refer to paragraph 19, page 10, of the Cover Letter of the Joint Application. Provide the cost of the LG&E and KU Smart Meter Business Case Assessment.

A-3. The cost of the LG&E and KU Smart Meter Business Case Assessment was $148,413.68.

LOUISVILLE GAS AND ELECTRIC COMPANY
KENTUCKY UTILITIES COMPANY

Response to the Commission Staff's First Information Request
Dated February 17, 2014

Case No. 2014-00003

Question No. 4

Witness: Michael E. Hornung

Q-4. Refer to page 5 of KU Electric Tariffs Supporting Calculations for DSM Cost Recovery Mechanism ("KU Supporting Calculations"), Exhibit RMC-1, of the Direct Testimony of Robert M. Conroy ("Conroy Testimony") of the Joint Application.

a. Provide, by DSM program within each rate schedule, the lost sales factor.

b. Explain, by DSM program, how the lost sales were determined.

c. Explain the methodology for determining kWh savings that was used in calculating lost net revenues for 2015. For example, were the projected kWh savings based on annual savings for new participants in 2015, cumulative (period of time greater than one year) of participant savings for 2015, or was some other methodology used?

A-4.

a. The Companies do not calculate the Lost Sales Rate Factor by program, but by rate class. The programmatic energy savings are calculated and applied to an allocation matrix by rate class. The accumulated rate class energy saving values are then multiplied by the appropriate non-variable revenue value to derive the total Lost Sales Dollars by rate class. These dollars are divided by the annual sales forecast in kWh or ccf to determine the specific Lost Sales Rate Factor. The non-variable revenue rate is calculated on a rate class basis, and thus is not applied to the calculation until the energy savings have been allocated to rate classes. The attached spreadsheet outlines the calculations associated with the proposed 2015 Lost Sales Rate Factor.

b. and c.
As stated above, the Companies do not calculate the Lost Sales Rate Factor by program, but by rate class. The following is an example of how the Companies calculate its lost sales. The data used in this example can be found in the attachment to part (a) of this response.

- The energy and gas savings are entered for each program in the DSM/EE Portfolio. The energy savings represent deemed savings based on the deployed measures of each specific program. These deemed savings are then input into the DSMore

model to calculate the annual savings based on specific load curves associated with each measure. These are then aggregated up for an annual program value. As it relates to the Lost Sales Calculation, the DSM Tariff allows the Companies to collect up to 36 months of lost sales, less impacts from a general rate case. These values found in rows 5 through 34 and columns A through F of the attachment represent the forecasted deemed savings for 2013-2015. Each program has a specific rate class allocation matrix which can be found in rows 37 through 51 and columns C tough L of the attachment. (Note: these values are adjusted at the end of each year through the DSM Balancing Adjustment, based on programmatic activities.

- Each program energy and gas savings are multiplied by its individual rate class allocation matrix. For example, the Residential Audit program has a total MWh savings of 14,511Mwh (cell F4 in the attachment). This value is multiplied by each of its associated program to rate class allocation matrices. In the case of the Residential Audit program its associated rate class allocations are LGE-RS (37%); KU-RS (63%); LGE-RS (100%) and LGE-CGS (0%) ((Row 39 and columns C – L of the attachment)). This process is completed for each program in the DSM/EE Portfolio. The outcomes of this step provide the Lost Sales Volume by Rate Class (row 69 and columns C through L of the attachment).

- Lost Sales Volume by Rate Class values are then multiplied by the Non-Variable Revenue for each rate class (rows75 through 87 and column D) as the Non-Variable Revenue Rate is not calculated on a programmatic basis. The summed value of each LG&E and KU electric and gas rate class provided the Companies lost sales (Cell F 90)

DSM - LOST SALES CALCULATION

Energy Savings (MWh)	**2013**	**2014**	**2015**	**Total**
Residential Audit	4,182	5,165	5,165	14,511
Residential WeCare	3,729	4,825	5,922	14,476
Residential Lighting	41,485	38,457	-	79,942
Residential HVAC	979	979	-	1,959
Residential Construction	2,420	2,784	-	5,204
Residential Demand	-	-	-	-
Commercial Audit	54,988	54,988	42,631	152,607
Commercial HVAC	88	88	-	176
Commerical Demand	-	-	-	-
Residential Incentives	10,721	16,291	25,221	52,233
Residential SEP	-	-	106,475	106,475
Residential Frig Removal	6,000	7,500	7,500	21,000
KSBA	12,312	12,370	-	24,681
Total	138,917	145,461	194,928	473,265

Gas Saving (CCF)	**2013**	**2014**	**2015**	**Total**
Residential Audit	133,124	165,031	165,031	463,185
Residential WeCare	291,706	377,502	463,298	1,132,505
Residential Lighting	-	-	-	-
Residential HVAC	-	-	-	-
Residential Construction	83,283	95,776	-	179,059
Residential Demand	-	-	-	-
Commercial Audit	(152,882)	(152,882)	(103,534)	(409,297)
Commercial HVAC	-	-	-	-
Commerical Demand	-	-	-	-
Residential Incentives	-	-	-	-
Residential SEP	-	-	1,767,178	1,767,178
Residential Frig Removal	-	-	-	-
KSBA	-	-	-	-
Total	355,232	485,427	2,291,972	3,132,630

Program to Rate Class - Allocation Matrix										
Utility	LGE-E	LGE-E	LGE-E	LGE-E	KU	KU	KU	KU	LGE-G	LGE-G
Rate Class	LGE-RS	LGE-GS	LGE-CPS	LGE-CTOD	KU-RS	KU-GS	KU-AES	KU-PS	LGE-RGS	LGE-CGS
Residential Audit	37.00%				63.00%				100.00%	0.00%
Residential WeCare	27.85%				72.15%				100.00%	0.00%
Residential Lighting	50.00%				50.00%					
Residential HVAC	50.00%				50.00%					
Residential Construction	41.08%				58.92%				100.00%	0.00%
Residential Demand	50.00%				50.00%					
Commercial Audit		27.15%	17.29%	5.56%		26.67%	0.91%	22.42%	0.00%	100.00%
Commercial HVAC		47.00%	2.83%	0.17%		46.17%	0.36%	3.47%		
Commerical Demand		10.08%	37.68%	1.84%		10.08%	3.75%	36.57%	0.00%	100.00%
Residential Incentives	50.00%				50.00%					
Smart Energy Profile	41.70%				58.30%				100.00%	0.00%
Residential Frig Removal	50.00%				50.00%					
KSBA		16.85%	10.73%	3.45%		36.79%	1.26%	30.92%		

Lost Sales Volume by Rate Class

Utility	LGE-E	LGE-E	LGE-E	LGE-E	KU	KU	KU	KU	LGE-G	LGE-G
Rate Class	LGE-RS	LGE-GS	LGE-CPS	LGE-CTOD	KU-RS	KU-GS	KU-AES	KU-PS	LGE-RGS	LGE-CGS
Residential Audit	5,369	-	-	-	9,142	-	-	-	463,185	-
Residential WeCare	4,032	-	-	-	10,445	-	-	-	1,132,505	-
Residential Lighting	39,971	-	-	-	39,971	-	-	-	-	-
Residential HVAC	979	-	-	-	979	-	-	-	-	-
Residential Construction	2,138	-	-	-	3,066	-	-	-	179,059	-
Residential Demand	-	-	-	-	-	-	-	-	-	-
Commercial Audit	-	41,433	26,386	8,485	-	40,700	1,389	34,215	-	(409,297)
Commercial HVAC	-	83	5	0	-	81	1	6	-	-
Commerical Demand	-	-	-	-	-	-	-	-	-	-
Residential Incentives	26,117	-	-	-	26,117	-	-	-	-	-
Smart Energy Profile	44,400	-	-	-	62,075	-	-	-	1,767,178	-
Residential Frig Removal	10,500	-	-	-	10,500	-	-	-	-	-
KSBA	-	4,159	2,649	852	-	9,079	310	7,633	-	-
	133,506	45,675	29,039	9,337	162,295	49,861	1,699	41,853	3,541,928	(409,297)

Lost Sales Calculations

Rate Class	Volume MWh	Non-Variable Revenue $/kWh	Value $	Billing Determinants kWh	Rate ¢/kWh
LGE-RS	133,506	$ 0.0522	$ 6,969,001	4,247,089,487	0.1641
LGE-GS	45,675	$ 0.0624	$ 2,850,104	1,424,587,692	0.2001
LGE-CPS	29,039	$ 0.0469	$ 1,361,952	2,032,406,244	0.0670
LGE-CTOD	9,337	$ 0.0414	$ 386,553	839,616,941	0.0460
KU-RS	162,295	$ 0.0454	$ 7,368,186	6,323,633,336	0.1165
KU-GS	49,861	$ 0.0586	$ 2,921,848	1,959,635,314	0.1491
KU-AES	1,699	$ 0.0423	$ 71,874	146,878,176	0.0489
KU-PS	41,853	$ 0.0399	$ 1,669,940	3,309,226,896	0.0505
	473,265				
	ccf	**$/ccf**	**$**	**ccf**	**¢/ccf**
LGE-RGS	3,541,928	0.2642	$ 935,777	197,851,872	0.4730
LGE-CGS	(409,297)	0.21	n/a	103,300,925	n/a
	3,132,630				
TOTAL			**$ 24,535,234**		

LOUISVILLE GAS AND ELECTRIC COMPANY
KENTUCKY UTILITIES COMPANY

Response to the Commission Staff's First Information Request
Dated February 17, 2014

Case No. 2014-00003

Question No. 5

Witness: Michael E. Hornung

Q-5. Refer to page 7 of KU Supporting Calculations, Exhibit RMC-1, of the Conroy Testimony of the Joint Application.

a. Provide, by program within each rate schedule, the incentive rate.

b. Explain, by program, how each incentive was determined.

A-5.

a. The Companies do not calculate the Incentive Factor by program, but by rate class. Net Resource Benefits and costs are calculated on a programmatic basis. These values are then used to determine the lesser of 15% Net Resource Benefits or 5% of the Program Costs to determine the incentive levels. The incentives are then applied to an allocation matrix to determine the rate-class level incentives. These are then divided into the appropriate billing determinants (kWh or ccf) to calculate the Incentive Rate Factor. The attached spreadsheet outlines the calculations associated with the proposed 2015 Incentive Rate Factor.

b. Resource Benefits and costs are calculated through the DSMore software by evaluating each individual program for the current calendar year. The costs in this calculation include both the utility costs as well as the participant cost for each program. These values are then summed and multiplied by 15% to determine the Net Resource Benefits allowable for each program unless specifically addressed in the Companies' tariff. Net Resource Benefits are then compared to 5% of the annual programmatic budgets outline in the DCR component of the DSM Rate. The Company is allowed to collect the lesser of these two values. The incentives are then applied to an allocation matrix to determine the rate-class level incentives. These are then divided into the appropriate billing determinants (kWh or ccf) to calculate the Incentive Rate Factor. The attached spreadsheet outlines the calculations associated with the proposed 2015 Incentive Rate Factor.

LOUISVILLE GAS AND ELECTRIC COMPANY
KENTUCKY UTILITIES COMPANY

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Case No. 2014-00003

Question No. 6

Witness: Michael E. Hornung

Q-6. Refer to pages 10-11 of KU Supporting Calculations, Exhibit RMC-1 of the Conroy Testimony of the Joint Application.

a. Provide, in electronic format, with formulas intact and cells unprotected, the support upon which the 10.89 percent Return on Rate Base is based.

b. Provide a breakdown of operation and maintenance ("O&M") expenses for both residential and commercial demand-load conservation ("DLC").

c. Provide a breakdown of O&M expenses for both the residential and the commercial automated meter infrastructure ("AMI")/Smart Grid ("SG").

d. Provide the depreciation rate used for AMI/SG.

A-6.

a. See attachment being provided in Excel format.

b. The tables below include operation and maintenance expenses for both residential and commercial demand-load conservation for both LG&E and KU.

2015 O&M Expenses	**Residential DLC**	**Commercial DLC**
Direct Program Labor	$207,057	$40,362
Office Supplies & Expenses	$8,657	$1,154
Data Processing	$11,543	$1,154
Advertising	$336,668	$1,125
Maintenance	$932,883	$22,571
Customer Incentives	$3,393,088	$172,026
Market Research	$10,612	$3,184
Program Evaluation	$31,836	$9,551
Outside Services	$0	$221,625
Total	$4,932,345	$472,752

c. The tables below include O&M expenses for both the residential and the commercial automated meter infrastructure/Smart Grid for both LG&E and KU.

2015 O&M Expenses	**Residential AMI**	**Commercial AMI**
Equipment & Systems	$22,250	$2,750
Direct Program Labor	$72,288	$8,934
Customer Education	$102,261	$12,639
Total	$196,799	$24,323

d. The book depreciation rate used for AMI/SG was 2.29%.

LOUISVILLE GAS AND ELECTRIC COMPANY
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Case No. 2014-00003

Question No. 7

Witness: Michael E. Hornung

Q-7. Refer to P.S.C. No. 16, Second Revision of Original Sheet No. 86.4, KU Electric Tariffs Red-Line Version ("KU Red-Line Version"), Exhibit RMC-1 of the Conroy Testimony of the Joint Application. Explain why the proposed range of incentives in the Residential Conservation/Home Energy Performance Program is revised from "incentives of $500 or $1,000" to "incentives ranging from $150 to $1,000."

A-7. There are currently only 2 levels of incentives in the existing Residential Conservation / Home Energy Performance Program. These incentives are Tier 2 at $500 and Tier 3 at $1,000. This is the basis for the current range of incentives of $500 to $1,000. In this new proposal, there is a new Tier 1 audit with an incentive of $300 for customers, but the incentive is only $150 for customers in a multi-family property. Thus, the new range of incentives is from $150 to $1,000.

LOUISVILLE GAS AND ELECTRIC COMPANY
KENTUCKY UTILITIES COMPANY

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Case No. 2014-00003

Question No. 8

Witness: Michael E. Hornung

Q-8. Refer to P.S.C. No. 16, Second Revision of Original Sheet No. 86.9, KU Red-Line Version, Exhibit RMC-1 of the Conroy Testimony of the Joint Application. The following sentence, "The Company will continue to enroll program participants until 10 MW curtailable load is achieved," is proposed to be deleted from the Customer Equipment Interface Option of the Commercial Load Management/Demand Conservation program.

a. State whether KU has achieved the 10 MW curtailable load.

b. If the response to part a. is yes, explain how and when this was achieved.

A-8.

a. KU has attained a demand reduction of 6.85MW and LG&E a 3.15MW demand reduction. The program goal of 10 MW is for KU and LG&E collectively.

b. Program goals were achieved through collaborative efforts between Company staff and business partner outreach. The business partner has national and worldwide contacts through similar programs they manage. The program was fully subscribed in summer 2013.

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KENTUCKY UTILITIES COMPANY

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Case No. 2014-00003

Question No. 9

Witness: Michael E. Hornung

Q-9. Refer to page 5 of LG&E Electric Tariffs Supporting Calculations for DSM Cost Recovery Mechanism ("LG&E Electric Supporting Calculations"), Exhibit RMC-2, of the Conroy Testimony of the Joint Application.

a. Provide, by DSM program within each rate schedule, the lost sales factor.

b. Explain, by DSM program, how the lost sales were determined.

c. Explain the methodology for determining kWh savings that was used in calculating lost net revenues for 2015. For example, were the projected kWh savings based on annual savings for new participants in 2015, cumulative (period of time greater than one year) of participant savings for 2015, or was some other methodology used?

A-9. a., b., c. Please see response to Question No. 4

LOUISVILLE GAS AND ELECTRIC COMPANY
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Case No. 2014-00003

Question No. 10

Witness: Michael E. Hornung

Q-10. Refer to page 7 of LG&E Tariffs Supporting Calculations, Exhibit RMC-2, of the Conroy Testimony of the Joint Application.

a. Provide, by program within each rate schedule, the incentives rate.

b. Explain, by program, how each incentive was determined.

A-10.

a. Please see response to Question No. 5

b. Please see response to Question No. 5.

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KENTUCKY UTILITIES COMPANY

Response to the Commission Staff's First Information Request
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Case No. 2014-00003

Question No. 11

Witness: Michael E. Hornung

Q-11. Refer to pages 10-11 of LG&E Electric Supporting Calculations, Exhibit RMC-2 of the Conroy Testimony of the Joint Application.

a. Provide, in electronic format, with formulas intact and cells unprotected, the support on which the 11.18 percent Return on Rate Base is based.

b. Provide a breakdown of O&M expenses for both residential and commercial DLC.

c. Provide a breakdown of O&M expenses for both residential and commercial AMI/SG.

d. Provide the depreciation rate used for AMI/SG.

A-11.

a. Please see the attachment being provided in Excel format.

b. Please see response to Question No. 6b.

c. Please see response to Question No. 6c.

d. The book depreciation rate used for AMI/SG was 2.92%.

LOUISVILLE GAS AND ELECTRIC COMPANY
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Case No. 2014-00003

Question No. 12

Witness: Michael E. Hornung

Q-12. Refer to P.S.C. No. 9, Second Revision of Original Sheet No. 86.4, LG&E Electric Tariffs Red-Line Version ("LG&E Electric Tariffs Red-Line Version"), Exhibit RMC-2 of the Conroy Testimony of the Joint Application. Explain why the proposed range of incentives in the Residential Conservation/Home Energy Performance Program is revised from "incentives of $500 or $1,000" to "incentives ranging from $150 to $1,000."

A-12. See the response to Question No. 7.

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Response to the Commission Staff's First Information Request
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Case No. 2014-00003

Question No. 13

Witness: Michael E. Hornung

Q-13. Refer to P.S.C. No. 9, Second Revision of Original Sheet No. 86.9, LG&E Electric Tariffs Red-Line Version, Exhibit RMC-2 of the Conroy Testimony of the Joint Application. The following sentence, "The Company will continue to enroll program participants until 10 MW curtailable load is achieved," is proposed to be deleted from the Customer Equipment Interface Option of the Commercial Load Management/Demand Conservation program.

a. State whether LG&E achieved the 10 MW curtailable load.

b. If the response to part a. is yes, explain how and when this was achieved.

A-13. a. Please see response to Question No. 8a.

b. Please see response to Question No. 8b.

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Response to the Commission Staff's First Information Request
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Case No. 2014-00003

Question No. 14

Witness: Michael E. Hornung

Q-14. Refer to page 5 of LG&E Gas Tariffs Supporting Calculations for DSM Cost Recovery Mechanism ("LG&E Gas Supporting Calculations"), Exhibit RMC-3, of the Conroy Testimony of the Joint Application.

a. Provide, by DSM program, the lost sales factor.

b. Explain, by DSM program, how the lost sales were determined.

c. Explain the methodology for determining Ccf savings that was used in calculating lost sales for 2015. For example, were the projected Ccf savings based on annual Ccf savings for new participants in 2015, cumulative (period of time greater than one year) savings of participant savings for 2015, or was some other methodology used?

A-14.

a., b., c. Please see response to Question No. 4

LOUISVILLE GAS AND ELECTRIC COMPANY
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Case No. 2014-00003

Question No. 15

Witness: Michael E. Hornung

Q-15. Refer to page 7 of LG&E Gas Tariffs Supporting Calculations, Exhibit RMC-3, of the Conroy Testimony of the Joint Testimony.

a. Provide, by program, the incentive rate.

b. Provide, by program, how each incentive was determined.

A-15.

a., b., Please see response to Question No. 5

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Case No. 2014-00003

Question No. 16

Witness: Michael E. Hornung

Q-16. Refer to P.S.C No. 9, Second Revision of Original Sheet No. 86.4, LG&E Gas Tariffs Red-Line Version ("LG&E Gas Tariffs Red-Line Version"), Exhibit RMC-3 of the Conroy Testimony of the Joint Application. Explain why the proposed range of incentives in the Residential Conservation/Home Energy Performance Program is revised from "incentives of $500 or $1,000" to "incentives ranging from $150 to $1,000."

A-16. Please see the response to Question No. 7.

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Case No. 2014-00003

Question No. 17

Witness: Michael E. Hornung

Q-17. Refer to lines 17-19, page 6 of the Direct Testimony of Michael E. Hornung ("Hornung Testimony") of the Joint Application, which state, "As the EE Potential Study notes, the Companies are currently on track to exhaust their achievable energy efficiency potential by 2018."

a. Explain whether all potential homes in the Companies' service territories that could be weatherized will have been weatherized by 2018.

b. Explain whether all potential homes in the Companies' service territories that have electric resistance heat will have been changed to energy-efficiency ("EE") heat pumps by 2018.

c. Explain what energy-efficiency potential will have been exhausted in the Companies' territories by 2018.

d. Discuss DSM and EE measures the Companies may consider after 2018.

A-17. The Energy Efficiency Potential Study conducted by Cadmus provided the Companies with information that provided the foundation for estimating the technical, economic and achievable potential in the Companies service territories. Technical potential accounts for all technologically feasible energy-efficiency measures, regardless of cost or market barriers. Economic potential is a subset of technical potential, consisting only of measures meeting cost-effectiveness criteria based on the Companies' avoided supply cost for delivering electricity; in other words, economic potential is the economically justifiable subset of technical potential. Finally, achievable potential is the subset of economic potential that is reasonably achievable in the planning horizon, given customer budgetary constraints, market barriers and other impediments to customer participation including customers' lack of interest in such programs.

The energy-efficiency potential the EE Potential Study indicates the Companies will have exhausted by the end of 2018 is the *achievable* potential the study identified, and not the technical or economic potential. Exhausting the Companies' achievable potential by the end of 2018 does not mean that all homes that could be weatherized will be weatherized

by then, and it does not mean that all homes that currently have electric-resistance heat will have converted to high-efficiency heat pumps by then; rather, it means that, based on currently reasonable assumptions about technology, costs, market barriers, and other factors that affect customer participation in DSM/EE programs, it appears today that the Companies will have exhausted the DSM/EE offerings in which customers are likely to participate. As long as DSM/EE programs remain voluntary to customers, they will have the final say about how much DSM/EE achievable potential exists

Nonetheless, the Companies will continue to monitor the energy-efficiency marketplace to explore new technologies and opportunities to provide customers with energy-saving solutions and reduce demand where economically feasible. The Companies will certainly consider new or revised DSM/EE programs through 2018 and beyond.

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Question No. 18

Witness: Michael E. Hornung

Q-18. Refer to lines 4-10, page 16 of the Hornung Testimony of the Joint Application, which state:

> . . . the Companies seek to enhance the Commercial Load Management/Demand Conservation Program by moving the large commercial load management effort to a full commercial deployment and being able to modify financial incentives to encourage customers to participate in this voluntary program capped at the approved program budgets. The expansion of the Commercial Load Management / Demand Conservation Program to include large commercial customers will allow the Companies to further reduce electricity usage during peak times.

a. Explain how the Companies plan to move the large commercial load-management effort to a full commercial deployment.

b. Explain how the Companies plan to modify financial incentives to encourage customers to participate in this voluntary program.

A-18.

a. The Companies will issue a new Request for Proposal ("RFP") and select a business partner to encourage customers to grow the program further. It is expected that the business partner's national or worldwide presence in combination with the Companies' Major Accounts and Communications Departments' staff will be instrumental in fulfilling program goals. Currently, the Companies have a waiting list because the program is fully subscribed at 10MW.

b. Performance incentives may be increased or reduced based on enrollment success. Performance incentives will be the same for all participating customers. If necessary, the Companies will review the possibility of a sign-on bonus. These or any changes will be filed with the Commission as the Companies do now when the levels change.

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Question No. 19

Witness: Michael E. Hornung

Q-19. Refer to lines 9-11, page 18 of the Hornung Testimony of the Joint Application, which state that "the Companies seek approval for an increased incentive budget to fund the program through 2018. The Companies' goal is to have 35,100 rebates annually in LG&E and KU's combined service territory." Explain whether there is any change as to the kind and range of incentives proposed to be offered in the increased incentive budget of the Residential Incentives Program.

A-19. There are no requested changes to the kind and range of incentives offered through the program. The changes are limited to an increase in rebate volumes for increased customer participation for the kinds of incentives already approved through the program.

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Question No. 20

Witness: Michael E. Hornung

Q-20. Refer to lines 12-17, page 19 of the Hornung Testimony of the Joint Application as to the Commercial Conservation/Commercial Incentive Program, which state:

> The Companies seek to enhance this program in several ways: (1) eliminating the on-site commercial audits; (2) further developing their online audit tool as well as additional special-purpose energy tools to support commercial customers; (3) providing rebates for new construction efforts where efficiency is above standard building code; and (4) reducing demand reduction and the associated rebate funding.

a. Explain how the Companies plan to further develop their online audit tool, as well as additional special-purpose energy tools, to support commercial customers.

b. Explain how the Companies plan to determine that new construction efforts for energy-efficiency are above standard building code, should receive a rebate, and in what amount.

c. Explain what is meant by "reducing demand reduction and the associated rebate funding."

A-20.

a. The Companies anticipate using the commercial customer's actual 12-month usage history, if available, to enhance the ability to recommend measures that will be optimal to the unique needs of the commercial customer. In addition, the Companies plan to implement special-purpose energy tools for available lighting, HVAC, and motor and pumps, which will provide useful and specific recommendations for the customer.

b. A third-party reviewer will use energy software for commercial buildings to determine how much a new building exceeds code. Rebate amounts will be correlated to various levels of exceeding code, as well as to various LEED-certification designations.

c. The Companies seek to lower their current annual commercial demand target from 20MW to 15MW. This equates to a commercial incentive reduction of $2.0 million to $1.5 million.

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Question No. 21

Witness: Michael E. Hornung

Q-21. Refer to lines 4-10, page 20 of the Hornung Testimony of the Joint Application, which state:

> In addition, one of the findings in the *Program Review* was the realization of fewer economic and achievable measures due to the current market conditions and costs. Therefore, the Companies propose to reduce their prior approved annual commercial incentive amount from $2.0 million to $1.5 million. Although the Companies are requesting to eliminate onsite commercial audits from the DSM/EE portfolio, they intend to rebate commercial customers who have an onsite commercial audit independently and implement recommended energy saving measures.

a. Explain what is meant by "the realization of fewer economic and achievable measures due to the current market conditions and costs."

b. Explain whether the Companies considered revising their rebates in this program, considering current market conditions and costs.

c. Explain what quality-assurance measures the Companies will take to ensure that the proposed independent onsite commercial audits and recommendations will provide the desired energy-saving measures.

A-21.

a. The Companies' relatively low energy rates and the relatively high cost of some energy-saving measures, such as LED lamps, have made some potential energy-saving measures uneconomical, at least over short payback periods, and have reduced some customers' overall interest in energy efficiency.

b. Although the Companies do not have formal incentive level studies, the Companies do consider, evaluate, and model revised rebates to these programs from time-to-time. However, because market conditions such as the Companies' avoided capacity cost compared to the cost of measures and incentives, effectively provide a cap on how much the company could offer and remain within least cost for customers, the

Companies are not considering revising rebates in this program. The program will continue to offer incentives comparable to the Companies' avoided capacity cost.

c. All energy-saving measures that result in rebates are subject to on-site verification through the Companies' business partner.

