

Meet Future Energy Needs Through Cost Effective Demand Side Management



July 31, 2012

Demand Side Management's Role in Resource Planning

Presentation Objective:

Review / Discuss the process for integrating DSM into the overall resource planning process

What This Presentation Includes:

- Changes in Regulatory Framework Since the last IRP
- EAI's achievement of Energy Efficiency activities to date
- Benefit Cost Analysis Changes
- The process used to identify the cost effective DSM opportunity for the Entergy Arkansas, Inc. (EAI) service area
- High level results of DSM potential study
- The role DSM can play in meeting future resource needs for Entergy Arkansas
- Next steps and framework needed to move forward

Demand Side Management's Role in Resource Planning

Presentation Objective Continued:

What This Presentation Doesn't Include:

- Detailed DSM program design

What is Demand Side Management (DSM)

Demand Side Management (DSM) is a set of actions, activities or measures that impacts energy use, energy use patterns or customer behavior as it relates to energy consumption. DSM includes:

- ***Conservation***: Activities / actions that reduce energy use through changes in life style and the reduction in energy consumption through activities such as increasing thermostat settings on air conditioning equipment in the summer, lower thermostat settings on water heaters, turning off lights when not in use, etc. Conservation activities typically require little to no investment by the customer to reduce energy usage.
- ***Energy Efficiency***: Activities / actions that typically require an investment to achieve lower energy usage, such as, improving insulation levels, sealing heating and cooling ducts, weather stripping, caulking, the purchase of more efficient appliances etc.
- ***Demand Response***: Activities or actions that result in changes to energy use patterns that may or may not reduce overall energy usage. Demand response programs are utilized to lessen customer usage / demand during peak periods or those times when the cost to supply energy is more expensive. Programs in this area include Time of Use (TOU) rates, load control programs such as AC or pool pump switches, etc.

Regulatory Framework

Arkansas' Regulatory Framework has Improved Significantly Since the last IRP.

EAI is allowed to recover

- Program cost concurrently with true up after each year is completed
- Lost contribution to fixed costs (LCFC) concurrently with true up each year of program completion and adjusted for independent evaluation.
- Performance incentives based upon completed year and with independent evaluated results

EAI has Regulatory Guidance for

- Program/ Portfolio comprehensiveness, including a portfolio comprehensiveness Checklist and targets¹
- Benefits and Objectives within the Rules for Conservation and Energy Efficiency Programs, and
- All energy savings and demand reduction results are adjusted based upon an independent and robust Evaluation Measurement & Verification (“EM&V”)

The Regulatory Framework has Implemented and Approved:

- Self- Direct Options for Customers
- A Technical Resource Manual (“TRM”) and updating process
- Conservation and Energy Efficiency Rules (“CEE”)
- Collaboratives for ongoing energy efficiency development

1) Subject to adjustments associated with Large Commercial and Industrial Customer Self-Directed Option.

Regulatory Framework

- Annual Commission Mandated Annual Targets, as a percent of 2010 Weather Adjusted MWh Sales

- 2011: 0.25% = 52,706 MWh
- 2012: 0.50% = 105,413 MWh
- 2013: 0.75% = 158,119 MWh

- Adjustments to Annual Targets Associated with Commercial and Industrial Self – Direct Option

	2012	2013
Impact to Overall 2012 and 2013 Targets	8.3%	10.2%
Impact to Commercial and Industrial Customer Classes	12.2%	15.3%

- Commission has ordered an 80% Net-To-Gross (“NTG”) Multiplier² for all programs but CFL and those are now at 63% NTG. The gross energy savings EAI is estimating on a portfolio basis to meet the Commission targets are as follows:

- The gross goals in 2011 is 65,883 MWh
- The gross goals for 2012 is 147,292 MWh
- The gross goals for 2013 is 215,554 MWh
- The three year gross goal of program plans are 428,729 MWh or 2% of 2010 weather adjusted sales.

2) 80% NTG was limited to 2011 plan. In 2011 a settlement was approved that reduced the CFL lighting NTG from 0.8 to 0.63. In 2012, all program NTGS are to be evaluated based upon Arkansas achievements and through an independent EM&V Consultant. The EM&V Consultant’s work is reviewed by Independent Evaluator Monitor reporting to the General Staff of the APSC

Regulatory Framework

Seven criteria (Check-List) were established in the Comprehensiveness Order on December 10, 2010 (Docket No. 08-144-U, Order No. 17). The Check List is to help the commission decide whether annual EE programs are comprehensive. The seven additional criteria are as follows:

- Provide, either directly or through identification and coordination the education, training, marketing, or outreach needed to address market barriers;
- Include adequate budgetary, management, and program delivery resources to plan, design, implement, oversee and evaluate EE programs;
- Reasonably address all major end-uses;
- Address to the maximum extent reasonable the needs of customers at one time, in order to avoid cream-skimming and lost opportunities;
- Take advantage of opportunities to address the needs of targeted customer sectors (schools, large retail stores, agricultural users, or restaurants) or to leverage non-utility program resources such as state or federal tax incentives, rebates, or lending programs;
- Enable the delivery of all achievable, cost-effective EE within a reasonable period and maximize net benefits to customers and the utility; and
- Have adequate EM&V procedures to support program management and improvement, calculation of energy, demand and revenue impacts, and resource planning decisions

Regulatory Framework

The Commission also established both formal and informal collaboratives

- Self Direct Collaborative was completed in 2011 with rules for commercial and industrial customers the provision to apply for a self direct certificate and opt out of utility programs and cost recovery riders.
- EM&V Collaborative in 2011 was instrumental in obtaining Commission approval for rules for independent Evaluation, Measurement and Verification (“EM&V”), established a Technical Resource Manual (“TRM”), identified an Independent Evaluation Monitor (“IEM”) that reports to the APSC General Staff and is responsible for managing the TRM, Filing summary reports of the independent EM&V consultants and assisting with continued decision making of the continuing EM&V Collaborative.
- More informally directed the utilities to work to identify ways to modify programs to deliver inter-utility and inter fuel programs to customers and report on results.

EAI Energy Efficiency Achievements

- Existing Approved Programs
 - EAI filed a new Program plan in March of 2011 in to meet the Commission mandated targets and check list.
 - On June 30, 2011 the APSC approved 16 programs through the end of 2013.
 - For the remainder of 2011 EAI was busy identifying implementing consultants, database providers, EM&V consultants, negotiating contracts for new programs and expanding EAI staff to manage these expanded programs.

EAI Energy Efficiency Achievements

Evolution from Quick Start to Comprehensive Programs

2010
\$3.9 Million

RESIDENTIAL PROGRAMS

2013
\$19 Million

Quick Start Program	Target Market
Residential Energy Solutions	Single family homes
CFL	All residential
AC Tune-Up	All homes with Central AC
AR Weatherization	Low Income

Corresponding Comprehensive Program & New Programs	Target Market
→ Home Energy Solutions	Single family homes
→ Lighting & Appliances	All residential
→ Residential Cooling Solutions	All homes with Central AC
→ AR Weatherization	Low Income
ENERGY STAR New Homes	New construction
Multifamily & Mobile Home Energy Solutions	Multifamily & mobile homes
Benchmarking	All residential
Direct Load Control	All homes with Central AC

2010
\$6.9 Million

C&I PROGRAMS

2013
\$33 Million

Quick Start Program	Target Market
Large C&I Energy Solutions	100 kW or larger facilities
Large C&I Standard Offer	100 kW or larger facilities
Small Commercial Energy Solutions	<100 kW facilities
AC Tune-Up	<100 kW facilities
CitySmart	City government
Irrigation Pump Load Control	Agriculture