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Case No. 2014-00003

Question No. 22

Witness: Michael E. Hornung

Q-22. Refer to lines 11-16, page 21 of the Hornung Testimony of the Joint Application, which state:

> . . . . the Companies are seeking approval for continuation in the following aspects: (1) continuing funds that will allow for further outreach to the current residential and commercial segments through mass media outlets and "future customer" education efforts through school based programming; (2) adding training opportunities for home construction professionals; and (3) extending the Customer Education and Public Information Program through 2018.

a. Explain how the Companies plan further outreach through education efforts through school-based programming.

b. Explain how the Companies plan to train home construction professionals in the Customer Education and Public Information Program.

A-22.

a. One of the fundamental principles of teaching and learning is that understanding develops over time. As such, through a contract with the National Energy Education Development Project-Kentucky, the Companies anticipate continuing to provide school-based educational programming to K-8 students to continue to grow student awareness about how to save energy at home. School-based programming will include training for teachers and school district personnel to support integration of energy education into the classroom, implementation of student energy management teams to monitor and reduce energy consumption, interdisciplinary classroom curriculums, and ongoing support for educational staff as they continue to implement curriculums.

b. The Companies plan to provide training opportunities to home construction professionals and Home Energy Rating System (HERS) Rater Professionals that will continue to support the growth of energy-efficient homes in the Companies' service territories. The Companies anticipate providing training that could include, but not be limited to, areas such as energy improvements for existing buildings, new energy efficiency technologies, energy efficiency for multi-family properties, and updates on energy-conservation codes and standards.

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Question No. 23

Witness: Michael E. Hornung

Q-23. Refer to lines 14-16, page 22 of the Hornung Testimony of the Joint Application, which state, "The Companies seek to enhance this program by implementing a tier structure for multi-family properties and implementing a tier structure for insulation and weatherization efforts as identified in the Program Review." Explain how the Companies plan to implement recommendations from the Program Review for the Residential Conservation/Home Energy Performance Program.

A-23. As this program is currently active in the DSM/EE portfolio, the implementation process will be negligible. The Companies will update their system and software tools to determine revised incentive levels based on the property type (single or multi-family) and savings level achieved. Upon approval from the Commission, the Companies will begin customer communications regarding the addition of the new tier levels. The process for participating in this program will not change for the customer. See response to Question No. 40 for additional information

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Case No. 2014-00003

Question No. 24

Witness: Michael E. Hornung

Q-24. Refer to page 24 of the Hornung Testimony of the Joint Application, which states that "the Companies use a third-party contractor to examine program design, delivery, impacts, and return on investment. This contractor ensures quality and effectiveness of the programs, optimal use of resources, and responsiveness to customers' need." Explain whether the Companies have revised or enhanced their evaluation, measurement, and verification since the filing made in Case No. 2011-00134[1]

A-24. The Companies have not made any changes to the process described in the cited testimony as this continues to provide constructive feedback related to programmatic design and effectiveness. The Companies perform program evaluation in two phases: process evaluation and impact evaluation. Process evaluation is a systematic assessment of an energy-efficiency program for the purposes of improving its design, delivery, and perceived quality and usefulness to customers. Impact evaluation focuses on quantifying the energy and demand savings and other economic benefits of the program.

The Companies contracted with Navigant Consulting, Inc. ("Navigant") to evaluate the Companies' program-savings estimates developed at the initiation of programs, or ex ante estimates, against verified savings that look back at the previous program years' actual results, or ex post savings. The most recent report was completed and received by the Companies in 2013. Please see attachment for the Companies 2010-2011 evaluation completed by Navigant. As the Navigant contract term was through the end of 2013, the Companies proceeded through their standard procurement process to identify a contractor to provide third-party evaluation services. Through the procurement process a new contract has been issued to Tetra Tech to continue this work. In 2013, Tetra Tech developed a work plan to continue the evaluative process for the DSM/EE Portfolio.

In addition, the Companies have contracted with ICF International and The Cadmus Group to provide broad reviews of their DSM/EE plans. ICF International conducted a

[1] Case No. 2011-00134, Joint Application of Louisville Gas and Electric Company and Kentucky Utilities Company for Review, Modification, and Continuation of Existing, and Addition of New Demand-Side Management and Energy-Efficiency Programs (Ky. PSC Nov. 9, 2011).

review of the DSM/EE program plan for 2011 to 2017. The Companies received a program report in 2011. The review included a detailed overview of existing programs that the Companies were enhancing and re-filing, and new programs. ICF also conducted a portfolio-level review of the Companies' overall DSM investments. The Cadmus Group provided a Program Review that involved consideration of the Companies' existing programs, a gap analysis to identify any potential new program measures and delivery options, secondary research of program topics and development of recommendations for each program moving forward.

NAVIGANT

PROGRAM YEAR 2010 AND 2011 EVALUATION REPORT FOR LG&E'S AND KU'S DEMAND SIDE MANAGEMENT (DSM) PROGRAMS

Prepared for:

LG&E & KU

LG&E KU

PPL companies

Prepared by:

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May 2013

Table of Contents

1. Executive Summary

Navigant Consulting Inc. (Navigant) is pleased to present this evaluation report that provides findings and recommendations for the impact and process evaluation of Louisville Gas and Electric Company's/Kentucky Utilities Company's (LG&E/KU's) 2010 and 2011 energy efficiency (EE) programs. These findings serve to inform LG&E/KU of the current status of programs and provide recommendations for future program modifications. In addition, the evaluation is designed to comply with any potential filing requirements from the Kentucky Public Service Commission (PSC).

1.1 Objectives of the Evaluation

The key objectives of this evaluation included the following:

- Verify program/portfolio performance
  - Quantify program energy and demand savings
  - Compare ex-ante to ex-post savings estimates
  - Provide data to support program cost effectiveness assessments
- Identify program achievements and successes, along with areas for potential improvement
  - Review and document program operations and structure
  - Characterize program actor feedback
  - Identify opportunities for program or portfolio improvement for future program cycles
  - Develop practical recommendations that leverage program opportunities.
- Engage program managers
  - Provide independent third-party perspective and best practices review
  - Investigate areas of specific interest in light of an evolving regulatory landscape.

For each program in the portfolio, Navigant selected an evaluation approach that was best suited for the program and the data available. The evaluation efforts can be described by three types of activities:

1. **Evaluability Assessment:** Navigant analyzed legacy database systems and conversions to Energy Efficiency Operations (EE OPS) platforms (where applicable), verified data collection and information flows, and identified current data challenges, and potential improvement opportunities.
2. **Impact Evaluation:** Impact evaluation methods included billing analyses, billing analyses to verify REM/*Rate*™ model assumptions, savings algorithms, and system load regression analyses.
3. **Process Evaluation:** Process evaluation methods included phone interviews with program participants to understand the strengths and opportunities to improve program delivery. In addition; Navigant interviewed partial participants, program dropouts, and non-participants in order to develop a fully comprehensive understanding of program characteristics.

1.2 Key Evaluation Findings for the Portfolio

1.2.1 Realization Rates

Navigant conducted both an impact and process evaluation for several of LG&E/KU's programs. As part of the impact evaluation findings, Navigant developed realization rates by comparing the program savings as estimated in the *LG&E and KU Energy Efficiency 2008 – 2014 Program Plan* published in 2007 (i.e., ex ante estimates) against Navigant's verified savings estimates (i.e., ex post estimates). The impact evaluation calculated savings and realization rates separately by:

- Utility
- Program
- Fuel type (i.e., electric or gas)
- Program subset (i.e., online vs. on-site participants).

Navigant developed realization rates as a way to succinctly convey the actual and verified performance of the program against the program's goals and estimated savings targets. Realization rates were calculated by dividing the verified program savings (i.e., total verified energy savings (kWh or CCF) by the total estimated energy savings (kWh or CCF) and were expressed as a percent realization factor. For example, a value of 100 percent indicated that all savings estimates were achieved; a value less than 100 percent meant that the program did not achieve all of the estimated savings; and a value greater than 100 percent meant that the program achieved more savings than initially estimated.

1.2.2 Impact Evaluation Results

At the portfolio level, LG&E/KU's EE programs are exceeding savings expectations. Navigant calculated a **portfolio-wide realization rate of 102 percent**. This specific realization rate at the portfolio level was calculated by comparing the total savings (electric: megawatt-hours [MWh] and gas: 100 cubic feet [CCF]) claimed by LG&E/KU for all programs (ex ante) to the evaluation's verified ex-post savings estimates for the given programs.[1] Navigant also reviewed the input assumptions, savings methodologies, and corresponding claimed savings estimates for the various programs and found them to be generally mathematically astute and consistent with industry standards.

Overall, the majority of LG&E/KU's programs met or exceeded savings expectations. Program designs and structures are ensuring that adequate numbers of utility customers are being reached and encouraged to participate by outreach efforts. The savings goals set for the majority of programs are reasonable and are being achieved by implementation contractors and the participants themselves. Additionally, the education and awareness components of several programs are helping LG&E/KU achieve savings beyond their initial estimates.

[1] The portfolio-wide realization rate (102%) was calculated by comparing energy savings (MWh and CCF). Navigant converted the energy units of gas energy savings in order to combine all savings (1 CCF = 30.2 kWh). This excludes the Load Management/Demand Conservation's results where calculations compared demand reductions (MW).

1.2.2.1 Program Cycle Consideration

Evaluation findings should be considered within the full context of LG&E/KU's program lifecycle. LG&E/KU program designs and associated savings targets consider a full seven year cycle, while Navigant's analysis scope examined activity during two program years. LG&E/KU's annual program targets reflect average annual achievements after normalizing for market introduction, pilot program periods, and ramp up phases to consistent operation. In any particular year, a program-specific realization rate may not align with the normalized seven year program goals. As an example, Navigant recognized that programs tend to achieve lower realization rates during the first few years because it takes time to vet the implementation processes and ensure that the marketing platforms effectively reach the desired customer segment. This was particularly evident within the Residential High Efficiency Lighting program where verified program savings more than doubled from 2010 to 2011 while the average of these two years aligns with the program's annual goal. Therefore, in addition to reviewing these evaluation results to understand current program performance, results should also be considered along with other evaluations conducted during the seven year cycle to provide a full assessment of program performance.

1.2.3 Process Evaluation Results

In addition to verifying savings, Navigant's evaluation activities also reviewed program processes for operational efficiencies and accurate data collection in order to aid LG&E/KU in their continuous improvement efforts. This effort was undertaken in partnership between LG&E/KU and Navigant and also ensured that the evaluation efforts aligned with actual program activities and are representative of the program designs. The following provides a summary of that process.

Overall, Navigant found that LG&E/KU successfully leverages the following strategies to achieve energy and demand savings goals from Energy Efficiency (EE) installations, EE recommendations, and behavioral changes:

- **Delivery Services:** LG&E/KU offers targeted EE delivery services, such as direct install, in-home energy audits, and increased marketing and outreach to effectively reach out to specific market contingents.
- **Technologies and Incentives:** LG&E/KU offers incentives for a wealth of EE technologies that promote participation in target markets while allowing LG&E/KU to meet its energy and demand reduction goals.
- **Program Redesign:** LG&E/KU actively embraces policy mechanisms that support energy efficiency, such as updated building codes and ENERGY STAR program changes, and seeks innovative ways to account for these changes in future program cycles by restructuring delivery services and/or incentive levels.

Moreover, Navigant worked with LG&E/KU and the various implementation contractors to develop quality control (QC) metrics for the program tracking databases while correcting for data errors mid-stream. The product of this effort will yield consistent and accurate data sets that align with actual program performance going forward. These efforts are also reflective of the high realization rates for the

majority of programs. Navigant worked closely with LG&E/KU in order to identify gaps in tracking databases and potential areas to improve program performance and savings assumptions.

Navigant recognized that many participants may have altered their operating profiles and behavior towards energy efficiency in the time between program installation and when program verification actually occurred for a myriad of reasons outside the realm of program influence, including the following:

- **Idiosyncratic Factors:** Changes in equipment usage and operating patterns that are unique to a participant's financial health and corresponding occupancy characteristics
- **Economic Factors:** Changes in equipment usage and operating patterns as a result of shifts in market sector and economic climates.

As part of the impact evaluation, Navigant developed methods to minimize the effect of these influences. For example, Navigant relied on a utility billing analysis evaluation method in order to quantify impacts for some programs. LG&E/KU provided extensive records on electric and gas consumption of participants over multiple years by month. In particular, Navigant, with the aid of LG&E/KU, was able to examine consumption patterns around those months directly before and after participation in an EE program, thereby limiting the amount of time for the influence of these idiosyncratic and economic factors.

Additionally, the process evaluations revealed that the LG&E/KU EE portfolio is operating efficiently and that the appropriate QC mechanisms are in place or are being expanded and improved upon to ensure that implementation services are carried out professionally and effectively. For example, the transition to the EE OPS platform from the legacy Access database file structures has improved the ability of programs to track and maintain records such as participant status.

The previous quality of program tracking information was the single largest challenge faced by the evaluation team. Oftentimes, data was spread across multiple program actors and database structures (e.g., Access databases and multiple Excel spreadsheets) and difficult to synchronize. Navigant has collaborated with LG&E/KU and played an active role in developing new, comprehensive, internal tracking databases for each energy efficiency program (EE OPS Automation). To date, several EE programs have experienced successes with transitions to the new database platform. Navigant recognizes that this new database platform is more robust, reliable, secure, and scalable than the previous legacy database structures:

- **Robust:** The updated database platform contains more options for data extraction and manipulation.
- **Reliable:** The updated database platform benefits from developer support that can troubleshoot issues with database content and queries.
- **Secure:** The updated database platform interfaces and integrates well with security protocols which ensure the confidentiality of customer data.

- **Scalable:** The updated database platform has the ability to store larger volumes of data. As such, it can be easily scaled and modified to accommodate new information (e.g., programs, customers, and participating customer contextual data.).

The EE OPS structure implemented by LG&E/KU will facilitate accurate information collection, data manipulation and calculation, and accurate information reporting. LG&E/KU's programs greatly benefit from the EE OPS effort specifically in the context of future evaluation efforts and responses to potential PSC filing requirements.

1.2.4 Portfolio Level Recommendations

Navigant provides the following cross-cutting, portfolio level recommendations to aid LG&E/KU in their continuous program improvement efforts:

- Going forward, Navigant recommends establishing internal review metrics and Quality Control (QC) mechanisms for the information stored within the recently launched EE OPS database
    - A systematic QC review of the database on a regular basis is imperative to ensure that missing or incomplete records are minimized, and that data is represented accurately/consistently.

It should be noted that this process is currently being developed by LG&E/KU. The QC system developed by LG&E/KU includes a data reconciliation process, for example, to ensure that records submitted by program implementation contractors align with LG&E/KU's own records.

Recommendations pertaining to individual programs are presented in the program specific sections, when applicable.

1.3 Program Specific Findings and Recommendations

Through the course of the impact and process evaluation effort, Navigant identified program-specific findings and recommendations. Navigant collaborated with LG&E/KU in many cases to implement actions in response to these recommendations. The following section documents the iterative feedback loop developed by Navigant and LG&E/KU to address each recommendation throughout the evaluation cycle.

1.3.1 Residential Conservation

- Future program efforts would benefit from tracking recommendations, particularly behavioral recommendations, as the billing analysis appears to indicate that measurable savings are achieved by behavioral change (i.e., participants changing their energy usage habits)
    - LG&E/KU's migration to the EE OPS platform is well suited to support this capture of additional program activity, and Navigant has been engaged in the database development and migration process.

- Navigant recommends enhancements to information collection, including full home characteristics, participation and non-participant survey data in order to track and understand reasons for dropouts, and integrated QC tools
  - LG&E/KU has expanded their online audit tool to capture additional home data
  - LG&E/KU is currently examining the feasibility of investigating reasons for participant dropout as a supplement to their new customer surveys
  - LG&E/KU also expanded their program to include QC components for field data recording.
- While the program is achieving its savings goals, the program should consider new energy efficiency offerings.
  - LG&E/KU is currently investigating and implementing enhancements to its offerings.
    - For example, Navigant collaborated with LG&E/KU to expand its measure offerings in 2012 to now include refrigerator thermostats, refrigerator coil cleaning brushes, and smart power strips.
    - Navigant notes for clarification that the program currently factors savings associated with efficient gas appliances into its calculations.
    - LG&E/KU has recently released a new enhanced version of the online audit tool.
- The program would benefit from targeted marketing to customers with high utility bills with more emphasis on making energy efficiency a priority. LG&E/KU has made the following program enhancements in response to this recommendation.
  - Program marketing initiatives now target customers with high energy bills.
  - The program cross-promotes with the new Smart Energy Profile program.
  - The program has reached out to contractors to promote awareness of residential incentives.
  - The program has expanded the onsite program to place greater emphasis on making energy efficiency a priority.

1.3.2 Residential New Construction

- Navigant recommends that LG&E/KU monitor participation levels of the program to understand how participant levels change in response to more stringent codes and stands, and to ensure that the overall program savings goals are still achievable in future program cycles.
  - LG&E/KU now tracks homes by tiers (i.e., tier 1 are Energy-Saving Homes, tier 2 are ENERGY STAR homes) and that the EE OPS platform facilitates this tracking by builder as well.
- The program may benefit from expanded research to enhance savings estimates:

  - Savings estimates may be improved by further developing the baseline home specifications that are consistent with the Kentucky Residential Code (KRC) instead of relying on REM/Rates baseline assumptions.
    - Navigant notes that recent (after 2012) Kentucky Code was updated to reference International Energy Conservation Code (IECC) 2009 and does not include any amendments unlike the previous code. Therefore, the current REM/*Rate* baseline home (IECC 2009) is now more representative of a Kentucky baseline home and appropriate for savings calculations.
  - The baseline energy consumption estimates may be further enhanced by accounting for use and behavioral traits specific to LG&E/KU customers or by developing a baseline using billing data from code-level homes. Current estimates rely on the consumption patterns built into the REM/*Rate* baseline home.
    - LG&E/KU investigated the use of a user defined home based on characteristics observed among utility customers that may differ from the REM/*Rate* baseline home. However, LG&E/KU notes that the program would lose the ability to compare future program results to homes rated previously against a different baseline, and therefore, would lose the ability to examine year-over-year performance.
- Future program data reviews would benefit from program tracking data that captures both estimated consumption data in addition to savings data.
  - LG&E/KU has undertaken steps to capture this kind of expanded data within the EE OPS platform as part of its continuous improvement process.

1.3.3 Load Management/Demand Conservation

- Navigant recommends enhancements to LG&E/KU program participation documentation. Specifically, understanding controlled equipment specifications (e.g., running amps, connected load, duty cycles, etc.), the estimated demand reduction per switch, and the variability in demand reduction per switch will help the program improve its savings estimate calculations.
  - LG&E/KU has recently initiated a M&V project supported by EE OPS data capturing enhancements that will facilitate the understanding of these factors.
- Navigant recommends that LG&E/KU also incorporate controlled equipment specifications into the tracking data in order to aid demand reduction estimations by stratifying by either historical air conditioner consumption (kWh) or air conditioner connected load (kW).
  - LG&E/KU has enhanced its data collection capabilities for new switch installations and captures information within its program data to facilitate this stratification.
- Navigant recommends that future evaluation efforts analyze only participant consumption data instead of the entire system load.

  - LG&E/KU is currently investigating the incorporation of distribution data at a feeder circuit level that would allow the program to analyze load at a more granular level rather than entire system load. This would facilitate statistically significantly analyses.

- Navigant also recommends that LG&E/KU continue to investigate the feasibility of incorporating two-way feedback devices in order to understand the number of equipment actually under control. Devices may also incorporate adaptive controls so that the full control strategies are realized even for air conditioners running at partial load during the event period.
  - LG&E/KU is actively investigating these features through its M&V project. LG&E/KU has planned to implement 100 advanced devices initially and expand that to approximately 400 units as part of a pilot study.

1.3.4 Commercial Energy Analysis and Rebates

- Input assumption recommendations for measures offered through the program, include:
  - Account for linear fluorescent ballast efficiency improvements.
    - LG&E/KU has incorporated ballast efficiency assumptions into the ex ante savings calculations. However, these assumptions should be regularly reviewed to incorporate technology changes and codes and standards updates.
  - Incorporate demand coincidence factors to reflect actual applications (e.g., for lighting, motors, pumps, and variable-frequency drives (VFDs)).
    - LG&E/KU has incorporated coincidence factors for motor, pump, and VFD ex ante savings calculations. LG&E/KU is currently developing coincidence factors for future lighting measures.
  - Refine motor efficiency assumptions to reflect actual and typical retrofit cases as well as recent Federal standards changes.
    - Navigant and LG&E/KU have reviewed the motor efficiency assumptions and confirmed they are reflective of industry standards. Going forward, the prescriptive efficiency improvements should be regularly reviewed to incorporate technology changes and codes and standards updates. LG&E/KU captures actual motor efficiencies for the custom rebate path.
  - Refine VFD savings assumptions to incorporate the actual application characteristics.
    - Navigant and LG&E/KU have reviewed the VFD savings assumptions and confirmed they are reflective of industry standards. Prescriptive efficiency improvements should be regularly reviewed to incorporate secondary study/industry/technology findings. LG&E/KU captures VFD savings assumptions for the custom rebate path.
  - Refine compressor and chiller savings to incorporate the actual equipment specifications (e.g., rated kW/ton).

        - Navigant and LG&E/KU have reviewed compressor and chiller efficiency improvements and found them to be consistent with industry standards. Prescriptive efficiency improvements should be regularly reviewed to incorporate technology changes and codes and standards updates. LG&E/KU captures actual equipment efficiencies for the custom rebate path.

- Navigant recommends that LG&E/KU track both the recommendations made by the on-site energy auditor and the recommendations (and rebates) implemented by participants.
    - LG&E/KU has implemented a follow up process with their outreach contractor to determine if implementation has occurred. The outreach contractor also assists with the rebate application process for customers who have not applied for rebates.
- Navigant recommends enhancements to the program's information collection to include tracking of behavioral recommendations.
    - LG&E/KU is currently refining and streamlining the data tracking process with the EE OPS data transfer; this will greatly improve the program's data capabilities and enable more efficient quality control efforts.
- Navigant recommends that LGE/KU track the program's influence (similar to the methods employed by Navigant's survey effort) to determine the effectiveness of the outreach initiative on encouraging participants to implement energy efficiency measures.
    - LG&E/KU plans to research this recommendation and the potential benefits associated with this type of effort.

1.3.5 Residential Low Income Weatherization (WeCare)

- Tier assignments are not based on energy savings potential. Therefore, Navigant recommends that LG&E/KU consider assigning tiers based on energy savings potential for future program cycles so that program funds can be allocated in order to maximize energy savings (e.g., kWh) per dollar spent.
    - LG&E/KU has recently modified the program to allow allocations of funding to align with energy savings potential in response to this finding. LG&E/KU is also currently investigating the feasibility of other options to enhance the programs savings potential within each tier.
- Navigant recommends enhanced program tracking in order to provide insight into the low realization rates found by this evaluation.
    - Navigant and LG&E/KU are investigating the feasibility of this option and potential overlapping efforts in the region that may be responsible for lower than expected savings. For example, the program may examine better coordination with other low-income/housing groups such as CAC and MHC.
- LG&E/KU should also examine expanding their current efficient measure offerings for future program cycles to ensure savings levels can be maintained.

  - LG&E/KU is examining its program offerings annually and will make modifications in response to new legislation, best practices updates, etc. Additionally, Navigant notes that the program recently added smart strips and storm doors as part of its continuous improvement process.

- Navigant recommends a documented QC methodology to be applied to database and spreadsheet tool management. Streamlined and comprehensive data capturing will facilitate a full understanding of data and will permit verification of the following:
  - Actual installations against NEAT recommendations.
  - Implementation contractor performance.
  - Program performance by Tiers A, B, and C (e.g., estimated kWh savings per implementation dollars allocated) and/or implementation contractor.
    - LG&E/KU has implemented database improvements through the EE OPS database effort. Improvements include further standardization of energy conservation measures (ECMs).
- Navigant recommends that program tracking data capture the recommendations provided as part of the educational component of the program. During 2010/2011, only installed measures and energy auditor improvements were tracked. This may provide further insight into low realization rates. Collecting information on recommended / installed measures will allow LG&E/KU to investigate other potentially cost effective measure offerings.
  - LG&E/KU is currently investigating these enhancements; the EE OPS efforts have allowed for enhanced data collection capabilities.
- Navigant recommends that LG&E/KU also use the existing NEAT data structure to track energy (e.g., kWh) savings per dollar spent as another quality control measure to ensure an effective program execution.
  - LG&E/KU is currently expanding their NEAT capabilities with training to address this recommendation.
- Navigant recommends that the program understand if initial participant reluctance exists based on non-programmatic factors (e.g., discomfort with being associated with low income services).
  - LG&E/KU's program manager has explored possible solutions to this problem through their customer satisfaction research.

1.3.6 HVAC Diagnostics and Tune-Up

- Understanding that this program will not be automated through the EE OPS effort, Navigant recommends that program tracking be consolidated to a single data structure and a documented QC process be implemented to ensure all savings are accounted for during the 2013-2016 time period.
  - LG&E/KU is currently working with their implementation contractor to pilot new software in the 2013 program cycle that will enable an electronic method for effectively

capturing program participation data. LG&E/KU will monitor this process closely to verify the accuracy and consistency of this data.

- LG&E/KU has transitioned from a two-part to a one-part program.
  - This consolidated program data and streamlined management.
  - This contributed to a significant decrease in program dropouts.

1.3.7 Residential High-Efficiency Lighting

- Navigant recommends enhancements to the Business Reply Cards (BRC) in order to collect additional information from participants such as:
  - Lamp type intended to be replaced
  - Room types where CFLs will likely be installed
  - Estimated number of CFLs in the participant's home
    - LG&E/KU is currently in the process of analyzing future residential lighting program opportunities and will consider this customer data as part of its decision making process.
- Navigant recommends that LG&E/KU examine other program offerings beyond general service, screw-type CFLs in order to maintain current efficiency thresholds. Additionally, LG&E/KU should consider lamp types not currently regulated at the Federal level.
  - LG&E/KU is currently in the process of analyzing future residential lighting program opportunities and is considering other technologies.

Louisville Gas and Electric Company /

Kentucky Utilities Company

DSM Program Review

Report

March 18, 2011

Louisville Gas and Electric Company / Kentucky Utilities Company

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Executive Summary

Louisville Gas and Electric Company (LG&E) and Kentucky Utilities Company (KU), and, hereafter referred to as "LG&E / KU" or the "Companies", engaged ICF to provide a broad review of their demand side management (DSM) plan for 2011 to 2017. This review included a detailed overview of existing programs that the Companies are enhancing and re-filing, and new programs. ICF also conducted a portfolio-level review of the Companies' overall DSM investments. Specifically, the Companies engaged ICF to:

1. Review the DSM planning materials and process as documented by the Companies.
2. Review the individual program designs developed by the Companies.
3. Compare the planning process and individual DSM program designs to known best practices and appropriate peer utilities.
4. Identify any gaps or shortcomings in the process or program designs, including specific recommendations regarding alternative approaches or designs.
5. Participate in program design and planning discussion as may be required by the Companies.
6. Prepare a report summarizing the review and providing a third-party opinion regarding the sufficiency of the process and designs.