Corresponding Comprehensive Program & New Programs	Target Market
→ C&I Prescriptive	100 kW or larger facilities
→ C&I Custom	100 kW or larger facilities
→ Small Commercial Direct Install	<100 kW facilities
→ Small Commercial Cooling Solutions	<100 kW facilities
→ CitySmart	City government
→ Irrigation Pump Load Control	Agriculture
Agriculture Energy Solutions	Farms & Agribusiness

EAI Energy Efficiency Achievements

- Budgets and First Year Basis cost of existing program plans.
 - 2010 actual spending³ was \$10,713,000 or \$0.24/kWh on First Year Basis without NTG
 - 2011 budgeted spending is \$18,685,000 or \$0.28/kWh on First Year Basis without NTG, \$0.35/kWh on First Year Basis with 0.8 NTG adjustment included.
 - 2012 budgeted spending is \$ 39,109,000 or \$27/kWh on First Year Basis without NTG, \$0.34/kWh on First Year Basis with 0.8 NTG adjustment included
 - 2013 budgeting spending is \$ 52,566,000 or \$0.24/kWh on First Year Basis without NTG, \$0.30/kWh on First Year Basis with 0.8 NTG adjustment included
- Program Costs are Competitive Nationally
- Programs are expanding with decreasing the cost per kWh

3) 2010 values do not include a 5% budget for independent EM&V nor cost of database (Around \$4 Million dollars for the three year period).

EAI Energy Efficiency Achievements Program Cost are Competitive Nationally

Investor Owned Utility Administered Program Spending, 2009

EAI's proposed programs are also very cost-effective vis-a-vis EAI's peers; as is EAI's financial commitment.

Investor Owned Utility State	Program Cost (\$Million)	Program Cost as % Revenue	\$/kWh
Pacific Gas & Electric Co CA	\$523.1	4.7%	\$0.99
Interstate Power and Light Co IA	\$60.0	4.5%	\$1.40
Massachusetts Electric Co MA	\$90.2	4.3%	\$0.76
Southern California Edison Co CA	\$404.9	3.4%	\$0.57
United Illuminating Co CT	\$29.9	3.3%	\$1.65
Idaho Power Co ID	\$34.8	3.3%	\$0.88
Entergy Arkansas Inc. (2013) AR	\$52.6	3.2%	\$0.32
Puget Sound Energy Inc. WA	\$70.7	3.2%	\$0.37
Baltimore Gas & Electric Co MD	\$87.6	3.1%	\$1.21
Western Massachusetts Elec Co MA	\$12.4	3.1%	\$0.99
The Narragansett Electric Co RI	\$27.1	3.0%	\$0.87
Northern States Power Co - Minnesota MN	\$75.8	2.2%	\$1.66
Nevada Power Co NV	\$50.0	2.0%	\$0.33
PacifiCorp OR	\$80.8	1.9%	\$0.52
Avista Corp WA	\$17.6	1.8%	\$0.51
MidAmerican Energy Co IA	\$42.4	1.7%	\$0.89
Florida Power & Light Co FL	\$186.1	1.6%	\$2.08
Public Service Co of Colorado CO	\$43.9	1.6%	\$9.71
Connecticut Light & Power Co CT	\$53.3	1.6%	\$0.86
Progress Energy Florida Inc FL	\$80.3	1.5%	\$2.02
Tampa Electric Co FL	\$32.2	1.5%	\$2.55
Kansas City Power & Light Co MO	\$18.8	1.4%	\$1.68
Public Service Co of NH NH	\$15.5	1.4%	\$0.86
Public Service Co of NM NM	\$12.1	1.2%	\$0.50
Alabama Power Co AL	\$56.3	1.0%	\$3.90
Arizona Public Service Co AZ	\$25.6	0.8%	\$0.24
Consumers Energy Co MI	\$22.2	0.6%	\$0.41
Duke Energy Ohio Inc OH	\$13.3	0.5%	\$0.59
Union Electric Co MO	\$13.7	0.5%	\$1.30
Progress Energy Carolinas Inc NC	\$21.0	0.5%	\$3.99
Consolidated Edison Co-NY Inc NY	\$31.4	0.4%	\$1.92
Georgia Power Co GA	\$28.7	0.4%	\$1.30

Notes:

Source: U.S. EIA Form 861 Data, 2009

\$/kWh is on a "first year" basis. That is, annual program spend divided by incremental savings achieved in the same year. Average=\$1.50/kWh and Median=\$0.94/kWh.

Average program cost as % revenue=2.04% and median=1.68%

Results of EAI Energy Efficiency Efforts

- 2011 reported evaluated savings energy savings was 41,958 MWH or 79.6% of APSC target.
- Sum of evaluated energy reductions since 2009 energy efficiency programs have delivered 134,277 MWh of sales reduction or 0.64% of 2010 sales.
- Demand Reduction is 58 MWs. 9.4 MWs of demand reduction is due to demand response programs and 48.6 is due to energy efficiency programs.
- The amount of incremental cost associated with energy efficiency since 2009 is \$ 29.4 Million and \$0.22 per kWh on a First Year Cost basis.

Benefit Cost Changes

Portfolio Benefit Cost Analysis of Three Year Plan

Benefit Cost Analysis Result For Comprehensive Portfolio Filed in March of 2011

Test	Results	
Participant Cost	NPV (all participants)	\$ 104,913,427
	Benefit-cost ratio	1.93
	NPV (average participant)	\$39
Ratepayer Impact Measure (RIM)	NPV	\$ 45,064,288
	Benefit-cost ratio	1.20
	Lifecycle revenue impact per kWh	-\$0.000166
	2011 revenue impact per kWh	\$0.000920
	2012 revenue impact per kWh	\$0.000922
	2013 revenue impact per kWh	\$0.000835
Total Resource Cost (TRC)	NPV	\$ 125,137,685
	Benefit-cost ratio	1.89
	Levelized cost per kWh	\$0.076
Program Administrator Cost (PAC)	NPV	\$ 174,516,441
	Benefit-cost ratio	2.89
	Levelized cost per kWh	\$0.049

Benefit Cost Changes

Updated Portfolio Benefit Cost Analysis

2012 Updated Benefit cost analysis of Programs filed in March 2011.

- Updates include of 2011 achieved results
- updated avoided capacity and energy cost, and
- more discrete application of avoided cost based upon time of day avoided cost.

Test	Results	
Participant Test (PC)	NPV	115,214
	Benefit Cost Ratio	2.05
	Levelized \$ per kWh	0.09
Ratepayer Impact Test (RIM)	NPV	72,894
	Benefit Cost Ratio	1.50
	Levelized \$ per kWh	0.09
Total Resource Cost Test (TRC)	NPV	52,083
	Benefit Cost Ratio	1.31
	Levelized \$ per kWh	0.09
Program Administrator Test (PAC)	NPV	129,927
	Benefit Cost Ratio	2.45
	Levelized \$ per kWh	0.09

Process to Identify Cost Effective Achievable DSM At Entergy Arkansas - Potential Study: Objectives & Deliverables

- In June 2012 (final report pending), ICF completed an updated DSM Potential Study for the period 2012-2031 assessing the potential for EAI. The results of which provide a basis for long-term planning. The ICF Study considered a Low, Reference and High Level of spending on a full range of potential Arkansas DSM programs and associated DSM peak load and energy reduction.
-
- Study objective: Develop high level, long-run achievable DSM program potential estimates suitable for inclusion in Entergy's IRP analysis.
 - *Achievable program potential* is the level of savings assumed to be reasonably achievable in the course of the planning horizon, given market barriers that may impede customer participation in utility programs. Achievable potential varies depending on program incentive structure, marketing efforts, energy costs, and other market factors, as well the regulatory treatment of the utility's programs
 - 3 scenarios: Low, Reference & High
- EAI Contracted with ICF International to Provide the Following Deliverables
 - Program loadshapes
 - Program cost estimates
 - Study report

Process to Identify Cost Effective Achievable DSM At Entergy Arkansas - Potential Study: Interpreting the estimates

- The purpose of the study was to provide to EAI loadshapes and costs representing a reasonable set of long-run assumptions about achievable DSM program potential.
- The long-run nature of the study means the estimates are not designed to be used for:
 - Program planning, or
 - Utility goal setting

Some key differences between long-run potential study & short-run DSM program plan

Study Activity/ Characteristic	Long-Run (IRP, 10-20 years)	Short-Run (Program Plan, 1-3 years)
Measure Review	Expansive/broad	Less expansive/more specific than in long-run study
Measure Analysis	Analyze universe of representative measures that could be implemented over long run.	Analyze currently offered measures, plus changes/additions per codes & standards, emerging technologies, and EM&V results.
Goal of Final Measure List	Groups of measures included should be reasonably representative of savings and costs within end-uses, over the long-run.	Measures should generally have well-understood performance in the short-run (exceptions for items like emerging technologies/pilots).
Program Review	Broad and representative	More likely to include currently offered programs with limited expansions, or contractions.
Program Design	Very high level/representative	Very specific
Program Costs	Estimated long-run average costs. Broad cost categories (incentive & non-incentive). Long-run average costs tend to be lower than short-run planning costs, especially for studies covering immature markets.	Based on current program costs. More specific cost categories (incentive, admin, marketing, training, EM&V, etc.).
Participation Model	Based more on measure and market economics, taking into account recent program performance (if available).	Based more on current program performance, or recent performance of similar programs in comparable jurisdictions, taking into account measure and market economics.
Uncertainty of Estimates	High, especially in territories with immature programs.	Low to medium depending on program maturity.

Process to Identify Cost Effective Achievable DSM At Entergy Arkansas – Potential Study ICF Overview

- **ICF International**
 - A global consultancy based in the Washington area with offices around the U.S., Canada, U.K., Belgium, Brazil, China, India, Russia
 - 4500 professionals, about 1700 of whom work on energy and environment, 350 full time energy-efficiency professionals
 - More than 20 years of public/private energy efficiency experience
 - One of the leading U.S. energy efficiency delivery companies:
 - Currently implement about 130 state/utility EE programs around the U.S.
 - Supported Federal programs including, ENERGY STAR® for over 10 years
 - Performed over 30 potential studies and program plans for utilities and state agencies

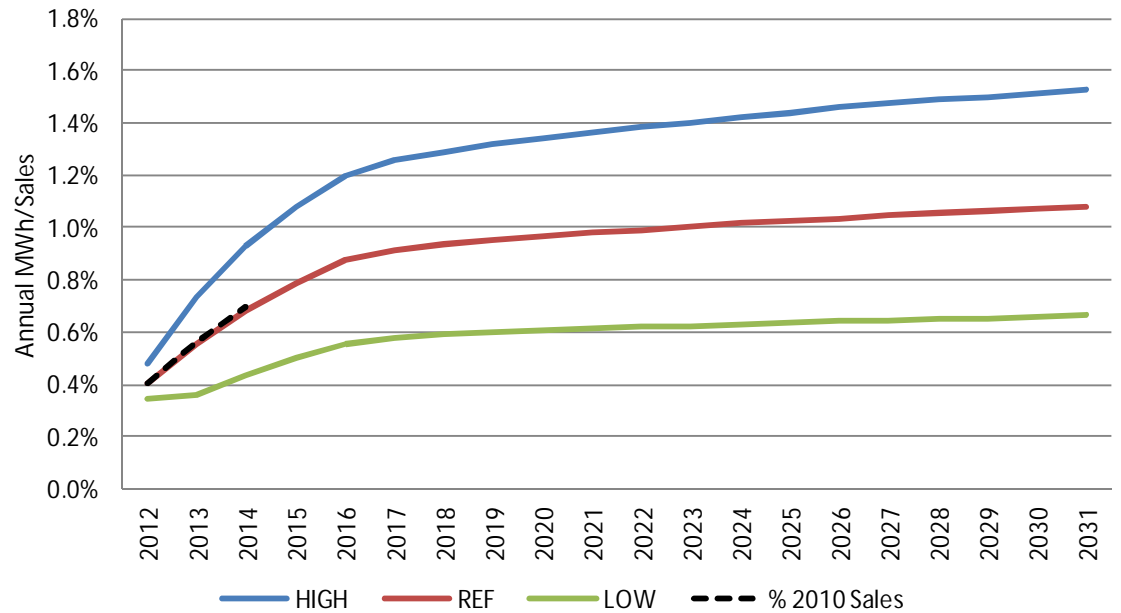
Process to Identify Cost Effective Achievable DSM At Entergy Arkansas - Potential Study: Interpreting the estimates – uncertainty

- All long-run economic forecasts are subject to high levels of uncertainty.
- Medium to high uncertainty for energy efficiency estimates, especially given evolving nature of fuel costs and the economy.
- Very high uncertainty for demand response estimates given uncertainty about AMI deployment.
- Used best data available at the time of the analysis.
- Assumes EAI continues receiving favorable regulatory treatment for programs (cost recovery, LCFCs, shareholder incentive).

Bottom-up study approach

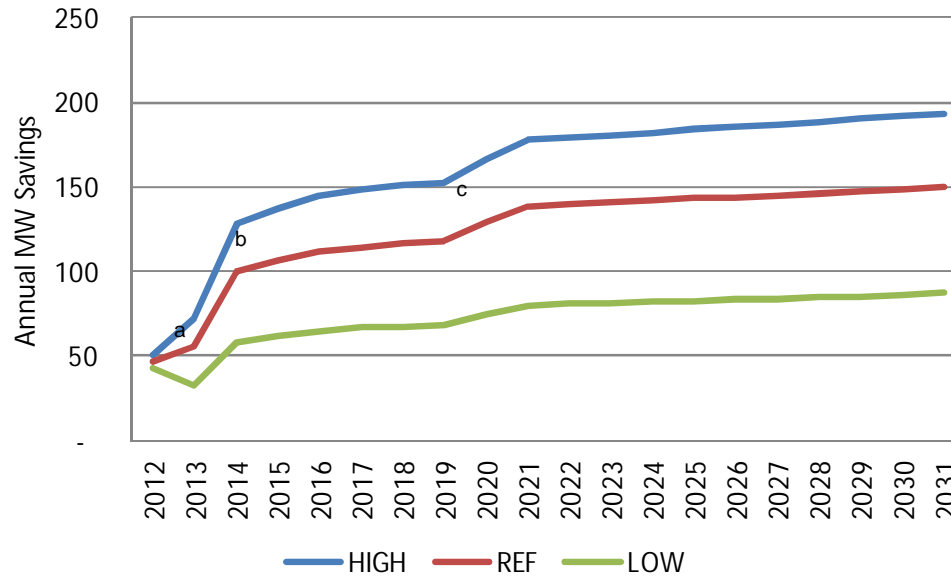
- 1. Data collection.** Utility data, baseline customer and building data, measure data and program data. Development and sourcing of non-deemed measure savings estimates and characteristics.
- 2. Baseline characterization.** Electricity use by sector by building type and end-use. Utility sales forecast.
- 3. Measure analysis.** Measure cost-effectiveness testing. Consideration of non-cost-effective measures for inclusion.
- 4. Program analysis.** Grouping measures into programs. Program cost and participation estimation. Calculation of reference case achievable potential estimates.
- 5. Scenario analysis.** Development of high and low achievable potential estimates.
- 6. Benchmarking.** Comparison of estimates from this study to those from other recent Southern studies.