This report is the culmination of ICF's work for this project and represents the summary report detailed in Task 6 above.

Regulatory and Policy Environment

The market for energy efficiency is evolving quickly, and nowhere in the country is this more evident than in Kentucky. Since ICF's last review of the Companies' programs in 2007, both state and federal policies have shifted strongly in favor of energy efficiency. At the state level, this was driven by Kentucky Governor Steven Beshear, who has placed energy efficiency squarely at the top of his Seven Point Energy Strategy. At the federal level, this was driven largely by the passage of 2009 American Reinvestment and Recovery Act (ARRA, or "the Stimulus package"). ARRA outlayed more than $16 billion nationwide in energy efficiency and related investments; Kentucky is slated to receive over $150 million during the three-year period spanning 2009-2011.

Commensurate with federal and state policy agendas, the Companies have made energy efficiency a high priority in their corporate strategies. In 2008, the Companies appointed a new Customer Energy Efficiency Management team, including a new director and two new department managers. The Companies also hired four additional program managers to manage new programs, and three new researchers/program analysts. These human resource investments represent a significant commitment to energy efficiency that will leave the Companies well-positioned to successfully grow their DSM portfolio in the future.

The Companies are also developing a DSM portfolio that is consistent with many of the specific actions outlined in the Governor's plan. By undertaking this review, the Companies are committed to incorporating best practices into their programs. In addition, with the new programs, the Companies are addressing the potential for energy efficiency in both the mass market and in targeted end uses.

Best Practices

Energy efficiency program *best practice* is much more a term of art than science; there simply is too much variability across objectives, regulatory structures, and program types to enable simple broad conclusions about what is *best*. Typically, best practice is considered a function of program result, such as whether the program met or exceeded its objectives. An alternative view of best practice focuses on the design and execution of essential program elements, such as marketing, service delivery, program back office efficiency, etc. For example, though a particular program might not have delivered particularly strong overall results, certain elements of its structure, such as incentive fulfillment, might be considered best-in-class. Alternatively, while difficult, it is not unheard of for a program based on inefficient or flawed processes to nevertheless deliver outstanding results.

In general, best practice programs and portfolios seek to achieve each of the following goals:

- Provide programs that are cost-effective.
- Provide a portfolio that covers hard-to-reach markets.
- Provide program budgets that are sufficient to deliver the programs effectively to market.
- Provide programs that have sufficient budgets for marketing, training and education (market transformation activities).
- Provide a portfolio that strikes an appropriate balance of mitigated risk, proven program types, and more innovative programs.
- Provide a portfolio that is flexible enough to adapt to changing market conditions in a cost-effective manner.
- Provide an evaluation, measurement, and verification (EM&V) budget for each program, and plans for program evaluations on a regular basis.

Portfolio Review

The Companies' programs satisfy each of the best practice criteria listed above. In addition, the Companies' projected program costs and savings compare favorably to the rest of the country. The Companies' overall cost of savings, expressed in dollars per first year kWh, are projected to be less expensive that the median cost of savings achieved by program administrators in the South, the Midwest, and the U.S. as a whole. In addition, the level of savings achieved by the Companies, expressed both as a percentage of annual kWh sales, and annual kW peak demand, also exceeds that of their peers.

Because the programs easily pass standard cost-effectiveness tests, and participants gain significant benefits from the programs, the Companies should continue to design and market the programs broadly, in order to increase participation and minimize the number of non-participants.

Overall Conclusions

Our review of the Companies' programs, and the context in which they were developed, leads us to the following conclusions:

- The Companies' proposed portfolio appropriately addresses evolving federal and state policies. In addition, the portfolio contains many elements of best practices, including cost-effectiveness, broad targeting, and flexible design.
- The Companies should commission a potential study or market characterization study, an action item the governor has also proposed for the state in his energy plan. The study results could be used to help plan programs that capture savings where potential is greatest and/or most cost-effective.
- Based on a market characterization study of the commercial sector, develop additional programs targeting the commercial sector.
- The Companies should continue to market their successful load control program, and offer additional demand response options.
- With their Residential Conservation/Home Energy Performance and Low Income Weatherization (WeCare) programs, the Companies should continue to leverage federal and statewide resources, where applicable, in order to maximize available funding and supplement existing program participation.
- As behavior-based programs gain entry into utility portfolios, the Companies should develop relationships with program implementers and utility program managers in order to learn from others' experiences, and adjust the design and delivery of their own behavior-based initiatives, including the Smart Energy Profile program.
- Coordinate and cross-promote their new residential programs with existing residential programs.

1. Introduction

1.1. Scope of ICF's Review

Louisville Gas and Electric Company (LG&E) and Kentucky Utilities Company (KU), and, hereafter referred to as "LG&E / KU" or the "Companies", engaged ICF to provide a broad review of their demand side management (DSM) plan for 2011 to 2017. This review included a detailed overview of existing programs that the Companies are enhancing and re-filing, and new programs. ICF also conducted a portfolio-level review of the Companies' overall DSM investments. Specifically, the Companies engaged ICF to:

1. Review the DSM planning materials and processes as documented by the Companies.
2. Review the individual program designs developed by the Companies.
3. Compare the planning processes and individual DSM program designs to known best practices and appropriate peer utilities.
4. Identify any gaps or shortcomings in the process or program designs, including specific recommendations regarding alternative approaches or designs.
5. Participate in program design and planning discussion as may be required by the Companies.
6. Prepare a report summarizing the review and providing a third-party opinion regarding the sufficiency of the process and designs.

1.2. ICF's Approach

The review began with a kick-off meeting during which ICF and the Companies discussed and clarified the objectives of the project. ICF discussed its approach to the review and provided the Companies with a data request that outlined the materials ICF required to complete the review, including: the Companies' draft DSM filing; load forecasts; integrated resource plans (IRPs); DSM program modeling inputs and outputs; and relevant reports produced by the State of Kentucky, including Governor Beshear's Energy Strategy.

Our review consisted of both bottom-up and top-down approaches. From the bottom-up, we reviewed each of the Companies' proposed programs against program best practices from around the country. These program-level reviews focused primarily on program delivery (e.g. how programs are marketed, to whom incentives are paid, etc.), but also examined key program metrics for reasonableness (e.g. program costs are appropriate for this program given market maturity in Kentucky). The top-down review included an analysis of portfolio level metrics (e.g. kWh savings as a percentage of sales) against the Companies' peers, a gap analysis to identify potential lost savings opportunities, and a portfolio best practices analysis to determine whether the Companies' proposed DSM portfolio:

- Is cost-effective;
- Targets markets and technologies where the largest potential exists;
- Targets hard-to-reach markets;
- Has sufficient marketing and education budgets – incentives are only one aspect of a program;
- Is flexible enough to adapt to changing market conditions;
- Has an appropriate mix of proven and innovative programs;

- Has an appropriate mix of energy and demand programs; and,
- Has new and modified programs that were selected through an appropriate planning process.

1.3. Report Overview

The remainder of this report is organized into the following sections: Section 2: Regulatory and Policy Environment; Section 3: Best Practices; Section 4: Portfolio Review; Section 5: Program Reviews; Section 6: Overall Conclusions.

Additional description for each section is provided below.

Section 2: Regulatory and Policy Environment explains current federal and state policy with regards to energy efficiency. The current policies help explain the context in which this report was developed. This section also includes a summary of how the Companies are responding to policy shifts. As these policies evolve, and especially as federal climate change legislation moves closer toward regulatory certainty, the Companies will need to keep abreast of these developments, and re-evaluate programs and portfolios to ensure materiality, compliance, and effectiveness.

Section 3: Best Practices defines "best practice" generally as well as how it is used in this report. As noted previously, "best practice" is a subjective label that is context-sensitive. ICF believes that the reviews included in Section 5 should be viewed as a comparative exercise, with caution given to differences in the market, climate, and administration. For each program review, several suggestions as to how the Companies can continue to improve their programs through design and delivery adjustments are offered. In addition, suggestions relating to increased engagement with national program sponsors (such as the EPA), statewide agencies, and other local stakeholders, where applicable are included.

Section 4: Portfolio Review conducts a brief overview of the Companies' complete DSM portfolio, including existing programs that were not subject to a best practice review. The portfolio is compared to its peers in the South, the Midwest, and the U.S. as a whole. In contrast with Section 3, this section contains a more quantitative comparison of portfolio savings and costs. This section also contains a discussion of regulatory treatment of program costs, and the impact of the portfolio on ratepayers.

Section 5: Program Reviews contains the reviews for enhanced existing and new programs. Each review begins by describing the Companies' existing program and proposed enhancements, if applicable. The review then describes a selection of best practice programs, and compares the Companies' programs using a variety of metrics. Finally, the review takes assessment of the differences, summarizes ICF's conclusions, and, if necessary, offers suggestions as to how to incorporate these in the future.

Section 6: Overall Conclusions includes conclusions drawn from the introduction, and recaps the individual program conclusions and suggestions contained in Section 5.

2. Regulatory and Policy Environment

The market for energy efficiency is evolving quickly, and nowhere in the country is this more evident than in Kentucky. Since ICF's last review of the Companies' programs in 2007, both state and federal policies have shifted strongly in favor of energy efficiency. At the state level, this was driven by Kentucky Governor Steven Beshear, who has placed energy efficiency squarely at the top of his Seven Point Energy Strategy. At the federal level, this was driven largely by the passage of 2009 American Reinvestment and Recovery Act (ARRA, or "the Stimulus package"). ARRA outlaid about $16.6 billion nationwide in energy efficiency and related investments; Kentucky is slated to receive over $150 million during the three-year period spanning 2009-2011.

Below is a discussion of these and other policy shifts in greater detail, the implications for the Companies' programs, and the Companies' response to this changing political environment.

2.1. Federal

There were three major developments at the federal level since ICF reviewed the Companies' portfolio in 2007. Below, are highlights of key Federal developments that have the potential to impact the Companies' DSM programs.

1. *Under cap-and-trade scenarios in pending legislation, DSM should become more cost-effective for the Companies.* However, a specific cap-and-trade scenario is unlikely to be implemented until 2011, and possibly even later. Possible options include:

    a. The American Clean Energy and Security (ACES) Act (H.R. 2454) was passed by the House of Representatives on June 26, 2009. ACES establishes a cap-and-trade program covering most U.S. greenhouse gas emissions (GHGs), a federal renewable electricity and energy efficiency standard (RES), new efficiency requirements, power plant performance standards, and other complementary measures. However, the Senate has not considered this bill and is unlikely to do so in the near future.

    b. The Senate has two other bills under consideration. The first, the Clean Energy Jobs and American Power Act (S. 1733), introduced on September 30, 2009, contains most of the same provisions as ACES with a few changes and some strategic omissions. A modified version of this bill, known as the American Power Act, has been discussed but not formally introduced. The second, Carbon Limits and Energy for America's Renewal (CLEAR) Act (S. 2877), was introduced on December 11, 2009. This "cap-and-dividend" bill would tax carbon emitters and use the revenues to provide refunds to affected ratepayers. The first bill is considered more feasible, though the actual date of passage for either bill is uncertain, and unlikely to occur in the near future.

    c. The EPA is moving forward with regulation of GHGs through the Clean Air Act (CAA), primarily through existing permitting rules that apply mostly to manufacturing facilities but also to some electricity generators. Future regulatory action by the EPA may be determined or limited by the Congress, such as legislation that would pre-empt the EPA from using the CAA to regulate GHGs.

2. *The Stimulus package provided unprecedented resources for energy efficiency and DSM nationwide.* The 2009 ARRA authorized about $16.6 billion in energy efficiency

funding that qualifying public entities—primarily states, cities, and counties—could pursue. The primary objectives of this funding are to create jobs, save energy, and build clean energy (energy efficiency and renewable energy) infrastructure for the longer term. The Department of Energy's (DOE) major allocations to Kentucky (over 2009-2011) include:

a. $70.9 million in Weatherization Assistance Program (WAP) funding;

b. $52.5 million in State Energy Program (SEP) funding;

c. $25.1 million in Energy Efficiency and Conservation Block Grants (EECBG); and,

d. $4.1 million in Energy Efficient Appliance Rebate Program funding.

In sum, this is approximately $50 million in average annual funding for energy efficiency programs in Kentucky. In 2008, the *total* energy efficiency program spending in Kentucky was $24 million.

3. *As compact fluorescent lamps (CFLs) become the baseline technology, obtaining cost-effective program savings will be more challenging.*[1] Federal lighting standards, including those for many popular lighting products like CFLs, will start to phase-in during 2012, which will diminish the impact of today's efficient lighting technologies.

2.2. State

Governor Beshear made energy efficiency a top priority within his energy strategy, *Intelligent Energy Choices for Kentucky's Future*. In this document, the governor set forth the following goal:

> *Energy efficiency will offset at least 18 percent of Kentucky's projected 2025 energy demand.*[2]

This amounts to reducing statewide energy consumption by an average of about 1 percent per year through 2025, an ambitious goal that would place Kentucky in the top tier of states in the Midwest and South in terms of DSM performance.

The governor's overall plan proposes to enact a renewable and efficiency portfolio standard (REPS) that would be set at 25 percent of the state's projected energy use in 2025. In addition to reducing projected emissions in 2025 by 50 percent, the REPS would also reduce emissions by 20 percent relative to the 1990 baseline. This aggressive goal surpasses the targets set by California's AB 32 law (2020 emissions equal to 1990), and New England's Regional Greenhouse Gas Initiative (2018 emissions 10 percent lower than 2009), and compares to the European Union's Emissions Trading Scheme (2020 emissions 20 percent lower than 1990).

[1] The Energy Independence and Security Act of 2007 (the "Energy Bill"), signed into law by President Bush on December 18, 2007, requires all light bulbs use 30 percent less energy than today's incandescent bulbs by 2012 to 2014. The phase-out will start with 100-watt bulbs in January 2012 and end with 40-watt bulbs in January 2014. By 2020, a Tier 2 would become effective, which requires all bulbs to be at least 70 percent more efficient (effectively equal to today's CFLs).

[2] Governor Steven L. Beshear. Intelligent Choices for Kentucky's Energy Future. November 2008. p. vi.

The governor's plan proposes that energy efficiency can be the primary method strategy to meet the REPS goal. Energy efficiency would offset 18 percent of the state's projected energy demand, with the remaining 7 percent coming from renewable energy and bio-fuels. In addition to the REPS that would apply to the state's utilities, the governor proposes that additional savings would result from aggressive energy savings targets for state government. The energy efficiency portion of the REPS would also include a comprehensive education, outreach, and marketing component by the state.

As a first step, the governor authorizes the Public Service Commission (PSC) to institute a proceeding that examines the impacts of an REPS. This proceeding will also identify cost-effective programs, and include recommendations for implementing them. The governor also encourages and authorizes the PSC to commit greater resources to DSM, including rules that would require the utilities to implement best practice programs, standardization of the rules regarding industrial customer opt-outs, and an increased focus on the evaluation of DSM programs. As a longer term action item (four to seven years from the plan's inception), the governor also encourages the PSC to work with the utilities on a smart grid policy.

2.3. How Is LG&E / KU Responding to State and Federal Policy Shifts?

2.3.1. Energy Efficiency is a Priority for the Companies' Upper Management

Commensurate with federal and state policy agendas, the Companies have made energy efficiency a high priority in their corporate strategies. In 2008, the Companies appointed a new Customer Energy Efficiency Management team, including a new director and two new department managers. The Companies also hired four additional program managers to manage new programs, and three new researchers/program analysts. These human resource investments represent a significant commitment to energy efficiency that will leave the Companies well-positioned to successfully grow their DSM portfolio in the future.

The Companies are also developing a DSM portfolio that is consistent with many of the specific actions outlined in the Governor's plan. By undertaking this review, the Companies are committed to incorporating best practices into their programs. In addition, with the new programs, the Companies are addressing the potential for energy efficiency in both the mass market and in targeted end uses.

2.3.2. LG&E / KU's Portfolio Is Growing and Diversifying

Table 1 and Figures 1-3 below help illustrate the recent evolution of the Companies' DSM portfolio.

- Column *b* in Table 1, "Target Sectors(s)" indicates the Companies' designations of the target market(s) for the programs in column *a*.
- Column *c*, "Program Status" includes:
    - Existing programs – Programs currently administered by the Companies that are not being modified substantially and re-filed in their DSM Plan;

- Enhanced programs - Programs currently administered by the Companies that are being modified substantially and re-filed in their DSM Plan; and,
- New programs that the Companies are proposing in their DSM Plan.

- Column *d* is an ICF-designated program label. Column *d*, "Program types," includes:
  - Resource acquisition – Programs designed primarily for the purpose of implementing efficiency measures in the marketplace;
  - Education and/or marketing – Programs designed primarily to educate the public about the Companies' DSM offerings, other efficiency programs (i.e. State and Federal), and energy efficiency, generally; and,
  - Low income – Programs that implement efficiency measures, but for which only qualified low income households are eligible.
- Column *e* is also an ICF-designated program label. Column *e*, "Risk/innovation," includes designations, based on ICF's professional judgment of the investment risk and degree of innovation in design, delivery, and technologies associated with each program. A risk/innovation designation of *low/low* means that on the risk side, the program is a very safe investment because the program is well-understood and is a proven design that has become a best practice by performing successfully (cost-effectively) in a variety of jurisdictions. On the innovation side, *low* means that the design, delivery, and technologies that comprise the program are widely understood and used successfully in programs in most jurisdictions.

  Conversely, a risk/innovation designation of *high/high* means on the risk side there is considerable uncertainty about the program's performance, either because the program has not been implemented before, or if it has, there is very little science or evaluation around program savings. On the innovation side, this means the program will employ delivery methods, technologies, or both that are novel, or at least whose performance is not well understood, but also have the potential (based on theory or pilot studies) to achieve significant savings levels.

Table 1: Existing, Revised, and New LG&E / KU Programs ("The Portfolio")

a	b	c	d	e	f	g
Program	**Target Sector(s)**	**Program Status**	**Program Type**	**Risk/ Innovation**	**Year 1 Budget**	**Year 1 Savings (MWh)**
Residential High Efficiency Lighting	Residential	Existing	Resource Acquisition	Low/Low	$3,416,046	65,150
Residential New Construction	Residential	Existing	Resource Acquisition	Med/Low	$1,102,635	2,297
Residential HVAC Tune Up	Residential	Existing	Resource Acquisition	Low/Med	$487,332	1,072
Commercial HVAC Tune Up	Commercial	Existing	Resource Acquisition	Low/Med	$411,778	1,942
Customer Education & Public Information	Res. and Com.	Existing	Education and/or Marketing	Med/Low	$3,296,660	0
Dealer Referral Network	Res. and Com.	Existing	Education and/or Marketing	Low/Med	$152,056	0
Residential Responsive Pricing (RRP)	Residential	Existing	Resource Acquisition	Med/High	$125,000	0
Program Development & Administration	Res. and Com.	Revised	Program Development & Admin.	Low/Low	$1,260,457	0
Residential Conservation (HEPP)	Residential	Revised	Resource Acquisition	Med/Med	$1,460,826	2,948
Residential Load Management	Residential	Revised	Resource Acquisition	Low/Low	$6,186,874	1,868
Commercial Load Management	Commercial	Revised	Resource Acquisition	Low/Low	$321,821	107
Residential Low Income Weatherization	Residential	Revised	Low Income	Low/Low	$2,368,462	2,632
Commercial Conservation/Incentives	Commercial	Revised	Resource Acquisition	Low/Low	$3,255,400	54,988
Smart Energy Profile	Residential	New	Resource Acquisition	Med/High	$1,370,800	29,664
Residential Refrigerator Removal	Residential	New	Resource Acquisition	Low/Low	$815,800	3,000
Residential Incentives	Residential	New	Resource Acquisition	Med/Low	$1,567,352	8,544
Total					**$27,599,300**	**174,211**

Figure 1 illustrates the distribution of the Companies' Year 1 portfolio budget across program status categories. Eighty six percent (86%) of the budget is earmarked for programs the Companies are currently operating, including existing and revised programs. The revised programs include program enhancements that the Companies believe will improve program performance, either because the Companies received feedback on the program through formal evaluation, or because after some time in the market, program staff sees opportunities that the current program is not capturing. By adapting to the marketplace through the modification of existing programs and making forays into the marketplace with new programs, the Companies demonstrate that they are seeking to improve and grow the portfolio.

Figure 1: Distribution of Year 1 Program Spending, by Program Status

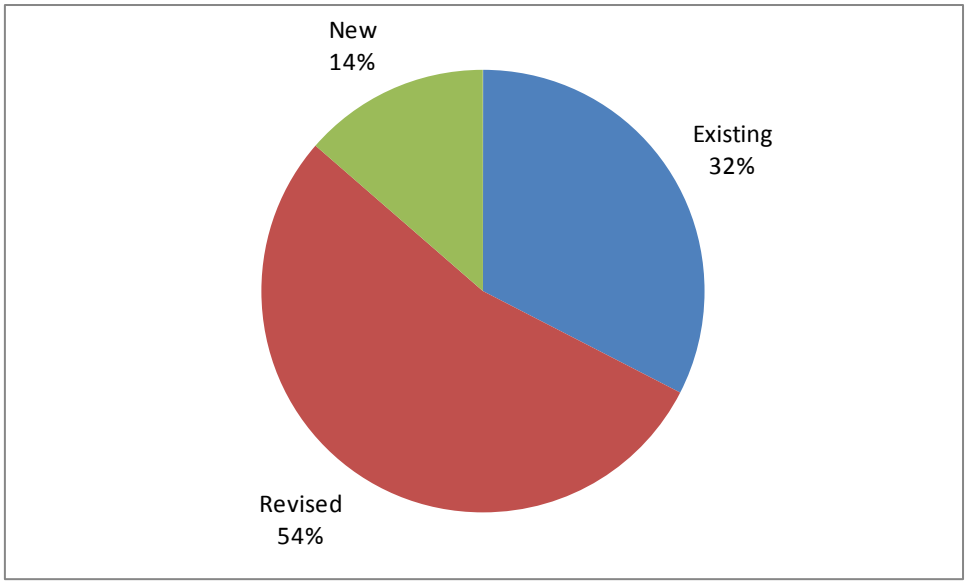


Figure 2 illustrates that the Companies will spend a large majority of their budget in Year 1 on programs designed primarily to acquire savings. It is important to note that this figure does not show the full extent of the Companies' planned marketing budget; each program budget includes funding for marketing and education activities.

Figure 2: Distribution of Year 1 Program Spending, by Program Type

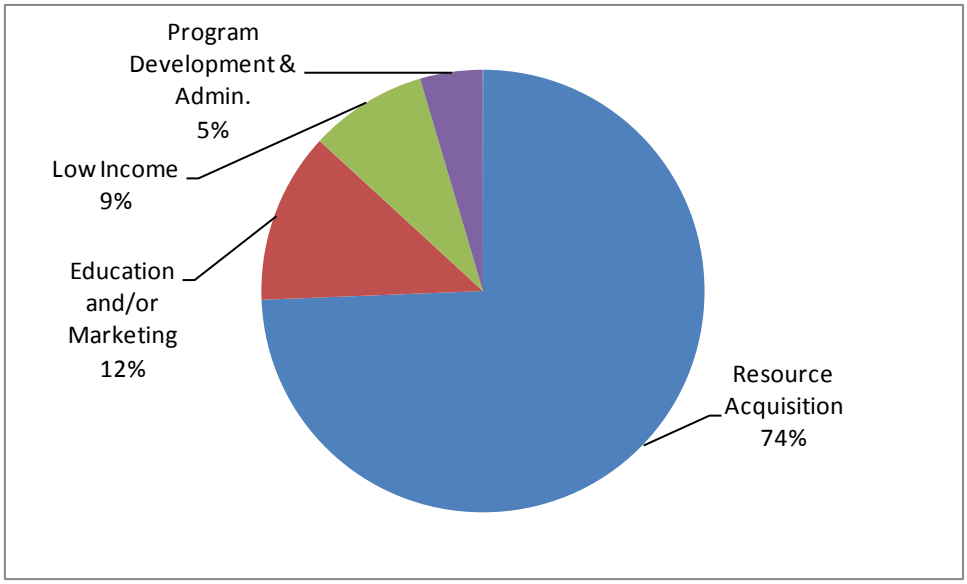
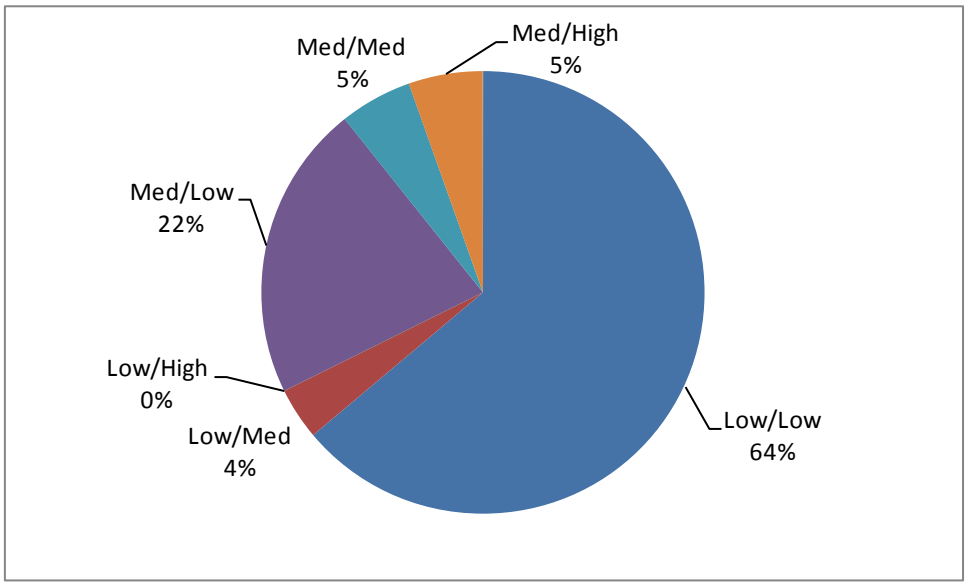


Figure 3 illustrates that the Companies' Year 1 portfolio is largely a low-risk investment, though the portfolio also includes some more innovative, though riskier elements. Overall, ICF believes that the Companies' proposed Year 1 portfolio is a relatively conservative investment that strikes an appropriate balance between low-risk programs that are well-understood (e.g. Residential HVAC-Tune Up and Commercial Conservation Rebates) and programs that have some innovative elements and are more forward looking (e.g. Smart Energy Profile and Residential Responsive Pricing), but are also more risky in that program performance is more uncertain. ICF does not characterize any of the Companies' programs as being a high risk investment.