Cost Effective Achievable DSM At Entergy Arkansas - Potential Study: Annual net MWh savings estimates as % sales



INC. SAVINGS/SALES	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2031
HIGH	0.5%	0.7%	0.9%	1.1%	1.2%	1.3%	1.3%	1.3%	1.3%	1.4%	1.5%
REF	0.4%	0.6%	0.7%	0.8%	0.9%	0.9%	0.9%	1.0%	1.0%	1.0%	1.1%
LOW	0.3%	0.4%	0.4%	0.5%	0.6%	0.6%	0.6%	0.6%	0.6%	0.6%	0.7%
% 2010 Sales	0.4%	0.6%	0.7%								

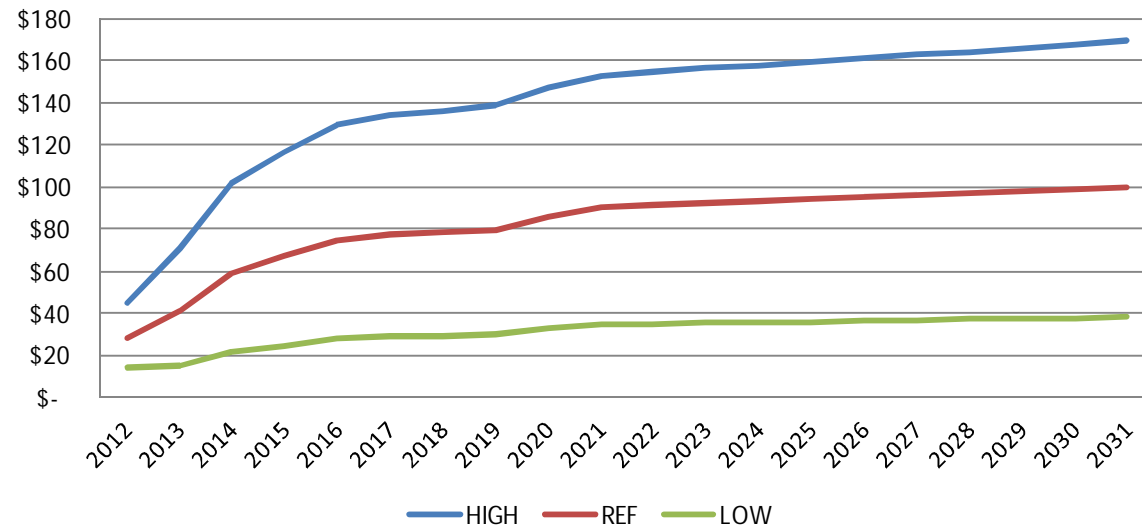
Cost Effective Achievable DSM At Entergy Arkansas - Potential Study: Annual net MW savings estimates



ANN. MW Savings	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2031
HIGH	51	72	129	138	145	148	151	153	167	178	193
REF	46	55	100	107	112	115	117	118	129	138	150
LOW	42	33	58	62	65	66	68	68	75	80	87

- a. Leveling-off of new Agricultural Irrigation Load Control enrollments
- b. Programs *not* included in current EAI portfolio added (except per below)
- c. Commercial dynamic rates added (consistent with AMI schedule)

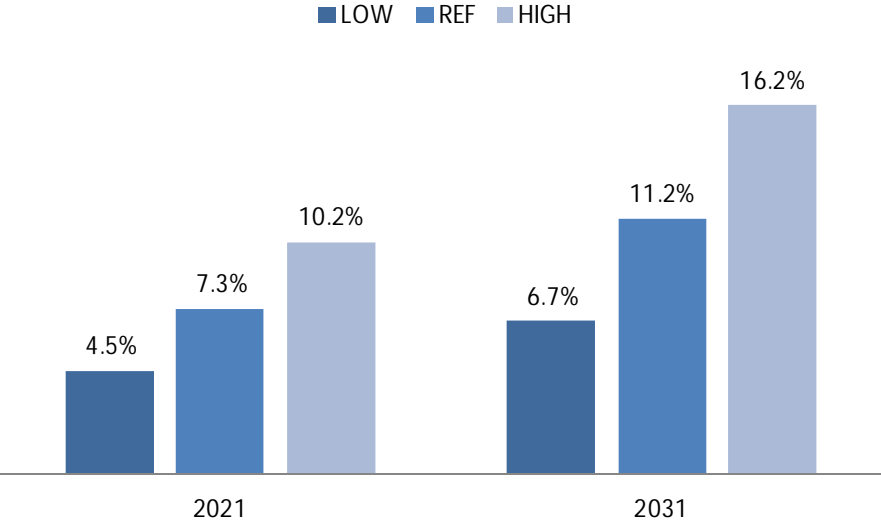
Cost Effective Achievable DSM At Entergy Arkansas - Potential Study: Program cost estimates (Real 2011\$)



Portfolio cost-effectiveness test result estimates

- Total Resource Cost (TRC) Test = 2.2
- Program Administrator Cost (PAC) Test = 2.9
- Participant Cost Test (PCT) = 3.9
- Ratepayer Impact Measure(RIM) Test = 0.9

**Cost Effective Achievable DSM At Entergy Arkansas - Potential Study:
Cumulative net MWh savings estimates as % of sales (10 & 20 year estimates)**



Cost Effective Achievable DSM At Entergy Arkansas - Potential Study: Benchmarking– comparison of this study’s estimates to those studies from other recent Southern studies

Study	Primary Author	Study Commissioned or Sponsored by	Year Released	Study Time Horizon	Methodology	Type of Achievable Potential	10 Year Savings Estimate	20 Year Savings Estimate
Entergy Arkansas (this study)	ICF International	Entergy, Corp.	2012	20 Year	Bottom-up	Achievable Low	4.5%	6.7%
						Achievable Reference	7.3%	11.2%
						Achievable High	10.2%	16.2%
Tennessee Valley Authority	Global Energy Partners	TVA	2011	20 Year	Bottom-up	Achievable Low	5.1%	10.6%
						Achievable High	9.8%	19.8%
Missouri Statewide	KEMA	MO PSC	2011	10 Year	Bottom-up	Three Year Payback Achievable Net	3%	N/A
						One Year Payback Achievable Net	7%	N/A
Missouri Statewide	ACEEE	ACEEE	2011	10 Year	Top-Down	Achievable program	6.4%	N/A
Arkansas Statewide	ACEEE	ACEEE	2011		Top-Down	"Medium" Case Achievable	9.8% by 2025	
U.S. National Study, Southern Region	Electric Power Research Institute	EPRI	2009	20 Year	Bottom-up	Maximum Achievable	10.0%	11.1%
						Realistic Achievable	4.4%	8.1%
Review of Southern EE Studies	Georgia Tech	Georgia Tech	2009	N/A	Meta-Study	Maximum Achievable	1.2% per year	
						Realistic Achievable	0.9% per year	

*Savings estimates are cumulative unless otherwise noted. Some studies did not develop 10 and 20 year savings estimates, rather estimates were developed that are one or two years shorter or longer in time frame. For the above table approximations were made for the purposes of benchmarking. All studies shown are long-term in nature and therefore subject to high levels of uncertainty.

Estimates from this study are most comparable to those from the other bottom-up studies (EPRI, TVA, KEMA). Estimates from this study are similar, if somewhat higher, than estimates from these studies.

Process to Identify Cost Effective Achievable DSM At Entergy Arkansas - Potential Study: Measures

- Key sources
 - AR deemed savings
 - ICF building simulations
 - FERC (some Demand Response measures)
- Many non-deemed measures added. Key additions include:
 - Retrocommissioning
 - Advanced new buildings
 - Lighting measures, particularly LEDs
 - Mini-split ACs
 - Industrial

Process to Identify Cost Effective Achievable DSM At Entergy Arkansas - Potential Study: Measure Types Analyzed & Included

	Measure Type							
	New Construction		Retrofit		Replace-on-Burnout		Totals	
	Analyzed	Included	Analyzed	Included	Analyzed	Included	Analyzed	Included
Non-Residential Measures	96	36	777	182	76	38	949	256
% Sector Total	10%	14%	82%	71%	8%	15%		27%
Residential Measures	164	34	378	213	216	130	758	377
% Sector Total	22%	9%	50%	56%	28%	34%		50%
Grand Total	260	70	1155	395	292	168	1707	633
% Grand Total	15%	11%	68%	62%	17%	27%		37%

Process to Identify Cost Effective Achievable DSM At Entergy Arkansas - Potential Study: Measure Analysis

Measure Included?	Measure TRC >= 1?		Total
	No	Yes	
No	934	140	1075
Yes	58	575	633
Grand Total	992	715	1707

Measure TRC test = $PV(\text{avoided costs over measure life}) \div PV(\text{measure incremental costs})$

Passing TRC test value = 1.0

Measures passing TRC but not included (140)

- Majority of measure applications not cost-effective (cool roofs)
- Duplicative measures (2" v. 3" hot water heater wrap)
- Measures targeting converted residences

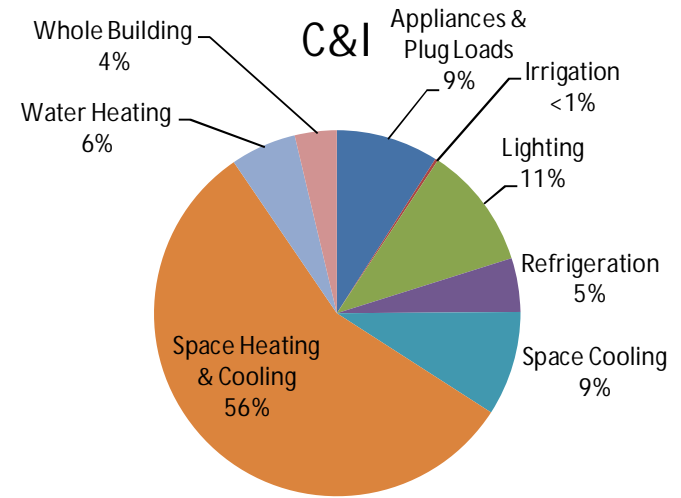
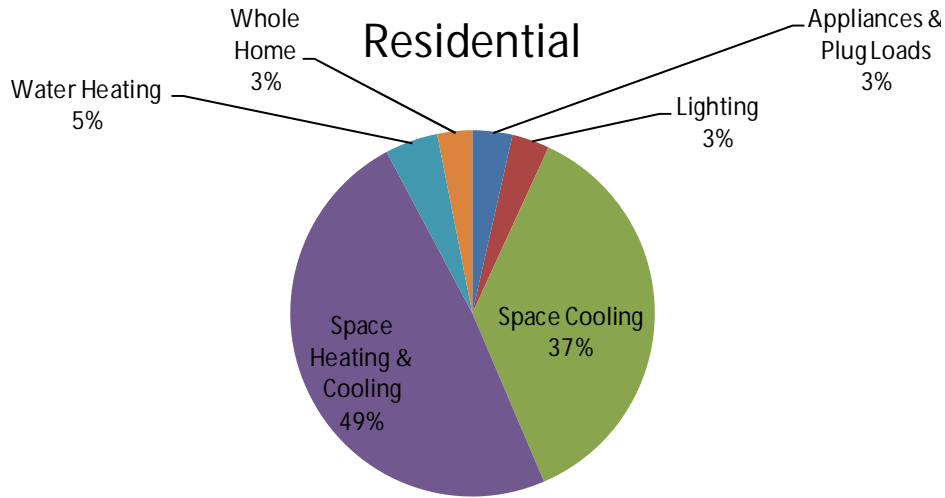
Process to Identify Cost Effective Achievable DSM At Entergy Arkansas - Potential Study: Measure Analysis – cont.

Measure Included?	Measure TRC >= 1?		Total
	No	Yes	
No	934	140	1075
Yes	58	575	633
Grand Total	992	715	1707

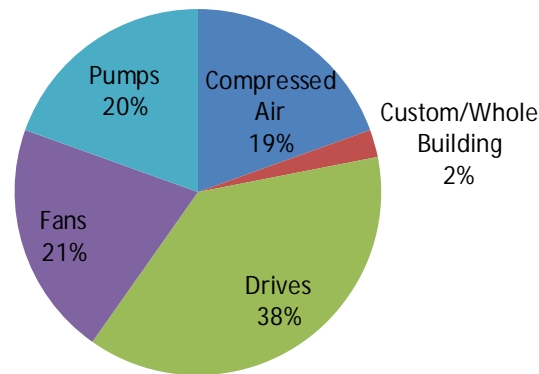
Measures not passing TRC but included (58)

- Majority of measure applications cost-effective (attic knee wall insulation)
- Policy measures (weatherization)
- Declining costs (LEDs)

Process to Identify Cost Effective Achievable DSM At Entergy Arkansas - Potential Study: Distribution of Measure Types Analyzed, by Sector & End Use



Industrial



Process to Identify Cost Effective Achievable DSM At Entergy Arkansas - Potential Study: Programs modeled

ICF then bundled the measures into programs that resemble the EAI's comprehensive programs.

Those that were not similar to EAI's Comprehensive Programs were bundled separately.

	Modeled Program Name	Relevant Sector(s)	Type	EAI Comprehensive Program?
1	Residential Lighting and Appliances	Residential	EE	Yes
2	Residential Cooling Solutions	Residential	EE	Yes
3	Home Energy Solutions	Residential	EE	Yes
4	Energy Efficiency Arkansas	Residential	EE	Yes
5	AR Weatherization	Residential	EE	Yes
6	Benchmarking	Residential	EE	Yes
7	ENERGY STAR Homes	Residential	EE	Yes
8	Mobile Homes	Residential	EE	Yes
9	Multifamily	Residential	EE	Yes
10	C&I Prescriptive	C&I	EE	Yes
11	City Smart	Government	EE	Yes
12	Commercial Custom	C&I	EE	Yes
13	Small Commercial	Small Commercial	EE	Yes
14	Agricultural Energy Solutions	Agricultural	EE	Yes
15	Direct Load Control	Residential	DR	Yes
16	Agricultural Irrigation Load Control	Agricultural	DR	Yes
17	Commercial New Construction	Commercial	EE	No
18	Retrocommissioning	Commercial	EE	No
19	Industrial	Industrial	EE	No
20	Interruptible Rate	Large C&I	DR	No
21	Enabled Pricing (Non-Res)	Commercial	DR	No
22	Non-Enabled Pricing (Non-Res)	Commercial	DR	No
23	Enabled Pricing (Res)	Residential	DR	No
24	Non-Enabled Pricing (Res)	Residential	DR	No

Process to Identify Cost Effective Achievable DSM At Entergy Arkansas - Potential Study: Estimating Participation – Two Approaches

- Market Adoption Curve Approach (Approach A)
 - Combines research on customers' financial motives with research on the diffusion of innovative technologies in the marketplace.
 - Usually applied to programs where payback acceptance is important to customer decision making, e.g.,
 - Mass Market programs (e.g., Residential Lighting)
 - Replace-on-burnout measures
 - Small to mid sized retrofit
- Program Experience Approach (Approach B)
 - Usually applied programs where payback acceptance is not as important to customer decision making, or where ICF program data or experience is more accurate than the market adoption curve approach.
 - Large retrofit/whole building (e.g., Residential Solutions, Retrocommissioning)
 - New home construction
 - Custom

Process to Identify Cost Effective Achievable DSM At Entergy Arkansas - Potential Study: Participation approach by program