Figure 3: Distribution of Year 1 Program Spending, by Risk/Innovation Category



3. Best Practices

3.1.1. Defining Best Practice

Energy efficiency program *best practice* is much more a term of art than science; there simply is too much variability across objectives, regulatory structures, and program types to enable simple broad conclusions about what is *best*. Typically, best practice is considered a function of program result, such as whether the program met or exceeded its objectives. An alternative view of best practice focuses on the design and execution of essential program elements, such as marketing, service delivery, program back office efficiency, etc. For example, though a particular program might not have delivered particularly strong results overall, certain elements of its structure, such as incentive fulfillment, might be considered best-in-class. Alternatively, while difficult, it is not unheard of for a program based on inefficient or flawed processes to nevertheless deliver outstanding results.

Best practice should be viewed partly as a function of the experience of the program administrator and implementer. What is best practice for a utility that has been designing and managing programs for two decades will be different in some cases from what should be viewed as best for an organization just entering the field. For example, ICF could not find one program *exactly* comparable to the Companies' proposed Residential Rebates program, but this is only because the Companies are packaging particular elements of their residential portfolio differently than other utilities. The programs that are often cited as best practice in other states (including California, New York, Oregon, Texas, Vermont, and Wisconsin) package some aspects of their portfolios in radically different ways. Although the Companies should look to these best practice states for ideas, ultimately the Companies must design a package that works best in *their own* markets.

In general, best practice programs and portfolios seek to achieve each of the following goals:

- **The programs are cost-effective.** Although cost-effectiveness can be defined in several ways, the most common method for investor-owned utilities to use is based on the California Standard Practice Manual tests. The manual contains four tests, the most comprehensive of which is the Total Resource Cost test. This test compares the net present value (NPV) of benefits (energy and demand savings multiplied by the value of avoided energy costs), with the NPV of costs (utility program costs and program participants' costs) over the lifetime of the implementation of DSM programs. If the benefit-cost ratio is greater than or equal to one (1.00), then the program provides a net benefit to the utility's ratepayers.
- **The portfolio covers hard-to-reach markets.** The portfolio must include programs that are targeted toward hard-to-reach segments, which typically include low-income and small commercial customers. Both of these customer segments face additional barriers to participation in DSM programs, including the *split incentive*. This term signifies the case where a customer would benefit from a lower utility bill but often lacks the authority to install energy-saving equipment in his leased residence or place of business.
- **Program budgets are sufficient to deliver the programs effectively to market.** Program budgets must be constructed to offer market-based incentives that will result in the expected level of participation. In addition, the budget should reflect any necessary increase of internal staffing or the use of an implementation contractor, and sufficient budgets for non-incentive and non-implementation costs (see below). In addition, program budgets should be monitored or adjusted annually to prevent over- and under-subscription of program funds.

- **Programs have sufficient budgets for marketing, training and education (market transformation activities).** A program that contains adequate funding for these activities can help customers and trade allies overcome the information barrier that is typical of energy efficiency investments. In addition, funds spent on information-related initiatives can pay dividends in the long term, when market transformation begins to take effect.
- **The portfolio strikes an appropriate balance of less risky, proven program types, and more innovative programs.** A less mature market would require more proven program types that have been implemented throughout the country, such as lighting and HVAC programs in both the residential and commercial sectors. Over time, as the market matures and savings potential decreases, new and innovative programs can be implemented. These programs can often develop from prior pilot programs or information initiatives, and can be co-marketed with proven program types.
- **The portfolio is flexible enough to adapt cost-effectively to changing market conditions.** A flexible and broad portfolio design will target all customer segments, and include a variety of program types (including rebates, direct install, demand response incentives, etc.) and energy efficiency measures (retrofit, replace-on-burnout, or new). This will ensure that economic conditions that negatively impact one customer segment will not affect the entire portfolio.
- **Evaluation, Measurement and Verification (EM&V) is budgeted for and the Companies have plans to have programs evaluated on a regular basis.** An adequate EM&V budget that results in timely process and impact evaluations should result in a feedback loop that validates program results and helps informs long-term program adjustments and design.

4. Portfolio Review

Portfolio Review Criteria	Summary Review
Intelligent Energy Choices for Kentucky's Future	
Programs will make progress toward the goal of reducing energy consumption in Kentucky by at least 18 percent below currently projected 2025 energy consumption.	Yes. The Companies' proposed portfolio savings are projected to achieve more than 0.5 percent of annual sales in Year 1. Greater savings levels may be achieved through the introduction of additional program targeting the commercial sector.
Industry Best Practice	
Programs are cost effective.	Yes. The portfolio is cost-effective from the perspective of all ratepayers (based on the results of the TRC test), the utility (based on the results of the UCT test), and program participants (based on the results of the Participant Test). Vis-à-vis the generation alternative, this portfolio will have a lower impact on customer rates over the long-term, based on the results of the UCT test.
The portfolio covers hard-to-reach markets.	Yes. The WeCare program, which targets low income customers, represents 9 percent of the total portfolio budget, increasing to 20 percent by Year 7. Further, there are a variety of other offerings that help make efficiency investments more affordable to low income customers and small businesses, including the Companies' Residential High Efficiency Lighting program, the Commercial Conservation program, and the Commercial Load Management program.
Program budgets are sufficient to deliver the programs effectively to market.	Yes. The Companies' programs are adequately sized. The programs include the necessary funds both for incentive and implementation costs. In addition, funding is consistent from year to year, which ensures program success.
Programs have sufficient budgets for marketing, training and education (market transformation activities).	Yes. The budget contains line items for each of these cost types.
The portfolio strikes an appropriate balance of less risky, proven program-types, and more innovative programs.	Yes. The Companies have a generally conservative approach to portfolio planning that is appropriate given that the market is fairly immature. Nonetheless, the Companies are making forays into more innovative, albeit more risky programs, which have the potential to capture high energy savings. This includes the social marketing-based program *Smart Energy Profile*. As a result, the Companies will be well-positioned to implement cutting-edge programs as their advanced metering infrastructure moves from planning to deployment.

Portfolio Review Criteria	Summary Review
The portfolio is flexible enough to adapt cost-effectively to changing market conditions.	Yes. One example of this is that 54 percent of the Companies' Year 1 budget is for existing programs that are being modified based on evaluations and/or the Companies' experience. The Companies have built flexibility into their program designs and is adapting programs to changing market conditions.
EM&V is budgeted for and the Companies have plans to have programs evaluated on a regular basis.	Yes. In the past, the Companies have had their programs evaluated on a regular basis, and have cancelled or adapted programs based on feedback from evaluators. Program budgets include EM&V.

4.1. Benchmarking Costs and Savings

The Companies' projected program costs and savings compare favorably to the rest of the country. Table 2 below compares the Companies' overall cost of savings, expressed in dollars per first year kWh, are projected to be less expensive that the median cost of savings achieved by program administrators in the South, the Midwest, and the U.S. as a whole.

The level of savings achieved by the Companies, expressed as a percentage of annual kWh sales, also exceeds that of their peers.[3] In Year 1, the Companies' projected programs savings will equal nearly 0.5 percent of annual sales, which is a significant step toward achieving the governor's savings goal.

Table 2: LG&E / KU's Energy Portfolio Performance versus the South, Midwest, and U.S. Median

Portfolio Metric	LG&E / KU Year 1	LG&E / KU Year 3	LG&E / KU Year 5	Southern Region Median (2008)[a]	Midwest Region Median (2008)[a]	U.S. Median (2008)[a]
$ per 1st year kWh	$0.16	$0.19	$0.17	$0.89	$0.47	$0.33
Annual kWh savings as % sales	0.5%	0.5%	0.5%	0.1%	0.1%	0.4%

[a]U.S. EIA Form 861 Data (2008); Program Administrator spending;
$1 million or more annually on DSM programs.

In addition, the level of savings achieved by the Companies, expressed as a percentage of annual kW peak demand, also exceeds that of their peers. The benchmarking study cited below was composed primarily of Midwest utilities; LG&E / KU's cost per kW, due to its successful demand response programs, is also lower than its peers.

[3] 2008 is the most recent year for which EIA Form 861 data is available.

Table 3: LG&E / KU's Demand Portfolio Performance versus Benchmarking Study

Portfolio Metric	LG&E / KU Year 1	LG&E / KU Year 3	LG&E / KU Year 5	Bench-marking Median (2007)[b]
$ per 1st year kW	$566	$682	$605	$836
Annual kW savings as % demand	0.7%	0.8%	0.8%	0.6%

[b]Summit Blue DSM Benchmarking Study. Greater Impacts at Reasonable Costs. ACEEE Summer Study, 2008

Portfolio-level metrics are a useful way to ensure that portfolio planning estimates are comparable to benchmarking and best practice studies. However, since the program mix in utility portfolios is dependent on numerous factors, including the level of market maturity, generation costs, and customer receptivity, caution should be exercised when attempting to compare a portfolio with best practice. Instead, a high-level portfolio view should be used in concert with more detailed views of individual programs.

4.2. Program Spending, by Sector

One way for the Companies to achieve even greater savings levels in the future is to target a greater percentage of their program spending on the commercial sector. Table 4 below shows estimated electricity consumption in the Companies' territories, by sector (excluding industrial), as well as projected DSM program spending levels and program costs. Residential customers consume approximately 50 percent of electricity but residential program spending is about 86 percent of total DSM program spending between Years 1 and 7.

ICF's experience is that allocation of program spending by sector is a complicated and highly political issue in most jurisdictions. Utility commissions and program administrators must balance the need to meet aggressive state savings goals against other policy priorities, including the need to target hard-to-reach populations (e.g. low income customers and small businesses), as well as the interests of ratepayer advocates, environmental organizations, the State Attorney General, and others. The Companies' proposed spending by sector may be entirely appropriate given Kentucky's political economy; however, strictly from the standpoint of potential energy savings, greater program spending on the commercial sector should result in higher-than-projected savings for the Companies. Additional spending on the commercial sector would also be cost-effective, as commercial programs tend to be less expensive than residential programs because businesses have the needs and means to make larger DSM investments than residential customers.

In discussing this topic with the Companies' staff, ICF learned that the Companies do recognize the potential within the commercial sector and, in the future, may file additional programs targeted at commercial customers. The Companies would prefer to wait and launch these programs once they have a better understanding of the local commercial market; currently the Companies are conducting such research. ICF believes that this is a reasonable strategy that is generally consistent with a conservative planning approach common for utilities that are running relatively new programs in immature markets. Such an approach helps mitigate risks to the Companies and their ratepayers, and helps ensure the long term success of the portfolio.

Table 4: Energy Consumption, Program Spending, and Program Costs, by Sector[4]

KU Customer Sector	Estimated Consump-tion, 2009 (GWh)		LG&E Customer Sector	Estimated Consump-tion, 2009 (GWh)		LG&E / KU Estimated Consump-tion, 2009 (GWh)		Sector	LG&E / KU Proposed Spending on DSM Programs ($M, Years 1-7)		LG&E / KU Avg Cost of Savings ($/kWh, Years 1-7)
Residential	6,353	53%	Residential	4,254	49%	10,607	51%	Residential	$218	86%	$0.21
General Service	1,835	15%	General Service	1,456	17%	3,291	16%	Commercial	$36	14%	$0.09
Large Power Service	3,910	32%	Large Commercial	2,980	34%	6,890	33%				
Total	**12,098**			**8,690**		**20,788**		**Portfolio**	**$254**		**$0.18**

Sources:
KU Elec - DSM RC Filing. 12-08
LG&E Elec - DSM RC Filing. 12-08
LG&E / KU Draft DSM Expansion Filing. 1-11

4.3. Regulatory Treatment of Program Costs

The state of Kentucky's cost recovery mechanism is consistent with best practice, in that it includes program cost recovery and lost revenues recovery. However, the Companies must still prove that a DSM portfolio is cost-effective, which can be difficult when avoided costs are low. Similarly, customers' willingness to participate in energy efficiency program is lessened when retail rates are low, leading to longer payback periods. As demonstrated throughout this document, the Companies continue to offer cost-effective programs to each segment of the customer base. The Companies should continue to review best practice programs and look for new and innovative methods of program design and delivery that are still cost-effective.

In addition to a cost recovery mechanism, the establishment of mandatory savings or budget goals is another method that can ensure sufficient and stable funding for DSM programs. Some states, including Minnesota and Wisconsin, set a requirement that a certain percentage of sales or revenue determine the savings target or the total budget. Other states, including California and Vermont, use historical performance to set three-year budgets (which increase for each cycle) for DSM programs. Though Kentucky's utilities are not yet required to reach a savings or budget target, the governor's goal to offset at least 18 percent of the state's 2025 energy demand will necessitate consistent DSM investment and enable the Companies to set long-term DSM planning goals. The Companies should continue to work with the PSC to reach regulatory certainty and ensure their DSM investments will count toward any statewide or legislative goals.

4.4. Ratepayer Impact

ICF contends that the Companies' proposed DSM investment will have smaller impacts on customer bills than additional customer electricity use. This is illustrated by the Utility Cost Test (UCT) results for the Companies' portfolio, which are well above 1.00 (the overall ratio is 3.39). The UCT compares the costs of DSM programs incurred by the utility ("costs") against avoided costs of energy and demand ("benefits"). If the UCT Benefit-Cost (BC) ratio is greater than one, this means that the DSM program is less expensive than, and therefore a better deal to all ratepayers, than the generation alternative.

[4] Does not include the Industrial sector.

Some interveners, stakeholders, and utility commissioners contend that the Ratepayer Impact (RIM) test is the appropriate indicator of program cost-effectiveness when considering the impact of DSM investments on customers. If the RIM test BC ratio is less than 1.00, then it is likely that utility rates will increase in the short-term, either through a cost recovery factor or through a rate case, especially for non-participants. The RIM test's main advantage over other standard measures of DSM cost-effectiveness is that it is the only test that reflects revenue shifts. However, the RIM test also has serious disadvantages; as stated in the California Standard Practice Manual (CSPM):

> Results of the RIM test are probably less certain than those of other tests because the test sensitive to the differences between long-term projections of marginal costs and long-term projections of rates, two cost streams that are difficult to quantify with certainty.[5]

The other cost-effectiveness test ratios, including the Participant (PCT) test and the Total Resource Cost (TRC) test, show easily the benefits to program participants, and all ratepayers as a whole. The PCT test results for the portfolio are 8.24, showing that for each dollar that is spent on energy efficiency improvements, the participant will receive more than eight times as many benefits, through bill reductions and program incentives. Even when excluding the high PCT ratios from the existing programs, participants will still receive significant benefits from participating in the enhanced Residential and Commercial Conservation/Rebates programs.

The TRC test results for the portfolio are 3.01; this shows that for each dollar that is spent by both participants and utilities, they will receive about three times as many benefits through avoided energy costs. The TRC test (or a variation of it, the Societal Cost Test) is the primary cost-effectiveness test used in most jurisdictions, with the UCT commonly used as a secondary cost-effectiveness test.

Because the programs easily pass the TRC and UCT, and participants gain significant benefits from the programs, the Companies should continue to design and market the programs broadly, in order to increase participation and minimize the number of non-participants. The Companies should also monitor the RIM test and PCT BC ratios for cost-effectiveness; they should also use these test results with caution, and should not judge the value of individual programs using these tests exclusively.

Table 5: Benefit-Cost Ratios, by Cost-Effectiveness Test

Cost-Effectiveness Test	Benefit-Cost Ratio
TRC	3.01
UCT	3.39
RIM	0.82
PCT	8.24

[5] California Public Utilities Commission. California Standard Practice Manual for the Economic Analysis of Demand-Side Programs and Projects. October 2001. p. 15.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5. Program Reviews

The following enhanced existing, and new programs were reviewed and compared with comparable best practice programs:

The enhanced existing programs reviewed were:

- Residential Load Management Program
- Commercial Load Management Program
- Commercial Conservation/Commercial Incentives Program
- Residential Conservation/Home Energy Performance Program
- Residential Low Income Weatherization Program (WeCare)

New programs reviewed were:

- Smart Energy Profile
- Residential Incentives
- Refrigerator Removal Program

5.1. Expanded Programs

5.1.1. Residential Load Management

Description of the Companies' Program

The Companies' Load Management program utilizes one-way radio load control switches and thermostats to cycle off residential and small commercial customers' central air conditioner (CAC) and other systems during system peak times to reduce demand usage. The equipment is controlled (or cycled off) about 30 to 45 percent of each peak event. In exchange, participants who choose the switch option receive free installation of the equipment, and an annual bill credit. Participants who choose the thermostat option do not receive a bill credit incentive.

Under this program modification, the Companies are requesting the flexibility to increase the annual bill credit for CAC units for electric water heaters and pool pumps. To estimate cost-effectiveness, the Companies have proposed annual bill credit increases in Years 2 and 4; the actual increase will be determined in the future based on numerous factors. Participants who choose the thermostat option would continue to receive no annual incentive. The Companies are also proposing, beginning in Year 1, a one-time install bonus to new participants, increasing by $5 every two years. The Companies are proposing to increase the financial incentives to help increase participation compared to prior years, which has been less than half of the planned goals.

Components of Best Practice Programs

The following are components of best practice load control programs[6]:

- Multiple equipment options, such as one-way switches and two-way thermostats
- Multiple cycling options and durations
- Bill credits commensurate with reduction
- Targeting of high-use residential customers
- If applicable, incorporation of critical-peak pricing element or real-time pricing
- Monitoring of load impacts and use of interval data

Summary of Best Practice Programs

The We Energies Energy Partners program utilizes a one-way load control switch for residential customers' CAC systems. Participants can choose among three cycling options, with varying durations, with no limit to the number of events per year. The participant would receive either a $40 annual incentive for continuous cycling of four hours, or $50 for six hours, per day. The third option is a $12 annual incentive for 45 minutes cycling off and 15 minutes cycling on per hour, for up to eight hours per day. Participants can receive up to two switches per household; however, they would receive only one bill credit.

[6] Adapted from http://www.peaklma.com/files/public/CustomerPrinciples.pdf.

We Energies has received approval to introduce new equipment and cycling options in order to expand the Energy Partners program by doubling the number of participants to 60,000 by 2012. The utility plans to introduce smart thermostats, in order to give participants additional control and allow them to override the utility signal. In addition, the utility plans to offer two new cycling options based on a 50 percent control strategy. Incentives for the three existing options will increase to between $50 and $80 per year. The utility also plans to target high-use residential users, in order to increase the demand reductions per participant.

The Energy Partners program expansion seeks to achieve greater participation goals through the adoption of best practice techniques. The use of a smart thermostat may attract new participants who otherwise would not have participated. In the future, the smart thermostat may also allow the utility to introduce real time pricing into the program. In addition, the introduction of new cycling options may also attract new participants, and give the utility more flexibility regarding demand reductions during events.

Southern California Edison's (SCE) Summer Discount Program (SDP) utilizes a one-way load control switch for residential and small commercial customers' CAC systems. For both residential and small commercial customers, SCE offers two cycling options and two incentive options, for a total of four program options. The cycling options consist of 50 percent and 100 percent; the two incentive options are Base and Enhanced. In the Base option, SCE is allowed to conduct a maximum of 15 load control events, with each event lasting up to six hours. In the Enhanced option, SCE is allowed to conduct an unlimited number of six-hour load control events. The participant would then choose one cycling option and one incentive option. Participants are eligible for up to $200 in bill credits per year.

The SDP incentives structure seems proportionate to the commitment required by the participant and the benefit to the utility, consistent with the best practice program components listed above. The SDP's incentives are more than three times higher for the 100 percent cycling option than for the 50 percent cycling option. Also, the Enhanced option incentives are twice as much as the Base option incentives. In addition, the incentive structure is based on system size, which rewards participants who achieve greater demand reductions. The varying incentive may also encourage the participation of high-use customers, who can then receive a bill credit that is among the highest in the country. Similarly, SCE incurs lower program costs by limiting incentive payments to participants whose system sizes are smaller than average.

Table 6: Residential Load Management Program Comparison

		Best Practice Program: Less Mature Market	Best Practice Program: More Mature Market
Program Element/ Metric	**LG&E / KU**	**We Energies, Energy Partners** Program Start Year: 1992	**Southern California Edison, Summer Discount Plan** Program Start Year: 1985
Program Objective(s)	Reduce peak demand, and delay the need for new generation	Provide reliable and cost-effective demand response	Provide reliable and cost-effective demand response
Target Market(s)	Residential single family homes	Residential single family homes	Residential single family homes
Market Penetration (annual)	Currently at 19%, increasing to 25% by Year 3	Estimated at 3%	Estimated at 13%
Measures Types (continuing)	One way switches and thermostats for CAC and other appliances	One way switch for CAC	One way switch for CAC
Measures Types (new)	One way switches and thermostats for CAC and other appliances	Smart thermostat	One way switch for CAC
Incentive Structure	• $20 bill credit per customer per CAC unit, flexibility to increase to $40 in Year 4 • No bill credit for thermostat option • $8 bill credit per customer per electric water heater/pool pump, flexibility to increase to $16 in Year 4 • Proposed install bonus	Ranges from $20 to $80 per year, depending on cycling strategy, size of AC unit, and choice of number of events per season	Ranges from 5 to 18 cents per day per AC system size in tons, depending on cycling strategy, size of AC unit, and choice of number of events per season
Marketing	Traditional marketing efforts through direct mail, website, bill inserts, and other activities and events	Targeting of high-use customers, in addition to traditional marketing efforts through direct mail, website, bill inserts, and other activities and events	Traditional marketing efforts; Use of targeting to high-use customers is unknown
Delivery	LG&E / KU handles marketing, and monitoring of load impacts; Implementation contractor handles all other program activities, including equipment installation, maintenance, and repair, and auditing and verification	Through an implementation contractor, which handles all activities (marketing, equipment installation, maintenance, and repair, auditing and verification, data tracking, monitoring of load impacts), except the call center	SCE handles marketing, recruitment, and call center; Implementation contractor handles all other program activities

Discussion of the Companies' versus Others' Programs

Overall, the Companies' Load Management program compares favorably to best practice load control programs. Equipment costs correspond to what is available in the market, and program costs are comparable to best practice programs. In addition, the program contains features, such as the control of multiple customer appliances, which set it apart from other programs. A comparison of savings and cost-effectiveness is more difficult due to the disparity in retail rates, avoided costs, and system peak demand between the Companies and their peers. However, ICF concludes the Companies are expanding the program correctly by increasing incentives in order to increase participation and savings and decrease program costs.

Conclusions

ICF suggests the Companies consider the following implementation strategies in the future:

1. In addition to increasing the incentives, structure the incentives based on system size, in order to reduce payments to participants with smaller CAC systems. This could also encourage customers with larger system sizes to participate in the program.
2. Target high-use residential customers, similar to what We Energies is planning to do. This could decrease the program's marketing costs per participants, as well as identify customers for participation in other programs.
3. Introduce other best practice techniques, such as the introduction of real-time pricing. The availability of real-time pricing data to the participant would be akin to a price response program, and would allow for greater participant control during an event. The Companies would be able to increase participation by promoting multiple control options to participants.

Table 7: Residential Load Management Program Results Comparison

Program Element/ Metric	LG&E / KU		Best Practice Program: Less Mature Market	Best Practice Program: More Mature Market
	Year 1	Year 3	We Energies, Energy Partners 2009–2011	Southern California Edison, Summer Discount Plan 2009
Annual Energy Savings MWh	5,923	12,860	N/A	N/A
Annual Demand Reduction kW	145,000	172,000	39,000	639,800
Annual Incentive Costs	$2,260,700	$4,266,834	$3,000,000	N/A
Annual Non-Incentive Costs	$3,926,175	$5,734,218	$9,748,220	N/A
Annual Budget	$6,186,874	$10,001,052	$12,748,220	$59,106,954
Participants	131,000	157,000	30,000	343,107
kWh/Participant	45	82	N/A	N/A
kW/Participant	1.1	1.1	1.3	1.9
% Budget Incentive Costs	37%	43%	24%	N/A
% Budget Non-Incentive Costs*	63%	57%	76%	N/A
% Budget EM&V	18%	16%	2%	N/A
$/1st Year kWh	$1.04	$0.78	N/A	N/A
$/1st Year kW	$43	$58	$327	$92
Cost/Participant	$47	$64	$425	$172
NTG Ratio	1.00	1.00	0.72	N/A

**Includes % EM&V costs*

Source(s): *We Energies filing, WI PSC website, Docket 05-UR-103*; *SCE filings, CA PUC website, Proceeding A0806001*

5.1.2. Commercial Load Management

Description of the Companies' Program

The Companies' Load Management program utilizes one-way radio load control switches and thermostats to cycle off residential and small commercial customers' central air conditioner (CAC) and other systems during system peak times in order to reduce demand usage. The equipment is controlled (or cycled off) about 30 to 45 percent of each peak event. In exchange, participants who choose the switch option receive free installation of the equipment, and an annual bill credit. Participants who choose the thermostat option do not receive a bill credit incentive.

Under this program modification, the Companies are requesting the flexibility to increase the annual bill credit for CAC units for electric water heaters and pool pumps. To estimate cost-effectiveness, the Companies have proposed annual bill credit increases in Years 2 and 4; the actual increase will be determined in the future based on numerous factors. Participants who choose the thermostat option would continue to receive no annual bill credit. The Companies are also proposing, beginning in Year 1, a one-time install bonus to new participants, increasing by $5 every two years. The Companies are proposing to increase the financial incentives in order to increase participation compared to prior years, which has been less than half of the planning goals.

Components of Best Practice Programs

The following are components of best practice load control programs[7]:

- Multiple equipment options, such as one-way switches and two-way thermostats
- Multiple cycling options and durations
- Bill credits commensurate with reduction
- Door-to-door recruitment of small commercial customers
- If applicable, incorporation of critical-peak pricing element or real-time pricing
- Monitoring of load impacts and use of interval data

Summary of Best Practice Programs

Both best practice comparison programs operate in the same market, California; however, the state's three investor-owned utilities (IOUs) and two largest municipal utilities have designed their direct load control programs differently. Pacific Gas & Electric (PG&E) has only been operating its current direct load control programs since 2007. PG&E's SmartAC program is targeted mostly to the residential sector (the share of small commercial customers is less than 1 percent) and is being co-marketed with SmartRate, a critical peak pricing tariff, using its recently installed smart meter technologies. Sacramento Municipal Utility District (SMUD) runs a best practice direct load control program that is open to residential customers only, while the Los Angeles Department of Water and Power (LADWP) does not run any direct load control programs.

[7] Adapted from http://www.peaklma.com/files/public/CustomerPrinciples.pdf.

San Diego Gas & Electric (SDG&E), which can be thought of as the less mature market, has only been operating its program since 2005. It has achieved a much larger share of small commercial customers due to its unique marketing approach. Southern California Edison (SCE), which can be thought of as the more mature market, has operated its program since 1985. The program has a high penetration rate in the residential sector, and a more modest penetration rate in the small commercial sector (though, with higher kW savings per participant). Although the Kentucky market has fewer system peak demand issues than California, there are some direct load control program design options that the Companies could incorporate into their programs.