	Modeled Program Name	Relevant Sector(s)	Type	EAI Comprehensive Program?	Participation Approach
1	Residential Lighting and Appliances	Residential	EE	Yes	A
2	Residential Cooling Solutions	Residential	EE	Yes	A
3	Home Energy Solutions	Residential	EE	Yes	B
4	Energy Efficiency Arkansas	Residential	EE	Yes	B
5	AR Weatherization	Residential	EE	Yes	B
6	Benchmarking	Residential	EE	Yes	B
7	ENERGY STAR Homes	Residential	EE	Yes	B
8	Mobile Homes	Residential	EE	Yes	A
9	Multifamily	Residential	EE	Yes	A
10	C&I Prescriptive	C&I	EE	Yes	A
11	City Smart	Government	EE	Yes	B
12	Commercial Custom	C&I	EE	Yes	B
13	Small Commercial	Small Commercial	EE	Yes	A
14	Agricultural Energy Solutions	Agricultural	EE	Yes	A
15	Direct Load Control	Residential	DR	Yes	B
16	Agricultural Irrigation Load Control	Agricultural	DR	Yes	B
17	Commercial New Construction	Commercial	EE	No	A
18	Retrocommissioning	Commercial	EE	No	B
19	Industrial	Industrial	EE	No	A
20	Interruptible Rate	Large C&I	DR	No	B
21	Enabled Pricing (Non-Res)	Commercial	DR	No	B
22	Non-Enabled Pricing (Non-Res)	Commercial	DR	No	B
23	Enabled Pricing (Res)	Residential	DR	No	B
24	Non-Enabled Pricing (Res)	Residential	DR	No	B

Process to Identify Cost Effective Achievable DSM At Entergy Arkansas - Potential Study: Scenarios

Variable	Scenario		
	Low	Reference	High
Incentive Simple Payback Target (Years)	3	2	1
Incentive Min. (% Incremental Cost)	10%	25%	50%
Incentive Max. (% Incremental Cost)	50%	75%	100%

Process to Identify Cost Effective Achievable DSM At Entergy Arkansas - Potential Study: Other program inputs

- Costs
 - Long-run
 - EAI filed programs
 - ICF program experience
- Net-To-Gross
 - 0.80 for each program, per APSC order

Process to Identify Cost Effective Achievable DSM At Entergy Arkansas - Potential Study: Utility assumptions

- Average avoided energy and capacity costs and discount rate provided by Entergy SPO.
- EAI 2011 retail rates escalated at same rate as avoided costs.
- Gas savings included for electric measures, where applicable. No “gas” measures included.
- Advanced meter deployment schedule.
- MISO benefits were included in the Potential Study. The Benefit Cost Analysis was adjusted to reflect a cost reduction in the Reserve Capacity cost.

Process to Identify Cost Effective Achievable DSM At Entergy Arkansas - Potential Study: Treatment of codes & standards

Residential

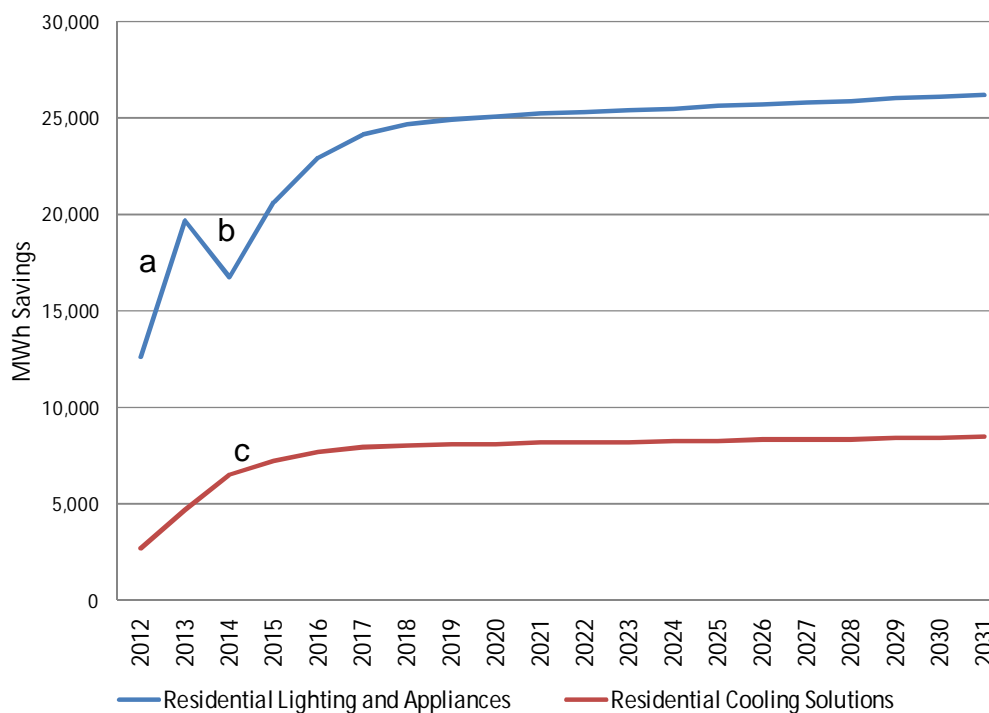
- Deemed savings
- IECC 2003* for non-deemed retrofit & new construction measures
- EISA 2007
 - Lighting: Changed CFL and lighting baselines according to EISA/DOE schedule (2012, 2013 or 2014 depending on bulb wattage)
 - CACs & HPs: Changed baseline from SEER 13 to SEER 14 in 2015

Commercial

- Deemed savings (assumes ASHRAE 90.1-2001*)
- ASHRAE 90.10-2010 for non-deemed retrofit & new construction measures

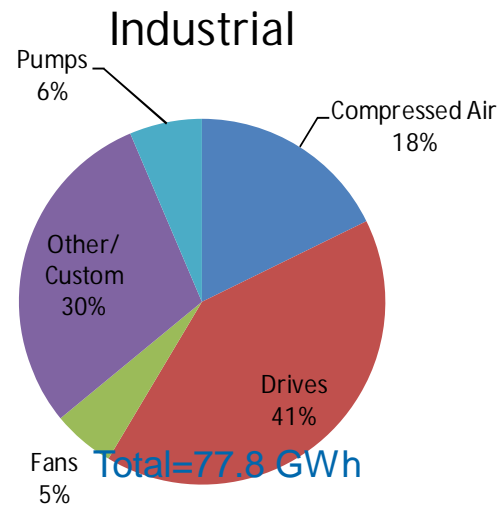
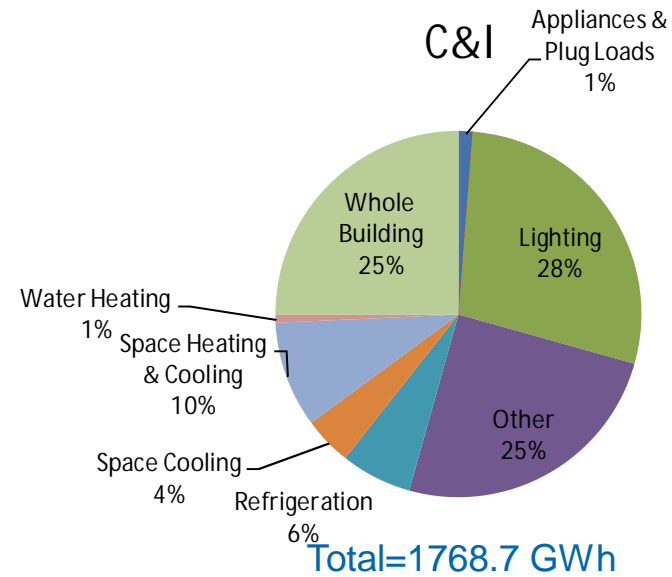
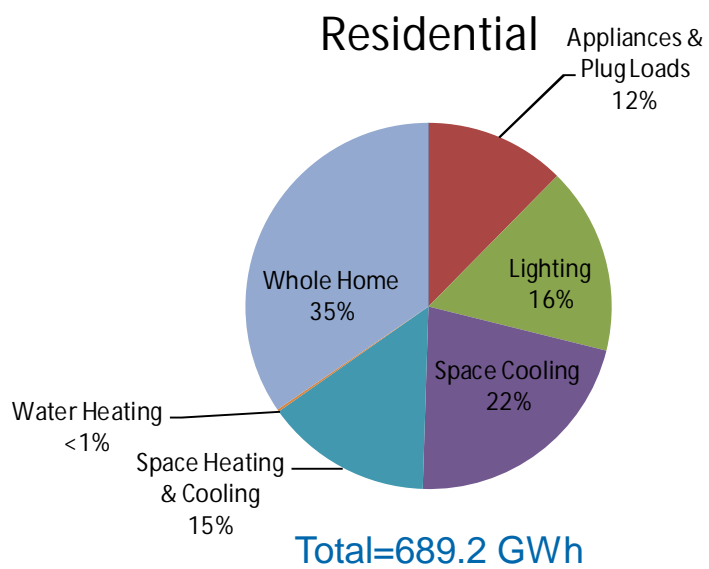
*Adopted AR building energy code at time of study