SDG&E's Summer Saver program utilizes a one-way control switch for residential and small commercial customers' CAC systems. For small commercial customers, SDG&E offers two cycling options, 30 percent and 50 percent. The duration of each event is between two to four hours, with an annual maximum of 15 event days.

The Summer Saver program is SDG&E's entry into the load control market, and offers a simple design and incentive structure to small commercial customers. Since the program's initiation in 2005, it has recruited more than 5,000 small commercial participants for an estimated participation level of nearly 7 percent. SDG&E and its implementation contractor, Comverge, have undertaken traditional, as well as unique, marketing efforts, including door-to-door recruitment, and outreach to a variety of community groups. Although the number of programs that include small commercial customers is few, SDG&E has achieved a penetration rate that is higher than the direct load control programs for fellow California IOUs SCE and PG&E.

SCE's Summer Discount Program (SDP) utilizes a one-way load control switch for residential and small commercial customers' CAC systems. For small commercial customers, SCE offers three cycling options and two incentive options, for a total of six program options. The cycling options consist of 30 percent, 50 percent and 100 percent; the two incentive options are Base and Enhanced. In the Base option, SCE is allowed to conduct a maximum of 15 load control events, with each event lasting up to six hours. In the Enhanced option, SCE is allowed to conduct an unlimited number of six-hour load control events. The participant would then choose one cycling option and one incentive option. Participants are eligible for up to $200 in bill credits per year.

The SDP incentives structure seems proportionate to the commitment required by the participant and the benefit to the utility, consistent with the best practice program components listed above. The SDP's incentives are nearly three times higher for the 100 percent cycling option than for the 50 percent cycling option, which are in turn five times higher than the 30 percent cycling option. Also, the Enhanced option incentives are twice as much as the Base option incentives. The inclusion of the 30 percent cycling option, which is known as the "Maximum Comfort" option, can provide an entry for new and/or hesitant participants. In addition, the incentive structure is based on system size, which rewards participants who achieve greater demand reductions. The varying incentive may also encourage the participation of high-use customers (considering that the average reduction per participant is 11.4 kW), who can then receive a bill credit that is among the highest in the country. Similarly, SCE incurs lower program costs by limiting incentive payments to participants whose system sizes are smaller than average.

Table 8: Commercial Load Management Program Comparison

		Best Practice Program: Less Mature Market	Best Practice Program: More Mature Market
Program Element/ Metric	LG&E / KU	SDG&E, Summer Saver Program Start Year: 2005	Southern California Edison, Summer Discount Plan Program Start Year: 1985
Program Objective	Reduce peak demand, and delay the need for new generation	Provide reliable and cost-effective demand response	Provide reliable and cost-effective demand response
Target Market(s)	Small commercial customers	Small commercial customers	Small commercial customers
Market Penetration (annual)	Currently at 5%, increasing to 6% in Year 3	Estimated at 7%	Estimated at 4%
Measures Types (continuing)	One way switches and thermostats for CAC and other appliances	One way switch for CAC	One way switch for CAC
Measures Types (new)	One way switches and thermostats for CAC and other appliances	One way switch for CAC	One way switch for CAC
Incentive Structure	• $20 bill credit per customer per CAC unit, flexibility to increase to $40 in Year 4 • Additional bill credit of $1 per ton per month for CAC units larger than 5 tons • No bill credit for thermostat option • $8 bill credit per customer per electric water heater/pool pump, flexibility to increase to $16 in Year 4 • Proposed install bonus	• Ranges from $9 to $15 per AC system size in tons, depending on cycling strategy, size of AC unit • Additional $10 Weekend Bonus Credit	Ranges from 1.4 to 40 cents per day per AC system size in tons, depending on cycling strategy, size of AC unit, and choice of number of events per season
Marketing	Traditional marketing efforts through direct mail, website, bill inserts, and other activities and events	Traditional marketing efforts, as well as door-to-door marketing and other direct outreach methods	Traditional marketing efforts; Use of targeting to high-use customers is unknown
Delivery	LG&E / KU handles marketing, and monitoring of load impacts; Implementation contractor handles all other program activities, including equipment installation, maintenance, and repair, and auditing and verification	Implementation contractor (Comverge) handles marketing and recruitment, and all other program activities	SCE handles marketing, recruitment, and call center; Implementation contractor handles all other program activities

Discussion of the Companies' versus Others' Programs

Overall, the Companies' Load Management program compares favorably to best practice load control programs. Equipment costs correspond to what is available in the market, and program costs are comparable to best practice. The most important feature is that the program is offered to commercial customers; most other load control programs are open only to residential customers. In addition, the program contains other features, such as the control of multiple customer appliances, which set it apart from other programs. A comparison of savings and cost-effectiveness is more difficult due to the disparity in retail rates, avoided costs, and system peak demand between the Companies and their peers. However, ICF concludes the Companies are expanding the program correctly by increasing incentives, in order to increase participation and savings, and decrease program costs.

Conclusions

ICF suggests the Companies consider the following implementation strategies in the future:

1. In addition to offering incentives based on system size, and increasing the annual incentives, the Companies should continue to monitor the incentive structures of comparable programs, and the relationship between incentives and new participants.
2. Recruit small commercial customers through unique marketing efforts, similar to what SDG&E does. In addition to increasing participation, this could decrease the program's marketing costs per participants, as well as identify customers for participation in other programs.
3. Introduce other best practice techniques, such as the introduction of real-time pricing. The availability of real-time pricing data to the participant would be akin to a price response program, and would allow for greater participant control during an event. The Companies would be able to increase participation by promoting multiple control options to participants.

Table 9: Commercial Load Management Program Results Comparison

Program Element/ Metric	LG&E / KU		Best Practice Program: Less Mature Market	Best Practice Program: More Mature Market
	Year 1	Year 3	We Energies, Energy Partners 2008	Southern California Edison, Summer Discount Plan 2009
Annual Energy Savings MWh	244	564	N/A	N/A
Annual Demand Reduction kW	5,800	7,500	12,132	127,100
Annual Incentive Costs	$81,724	$152,594	N/A	N/A
Annual Non-Incentive Costs	$240,096	$325,983	N/A	N/A
Annual Budget	$321,821	$478,578	$1,968,400	$14,776,739
Participants	5,100	6,300	5,403	11,167
kWh/Participant	48	90	N/A	N/A
kW/Participant	1.1	1.2	2.2	11.4
% Budget incentive costs	25%	32%	N/A	N/A
% Budget non-incentive costs*	75%	68%	N/A	N/A
% Budget EM&V	17%	15%	N/A	N/A
$/1st year kWh	$1.32	$0.85	N/A	N/A
$/1st year kW	$55	$64	$162	$116
Cost/Participant	$63	$76	$364	$1,323
NTG Ratio	1.00	1.00	N/A	N/A
**Includes % EM&V costs*		*Source(s):*	*SDG&E filing, CA PUC website, Proceeding A0806002; Evaluations available at CALMAC.org*	*SCE filing, CA PUC website, Proceeding A0806001; Evaluations available at CALMAC.org*

5.1.3. Commercial Conservation / Commercial Incentives

Description of the Companies' program

The Companies' Commercial Conservation (Energy Audits)/Commercial Incentives program expands upon the current commercial audit program by providing additional incentives to commercial customers to make energy efficiency upgrades. In the current program, a customer receives a visit from a certified auditor, who then conducts a facility audit – either Level 1 for small commercial customers, or Level 2 or 3 for custom projects. The auditor then provides a report with recommendations for energy savings upgrades and the costs to install them. Customers can then choose to have the auditor install the upgrades, or can have another contractor implement the recommendations. Customers would receive the audit at no cost, but would have to pay for the upgrades themselves.

In the program expansion, the Companies seek to add refrigeration measures to the list of eligible projects, as well as offer incentives for custom measures. The Companies are also increasing the total amount of incentives available through the program by offering a set $100 per kW reduced incentive.

Components of Best Practice programs

The following are components of best practice load control programs:

- Inclusion of audits/assessments to educate customers and encourage participation
- Program design that includes both prescriptive and custom incentives for all measure types
- Applicability to and participation of all customer sub-sectors and sizes
- Use of trained contractors and trade allies, to market and implement the program
- Incorporation of EPA's Portfolio Manager benchmarking tool, in order to identify potential projects and monitor post-installation progress

Summary of Best Practice programs

The two programs discussed below can be considered best practice; however, the primary rationale to use them as comparison points is to detail the two models that are used most often for commercial and industrial (C&I) retrofit programs. Entergy Arkansas Inc. (EAI) has designed their C&I portfolio based on customer size, and developed custom incentives to encourage participation. On the other hand, NV Energy (comprised of Nevada Power and Sierra Pacific Power) uses a portfolio approach that segments each program based on measure type. The measure types are typically denoted as Prescriptive, Custom, and Retro-commissioning. A Prescriptive program generally includes a set incentive for a specific piece of equipment, such as $10 for a T8 lighting fixture. A Custom program typically sets an incentive according to kWh or kW saved in order to include equipment that is not covered by the Prescriptive program. Retro-commissioning programs include measures that are designed to improve building performance, and can include both prescriptive and custom incentives.

The Entergy Arkansas, Inc. (EAI) Quick Start portfolio was developed as a result of an Arkansas Public Service Commission order in 2007 for the state's investor-owned utilities to offer DSM programs to their customers. The Quick Start portfolio includes three energy efficiency programs that are targeted to commercial and industrial (C&I) customers, based on customer size and familiarity with energy efficiency upgrades.[8] The Small C&I program is available to customers with peak electricity demand of less than 100 kW. Customers can choose from a list of participating contractors, and receive a free walk-through assessment. The incentive amount is $115 per kW reduction for lighting, HVAC and chiller, and motors upgrades that are installed within 45 days. The Large C&I Energy Solutions is available to customers with peak electricity demand of 100 kW or greater. Customers are given more flexibility with regards to their energy assessment (i.e. they can choose their own contractor or have the program provide one). Similar to the Small C&I program, the incentive amount of $159 per kW reduction applies only to lighting, HVAC and chiller, and motors upgrades.

The Large C&I Standard Offer program is also available to customers with peak electricity demand of 100 kW or greater. This customer segment is assumed to be familiar with implementing energy efficiency upgrades and is given flexibility with regards to the participation process (i.e. they are not required to conduct an assessment). The process for this program is similar to other standard offer programs, where participant facilities are subject to pre- and post-installation inspections, and receive incentives based on the amount of peak demand reduced; for EAI's program, the incentive is $230 per kW reduction. For all three programs, incentives are paid by the utility following completion or verification of the project.

The advantage of this *Customer* approach is the simple design; customers are eligible for one program, and can receive incentives for the installation of upgrades for all end-uses and building types. If a customer has a peak demand of 50 kW, they know they are eligible only for the Small C&I program. They would then speak with an account representative, choose a contractor, and begin participation in the program. One disadvantage of the Customer approach is the lack of flexibility regarding program design. If, for example, because of the economic downturn, small commercial customers are not participating due to a lack of financing, the unused portion of the program budget is not easily transferable to the large customer programs. Another disadvantage is the preference given to measures that produce higher peak demand savings (HVAC, motors, etc.) versus those that produce lower peak demand savings (lighting, etc.). This would result in lost opportunities for certain energy efficiency retrofits that save energy but not demand.

NV Energy's Sure Bet Commercial Incentives program provides a variety of prescriptive and custom incentives, and technical assistance for non-residential customers across the utility's geographically-disparate Northern and Southern territories.[9] Customers submit one single pre-application form (required for large Prescriptive and all Custom projects), install the upgrades (using their preferred or an NV Energy-trained contractor), and receive incentive payments within 4-6 weeks of submitting post-installation project documentation. Through 2007, the program was utilizing 39 trained contractors.

The Prescriptive component of the program includes incentives for lighting, cooling (including HVAC units, variable speed drives for fans and pumps, and window film), miscellaneous (motor controllers

[8] More information is available at http://www.entergy-arkansas.com/energy_efficiency/business.aspx.

[9] More information is available at http://www.nvenergy.com/saveenergy/business/incentives/surebet/documents/applications/2009SureBetPP.pdf.

and pool/spa pumps), and commercial kitchen/refrigeration measures. The Custom component of the program provides incentives (for measures not covered by the Prescriptive component) of 10 cents per kWh for the first year's on-peak savings, and 5 cents per kWh for the first year's off-peak savings. The program also contains services for building optimization (similar to Retro-commissioning, as discussed above) and small commercial direct install incentives. Incentive payments to participants have a soft cap of $100,000; projects above this amount receive between 10% and 50% of the total incentive. In general, the incentives were designed to achieve a two year post-incentive payback. Program savings were nearly equal between Prescriptive and Custom projects, which show broad inclusion and participation among measure and customer types.

The advantage of this *Measure* approach is the flexibility with regards to program design. Customers are able to participate in multiple program components, while still receiving incentives for a variety of upgrades. A customer that needs both lighting upgrades and a chiller replacement would participate in both the Prescriptive and Custom components (while, at least in the Sure Bet case, submitting only one application). In addition, under this approach, programs would be unaffected by economic or other barriers that would restrict a customer segment from program participation. As explained above, in the "Customer" approach, if the Small C&I program is less popular than the Large C&I program, it would not be easy to transfer program funds from the Small C&I budget to the Large C&I budget. However, in the "Measure" approach, if lighting upgrades are less popular than HVAC upgrades within the Prescriptive component, additional funds could be used to market and install more HVAC upgrades. One disadvantage of the "Measure" approach is the additional infrastructure and costs needed to engage trade allies (manufacturers, retailers, etc.) for a Prescriptive component. In order to offer incentives for lighting and other upgrades, a utility would need to work with these trade allies to make sure their products are available in the market. However, over time, these costs should decline as the program expands.

Duke Energy Kentucky is following the *Measure* approach, and includes prescriptive incentives for lighting, motors, HVAC, refrigeration, and other measures as part of its SmartSaver program. The utility also offers an on-line benchmarking analysis. However, it does not offer any custom incentives, and incentive payments are typically capped at 50% of total project costs up to a maximum of $50,000 per customer facility. In the past few years, the number of installations has been heavily weighted towards lighting measures.

Table 10: Commercial Conservation / Commercial Incentives Program Comparison

		Best Practice Program: Less Mature Market	Best Practice Program: More Mature Market
Program Element/ Metric	LG&E / KU	Entergy Arkansas C&I Programs Program Start Year: 2007	Nevada Energy Sure Bet Program Start Year: 1985
Program Objective(s)	Provide audits and rebates to qualifying commercial customers for the retrofit of less efficient equipment by adding refrigeration measures and a set per kW incentive to its existing program	Provide a suite of energy efficiency options to C&I customers, including audits, rebates, and custom incentives, including per kW	Provide prescriptive and custom energy efficiency incentives to C&I customers
Target Market(s)	Large commercial customers	All non-residential customers	All non-residential customers
Market Penetration (annual)	Estimated at 1%	Estimated at < 1%	Estimated at < 1%
Measures Types (continuing)	Facility audit, with recommendations for lighting, HVAC, and other measures	Facility energy assessments, with rebates for lighting, HVAC and chillers, and motors	Lighting, HVAC, refrigeration, and other prescriptive, as well as custom measures
Measures Types (new)	Facility audit, with incentives for lighting, HVAC, refrigeration, and custom measures	Facility energy assessments, with rebates for lighting, HVAC and chillers, and motors	Lighting, HVAC, refrigeration, and other prescriptive, as well as custom measures
Incentive Structure	$100 per kW reduced, up to an annual maximum of $50,000, or $100,000 over two years, per facility	Ranges from $115 to $230 per kW reduced	• Prescriptive – varies by measure • Custom – 5 to 10 cents per kWh reduced • Soft cap of $100,000 per participant
Marketing	Through the Business Service Center, the audit contractor, and trade allies, as well as through direct mail, newsletters, and targeting of large customers	• Small customers – through direct mail • Large customers – through Account Managers	Through the website and account executives, as well as direct outreach to CoC organizations, BOMA, etc.
Delivery	Current audit contractors will conduct audits, prepare reports with energy savings recommendations, install upgrades, or refer customers to Dealer Referral Network; Upgrades will then be installed by participating contractors	Depending on the program, both participating and non-participating contractors will conduct assessments and install upgrades	Implementation contractor (KEMA) handles all program activities, including applications, inspections and incentive processing

Discussion of the Companies' versus Others' Programs

The Companies' program is unique among the state's largest utilities, and it has historically exceeded their goals for number of audits performed, and achieved their goals for energy savings. The proposed expansion will address some of the issues detailed in the most recent evaluation report. For example, the $100 per kW incentive will likely increase the participation of large customers, whose peak demand reduction potential is greater than small customers. In addition, the inclusion of refrigeration measures will match the design of several best practice programs. Overall, the program's expansion to include additional prescriptive and custom measures makes it more similar to best practice programs in California, Nevada, Wisconsin, and other states.

Conclusions

ICF suggests the following in order for the program to reach its goals and continue program cost-effectiveness:

1. Per the most recent evaluation report, the Companies should ensure that the audits are comprehensive and are continuing to motivate customers to participate in the program. Many best practice programs also include audits and other technical assistance as a way to educate customers and market programs.
2. Monitor participation to ensure engagement with both small and large commercial customers. The incentive per kW will encourage participation from a broad mix of customers, and lead to cost-effective savings and achievement of program goals.
3. Continue to add prescriptive measures that are cost-effective, innovative, and available in the market. The Companies should also continue to work with trade allies to ensure their continued participation with and promotion of the program.
4. In the future, consider incorporating the EPA's Portfolio Manager benchmarking tool to provide customers with ongoing and post-project information regarding facility usage and savings. The tool is becoming an innovative program option in multiple utility portfolios, including California, Massachusetts, and Washington.[10] In addition, the Companies can use LG&E's experience with the *Louisville Kilowatt Crackdown* to introduce this to other parts of the territory. Since this initiative requires investment in equipment and personnel, the Companies should implement it once the expanded program has been running for a few years. This will allow the tool to be applied to a larger participant base, and ensure greater persistence of energy savings.

[10] More information is available at http://www.cee1.org/cee/mtg/06-09mtg/files/BB2Narel.pdf.

Table 11: Commercial Conservation / Commercial Incentives Program Results Comparison

			Best Practice Program: Less Mature Market	Best Practice Program: More Mature Market
Program Element/ Metric	LG&E / KU		Entergy Arkansas C&I Programs 2008	Nevada Energy Sure Bet 2007
	Year 1	Year 3		
Annual Energy Savings MWh	54,988	54,988	31,834	84,532
Annual Demand Reduction kW	20,689	20,689	5,610	14,140
Annual Incentive Costs	$2,000,000	$2,000,000	$1,666,835	$3,579,927
Annual Non-Incentive Costs	$1,255,400	$1,316,121	$518,441	$2,796,550
Annual Budget	$3,255,400	$3,316,121	$2,185,276	$6,376,477
Participants	880	880	52	527
kWh/Participant	62,486	62,486	612,192	160,402
kW/Participant	23.5	23.5	107.9	26.8
% Budget incentive costs	61%	60%	76%	56%
% Budget non-incentive costs*	39%	40%	24%	44%
% Budget EM&V	1%	0%	N/A	N/A
$/1st year kWh	$0.06	$0.06	$0.07	$0.08
$/1st year kW	$157	$160	$390	$451
Cost/Participant	$3,699	$3,768	$42,025	$12,100
NTG Ratio	0.80 to 0.90	0.80 to 0.90	1.00	0.63

**Includes % EM&V costs*

Source(s): *EAI filing, Arkansas PSC website, Docket 07-085-TF*; *NV Energy filing, Nevada PUC, Docket 08-8011, 08-8012*

5.1.4. Residential Conservation / Home Energy Performance

Description of the Companies' program

The Companies' Residential Conservation/Home Energy Performance program expands upon the current audit program by providing additional incentives to single family customers to make energy efficiency retrofits for their homes. In the current program, a customer receives a visit from a certified auditor, who records appliance data and energy characteristics of the home. A blower door test was included in the audit in 2009. The auditor then prepares a report that includes historical energy usage, and provides a list of recommended energy upgrades and their related savings and costs. The customer would pay the $25 audit cost, and the full cost of any measure installations.

In the program expansion, customers choose from among three tiered participation options, corresponding to 10 percent, 20 percent, and 30 percent savings relative to total energy usage. Certified auditors conduct the Tier 1 audit (equivalent to the current level of service), and provide the participant with a list of Tier 2 and Tier 3 upgrades, and referrals to certified contractors. Participants can then choose to implement these upgrades at their own cost within 12 months of the initial audit, and submit post-installation rebate applications to the Companies. The rebate amounts are a maximum of $500 for Tier 2, and $1000 for Tier 3.

The current online audit would continue as part of the program. In addition to receiving the above report, online audit participants also receive a free four-pack of high efficiency light bulbs and are encouraged to participate in other components of the program to obtain additional savings.

Components of Best Practice programs

The following are components of best practice residential retrofit programs:

- Tiered efficiency options, ranging from walk-though audits to comprehensive audits (diagnostic audits that include blower-door and duct blaster tests), as well as a range of home efficiency project options
- Incentive options (with cost cap) commensurate with efficiency options, including audit with direct install to rebates
- Focus on whole-home approach
- Use of certified (e.g. RESNET or BPI) contractors, to market and implement the program
- Coordinate with statewide agencies, if applicable

Summary of Best Practice programs

The Baltimore Gas and Electric (BG&E) Smart Energy Savers portfolio includes an audit component, a Quick Home Energy Check-up, and a Home Performance with ENERGY STAR® (HPwES) component, for residential single-family customers. Customers who choose the quick audit receive a visit from a certified auditor, and can have the $40 audit fee waived by installing at least three out of five measures from a list that includes CFLs and hot water measures. The auditor also checks the insulation and air sealing levels, and the HVAC systems, and provides a list of findings and recommendations that can further reduce the participant's energy usage and costs.

Participants can also choose to receive a more comprehensive and diagnostic audit through HPwES. A BPI-certified contractor would conduct an HPwES Home Energy Audit, including blower door and duct blaster tests, and present a list of efficiency upgrade opportunities to the participant. The upgrades include air and duct sealing, insulation, and HVAC and hot water systems. The contractor would then install the agreed-upon upgrades, and receive full payment for services from the participant. After about six to eight weeks, the participant would receive partial reimbursement via the rebate check. Rebates are limited to $1300 per participant, but can exceed this amount if a new HVAC unit is installed.

The HPwES program began in Maryland in 2007 as a pilot program run by the Maryland Energy Administration (MEA). MEA's program was a success, and received an EPA Excellence in ENERGY STAR Promotion Award in 2009. Using the successful pilot as a model, BG&E's HPwES program design was submitted for and received regulatory approval in the fourth quarter of 2008, and was approved by the EPA as a Program Sponsor in the second quarter of 2009. Sponsors are able to market their programs using the nationally-known ENERGY STAR brand name, and take advantage of other support, including marketing toolkits and sales and contractor training courses. The program began operating in the third quarter of 2009 as the state's first utility-run HPwES program, and includes 25 qualified contractors.

With the use of multiple installation contractors, BG&E's program follows the HPwES market transformation model. This approach typically can take up to one year or more to ramp-up, in order to build program infrastructure, and can be more expensive in the short term than the resource acquisition model. However, in the long term, awareness of the program and its contractor network could result in lower costs and greater energy savings. BG&E's tiered approach, beginning with the Quick Home Energy Check-up, is designed to mitigate the long lead time, and provide customers with simply-designed retrofit options.

Massachusetts' MassSAVE portfolio is a public/private partnership that provides energy efficiency options to customers through their local utility. MassSAVE has contained an HPwES component since 2002, is also an HPwES Program Sponsor, and has been recognized as Best Practice by The American Council for an Energy-Efficient Economy (ACEEE). National Grid's HPwES program contains a no-cost home energy assessment (HEA) and offers rebates for efficiency upgrades. The HEA is conducted by the implementation contractor's (Conservation Services Group) certified auditors, and includes blower door and duct leakage tests. The contractor then installs the agreed-upon upgrades, and coordinates with sub-contractors for additional upgrades as necessary. Typical upgrades include air sealing, insulation, and the installation of efficient HVAC systems. Rebates are available for up to 75 percent of installation costs, with a $2000 maximum. Participants are also eligible for zero-interest financing of up to $15,000 over seven years, through MassSave's HEAT Loan program.

National Grid's retrofit program has been conducting HEAs since 1980, but the program's original focus was on education. Since the advent of the HPwES model in 2001, the program has evolved into a whole-home approach. National Grid's HPwES program follows the resource acquisition model, where typically one contractor implements the program, and installs the efficiency upgrades. This results in lower marketing and training costs, and allows the utility and the contractor to bring the program to the market more quickly. In addition, the resource acquisition model can result in more participants and installations, greater energy savings per home, and market penetration rates compared to the market transformation model.

Table 12: Residential Conservation / Home Energy Performance Program Comparison

		Best Practice Program: Less Mature Market	Best Practice Program: More Mature Market
Program Element/ Metric	LG&E / KU	BGE, Retrofit Program Start Year: 2009	National Grid, MassSAVE Program Start Year: 2000
Program Objective(s)	Utilize a whole-house approach to provide single family homes with additional options for energy saving retrofits and continue the participation from current audit programs	Two-tiered approach to motivate residential single family homes to adopt comprehensive, whole-home energy retrofits	Provide a singular source for home retrofit measures through audits, incentives, and education
Target Market(s)	Residential single family homes	Residential single family homes	Residential single family homes
Market Penetration (annual)	• 0.2% in Year 1, increasing to 0.3% in Year 3 • On-line audit penetration of 0.4% (3,000 audits) in Year 1, increasing to 0.8% (6,000 audits) in Year 3	Estimated at 0.04%; Increasing to 0.2% in 2010	Estimated at 0.6%
Measures Types (continuing)	• On-line audit - 4-pack high efficiency light bulbs; On-site audit consisting of visual inspection, appliance data recording, and other home measurements • Also includes a blower door test	• Tier 1 - Quick Home Energy Check-up • Tier 2 - Home Performance with ENERGY STAR	• Tier 1 - Information only • Tier 2 - Audit, and installation of insulation, air sealing measures, programmable thermostats
Measures Types (new)	• On-line audit - 4-pack high efficiency light bulbs; Tier 1 - Similar to on-site audit, and includes CFLs, hot water and minor air sealing direct install measures • Tiers 2 and 3 - Other air sealing, insulation, and HVAC maintenance measures	• Tier 1 - Quick Home Energy Check-up • Tier 2 - Home Performance with ENERGY STAR	• Tier 1 - Information only • Tier 2 - Audit, and installation of insulation, air sealing measures, programmable thermostats
Incentive Structure	• Tier 1 - Direct install measures (corresponds to 10% savings) • Tier 2 - Post installation $500 rebate (20% savings); Tier 3 - Post-installation $1000 rebate, (30% savings)	• Tier 1 - Audit with CFL and hot water kit • Tier 2 - Prescriptive incentives with 15% measure cost cap	75% of measure costs up to $2000

		Best Practice Program: Less Mature Market	Best Practice Program: More Mature Market
Program Element/ Metric	LG&E / KU	BGE, Retrofit Program Start Year: 2009	National Grid, MassSAVE Program Start Year: 2000
Marketing	• Traditional marketing efforts through direct mail, website, bill inserts, and other activities and events • Prior program has had most success with bill inserts/direct mail	Traditional marketing efforts, as well as through contractor outreach	Through MassSave brand awareness campaign, which includes media buys and direct mail, and through implementation contractor
Delivery	Through Dealer Referral Network, consisting of certified contractors	Through implementation contractor, and technical sub-contractors, many of whom are HERS raters and/or BPI Building Analysts	Through primary implementation contractor, and sub-contractors

Discussion of the Companies' versus Others' Programs

Overall, the Companies' Residential Conservation / Home Energy Performance program compares favorably to best practice home retrofit programs. The program's expansion to include multiple audit and rebate options and focus on a whole-home approach makes it similar to best practice programs in Maryland, Massachusetts, New York, Wisconsin, and other states. In addition, the Companies can take advantage of their existing relationship with the BPI network to expand program infrastructure. However, since the program is not run statewide, as is the case in other states, the Companies are at a disadvantage in that they are not able to share marketing, contractor training, and other costs.