Process to Identify Cost Effective Achievable DSM At Entergy Arkansas - Potential Study: Treatment of codes & standards – cont.



- a. 27W CFL with 100W Florescent baseline phased-out
23W CFL with 75W Florescent baseline phased-out
- b. 11W CFL with 40W Florescent baseline phased-out
15W CFL with 60W Florescent baseline phased-out
Program continues with CFLs and LEDs with EISA compliant Halogen baselines
- c. Shift from SEER 13 to SEER 14 baseline for residential ACs and heat pumps has a comparatively smaller impact on program trajectory

Cost Effective Achievable DSM At Entergy Arkansas - Potential Study: Distribution of net 2031 cumulative electric savings, by sector & end use, reference case



Cost Effective Achievable DSM At Entergy Arkansas - Potential Study: Annual Net MWh savings estimates by program, Reference Case

			Incremental Electricity Savings - MWh										
Type	Sector	Program Name	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2031
EE	Residential	Residential Lighting and Appliances	12,588	19,691	16,771	20,621	22,931	24,098	24,642	24,912	25,073	25,194	26,185
EE	Residential	Residential Cooling Solutions	2,728	4,732	6,489	7,249	7,719	7,925	8,023	8,079	8,119	8,153	8,471
EE	Residential	Home Energy Solutions	2,863	3,832	4,809	6,372	9,691	9,728	9,765	9,802	9,839	9,877	10,259
EE	Residential	Energy Efficiency Arkansas	-	-	-	-	-	-	-	-	-	-	-
EE	Residential	AR Weatherization	2,832	2,843	2,854	2,864	2,875	2,886	2,897	2,908	2,919	2,930	3,044
EE	Residential	Benchmarking	15,030	7,543	7,572	7,601	7,630	7,659	7,688	7,717	7,747	7,776	8,078
EE	Residential	ENERGY STAR Homes	1,376	1,658	2,219	3,675	5,589	5,610	5,632	5,653	5,675	5,696	5,917
EE	Residential	Mobile Homes	493	856	1,173	1,361	1,449	1,488	1,506	1,516	1,524	1,530	1,590
EE	Residential	Multifamily	963	1,671	2,291	2,658	2,830	2,905	2,941	2,962	2,976	2,989	3,105
EE	Non-Residential	C&I Prescriptive	20,385	35,823	49,757	58,469	63,071	65,609	67,296	68,664	69,927	71,166	84,776
EE	Non-Residential	City Smart	6,256	8,519	10,877	11,109	11,347	11,589	11,837	12,090	12,348	12,612	15,581
EE	Non-Residential	Commercial Custom	14,747	22,593	30,768	31,425	32,096	32,782	33,482	34,198	34,928	35,675	44,073
EE	Non-Residential	Small Commercial	1,814	3,138	4,292	4,965	5,272	5,398	5,449	5,472	5,484	5,493	5,553
EE	Non-Residential	Agricultural Energy Solutions	498	879	1,226	1,447	1,568	1,638	1,687	1,729	1,768	1,806	2,232
EE	Residential	Commercial New Construction	-	-	-	1,967	3,463	4,820	5,676	6,136	6,395	6,573	7,999
EE	Non-Residential	Retrocommissioning	-	-	-	1,907	3,893	5,962	6,087	6,214	6,344	6,477	7,972
EE	Non-Residential	Industrial	2,203	3,811	5,212	6,029	6,402	6,555	6,618	6,646	6,661	6,671	6,744
DR	Residential	Direct Load Control	-	-	-	-	-	-	-	-	-	-	-
DR	Non-Residential	Agricultural Irrigation Load Control	-	-	-	-	-	-	-	-	-	-	-
DR	Non-Residential	Interruptible Rate	-	-	-	-	-	-	-	-	-	-	-
DR	Non-Residential	Enabled Pricing (Non-Res)	-	-	-	-	-	-	-	-	-	-	-
DR	Residential	Enabled Pricing (Res)	-	-	-	-	-	-	-	-	-	-	-
DR	Residential	Non-Enabled Pricing (Res)	-	-	-	-	-	-	-	-	-	-	-
DR	Non-Residential	Non-Enabled Pricing (Non-Res)	-	-	-	-	-	-	-	-	-	-	-
Total Portfolio			84,776	117,590	146,308	169,718	187,825	196,654	201,227	204,698	207,728	210,617	241,580

Cost Effective Achievable DSM At Entergy Arkansas - Potential Study: Annual Net MW savings estimates by program, Reference Case

Program Name	Incremental Electricity Savings - MW										
	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2031
Residential Lighting and Appliances	3.0	5.1	5.8	6.9	7.4	7.7	7.8	7.9	7.9	8.0	8.3
Residential Cooling Solutions	1.0	1.8	2.5	2.8	2.9	3.0	3.0	3.1	3.1	3.1	3.2
Home Energy Solutions	1.3	1.7	2.1	2.8	4.2	4.3	4.3	4.3	4.3	4.3	4.5
Energy Efficiency Arkansas	-	-	-	-	-	-	-	-	-	-	-
AR Weatherization	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.9
Benchmarking	5.2	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.7	2.7	2.8
ENERGY STAR Homes	0.4	0.5	0.7	1.1	1.7	1.7	1.7	1.7	1.7	1.7	1.8
Mobile Homes	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
Multifamily	0.1	0.2	0.3	0.3	0.4	0.4	0.4	0.4	0.4	0.4	0.4
C&I Prescriptive	4.7	8.3	11.5	13.4	14.4	15.0	15.3	15.5	15.8	16.0	18.4
City Smart	0.8	1.1	1.5	1.5	1.5	1.5	1.6	1.6	1.6	1.7	2.1
Commercial Custom	2.7	4.1	5.6	5.7	5.8	6.0	6.1	6.2	6.4	6.5	8.0
Small Commercial	0.7	1.2	1.6	1.8	1.9	2.0	2.0	2.0	2.0	2.0	2.0
Agricultural Energy Solutions	0.1	0.3	0.4	0.4	0.5	0.5	0.5	0.5	0.5	0.5	0.7
Commercial New Construction	-	-	-	0.4	0.6	0.9	1.1	1.1	1.2	1.2	1.5
Retrocommissioning	-	-	-	0.3	0.7	1.1	1.1	1.1	1.1	1.2	1.4
Industrial	0.3	0.5	0.7	0.8	0.8	0.9	0.9	0.9	0.9	0.9	0.9
Direct Load Control	11.3	18.1	27.2	27.3	27.5	27.6	27.7	27.8	27.9	28.0	29.1
Agricultural Irrigation Load Control	13.5	9.0	9.2	9.4	9.6	9.8	10.0	10.2	10.4	10.6	13.1
Interruptible Rate	-	-	24.7	24.7	24.7	24.7	24.8	24.8	24.8	24.9	25.1
Enabled Pricing (Non-Res)	-	-	-	-	-	-	-	-	-	4.5	5.5
Enabled Pricing (Res)	-	-	0.2	0.4	0.7	0.9	1.3	1.5	8.8	11.0	11.5
Non-Enabled Pricing (Res)	-	-	0.1	0.2	0.3	0.4	0.6	0.7	4.0	5.0	5.2
Non-Enabled Pricing (Non-Res)	-	-	2.6	2.7	2.7	2.8	2.9	2.9	3.0	3.1	3.8
Total Portfolio	46.0	55.3	100.1	106.6	112.1	114.6	116.5	117.9	129.5	138.2	150.3