Conclusions

ICF suggests the following in order to overcome this and continue program cost-effectiveness:

1. Investigate the option of becoming an HPwES Program Sponsor. Based on conversations with the Companies, ICF believes they have already begun researching the advantages and disadvantages of sponsorship.
2. While considering HPwES resource acquisition model and the market transformation model, also consider a hybrid approach, where the resource acquisition model eventually evolves into the market transformation model.
3. If using the market transformation model, build the program infrastructure and contractor network such that, over time, minimal involvement by the Companies will be necessary. The availability of more contractors will increase competition, decrease customers' costs, and decrease the Companies' program costs.
4. In lieu of statewide resources, take advantage of EPA national program support and expertise from utilities in other states.

Table 13: Residential Conservation/Home Energy Performance Program Results Comparison

Program Element/ Metric	LG&E / KU		Best Practice Program: Less Mature Market	Best Practice Program: More Mature Market
	Year 1	Year 3	BGE, Retrofit 2009	National Grid, MassSAVE 2007
Annual Energy Savings MWh	2,948	5,165	642	4,839
Annual Demand Reduction kW	767	1,313	190	1,169
Annual Incentive Costs	$180,000	$300,000	N/A	N/A
Annual Non-Incentive Costs	$1,280,826	$1,907,217	N/A	N/A
Annual Budget	$1,460,826	$2,207,217	$1,361,268	$5,378,468
Participants	7,200	14,000	1,716	6,000
kWh/Participant	409	369	374	807
kW/Participant	0.1	0.1	0.1	0.2
% Budget incentive costs	12%	14%	N/A	N/A
% Budget non-incentive costs*	88%	86%	N/A	N/A
% Budget EM&V	0%	0%	0%	3%
$/1st year kWh	$0.50	$0.43	$2.12	$1.11
$/1st year kW	$1,905	$1,681	$7,165	$4,601
Cost/Participant	$203	$158	$793	$896
NTG Ratio	1.00	1.00	0.90	N/A

**Includes % EM&V costs*

Source(s): *BGE filing, MD PSC, Case 9154*; *National Grid filing, MA DOER website; ACEEE Compendium of Champions report, 2008*

5.1.5. Residential Low Income Weatherization (WeCare)

Description of the Companies' program

The Residential Low Income Weatherization Program (WeCare) is designed to reduce energy consumption for LG&E and KU's low income customers. The program provides energy audits, energy education, performs blower door tests, and installs weatherization and other energy conservation measures on qualified houses. The modified WeCare program presented in this filing is the third generation of the Companies' Low Income weatherization initiative. The original Energy Partners Program (EPP) pilot (1994) was modified to increase cost-effective savings based on EM&V findings; the program evolved into the WeCare Low Income Weatherization Program in 2001. The third generation program (also called WeCare) builds upon the Companies' experience with this hard-to-reach sector by adding HVAC unit replacement and envelope sealing measures to their list of offerings. The Companies are proposing this expansion in WeCare's offerings because the program has found that for a portion of eligible customers, there is a significant need for, and significant savings potential associated with installing a new HVAC unit and/or envelope sealing. In addition, the Companies are committed to the expansion of the program by more than tripling the budget and number of participants between Year 1 and Year 7 of program operation.

Components of Best Practice programs

Low income weatherization programs have been implemented by both public and private organizations for decades. Therefore, there is a wealth of literature on best practices.

Best practices in the delivery of low income weatherization program include:

- Leveraging efforts of other programs, e.g. local LIHEAP and WAP programs;
- Making the program stable and consistent;
- Setting clear expectations with auditors/contractors;
- Auditing a statistically significant sample of weatherized homes;
- Developing a network of local auditors and installers who are committed to high-quality standards;
- Controlling for free-ridership through periodic market studies, and consumer surveys; and,
- Offering a mix of services and measures attractive to homeowners.[11]

Summary of Best Practice programs

It is standard practice in the U.S. that DSM portfolios include at least one program that provides energy efficiency services to low income customers. Even though these programs are typically less cost-effective (have lower TRC and UCT test results) than other programs, most utility commissions make exceptions to their cost-effectiveness rules under certain circumstances. In the case of low income programs, commissions also consider fairness criteria in order to ensure that DSM services are made available to each market segment. Further, most commissions also

[11] Many of these best practices were drawn from Best Practice Benchmarking for Energy Efficiency Programs: Residential Single-Family Comprehensive Weatherization Best Practices Report. Available at, http://www.eebestpractices.com/pdf/BPSummaryTable_R4.PDF.

require the DSM portfolio as a whole to be cost-effective so that more expensive low-income, education and pilot initiatives are offset by other programs that are less expensive such that the end result is a portfolio of DSM programs that passes the TRC and/or the UCT test(s).

ICF chose three programs against which to compare WeCare. These programs are operated in states with different levels of market maturity; California (most mature), Colorado (somewhat mature), and Texas (less mature).

The PG&E, Xcel (Public Service), and AEP-Texas North (TNC) low-income weatherization programs have many common elements, including:

- Comprehensive audit and weatherization services;
- Customer education;
- Coordination with local LIHEAP of WAP programs; and,
- Reliance on weatherization contractors to deliver program services.

Based on our understanding of these utilities' low income initiatives, each program conducts all of the seven best practices listed above.[12]

The main differences between these programs are the extent of their coordination with other low income programs and the range and extent of program marketing. Xcel's program, for example, is heavily leveraged by state and federal low income programs; in fact, the program was designed to complement the services of, and acquire additional savings beyond those achieved by public programs. PG&E promotes their program heavily in communities throughout its large service territory. Program representatives travel to community forums and conduct presentations on the utility's low income energy efficiency offerings and the "CARE" tariff (mandated by the CPUC), which is available to qualified low income customers. TNC's program is a requirement set forth by the State Senate to provide weatherization services and efficiency education to low income customers. Participating agencies verify customer eligibility, audit homes, and determine which measures to install based on savings-to-investment ratios (SIRs). home, and market penetration rates compared to the market transformation model.

[12] One exception noted by ICF is that it is not clear how often and at what level of detail the Xcel and TNC programs are evaluated.

Table 14: Residential Low Income Weatherization (WeCare) Program Comparison

		Best Practice Program: Market Maturity High	Best Practice Program: Market Maturity Mid	Best Practice Program: Market Maturity Mid-to-Low
Program Element/ Metric	LG&E / KU	PG&E, Energy Partners Program Program Start Year: 1983	Xcel Energy Colorado, Single Family Low-Income Weatherization Program Program Start Year: NA	AEP North Texas (TNC), Targeted Low-Income Program Start Year: NA
Program objective(s)	(1) Reduce customer energy consumption and expenditures, and arrearages (2) Provide program participation opportunities for hard-to-reach markets	Increase low income customer comfort while reducing their energy consumption, costs and economic hardship.	Provide no-cost energy efficiency services to income-eligible customers, seniors and disabled. Increase and expand education among low income customers on the importance of energy efficiency and the value of taking action to improve efficiency in their homes.	Cost-effectively reduce the energy consumption and energy costs of TNC's low income residential customers.This program is required per TX State Senate Bill 712 "Weatherization Program"
Target Market(s)	Households at or below LIHEAP Federal Poverty level. Both homeowner and renters are eligible. There are 3 Tiers of participants: A, B, and C. Customers in Tier A have the lowest energy use and those in Tier C have the highest. The higher use clients (Tiers B and C) are initially identified by their annual gas or electric consumption. These clients usually receive multiple visits from the Weatherization Audit Contractor.	Low income households as defined by the CA Public Utilities Commission (CPUC). 2006 threshold was household income less than or equal to 200% of poverty level.	Households with median income below 80% of area median income. Participants must first apply for LIHEAP funding. Customers meeting DOE WAP funding guidelines are also automatically considered eligible	To be eligible, customers must meet current DOE Weatherization Assistance Program (WAP) income eligibility guidelines (200% of poverty level in 2009), receive electric power from TNC, and have electric air conditioning.
Market penetration (annual)	1,200 homes/year, increasing to 4,200 homes/year in Year 7	66,000 homes (approximately 2% of qualified homes)	1,958 single family homes	39 homes

		Best Practice Program: Market Maturity High	Best Practice Program: Market Maturity Mid	Best Practice Program: Market Maturity Mid-to-Low
Program Element/ Metric	LG&E / KU	PG&E, Energy Partners Program Program Start Year: 1983	Xcel Energy Colorado, Single Family Low-Income Weatherization Program Program Start Year: NA	AEP North Texas (TNC), Targeted Low-Income Program Start Year: NA
Measure types (continuing)	Weatherization, appliances, HVAC repair, hot water, CFLs	Weatherization, appliances, HVAC repair, hot water, CFLs	Services can include an energy audit, attic, wall and crawlspace insulation, air leakage reduction, appliance safety inspections, forced air efficiency assessment, high efficiency lighting surveys and other safety inspections.	Weatherization, other cost-effective measures.
Measures types (new)	HVAC (replacement) and envelope repair	NA	NA	NA
Incentive structure	All program services and measures are free to participants. Measure caps vary by customer Tier.	All program services and measures are free to participants.	All program services and measures are free to participants.	Measures are installed based on measure savings-to-investment (SIR) ratio. Installed measures are free to participants.
Marketing	The Weatherization Audit Contractors (WACs) are the primary marketing arm of the program, conducting direct marketing through mail and telephone solicitation. The primary source of participants is a targeted list prepared by LG&E / KU. Secondary sources of clients include, LIHEAP clients, referrals from local WAP programs, and referrals by local community-based organizations.	The program is promoted primarily through auditors/contractors, but PG&E also conducts extensive community outreach, in addition to traditional marketing collateral telemarketing, and promotion through the program Web site. Participation in community events has been extensive. Presentations promote both the weatherization services as well as the state's special billing rate for low income populations.	The program is promoted through local low income service providers. The program Web site directs interested customers to appropriate agencies. Xcel customers are informed of the program when they sign up for LIHEAP funding.	The program conducts targeted outreach to weatherization service providers in TNC's territory.

		Best Practice Program: Market Maturity High	Best Practice Program: Market Maturity Mid	Best Practice Program: Market Maturity Mid-to-Low
Program Element/ Metric	LG&E / KU	PG&E, Energy Partners Program Program Start Year: 1983	Xcel Energy Colorado, Single Family Low-Income Weatherization Program Program Start Year: NA	AEP North Texas (TNC), Targeted Low-Income Program Start Year: NA
Delivery	The program is delivered primarily by the WACs. All participants (Tiers) receive an initial visit during which the WAC performs a walk through audit and installs low-cost measures. WACs recommend additional measures and the program pays for any recommended projects implemented, up to the cap for the customer's Tier. For all projects completed, the auditor conducts a post-installation inspection and education session.	All participants receive a comprehensive energy analysis of their home. Customers are asked to commit to at least 3 energy conservation practices. CFLs are directly installed. Participants are eligible installation qualified measures recommended by the auditor.	During the weatherization process auditors provide participants with education materials historical energy use data, and a billing analysis.	Weatherization service providers verify customer eligibility, conduct an assessment of eligible customer homes, and install cost-effective measures.
Leveraging of Federal funds for low income weatherization	WeCare coordinates with the local Weatherization Assistance Program (WAP). Coordination efforts are focused on Tier A WeCare customers who are eligible for fewer WeCare incentives than Tier B and C customers.	Program coordinates with local LIHEAP and WAP programs, as well as other low income programs run by state agencies.	Xcel's program complements federal weatherization (WAP) grants to produce incremental, cost-effective energy savings, and develops annual contracts wit the eight weatherization agencies within their territory.	The program coordinates with the local WAP program.

Discussion of the Companies' versus Others' Programs

ICF finds that the Companies' WeCare program is consistent with best practice in low income weatherization program design. Amongst others, best practices exhibited by WeCare include (1) Leveraging federal funds for Weatherization; and, (2) Offering a mix of services and measures attractive to homeowners. This is very challenging market in which to achieve cost-effective savings, but the Companies have learned from their experience and adapted the program to changing market conditions, making WeCare more cost-effective than most comparable programs around the country.

The differences in program delivery between WeCare and the other programs primarily reflects state rules about low-income programs, or are implementation strategies found to be effective in those particular territories. For example, WeCare's tiered approach to low-income program services helps the Companies maximize program cost-effectiveness.

The Companies' tiered approach to program delivery helps ensure that low income program dollars are spent cost-effectively by spending more on homes that are the most energy-intensive (Tier C, customers using more than 16,000 kWh). This does not preclude other low income customers from receiving program services. Tier A (customers who use up to 11,499 kWh annually) and Tier B (customers who use between 11,500 and 16,000 kWh annually) customers are also eligible to receive a comprehensive audit, education and free measures (spending caps are lower for Tier A and B customers).

WeCare also compares favorably against other programs in terms of spending levels. Most low income program cost at least $1 per first year kWh, but the Companies have managed to keep overhead low, maintain high quality services, and deliver results. Although Xcel's program is less expensive, this largely reflects the explicit role of Xcel's low income programs within the state of Colorado – its program is heavily leveraged by federal and state funds.

Approximately 9 percent of the Companies' proposed portfolio budget is dedicated to low-income customers for weatherization and related services; this amount increases to nearly 20 percent in Year 7. ICF finds that the Companies' initial level of spending on low income energy efficiency services is reasonable and appropriate, given the maturity of the market in the Companies' territory, given the levels of federal spending and program activity (WAP and LIHEAP) in Kentucky, and balanced against the Companies' need to meet the governor's aggressive energy savings goals.[13]

ICF also commends the Companies for increasing the program's participation and budget goals each year of program implementation. Since the State of Kentucky received an influx of WAP dollars through the federal Stimulus bill, ICF recommends that the Companies continue coordination efforts with local WAP and LIHEAP programs so that ratepayer dollars dedicated to the Companies' low-income initiatives are not wasted on supplemental program services. In addition, ICF recommends that the Companies monitor and evaluate the program to ensure that spending is efficient, and is generating consistent impacts over time.

[13] As stated in "Intelligent Choices for Kentucky's Energy Future", the goals are to reduce energy consumption in Kentucky by at least 18 percent below currently projected 2025 energy consumption.

Conclusions

Based on a review of the proposed WeCare modification in this filing, and the existing WeCare program implementation manual, ICF concludes that WeCare implements the following best practices:

1. Leveraging efforts of other programs, e.g. local LIHEAP and WAP programs. WeCare coordinates with these programs intelligently by leveraging federal dollars where is the Companies are spending less – on Tier A customers. ICF hopes that the Companies continue to carefully coordinate with local WAP and LIHEAP programs to ensure that WeCare's services complement those provided by the federal programs as these public programs grow through funds provided by the Stimulus package.
2. Making the program stable and consistent. WeCare's core program services have remained stable over time. Changes and new offerings were/are being made consistent with EM&V results and market demand.
3. Auditing a statistically significant sample of weatherized homes. WeCare conducts a technical process review (TPR) of each project. TPRs take place on 100 percent of participant jobs within one week of the field work.
4. Offer a mix of services and measures attractive to homeowners. The Companies continue to add and change program offerings over time to capitalize on existing market conditions and demand. Adding HVAC replacement measures further diversifies the Companies' measure mix available to low-income customers.

Table 15: Residential Low Income Weatherization (WeCare) Program Results Comparison

			Best Practice Program: Market Maturity High	Best Practice Program: Market Maturity Mid	Best Practice Program: Market Maturity Mid-to-Low
Program Element/ Metric	LG&E / KU		PG&E, Energy Partners Program 2006	Xcel Energy Colorado, Single Family Low-Income Weatherization Program 2009 (from DSM Plan0	AEP North Texas (TNC), Targeted Low-Income 2008
	Year 1	Year 3			
Annual Energy Savings MWh	2,632	4,825	24,300	1,983	95
Annual Demand Reduction kW	262	481	NA	175	31
Annual Incentive Costs	$0	$0	NA	$666,421	$131,300
Annual Non-Incentive Costs	$2,368,462	$3,956,847	NA	$83,049	$21,700
Annual Budget	$2,368,462	$3,956,847	$90,000,000	$749,470	$153,000
Participants	1,200	2,200	66,000	1,958	39
kWh/Participant	2,193	2,193	368	1,013	2,436
kW/Participant	0.2	0.2	NA	0.1	0.8
% Budget incentive costs	0%	0%	NA	89%	86%
% Budget non-incentive costs*	100%	100%	NA	11%	14%
% Budget EM&V	5%	3%	NA	2%	NA
% Portfolio budget dedicated to low income weatherization services	9%	11% (increases to 20% in Year 7)	California PUC rules treat low income programs separately from resource, or "impact" programs. The Low Income Energy Efficiency (LIEE) programs have their own portfolio and cost-effectiveness standards.	4%	15%
$/1st year kWh	$0.90	$0.82	$3.71	$0.38	$1.38
$/1st year kW	$9,033	$8,231	NA	$4,278	$4,935
Cost/Participant	$1,974	$1,799	$1,364	$378	$3,923
NTG Ratio	1.00	1.00	1.00	0.96	1.00
**Includes % EM&V costs*		*Source(s):*	*ACEEE. 2008 Compendium of Champions*	*Xcel Energy. 2009/2010 DSM Biennial Plan. Docket No 08A-366EG. Public Service Commission of Colorado. February 2009.*	*AEP North Texas (TNC). 2009 Energy Efficiency Plan and Report. April 1, 2009.*

5.2. New Programs

5.2.1. Smart Energy Profile

Description of the Companies' program

The Smart Energy Profile (SEP) program is unique amongst energy report-type initiatives in its foundations in social marketing research, and its built-in experimental design. The program will select large samples of test and control customers and directly mail the report to the test group on a monthly basis. Savings will be estimated through an econometric analysis comparing energy use between the test and control group. The program will specifically target high-use customers, at least in initial program years.

The Companies will use existing customer data, such as service point information, account information and current energy consumption to develop targeted, customer Smart Energy Profiles that will be mailed to customers at regular intervals throughout the year (e.g. monthly). Elements that are presented in the report may include a comparison of the customer's energy use vis-à-vis their peers (residents with similar home/building characteristics), presentation of the customer's current energy use versus their historical use, as well as customized and targeted messages to help the customer reduce energy use. The report will promote and recommend program and efficiency measures likely to benefit the customer based on individual household energy usage patterns.

Components of Best Practice programs

There are not any established best practices for social marketing-type programs, as these represent a relatively new type (or at least, less-evaluated) form of DSM initiative. Based on ICF's professional judgment and experience implementing DSM programs nationwide, we believe the following activities comprise best practices in the delivery of a Smart Energy Profile program:

- A clear and careful experimental design. Precise measurement of program savings requires early coordination with an EM&V contractor to ensure that the test and control groups are properly selected.
- Longitudinal data collection. Evaluations can demonstrate that first year program savings are significant and very cost-effective. However, savings persistence is not as well understood. For the program to learn and improve over time, both test and control group energy use data should be tracked and evaluated once customers have stopped receiving the report.
- Identify and target high-use customers. Research has shown the biggest energy reduction comes from this group.
- Deliver information in the reports in a manner than minimizes the boomerang effect. Often, customers that find out their energy use is less than their peers can subsequently increase their energy use. Some programs have found that the means of delivering information about peer energy use can minimize this effect.[14]

[14] Hunt Alcott. Social Norms and Energy Conservation. Departments of Economics and Sloan School of Management, Massachusetts Institute of Technology (MIT). October 2009.

Summary of Best Practice programs

These programs are not necessarily *best practice*, for reasons discussed above. Rather, they represent two distinct approaches to Smart Energy Profiles implemented by program administrators.

Connexus Energy in central Minnesota began implementing its HER program in 2008. Connexus' program provides a monthly report to a large group of residential customers; the report contains two modules (1) The Social Comparison Module, which compares household electricity consumption over the past twelve months to the mean of its comparison group in the twentieth percentile, and (2) The Action Steps Module, which includes energy conservation tips (behavioral) and retrofit measures offered through Connexus' other programs. A recent evaluation of Connexus' HER program, which compared changes in household energy use in the test group to that of the control group (who did not receive the report) showed annual electricity savings of approximately two percent in the test group (those receiving the report for a year).

Duke Energy Kentucky's Personalized Energy Report (PER) pilot program also delivers customized home energy use information to residential customers. The PER program is provided to qualified residential customers who complete a basic home energy survey, either on-line or mailed-in. The PER is then produced on-line, or mailed to participants, depending on the customer's preference. The PER the report evaluates energy usage in the entire home and provides recommendations, many of which are very low cost, to the consumer who may later undertake some of these actions. Participants also receive six free CFLs.

Connexus' program design and costs are very similar to the Companies' proposed SEP program, as shown in Tables 15 and 16. Note that while the data shows higher first year market penetration for Connexus' program, they are also a much smaller utility than the Companies, totaling 96,000 residential customers. Because of the similarity in program design, we would expect the Companies' program to perform similarly to Connexus', as well to a similar pilot run by the Sacramento Municipal Utility District (SMUD), which also resulted in evaluated annual energy savings of approximately two percent in for the test group receiving the Smart Energy Profile.[15]

Based purely on program design, ICF believes that the Companies' proposed energy report program is superior to Duke's PER pilot. The SEP program will have significant market penetration, which will be challenging for the PER pilot to achieve since participants enroll voluntarily.[16] The SEP program also contains a social marketing component (comparing peer energy use), which research shows has been very effective at reducing customer energy use. Further, the SEP program has a built-in experimental design that helps ensure precise measurement of participant savings.

[15] Summit Blue Consulting. Impact Evaluation of Positive Energy SMUD Pilot. May 2009.

[16] Note that programs similar in design to the Companies' have shown very low opt-out rates (less than one percent).

Table 16: Smart Energy Profile Program Comparison

		Best Practice Program: Less Mature Market	Best Practice Program: More Mature Market
Program Element/ Metric	LG&E / KU	Connexus Energy (Central Minnesota), Home Energy Report Program Start Year: 2008	Duke Energy Kentucky, Personalized Energy Report (PER) Program Start Year: FY2009
Program Objective(s)	The objective of this program will be to educate customers about their energy consumption, encourage them to reduce consumption and empower them with tools, techniques and technology to use energy more wisely.	The objective of this program is to reduce customer home energy use through targeted, customized residential energy use education and marketing.	This program was designed to overcome market barriers amongst residential customers such as lack of consumer education and knowledge of specific ideas for reducing energy usage. The customized energy report is designed to help customers better manage their energy costs.
Target Market(s)	Residential. High energy users.	Residential. Those receiving the report must have one full year of electricity bill history as of the program start.	Residential single family customers who have not received measures through Duke's Home Energy House Call or Residential Conservation & Energy Education programs within the last three years.
Market penetration	14% after Year 1, 50% after Year 3	41%	NA
Measures	There are no specific measures offered by this program beyond the provision of the home energy report. The report will recommend measures available through other LG&E / KU programs based on the customer's energy use profile.	There are no specific measures offered by this program beyond the provision of the home energy report. The report will recommend measures available through other utility programs based on the customer's energy use profile.	In addition to the home energy report, participating customers will also receive 6 free CFLs.
Incentive structure	There are no specific incentives offered by this program beyond the provision of the home energy report. The report will recommend incentives available through other LG&E / KU programs based on the customer's energy use profile.	There are no specific incentives offered by this program beyond the provision of the home energy report. The report will recommend incentives available through other utility programs based on the customer's energy use profile.	The report will recommend incentives available through other utility programs based on the customer's energy use profile. Participating customers will also receive 6 free CFLs.
Marketing	The report will promote and recommend program and efficiency measures likely to benefit the customer based on individual household energy usage patterns	The report will promote and recommend program and efficiency measures likely to benefit the customer based on individual household energy usage patterns	The paper PER program begins with a letter to the customer offering the paper PER if they return a short energy survey about their home.

		Best Practice Program: Less Mature Market	Best Practice Program: More Mature Market
Program Element/ Metric	LG&E / KU	Connexus Energy (Central Minnesota), Home Energy Report Program Start Year: 2008	Duke Energy Kentucky, Personalized Energy Report (PER) Program Start Year: FY2009
Delivery	The Companies will use existing customer data, such as service point information, account information and current energy consumption to develop targeted, customer home energy reports that will be mailed to customers at regular intervals throughout the year (e.g. monthly). Elements that are presented in the report may include a comparison of the customer's home energy use vis-à-vis their peers (residents with similar home/building characteristics), presentation of the customer's current energy use versus their historical use, as well as customized and targeted messages to help the customer reduce energy use. The report will promote and recommend program and efficiency measures likely to benefit the customer based on individual household energy usage patterns.	The program mails a monthly report to participants separate from their utility bill. The report has two parts. The first part compares the customer's monthly energy use against that of their peers (similar households), and against their own historical energy use. The second part includes action steps that suggests behavioral and retrofit measures to reduce customer energy use; these suggestions are targeted to different households based on historical energy use patterns and demographic characteristics.	The customer completes an energy survey and this data is used to generate a personalized energy report based on information the customer provided. The report is either mailed to the consumer or created in real time online. The report evaluates energy usage in the entire home and provides recommendations, many of which are very low cost, to the consumer who may undertake some of these actions.

Discussion of the Companies' versus Others' Programs

The Companies' proposed SEP program is an innovative customer education initiative based on social marketing concepts that have proven successful when applied to other business models.[17] The SEP program is designed after comparable pilot programs implemented by other utilities across the nation that show promising evaluated savings results of approximately two percent average annual savings per participant.[18] The Companies are in the advantageous position of not being the "guinea pig" implementing this innovative program while the program is still "cutting-edge" – to ICF's knowledge, no other IOU in Kentucky has proposed the same program design.

ICF finds that the Companies' proposed SEP program is designed consistent with similar innovative social marketing programs implemented in by other program administrators that have

[17] Research shows the peer pressure is a powerful motivator. The SEP program applies this research by presenting to the test group their home energy use vis-à-vis. that of their "peers" (customers with similar homes).

[18] Note that savings persistence attributable to this program is not well-understood.

resulted in significant, very cost-effective residential energy savings. The Companies' planned costs and savings are reasonable and consistent with that of similar programs.

Connexus' program design and costs are very similar to the Companies' proposed SEP program, as shown in Tables 16 and 17. Note that while Table 15 shows higher first year market penetration for Connexus' program, they are also a much smaller utility than the Companies, totaling 96,000 residential customers. Because of the similarity in program design, we would expect the Companies' program to perform similarly to Connexus', as well to a similar pilot run by the Sacramento Municipal Utility District (SMUD), which also resulted in evaluated annual energy savings of approximately two percent in for the test group receiving the Smart Energy Profile.

Based purely on program design, ICF believes that the Companies' proposed energy report program is superior to Duke's PER pilot. The SEP program will have significant market penetration, which will be challenging for the PER pilot to achieve since participants enroll voluntarily. The SEP program also contains a social marketing component (comparing peer energy use), which research shows has been very effective at reducing customer energy use. Further, the SEP program has a built-in experimental design that helps ensure precise measurement of participant savings.

Conclusions

The Companies' proposed SEP program is innovative and designed for success. In order to help ensure its success, ICF suggests that the Companies follow the best practices listed above. Further, persistence of savings is not well understood for these types of programs; therefore the EM&V plan should include an approach for estimating SEP program savings beyond the first year.

Table 17: Smart Energy Profile Program Results Comparison

Program Element/ Metric	LG&E / KU		Best Practice Program: Less Mature Market	Best Practice Program: More Mature Market
	Year 1	Year 3	Connexus Energy (Central Minnesota), Home Energy Report 2008–2009	Duke Energy Kentucky, Personalized Energy Report (PER) FY2010
Annual Energy Savings MWh	29,664	58,078	12,675	NA
Annual Demand Reduction kW	5,693	11,117	NA	NA
Annual Incentive Costs	$0	$0	NA	NA
Annual Non-Incentive Costs	$1,370,800	$2,240,807	NA	NA
Annual Budget	$1,370,800	$2,240,807	$507,000	$153,000
Participants	105,000	205,000	39,000	NA
kWh/Participant	283	283	325	NA
kW/Participant	0.1	0.1	NA	NA
% Budget incentive costs	0%	0%	NA	NA
% Budget non-incentive costs*	100%	100%	NA	NA
% Budget EM&V	0%	0%	NA	NA
$/1st year kWh	$0.05	$0.04	$0.04	NA
$/1st year kW	$241	$202	NA	NA
Cost/Participant	$13	$11	$13	NA
NTG Ratio	NA	NA	NA	NA
		Source(s):	*Hunt Alcott. Social Norms and Energy Conservation. Departments of Economics and Sloan School of Management, Massachusetts Institute of Technology (MIT). October 2009.*	*Duke Energy. Annual Status Report and Adjustment of the 2009 DSM Cost Recovery Mechanism. Case No. 2009-00444. Filed with the Kentucky Public Service Commission November 16, 2009.* *Hamilton Consulting. Plans for EM&V, Duke Energy.*

**Includes % EM&V costs*

5.2.2. Residential Incentives

Description of the Companies' Program

The Companies' proposed Residential Incentives program will deliver a wide range of energy efficiency measures and services that are cost-effective, but are not included in the Companies' other residential offerings. The program would promote and provide incentives for ENERGY STAR appliances, efficient HVAC equipment, and window film. ICF's understanding is that the Companies are proposing to promote these measures not only because the measures are cost-effective, but because the Companies received feedback from customers that there is demand for these efficient products. The Companies have conducted research on the relevant market channels and end-users and believes that it has sufficient understanding of the market to effectively deliver a program around these measures.

Components of Best Practice Programs

Residential Incentives contains distinct program elements, each of which has unique best practices: these include elements of ENERGY STAR Products-type programs and Efficient HVAC-type programs:

Best practices of programs that promote ENERGY STAR products include:

- Leveraging of the ENERGY STAR brand. This can be achieved by becoming an ENERGY STAR Program Sponsor and/or building public awareness of the ENERGY STAR brand. Activities key to building ENERGY STAR brand awareness include:
  a. Educating retailers and ensuring that ENERGY STAR is promoted on retail floors; and
  b. Developing partnerships with suppliers.
- Spending incentive dollars upstream and midstream, where possible. Such a top-down approach helps transform the market throughout the product stream and makes participation easy for customers through point-of-purchase (instant) rebates.

The following summarizes components of program delivery common amongst best practice residential HVAC programs:

- The use of HVAC contractors as the main vehicle for program deployment. Contractors receive program training and are paid incentives for installing efficient units. This helps keep participation simple for customers. Contractors are also the main delivery method for window film installation.
- Training and education of HVAC distributors;
- Quality Install (QI) training and incentives;
- An AC tune-up element, or cross-promotion with an AC tune-up program; and
- A process for verifying contractor work, including on-site inspections.

Summary of Best Practice Programs

ICF choose three distinct program types to compare to the Companies' proposed Residential Incentives program since the program contains elements of each of these program types, but is

not directly comparable to any one program type. The three best practice programs we selected are: San Diego Gas & Electric's (SDG&E) Residential Retrofit Single Family program, the U.S. EPA's Rapid Deployment Energy Efficiency (RDEE) Residential Efficient Heating and Cooling program (which was reviewed as a best practice program by the National Action Plan on Energy Efficiency in the course of EPA's development of the RDEE Toolkit, in spring 2009), and the Residential Retail Products program, which is run jointly by Connecticut Light & Power (CL&P) and United Illuminating (UI).

SDG&E's Residential Retrofit Single Family program is part of a California statewide program effort of the same name. In 2004, the Residential Lighting and Home Energy Efficiency Rebates (HEER) Programs were combined to form the Statewide Single-Family Energy Efficiency Rebate (SFEER) Program to streamline internal operations for the utilities. The SFEER Program includes a diverse array of energy efficiency measures including home improvement products, heating and cooling equipment, lighting, appliances, and pool equipment. The 2004-2005 Program targeted all residential customers paying a Public Goods Charge and residing in dwellings of four units or less, including condominiums and mobile homes.[19]

The objectives of the RDEE Residential Efficient Heating and Cooling program are to increase sales of efficient (ENERGY STAR qualified, or better) heating and cooling equipment in replace-on-burnout, retrofit, and new construction opportunities, and to improve the operating efficiency of equipment through tune-ups of existing units and Quality Installation (QI) of new units. HVAC contractors are the main vehicle for deployment of this program. Contractors must complete trainings for AC tune-ups (refrigerant charge, coil cleaning, filter change, and a blower speed test), AC quality installation (proper sizing, refrigerant charge, and air flow test), furnace quality installation (proper sizing, air flow adjustment, furnace on-rate check), and other program requirements.[20]

CL&P and UI's Residential Retail Products program is essentially an ENERGY STAR Products program than provides incentives for CFLs and ENERGY STAR appliances. In both the lighting and appliances segments, the program uses Negotiated Cooperative Promotions (NCPs), which the Companies' find to be a successful approach to increase stocking and sales of efficient products at considerably lower cost than traditional coupons and rebates. NCPs involve partnerships between the program and retailers and manufacturers and are structured with underlying memoranda of understanding (MOUs) that tie payment of incentives to the Companies' receipt of store-level sales data.[21]

[19] Itron. 2004/2005 Statewide Residential Retrofit Single-Family energy Efficiency Rebate Evaluation. October 2, 2007.
Best Practice Benchmarking for Energy Efficiency Programs. Summary Profile Report. CA Single Family EE Rebates. http://www.eebestpractices.com/Summary.asp?BPProgID=R24E.
San Diego Gas & Electric Company – Statewide residential Single Family Home Energy Efficiency Rebates (PGC) – SDGE service area – IOU Statewide Program – Jan-06 Report.

[20] U.S. EPA. Rapid Deployment Energy Efficiency Toolkit, Planning and Implementation Guides. October 2009.

[21] Connecticut Light & Power and United Illuminating. 2009 Conservation and Load Management Plan. October 2008.

Table 18: Residential Incentives Program Comparison

		Best Practice Program: Market Maturity High	Best Practice Program: Market Maturity Mid	Best Practice Program: Market Maturity Mid-to-Low
Program Element/ Metric	LG&E / KU	San Diego Gas & Electric (Sempra), Residential Retrofit Single Family Program Program start year: 2001	U.S. EPA, Rapid Deployment Energy Efficiency (RDEE) Toolkit, Residential Efficient Heating and Cooling Program Program start year: NA	Connecticut Light & Power and United Illuminating, Residential Retail Products Program start year: 2000
Program Objective(s)	Encourage customers to purchase various ENERGY STAR products, HVAC equipment and window films.	Achieve energy savings and demand reduction.	The objectives of this program are to increase sales of efficient (ENERGY STAR qualified, or better) heating and cooling equipment in replace-on-burnout, retrofit, and new construction opportunities, and to improve the operating efficiency of equipment through tune-ups of existing units and quality installation of new units.	Build awareness, acceptance and market share of ENERGY STAR lighting, appliances and electronics.
Target Market(s)	Residential	All residential customers paying a Public Goods Charge and residing in dwellings of four units or less, including condominiums and mobile homes.	This program targets HVAC contractors and homeowners with central air conditioners and furnaces.	Residential
Market Penetration	Build to 20,500 rebates per year by Year 3	NA	4% after 3 years	2,409,313 (units)
Measures	HVAC, ENERGY STAR appliances, window films.	HVAC, lighting, appliances, home improvement products, pool pumps.	ENERGY STAR Heating and Cooling equipment. AC Tune-ups. Quality Install (QI) of HVAC units.	ENERGY STAR lighting (CFLs), appliances, and electronics
Incentive Structure	Incentives will be paid directly to customers via mail-in rebates.	Lighting, upstream (manufacturers). Appliances, midstream (retailers). HVAC, midstream (installation contractors).	Incentives paid mid-stream to HVAC contractors (typically 50-75% of measure incremental costs)	Point of purchase and mail-in rebates.

		Best Practice Program: Market Maturity High	Best Practice Program: Market Maturity Mid	Best Practice Program: Market Maturity Mid-to-Low
Program Element/ Metric	LG&E / KU	San Diego Gas & Electric (Sempra), Residential Retrofit Single Family Program Program start year: 2001	U.S. EPA, Rapid Deployment Energy Efficiency (RDEE) Toolkit, Residential Efficient Heating and Cooling Program Program start year: NA	Connecticut Light & Power and United Illuminating, Residential Retail Products Program start year: 2000
Marketing	Marketing will include retailer training and point-of-purchase displays, among other activities and collateral. A full marketing plan will be developed pending program approval.	Bill inserts direct mail, newspaper and radio advertising, email blasts, community events, and information from their web sites and phone centers. The IOUs also coordinated with market actors including manufacturers, distributors, retailers, contractors, and others.	Consumer collateral. Program Web site. HVAC contractor & distributor recruitment and training. Call center.	Direct mail. Publications in community and business newsletters. Attendance at ENERGY STAR sales events. General promotion of the ENERGY STAR label.
Delivery	The Companies will hire, through an RFP process, a 3rd party contractor to develop the appropriate application and documentation supporting customer purchases, provide QA/QC of rebate applications, and process rebate checks. All documentation will be submitted to the Companies for auditing and data retention. The Companies will have customer verification/audit rights as well.	For lighting, the program worked with lighting manufacturers to buydown the cost of CFLs. For appliances, the program worked with manufacturers to buydown the cost of the units in some areas; mail in rebates were used otherwise. For HVAC measures, the program worked with HVAC contractors, who received training and were paid incentives.	HVAC contractors are the main vehicle for deployment of this program.	Midstream and upstream partnerships with retailers and manufacturers - Negotiated Cooperative Promotions (NCPs).

Discussion of the Companies' versus Others' Programs

In general, ICF finds that Companies' analytical methodology leading to this proposed program is sound and consistent with our own experience planning similar programs in other jurisdictions, including Louisiana, Maryland, and Wisconsin. Further, ICF finds that the Companies' planned costs and savings are reasonable and appropriate for a new program of this nature operating in a relatively immature market.

Residential Incentives contains some distinct elements of best practice programs described above. There are many models for delivering residential programs of this nature; some utilities combine all program elements into an umbrella residential mass market program that includes lighting, HVAC, appliances, and home performance; others include each of these as distinct programs; some utilities combine lighting and appliances into one ENERGY STAR Products program. Ultimately, each utility needs to package and market its programs in a manner that results in the most cost-effective savings that can be achieved within its own territory. The packaging usually changes over time as markets and technologies evolve; this is a key reason why it is important for program administrators to retain flexibility in how they deliver their programs.

While ICF could not find one program exactly comparable to the Companies' proposed Residential Incentives initiative, this is only because the Companies are packaging particular elements of their residential portfolio differently from other utilities. Further, the Companies' cost and savings assumptions, which ICF reviewed and finds reasonable, show the program is cost-effective.

Conclusions

ICF suggests the Companies consider the following possible strategies for delivering each component of the proposed Residential Incentives program.

1. Coordinate and cross-promote the new HVAC equipment rebates together the existing AC tune-up program. This would allow the Companies to capitalize on their existing relationships with AC contractors developed through the AC tune-up program.
2. Coordinate and cross-promote the appliance rebate and window film elements of the Residential Incentives initiative with the existing Residential High Efficiency Lighting program. This could allow new Residential Incentives elements (appliance, window film) to be co-branded along with CFLs, and allow the Companies to capitalize on existing retailer relationships achieved through the current CFL program. If the Companies plan on promoting window film as a low-cost DIY measure that will eventually replace some portion of CFL savings, window film should be promoted, where possible, in the same retail channels as CFLs (e.g. Lowe's, Home Depot, hardware stores).

Table 19: Residential Incentives Program Results Comparison

			Best Practice Program: Market Maturity High	Best Practice Program: Market Maturity Mid	Best Practice Program: Market Maturity Mid-to-Low
Program Element/ Metric	LG&E / KU		San Diego Gas & Electric (Sempra), Residential Retrofit Single Family Program 2004–2005	U.S. EPA, Rapid Deployment Energy Efficiency (RDEE) Toolkit, Residential Efficient Heating and Cooling Program 2009	Connecticut Light & Power and United Illuminating, Residential Retail Products Program start year: 2007
	Year 1	Year 3			
Annual Energy Savings MWh	8,544	16,291	CFLs: 60,457 (net) Non-lighting: 2,672 (net)	NA	62,000
Annual Demand Reduction kW	1,477	3,042	CFLs: 4,450 (net) Non-lighting: 1,257	NA	968
Annual Incentive Costs	$942,500	$1,772,500	$6,254,533	NA	$4,438,000
Annual Non-Incentive Costs	$642,852	$873,230	$1,907,380	NA	$1,524,000
Annual Budget	$1,567,352	$2,645,730	$8,161,914	NA	$5,962,000
Participants	11,700	20,500		10,000	2,409,313
kWh/Participant	730	795	NA	2,000 (varies by climate zone and fuel type)	26
kW/Participant	0.1	0.1	NA	0.2 (varies by climate zone)	<.01
% Budget incentive costs	60%	67%	77%	60%	74%
% Budget non-incentive costs*	40%	33%	23%	40%	26%
% Budget EM&V	5%	2%	3%	4%	NA
$/1st year kWh	$0.18	$0.16	$0.08	$0.17	$0.10
$/1st year kW	$1,061	$870	$470	$1,900	$6,159
Cost/Participant (rebate)	$134	$129	NA	$400	$2
NTG Ratio	0.87 (average across all measures types)		CFLs: 0.62 Non-lighting: 0.56	0.80	NA

			Best Practice Program: Market Maturity High	Best Practice Program: Market Maturity Mid	Best Practice Program: Market Maturity Mid-to-Low
Program Element/ Metric	LG&E / KU		San Diego Gas & Electric (Sempra), Residential Retrofit Single Family Program 2004–2005	U.S. EPA, Rapid Deployment Energy Efficiency (RDEE) Toolkit, Residential Efficient Heating and Cooling Program 2009	Connecticut Light & Power and United Illuminating, Residential Retail Products Program start year: 2007
	Year 1	Year 3			
**Includes % EM&V costs*		*Source(s)*	*Itron. 2004/2005 Statewide Residential Retrofit Single-Family energy Efficiency Rebate Evaluation. October 2, 2007.* *Best Practice Benchmarking for Energy Efficiency Programs. Summary Profile Report. CA Single Family EE Rebates. http://www.eebestpractices.com/Summary.asp?BPProgID=R24E . Retrieved 11-09.* *San Diego Gas & Electric Company – Statewide residential Single Family Home Energy Efficiency Rebates (PGC) – SDGE service area – IOU Statewide Program – Jan-06 Report.*	*U.S. EPA. Rapid Deployment Energy Efficiency Toolkit, Planning and Implementation Guides. October 2009.*	*Connecticut Light & Power and United Illuminating. 2009 Conservation and Load Management Plan. October 2008.*

5.2.3. Residential Refrigerator Removal

Description of the Companies' program

The objectives of the Companies' proposed Residential Refrigerator Removal program are to remove and recycle old and inefficient working secondary refrigerators and freezers from the grid, and to reduce environmental impacts associated with improper appliance disposal. The Companies' proposed program is based on a proven, cost-effective program design that has been run successfully by numerous program administrators around the country.

Components of Best Practice Programs

The following summarizes components of program delivery common amongst best practice residential appliance recycling programs; best practice programs:

- Partner with an experienced appliance recycling company who can provide cost-effective, turn-key program services.
- Have procedures in place (e.g., random inspections) to ensure that participants' units are working and in-use prior to pick-up.
- Ensure that scheduling is made simple for customers and that pick-ups are timely.
- Cross-promote other utility programs.
- Plan with evaluators early to ensure they have access to an appropriate sample of units for data logging.

Summary of Best Practice Programs

ICF chose two existing programs to compare against the proposed program: Oncor's Refrigerator Round-Up program, and Southern California Edison's (SCE) Appliance Recycling program. These programs represent best practice in program implementation in two different energy efficiency markets, one more mature (California) and one less mature (Texas). Both these programs partner with appliance recycling companies who provide turn-key program services, including:

- Scheduling
- Pick-up
- Recycling
- Program tracking
- Incentive fulfillment
- Assistance with program marketing

Oncor partners with the Appliance Recycling Centers of America (ARCA) to implement the Refrigerator Roundup program, which launched in 2004. The program offers an incentive of $50 per working unit to customers. In 2008, the program recycled nearly 5,000 refrigerators and freezers in the Dallas region.

SCE's Appliance Recycling Program launched in 1994, and partners with both ARCA and JACO Environmental to manage the program's recycling services. This program removes over 100,000 old units from the grid in the Southern California region every year.

Table 20: Residential Refrigerator Removal Program Comparison

		Best Practice Program: Less Mature Market	Best Practice Program: More Mature Market
Program Element/ Metric	LG&E / KU	Oncor, Refrigerator Round-up Program Start Year: 2004 Data year(s): 2008	Southern California Edison, Appliance Recycling Program Program Start Year: 1994 Data year(s): 2004–2005
Program Objective(s)	Remove and recycle old and inefficient working secondary refrigerators and freezers from the grid. Reduce environmental impacts associated with improper appliance disposal.	Remove operating spare refrigerators and freezers from customers' homes.	Reduce customer bills. Remove inefficient units from the grid. Reduce CFC emissions. Eliminate "hassle factor" of removing appliance(s) for customers.
Target Market(s)	Residential	Residential	Residential and small business
Market Penetration	Build to 10,000 units per year by Year 3	4,900 units recycled	120,000 units recycled
Measures	Refrigerator and freezer removal and recycling	Refrigerator and freezer removal and recycling	Refrigerator and freezer removal and recycling; limit of 2 units per customer per year; window ACs also eligible
Incentive Structure	$30 per working unit	$50 per working unit	$35 per working unit (note: this amount was increased to $50/unit in 2006)
Marketing	Targeted direct mail; full marketing plan developed	Direct mail, website, mass media, appliance dealers	Direct mail, media outlets; website, appliance dealers
Delivery	Turn-key program implementation through appliance recycling company.	Turn-key program implementation through appliance recycling company.	Turn-key program implementation through appliance recycling company.

Discussion of the Companies' versus Others' Programs

The Companies' proposed program is very similar in design to the example programs, as shown in the table below.[22] The Companies propose that an established appliance recycling company will provide turn-key program services. All similar programs use this program delivery method, to ICF's knowledge. There are only two major appliance recycling companies in the U.S. who are experienced at working with utilities on efficiency programs. The Companies will benefit from lessons learned by either of these firms should it move forward with this initiative.

[22] ADM Associates et al. Evaluation of the 2004-2005 Statewide Residential Appliance Recycling Program. Final Report. April 2008. Southern California Edison – Residential Appliance Recycling – SCE service area – IOU Statewide Program – Jan-06 Report

At this planning stage, the only difference between the proposed program and the example programs' is the incentive level. The Companies' proposed incentive is somewhat lower than incentives offered by other utilities; however ICF believes that the Companies' proposed incentive is appropriate in initial program years within the Companies' territory, which is a relatively immature market for energy efficiency. Because the program has not been offered before, customers will likely find an incentive of $30 for removing and properly disposing of their old appliance to be an attractive offer. Note that SCE' per unit incentive in 2004-2005 was $35, when the program was new, and was increased in subsequent years.

In general, ICF finds that the Companies' planning assumptions for program costs and savings are reasonable and appropriate. As shown below, based on The Companies' proposed program costs and net savings estimates, The Companies' program will cost approximately $0.27 per kWh in Year 1, which is similar to the net cost of SCE's program; Oncor's cost per kWh is somewhat lower, although Oncor's savings estimates do not include free-riders (which, if included, would drive cost-effectiveness down). The Companies' total cost per unit ($204) is also higher than SCE's ($158), though not unreasonably high.[23]

Conclusions

The Companies' proposed Refrigerator Recycling program contains many elements of best practice programs and the planned cost and savings are reasonable for such a program entering a relatively immature market. Although we believe the program plan generally reflects best practices, below, ICF provides some suggestions for The Companies' consideration

1. Establish a procedure for ensuring program compliance. The primary concern here is ensuring that the vendor is paying incentives only for working units.
2. Work with an evaluator from the start. Typically, program savings are estimated through a combination of data logging and participant and non-participant surveys. The evaluator will need to work with the recycling vendor to have a sample of units set aside for data logging.
3. Cross promote other programs. This program results in customer contacts at a number of points in the participation process, each of which provides an opportunity to promote other efficiency programs; one obvious synergy is the Residential Rebate program, which rebates ENERGY STAR appliances, including refrigerators and freezers.

[23] ADM Associates et al.

Table 21: Residential Refrigerator Removal Program Results Comparison

			Best Practice Program: Less Mature Market	Best Practice Program: More Mature Market
Program Element/ Metric	LG&E / KU		Oncor, Refrigerator Round-up Program Start Year: 2004 Data year(s): 2008	Southern California Edison, Appliance Recycling Program Program Start Year: 1994 Data year(s): 2004–2005
	Year 1	Year 3		
Annual Energy Savings MWh	3,000	7,500	7,131 (gross)	120,949 (net)
Annual Demand Reduction kW	339	849	1,100 (gross)	NA
Annual Incentive Costs	$120,000	$300,000	$471,416	NA
Annual Non-Incentive Costs	$695,800	$1,655,829	$89,316	NA
Annual Budget	$815,800	$1,955,829	$560,732	NA
Participants	4,000	10,000	4,900 (units)	
kWh/Participant	750	750	1,466 per refrigerator (gross; 1,701 per freezer (gross)	1,776 per refrigerator (gross; 1,415 per freezer (gross)
kW/Participant	0.1	0.1	0.26 per refrigerator (gross; 0.18 per freezer (gross)	NA
% Budget Incentive Costs	15%	15%	84%	88%
% Budget Non-Incentive Costs	85%	85%	16%	12%
% Budget EM&V	0%	0%	NA	3%
$/1st Year kWh	$0.27	$0.26	$0.16	$0.22
$1st Year kW	$2,414	$2,304	$956	$1,298
Cost/Participant	$204	$196	$114 per unit	$158 per unit
NTG Ratio	1.00	1.00	NA	0.72
**includes %EM&V costs*		*Source(s):*	*Oncor 2009 Energy Efficiency Plan and Report. April 1, 2009*	*ADM Associates, et al. Evaluation of the 2004–2005 Statewide Residential Appliance Recycling Program. Final Report, April 2008. Southern California Edison – Residential Appliance Recycling – SCE Service Area — IOU Statewide Program — January 2006 Report*

6. Overall Conclusions

Our review of the Companies' portfolio, and the context in which they were developed, leads us to the following conclusions:

- The Companies' proposed portfolio is consistent with evolving federal and state policies. In addition, the portfolio contains many elements of best practices, including cost-effectiveness, broad targeting, and flexible design.
- The Companies should commission a potential study or market characterization study, an action item the governor has also proposed for the state in his energy plan. The study results could be used to help plan programs that capture savings where potential is greatest and/or most cost-effective.
- Based on a market characterization study of the commercial sector, the Companies should develop additional programs targeting the commercial sector. Though the Companies continue to offer cost-effective programs, the portfolio could improve its cost-effectiveness through additional commercial programs. These could be achieved through the continuation of proven program types related to lighting, HVAC, and motors measures, or through the identification and targeting of customers interested in custom projects.

Our review of the Companies' proposed programs leads us to the following conclusions:

- Load Control Management - The Companies currently operate a successful load control program for residential and commercial customers, and are appropriately proposing to increase incentives to increase participation. The Companies should also consider and promote additional program options that would result in greater participation, lower program unit costs, and greater cost-effectiveness. Examples of these options include an enhanced incentive structure (that targets larger and high-use customers), multiple control options, and a real-time pricing element. In addition, because the program has significant market penetration, the Companies can use points of contact with these current participants to market other programs. In addition, the Companies' experience with demand response programs will help to develop a successful and cost-effective strategy for any eventual AMI deployment.

- Commercial Conservation / Commercial Incentives - The Companies should ensure that the audits are comprehensive and are continuing to motivate customers to participate in the program. In addition, the Companies should monitor the incentive structure and participation to ensure a broad mix of customer participation, which will result in cost-effective savings and achievement of program goals. The Companies should also continue to add prescriptive measures and work with trade allies to ensure their continued participation with and promotion of the program. In the future, the Companies should consider incorporating the EPA's Portfolio Manager benchmarking tool to provide customers with ongoing and post-project information regarding facility usage and savings. Since this initiative requires investment in equipment and personnel, the Companies should implement it once the expanded program has been running for a few years. This will allow the tool to be applied to a larger participant base, and ensure greater persistence of energy savings.

- Residential Conservation/Home Energy Performance program - The Companies should continue to consider Program Sponsorship through the EPA, in order to take advantage of existing resources and expand program participation. The Companies should also consider

the benefits of sponsorship in the context of a program design that uses the resource acquisition model, the market transformation model, or a hybrid approach (where the resource acquisition model evolves into the market transformation model). Through the market transformation model, the Companies would be able to build the program infrastructure and contractor network and reduce their day-to-day involvement. The availability of more contractors will increase competition, decrease customers' costs, and decrease the Companies' program costs.

- Low Income Weatherization (WeCare) program – The Companies should continue to coordinate carefully with local WAP and LIHEAP programs to ensure that WeCare's services complement those provided by the federal programs. Consistent with existing practice, the Companies should ensure that program funding is stable and consistent over time. The Companies should also continue to modify program offerings, based on EM&V or TPR, and existing market conditions and demand. To the extent that this program is similar to the Residential Conservation/Home Energy Performance program, in terms of measure types and contractor networks, the Companies should identify and implement additional cost efficiencies.

- Smart Energy Profile – ICF concludes that the SEP program's social marketing component will result in significant participant savings, and its built-in experimental design will help ensure precise measurement of these savings. As behavior-based programs gain entry into utility portfolios, the Companies should develop relationships with program implementers and utility program managers in order to adjust the design and delivery, or gain experience for their SEP program. The Companies should also incorporate other innovative pilots or programs, such as an in-home display program, into their portfolio.

- Residential Incentives – The Companies should coordinate and cross-promote their new residential programs with their existing residential programs. For example, the new HVAC equipment component is complementary with the existing AC tune-up program. This would allow the Companies to capitalize on their existing relationships with AC contractors. The Companies should also coordinate and cross-promote the appliance rebate and window film elements with the existing Residential High Efficiency Lighting program. This could allow new Residential Incentives elements (appliance, window film) to be co-branded along with CFLs, and allow the Companies to capitalize on existing retailer relationships achieved through the current CFL program.

- Refrigerator Recycling - ICF concludes that the program contains many elements of best practice programs and the planned cost and savings are reasonable for such a program entering a relatively immature market. ICF also suggests that the Companies establish procedures to ensure that the vendor is paying incentives only for working units. ICF also recommends that the vendor work with an evaluator from the start, in order to have a sample of units set aside for data logging. In addition, similar to the other residential programs, the Companies should engage in cross promotion. This program results in customer contacts at a number of points in the participation process, each of which provides an opportunity to promote other efficiency programs.

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Question No. 25

Witness: Michael E. Hornung

Q-25. Refer to page 25 of Exhibit MEH-1 of the Hornung Testimony of the Joint Application, which states,

> . . . the Companies are requesting additional funds to support the continuation of this highly utilized program through its approved 2018 funding cycle. The Companies recognize that program participation may become more standardized as the program continues; however, to continue support for our current residential customer segment at its current rate the Companies request to increase the incentive dollars by 65% for 2015-2018 to mirror the historic 2012-2013 customer participation.

Provide the proposed measures that are represented by the increase in customer rebates for years 2015-2018 in the Companies' proposed request for the Residential Incentives Program.

A-25. The proposed measures that represent the increase requested in this case are the same list as currently approved, i.e., there is no request to add incentive items to the list. The current list is as follows:

Category	Item	Incentive
Appliances	Heat Pump Water Heaters (HPWH)	$300 per qualifying item purchased
	Washing Machine	$75 per qualifying item purchased
	Refrigerator	$100 per qualifying item purchased
	Freezer	$50 per qualifying item purchased
	Dishwasher	$50 per qualifying item purchased
Window Film	Window Film	Up to 50% of materials cost only; max of $200 per customer account; product must meet applicable criteria.
HVAC	Central Air Conditioner	$100 per Energy Star item purchased plus an additional $100 per SEER improvement above minimum
	Electric Air-Source Heat Pump	$100 per Energy Star item purchased plus additional $100 per SEER improvement above minimum

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Question No. 26

Witness: Michael E. Hornung

Q-26. Refer to page 35 of Exhibit MEH-1 of the Hornung Testimony of the Joint Application, which states, "The Customer Education and Public Information Program was approved in the Companies' DSM/EE Plan in Case No. 2007-00319[2] which granted approval through 2014." Confirm that the Companies desire this program to continue through 2018.

A-26. Yes, the Companies desire to continue Customer Education and Public Information Programming through 2018. The Companies see significant value in continuing programming as it provides an opportunity to increase customer awareness and encourage use of energy efficiency products and services. Without Customer Education and Public Information Programming, participation levels in programming provided by the Companies are likely to diminish due to the inability to adequately market energy-efficiency programs to the Companies' residential and commercial customers.

[2] Case No. 2007-00319, Joint Application of Louisville Gas and Electric Company and Kentucky Utilities Company Demand-Side Management for the Review, Modification, and Continuation of Energy Efficiency Programs and DSM Cost Recovery Mechanisms (Ky. PSC Mar. 31, 2008).

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Question No. 27

Witness: David E. Huff

Q-27. Refer to page 47 of Exhibit MEH-1 of the Hornung Testimony of the Joint Application, which states, "The offering is limited to 5,000 LG&E and 5,000 KU RS and GS customers on a first-come-first-serve basis. Advanced meters would be installed for customers who elect to participate." Explain whether there are any circumstances that might prevent a customer from participating.

A-27. Participation in the program is voluntary, so personal choice is the primary limiting factor to participation. Also, the AMS will be subject to the communication limitations, such as the availability of cellular coverage, which may limit some customers' ability to participate.

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Question No. 28

Witness: David E. Huff

Q-28. Refer to page 47 of Exhibit MEH-1 of the Hornung Testimony of the Joint Application, which states, "The Companies did not calculate TRC or other California benefit-cost metrics for Advanced Metering Systems, and did not include the expense of this program in the California benefit-cost metrics for the Companies' proposed DSMEE portfolio because the benefits from these meters are uncertain." Explain the uncertainty of the benefits and how benefits will be determined.

A-28. It is uncertain what customers will do with the additional information the AMS will provide, with what frequency will they look at their information, what if any actions (both behavioral or implementing energy efficiency measures) customers will take. Additionally, it is uncertain if any level of reduction is sustainable over time. Therefore, it is proper not to claim or include savings when there is so much uncertainty.

Also, the Companies do not have plans to attempt to quantify consumption savings because any participating customer may have a self-selection bias and the savings, if any, may not be applicable to the customer base as a whole.

Please see also the response to AG 1-10.

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Question No. 29

Witness: Robert M. Conroy

Q-29. Refer to page 47 of Exhibit MEH-1 of the Hornung Testimony of the Joint Application, which states, "The average monthly bill for all LG&E and KU residential customers combined is approximately $104.75."

a. Provide the 2012 and 2013 average monthly bill and usage for LG&E residential customer and KU residential customers.

b. Provide the 2012 and 2013 average monthly bill and usage for an LG&E GS customer and a KU GS customer.

A-29. a. Please see the table below.

Rate RS - All Residential Customers

	KU		LG&E	
	Average Monthly Bill	**Average Monthly Usage** (kwh/Cust.)	**Average Monthly Bill**	**Average Monthly Usage** (kwh/Cust.)
2012	$ 97.42	1,183	$ 92.16	1,025
2013	$ 110.39	1,229	$ 97.20	997

b. Please see the table below.

Rate GS - All Customers

	KU		LG&E	
	Average Monthly Bill	**Average Monthly Usage** (kwh/Cust.)	**Average Monthly Bill**	**Average Monthly Usage** (kwh/Cust.)
2012	$ 190.22	1,981	$ 270.87	2,771
2013	$ 203.41	1,940	$ 278.41	2,666

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Question No. 30

Witness: David E. Huff

Q-30. Describe the type of equipment and systems for the proposed Advanced Metering Systems.

A-30. Components of the AMS include meters capable of two-way communications via a network-communications infrastructure, computer systems to control the network and meters, meter data management system, software for the customer web portal, and other hardware and software to support operation and maintenance of the AMS. The AMS can provide advanced metering information such as on-demand meter reads, 15-, 30-, and 60-minute load-interval data, and voltage and power quality data.

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Question No. 31

Witness: Michael E. Hornung

Q-31. Refer to Appendix B, LG&E and KU Input Summary Reports, Exhibit MEH-1 of the Hornung Testimony of the Joint Application. Provide in electronic format, with formulas intact and cells unprotected, the 130 pages of the Appendix B in readable form. Also, provide one printed copy, in readable form, of the information provided on the 130 pages of Appendix B, so that Commission Staff can properly review the information filed.

A-31. Please see the attachment being provided in Excel format. These are the direct output files provided by the DSMore program. This database is not designed to be printed and thus the Companies have not provided a printed copy.

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Question No. 32

Witness: Michael E. Hornung

Q-32. Discuss the types of inputs used in the DSMore Input Summary Report.

A-32. DSMore inputs include utility, market, and program-specific data. Utility-specific data includes load forecasts, avoided costs, and electric and gas rate information including riders, tax rates, discount rates, and price escalators. Market-specific data input in the model is electricity prices. Program-specific data includes measure life, annual and monthly performance adjustments, annual incremental participants, operational costs, and customer costs.

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Question No. 33

Witness: Michael E. Hornung

Q-33. Refer to Appendix C, LG&E and KU Output Reports, Exhibit MEH-1 of the Hornung Testimony of the Joint Application. Provide in electronic format, with formulas intact and cells unprotected, Appendix C.

A-33. Please see the attachment being provided in Excel format.

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Question No. 34

Witness: Michael E. Hornung

Q-34. Refer to pages 6 through 24 of Appendix C, LG&E and KU Output Reports, Exhibit MEH-1 of the Hornung Testimony of the Joint Application. Explain the Participant Test result 65535.

A-34. The Participant Test result is calculated as follows:

$$\frac{\text{Lost Revenue + Incentives + Tax Savings}}{\text{Participant Costs}}$$

In the example noted above, there are no additional participant costs incurred by customers participating in those programs. DSMore provides an output of "65535" when a formula divides by zero. This result does not adversely affect subsequent calculations.

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Question No. 35

Witness: Michael E. Hornung

Q-35. Refer to Appendix D of Exhibit MEH-1 of the Hornung Testimony of the Joint Application. Provide a list of all those invited to EE DSM Advisory Group meetings.

A-35. The table below provides a listing of those organizations/agencies invited to participate in the EE DSM Advisory Group.

Organization / Agency of Affiliation	Representative
Office of the Attorney General	Dennis Howard Larry Cook
Metropolitan Housing Council	Cathy Hinko
Louisville Metro Air Pollution Control District	Cynthia Lee Michelle King
University of Kentucky	Donald Colliver
Kentucky Division for Air Quality	Elizabeth Robb
West Louisville Community Ministries	George Sanders
Department for Energy Development and Independence	John Davies Greg Guess Lee Colton
Community Action Council for Lexington-Fayette, Bourbon, Harrison & Nicholas Counties	Malcolm Ratchford Charlie Lanter
KY Community Action Council	Jim Christian
KY National Energy Education Development Project	Karen Reagor

Legal Aid Society	Lisa Kilkelly Eileen L. Ordover
Kentucky Home Builders Association	Bob Weiss Lora Werner
Association of Community Ministries	Marlon Cummings
Kentucky Industrial Utilities Customers	Michael Kurtz
Kentucky School Board Association	Ronald Willhite Martha Casher John Nipple
Shelby County Public Schools	Sherman Adams
Kentucky Resources Council	Tom Fitzgerald
Kroger	Tracy McDonald
Community Action Kentucky	Michael Moynahan
Partnership for a Green City	Brent Fryrear
Midwest Energy Efficiency Alliance	Samantha Williams
Louisville Metro Government	Maria Koetter
University of Louisville	Allan Dittmer

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Question No. 36

Witness: Michael E. Hornung

Q-36. Refer to page 32 of Exhibit MEH-2, LG&E and KU DSM Potential Review, of the Hornung Testimony of the Joint Application. Cadmus recommends that the Companies include the Commercial Demand Conservation program, which was launched as a pilot program in 2012, in its 2015-2018 program cycle. Explain whether the Companies are requesting to move this program from its pilot status to that of a regular program through 2018.

A-36. The Companies are requesting to move the Commercial Demand Conservation program from pilot status to a regular, full-scale program funded through 2018.

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Question No. 37

Witness: Michael E. Hornung

Q-37. Refer to pages 32-39 of Exhibit MEH-2, LG&E and KU DSM Potential Review, of the Hornung Testimony of the Joint Application. Explain what recommendations presented by Cadmus for the Home Energy Rebates the Companies are considering and how those recommendations would be implemented, including any expansions or enhancements considered by the Companies.

A-37. Cadmus "Outcomes" on page 39 of MEH-2 contains four recommendations for the Home Energy Rebates program and they are summarized below. The Companies planned action is also provided for each recommendation.

- Increase budget to allow for more participation – The Companies' are requesting budget increases to allow for more participants.
- Continue monitoring program savings and participation while looking to add cost-effective measures as needed – The Companies will continue to review and research possible cost-effective rebate possibilities.
- Consider making rebate application more available through retailers and contractors – The Companies have no plans currently to make the application available through contractors and retailers. While the Companies recognize that the recommendation would make it easier for customers to access the program application, it would not necessarily improve processing time and may layer more cost on application processing by adding back and forth communications to fill information gaps. The program is experiencing tremendous success; therefore additional outlets for application disbursement through retailers or contractors are not necessary.
- Continue monitoring program and implement best practices as necessary to ensure program continues to meet objectives – The Companies will continue assuring the program uses best practices.

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Question No. 38

Witness: Michael E. Hornung

Q-38. Refer to pages 39-48 of Exhibit MEH-2, LG&E and KU DSM Potential Review, of the Hornung Testimony of the Joint Application. Explain what recommendations presented by Cadmus for the Commercial Energy Analysis the Companies are considering and how those recommendations would be implemented, including any expansions or enhancements considered by the Companies.

A-38. Cadmus "Outcomes" on page 48 of MEH-2 contains five recommendations for the Commercial Energy Analysis program and they are summarized below. The Companies' planned action is also provided for each recommendation.

- Integrate assessments, rebates, and new construction program under new program umbrella – The Companies are requesting to do this in the program request. The assessments will no longer be offered by the Companies, but will be incentivized through the program. Rebates will continue to be offered as part of the program and a new construction component is requested in this filing.
- Continue offering onsite audits for customers that install energy efficient projects – Onsite audits will no longer be offered by the Companies, but will be incentivized through the program.
- Offer sophisticated online audit component that directs customers towards potential prescriptive upgrades or to prequalify them for onsite audits as appropriate – The Companies' request includes the addition of an online component that will recommend additional actions necessary to receive incentives.
- Add new construction component to program – The Companies are requesting the addition of a new construction component. Incentives will be based on performance above building code.
- Continue monitoring program and implement best practices as necessary to ensure program continues to meet objectives – The Companies will continue assuring the program uses best practices.

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Question No. 39

Witness: Michael E. Hornung

Q-39. Refer to pages 48-55 of Exhibit MEH-2, LG&E and KU DSM Potential Review, of the Hornung Testimony of the Joint Application. Explain what recommendations presented by Cadmus for the Customer Education and Public Information and Children's Energy Education Programs the Companies are considering and how those recommendations would be implemented, including any expansions or enhancements considered by the Companies.

A-39. Cadmus "Outcomes" on pages 54-55 of MEH-2 contains four recommendations for the Customer Education and Public Information and Children's Energy Education Programs summarized below. The Companies' planned action is also provided for each recommendation.

- Maintain current General Customer Education marketing budget – The marketing budget expires at the end of 2014 and the Companies are requesting to extend the budget through the four-year proposed program plan.
- Implement trade ally training focusing on Kentucky building code standards and on energy-efficient new construction for builders – The Companies are requesting to add this recommendation to the program in this program plan. The training budget is requested as part of the education program because the New Home Construction program is expiring at the end of 2014.
- Maintain current outreach to new school boards to encourage participation but do not increase financial investment – The Companies' request includes continuing outreach to school boards at the same level of historical effort.
- Continue monitoring program and implement best practices as necessary to ensure program continues to meet objectives – The Companies will continue assuring the program uses best practices.

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Question No. 40

Witness: Michael E. Hornung

Q-40. Refer to pages 55-61 of Exhibit MEH-2, LG&E and KU DSM Potential Review, of the Hornung Testimony of the Joint Application. Explain what recommendations presented by Cadmus for the Home Energy Analysis program the Companies are considering and how those recommendations would be implemented, including any expansions or enhancements considered by the Companies.

A-40. Cadmus "Outcomes" on page 60 of MEH-2 contains three recommendations for the Home Energy Analysis program and they are summarized below. The Companies' planned action is also provided for each recommendation.

- Increase outreach focus on performance-based rebate component to improve conversion rate – The Companies plan to increase outreach to customers to inform them of energy-efficiency benefits in recommended work necessary to reach tiered incentives.
- Implement weatherization measure incentive track – The Companies are requesting to add a tier allowing for this incentive. Customers will receive incentives up to $300 for insulation and weatherization improvements.
- Continue monitoring program and implement best practices as necessary to ensure program continues to meet objectives – The Companies will continue assuring the program uses best practices.

Cadmus also provides recommendations in "Program Design Strategy" on pages 60-61 of MEH-2 and contains seven additional recommendations for the Home Energy Analysis program's incentive component that are summarized below. The Companies' planned action is also provided for each recommendation.

- Require an onsite energy audit as a prerequisite of receiving incentives – The Companies plan to continue the requirement of an onsite audit for a customer to receive incentives.
- Continue providing cost-effective direct installation measures as part of the audit – The Companies plan on continuing to provide cost-effective direct installation measures as part of the audit.

- Consider offering incentives for installation of insulation, infiltration reduction, and duct sealing – The Companies are requesting the addition of another tier to allow for customer completion of audit-report-recommended insulation and weatherization measures. Customers are eligible for an incentive up to $300 for this entry-level tier.
- Allow customers to select and hire qualified contractor – Customers will be responsible for selecting a qualified contractor to perform installation services.
- Use mail-in rebate application or allow customer to assign incentive to contractor to reduce customer's invoice – There are no plans currently to allow a customer to assign a rebate to a contractor to reduce a customer's invoice. This would be operationally challenging because the work may be done well before test-out to determine the efficiency improvement. The matter may be further complicated if expected performance improvements are not realized and the rebate is lower than anticipated.
- Conduct outreach and education to insulation contractors to inform them of new program component – The Companies plan to reach out to the contractor community concerning the program.
- Use sample-based verification and quality assurance approach to reduce implementation costs – The Companies plan to use a sample-based verification and quality-assurance approach

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Question No. 41

Witness: Michael E. Hornung

Q-41. Refer to pages 64-68 of Exhibit MEH-2, LG&E and KU DSM Potential Review, of the Hornung Testimony of the Joint Application. Explain what recommendations presented by Cadmus for the Residential Demand Conservation program the Companies are considering and how those recommendations would be implemented, including any expansions or enhancements considered by the Companies.

A-41. Cadmus "Outcomes" on page 68 of MEH-2 contains one recommendation for the Residential Demand Conservation program and it is summarized below. The Companies' planned action is also provided for each recommendation.

- Continue monitoring program and implement best practices as necessary to ensure program continues to meet objectives – The Companies will continue assuring the program uses best practices through process improvements, customer education, and research and development into new technologies.

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Question No. 42

Witness: Michael E. Hornung

Q-42. Refer to pages 72-75 of Exhibit MEH-2, LG&E and KU DSM Potential Review, of the Hornung Testimony of the Joint Application. Explain what recommendations presented by Cadmus for the WeCare program the Companies are considering and how those recommendations would be implemented, including any expansions or enhancements considered by the Companies.

A-42. Cadmus "Outcomes" on pages 74-75 of MEH-2 contains two recommendations for the WeCare program and they are summarized below. The Companies, planned action is also provided for each recommendation.

- Recruit new community action groups to support program activities when necessary to assure program goals are met – The Companies have reached out to community organizations to meet program goals. To this end, the Companies have created a rebate structure to complement many of the existing community organizations' processes.
- Continue monitoring program and implement best practices as necessary to ensure program continues to meet objectives – The Companies will continue assuring the program uses best practices.

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Question No. 43

Witness: Michael E. Hornung

Q-43. Refer to pages 76-82, Table 25 - Residential Measure Gap Analysis, of Exhibit MEH-2, LG&E and KU DSM Potential Review, of the Hornung Testimony of the Joint Application.

a. Explain what measures currently offered by the Companies may be dropped, if any, due to low ranking or low energy savings.

b. Explain what measures not currently offered by the Companies may be considered, if any, due to potential energy savings.

A-43. a. For the residential sector, High-Efficiency Lighting and AC Testing and Tune-up programs are expiring at the end of 2014. Otherwise, all residential measures are expected to continue through 2018.

For the commercial sector, AC Testing and Tune-up is expiring. All other commercial measures are expected to continue through 2018.

b. Nine residential measures listed in the gap analysis are not currently offered by the Companies. There are no plans currently to incentivize any of the nine measures. However, customers participating in the Home Energy Analysis program can implement any or all of the measures as they will provide energy savings and possibly move the customer into a higher-tiered incentive.

Seventeen commercial measures listed in the gap analysis are not currently offered by the Companies. One of the measures, occupancy sensor controls, is currently rebated as part of Commercial Rebates prescriptive component. There are no plans to offer prescriptive rebates for the other measures, but all measures that provide demand savings are eligible for rebate as part of the customer component of the Commercial Rebate program.

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Question No. 44

Witness: Michael E. Hornung

Q-44. Refer to page 47, Exhibit MEH-3, EE Potential Study, of the Hornung Testimony of the Joint Application, which states:

> While this study indicates that the Company will exhaust the discretionary residential and commercial electric energy-efficiency potential in less than six years, small amounts of non-discretionary savings from new construction and replacement of existing equipment upon burnout will remain. While Cadmus only considered current equipment costs and existing technologies, potential declines in the cost of energy-efficient existing energy-efficiency technologies and emergence of new technologies could provide additional opportunities for further savings.

Also, refer to page 8, Exhibit MEH-3, EE Potential Study, of the Hornung Testimony of the Joint Application, which states, "the Company should consider the findings of this study as indicative of actual long-term potential and, to the extent possible, revisit the underpinning data and assumptions of the study periodically." Explain what recommendations from the findings and conclusions of this study the Companies are considering.

A-44. The results of the study indicate that 67% of the estimated medium case 20-year achievable potential is in the residential sector and 33% in the commercial sector. The balance is in line with current program offerings, and the Companies will continue planning to a similar balance. The potential study also highlighted the aggressive but successful energy-efficiency programs that have historically been offered by the Companies. Energy-efficiency potential is expected to be exhausted within five years and it will be necessary for the Companies to continue monitoring technology costs and other variables that will affect the cost-effectiveness of energy-efficiency measures, such as changes in regulation or avoided costs. Please see also the Companies' response to Question No. 17 concerning the context of the quote referenced in the data request above.

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Question No. 45

Witness: David E. Huff

Q-45. Refer to the Direct Testimony of David E. Huff ("Huff Testimony") of the Joint Application. In paragraph 17, page 9 of the Cover Letter, it states, "For reasons explained in the testimony of David E. Huff, the Companies did not apply the California tests to the Advanced Metering Systems." Provide where that explanation is found.

A-45. Please refer to numbered items 1 and 2 of Exhibit MEH-1 section 7.1.

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Response to the Commission Staff's First Information Request
Dated February 17, 2014

Case No. 2014-00003

Question No. 46

Witness: David E. Huff

Q-46. Refer to page 1, Exhibit DEH-1 of the Huff Testimony of the Joint Application, which states, "Average customer electric bills are low as compared to the region and nationally, which makes customer reported expectations for engaging in time-varying rates unrealistic and unlikely to be realized." Also, refer to page 2, Exhibit DEH-1 of the Huff Testimony of the Joint Application, which states, "While customers responding to a Smart Meter survey indicated interest in time-varying rate options, their expectations for savings on the monthly bill are high - $25 per month or 24 percent savings — when compared to actual pilot program savings of $7.58 over the four month summer period, or $1.89 per month (1.4 percent bill savings)." Explain what may have led to customers' unrealistic savings as to monthly bills and kWh usage.

A-46. The Smart Meter survey question to which the quotation from Exhibit DEH-1 refers is below:

> Q11 How much would you need to save on your <u>monthly</u> electric bill in order to change your behavior, such as adjusting your thermostat to sometimes less-comfortable settings, changing the time of day you use appliances, etc.?
>
> 1. Save $5 / month
> 2. Save $10 / month
> 3. Save $15 / month
> 4. Save $20 / month
> 5. Save $25 / month
> 98. Other (specify) _____

Therefore, the quote from Exhibit DEH-1 is attempting to communicate that customers have expressed a need for a relatively high incentive—about $25 of savings per month—to change their energy-consuming behaviors. The quote is not intended to communicate that customers actually believe they will receive that level of savings from time-varying rates or advanced-meter usage.

The Companies do not have survey information concerning their customers' savings expectations for time-varying rates or advanced-meter usage, and therefore do not have any information concerning how customers came to have their expectations.

LOUISVILLE GAS AND ELECTRIC COMPANY
KENTUCKY UTILITIES COMPANY

Response to the Commission Staff's First Information Request
Dated February 17, 2014

Case No. 2014-00003

Question No. 47

Witness: Robert M. Conroy/David E. Huff

Q-47. Explain how the proposals in the Joint Application, with their proposed costs, benefit the customers, both those affected and unaffected by the proposals.

A-47. The Commission requires utilities to use the California Standard Practice Manual cost-benefit tests to demonstrate that their DSM/EE portfolios provide benefits commensurate with their costs: "Any new DSM program or change to an existing DSM program shall be supported by … [t]he results of the four traditional DSM cost-benefit tests [Participant, Total Resource Cost, Ratepayer Impact, and Utility Cost tests]."[3] A score of one or greater on any California test means the proposed program or portfolio of programs should create more benefits than costs with respect to the test's measurements of costs and benefits. The Companies' Proposed DSM/EE Program Plan is a program portfolio with scores exceeding one in three California tests, and with a score close to one in the remaining test. The Commission has historically approved the Companies' DSM/EE portfolios when a portfolio of programs has scores exceeding one in three California tests, and has a score close to one in the remaining test.[4]

More concretely, the Proposed DSM/EE Program Plan will provide benefits to all of the Companies' customers, regardless of their participation in DSM programs. Reduced energy consumption, and therefore reduced fuel consumption, creates relative savings for all customers. The Proposed DSM/EE Program Plan will also create significant demand reductions. By helping to reduce demand relative to what it would have been absent DSM programs, DSM may help reduce the relative frequency of building new units or the relative size of such units.

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[3] *In the Matter of the Joint Application of the Members of the Louisville Gas and Electric Company Demand-Side Management Collaborative for the Review, Modification, and Continuation of the Collaborative, DSM Programs, and Cost Recovery Mechanism*, Case No. 1997-00083, Order at 20 (April 27, 1998).

[4] *In the Matter of: Joint Application of Louisville Gas and Electric Company and Kentucky Utilities Company for Review, Modification, and Continuation of Existing, and Addition of New, Demand-Side Management and Energy-Efficiency Programs*, Case No. 2011-00134, Order (Nov. 9, 2011); *In the Matter of the Joint Application of Louisville Gas and Electric Company and Kentucky Utilities Company Demand-Side Management for the Review, Modification, and Continuation of Energy-Efficiency Programs and DSM Cost Recovery Mechanisms*, Case No. 2007-00319, Order (Mar. 31, 2008).