Cost Effective Achievable DSM At Entergy Arkansas - Potential Study: Program costs, Reference Case

Type	Sector	Program Name	Annual Program Cost Estimates (\$Millions)										
			2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2031
EE	Residential	Residential Lighting and Appliances	\$3.3	\$5.7	\$7.4	\$8.6	\$9.2	\$9.4	\$9.6	\$9.6	\$9.7	\$9.7	\$10.1
EE	Residential	Residential Cooling Solutions	\$1.5	\$2.6	\$3.5	\$4.0	\$4.2	\$4.4	\$4.4	\$4.4	\$4.5	\$4.5	\$4.7
EE	Residential	Home Energy Solutions	\$3.1	\$4.1	\$5.1	\$6.8	\$10.4	\$10.4	\$10.4	\$10.5	\$10.5	\$10.6	\$11.0
EE	Residential	Energy Efficiency Arkansas	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
EE	Residential	AR Weatherization	\$1.8	\$1.8	\$1.8	\$1.8	\$1.8	\$1.8	\$1.8	\$1.8	\$1.8	\$1.8	\$1.9
EE	Residential	Benchmarking	\$1.1	\$0.5	\$0.5	\$0.5	\$0.5	\$0.5	\$0.5	\$0.5	\$0.6	\$0.6	\$0.6
EE	Residential	ENERGY STAR Homes	\$0.6	\$0.8	\$1.0	\$1.7	\$2.6	\$2.6	\$2.6	\$2.7	\$2.7	\$2.7	\$2.8
EE	Residential	Mobile Homes	\$0.2	\$0.3	\$0.4	\$0.4	\$0.5	\$0.5	\$0.5	\$0.5	\$0.5	\$0.5	\$0.5
EE	Residential	Multifamily	\$0.4	\$0.7	\$0.9	\$1.1	\$1.2	\$1.2	\$1.2	\$1.2	\$1.2	\$1.2	\$1.3
EE	Non-Residential	C&I Prescriptive	\$5.6	\$9.8	\$13.6	\$15.9	\$17.1	\$17.7	\$18.1	\$18.4	\$18.7	\$19.0	\$21.9
EE	Non-Residential	City Smart	\$1.6	\$2.2	\$2.9	\$2.9	\$3.0	\$3.0	\$3.1	\$3.2	\$3.2	\$3.3	\$4.1
EE	Non-Residential	Commercial Custom	\$3.8	\$5.9	\$8.0	\$8.1	\$8.3	\$8.5	\$8.7	\$8.9	\$9.1	\$9.2	\$11.4
EE	Non-Residential	Small Commercial	\$0.9	\$1.6	\$2.2	\$2.6	\$2.8	\$2.8	\$2.8	\$2.9	\$2.9	\$2.9	\$2.9
EE	Non-Residential	Agricultural Energy Solutions	\$0.2	\$0.4	\$0.6	\$0.7	\$0.7	\$0.8	\$0.8	\$0.8	\$0.8	\$0.8	\$1.0
EE	Residential	Commercial New Construction	\$0.0	\$0.0	\$0.0	\$0.5	\$0.8	\$1.1	\$1.3	\$1.4	\$1.5	\$1.5	\$1.8
EE	Non-Residential	Retrocommissioning	\$0.0	\$0.0	\$0.0	\$0.2	\$0.4	\$0.6	\$0.6	\$0.6	\$0.6	\$0.6	\$0.8
EE	Non-Residential	Industrial	\$0.7	\$1.3	\$1.7	\$2.0	\$2.1	\$2.2	\$2.2	\$2.2	\$2.2	\$2.2	\$2.2
DR	Residential	Direct Load Control	\$1.1	\$1.7	\$2.6	\$2.6	\$2.6	\$2.6	\$2.6	\$2.6	\$2.6	\$2.6	\$2.7
DR	Non-Residential	Agricultural Irrigation Load Control	\$2.2	\$1.5	\$1.5	\$1.5	\$1.6	\$1.6	\$1.6	\$1.7	\$1.7	\$1.7	\$2.1
DR	Non-Residential	Interruptible Rate	\$0.0	\$0.0	\$3.8	\$3.8	\$3.8	\$3.8	\$3.8	\$3.8	\$3.8	\$3.8	\$3.9
DR	Non-Residential	Enabled Pricing (Non-Res)	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$2.3	\$2.8
DR	Residential	Enabled Pricing (Res)	\$0.0	\$0.0	\$0.1	\$0.2	\$0.3	\$0.4	\$0.6	\$0.8	\$4.3	\$5.4	\$5.6
DR	Residential	Non-Enabled Pricing (Res)	\$0.0	\$0.0	\$0.0	\$0.1	\$0.1	\$0.2	\$0.3	\$0.3	\$1.9	\$2.4	\$2.5
DR	Non-Residential	Non-Enabled Pricing (Non-Res)	\$0.0	\$0.0	\$0.8	\$0.8	\$0.8	\$0.8	\$0.8	\$0.9	\$0.9	\$0.9	\$1.1
		Total Portfolio	\$28.1	\$40.8	\$58.4	\$66.8	\$74.8	\$77.0	\$78.6	\$79.7	\$85.6	\$90.3	\$99.7

*Real 2011 \$

Cost Effective Achievable DSM At Entergy Arkansas - Potential Study: Cost-effectiveness estimates, Reference Case

Type	Program Name	TRC Test	PAC Test	RIM Test	PCT Test
EE	Residential Lighting and Appliances	1.8	2.4	0.7	4.2
EE	Residential Cooling Solutions	1.1	1.2	0.6	3.0
EE	Home Energy Solutions	1.0	1.5	0.6	2.5
EE	Energy Efficiency Arkansas				
EE	AR Weatherization	1.3	1.3	0.5	4.6
EE	Benchmarking	1.6	1.6	0.6	4.3
EE	ENERGY STAR Homes	1.4	3.5	0.7	3.0
EE	Mobile Homes	1.2	1.4	0.5	3.9
EE	Multifamily	1.2	1.4	0.5	3.6
EE	C&I Prescriptive	2.4	3.0	0.9	4.5
EE	City Smart	1.6	2.4	0.8	2.9
EE	Commercial Custom	1.9	3.1	0.9	3.2
EE	Small Commercial	1.6	1.9	0.7	3.0
EE	Agricultural Energy Solutions	1.3	1.8	0.7	2.6
EE	Commercial New Construction	3.9	5.3	1.0	7.2
EE	Retrocommissioning	4.4	6.2	1.0	7.6
EE	Industrial	1.7	2.1	0.8	3.3
DR	Direct Load Control	6.5	7.4	7.4	0.8
DR	Agricultural Irrigation Load Control	4.9	4.3	1.0	N/A*
DR	Interruptible Rate	27.5	7.7	1.2	N/A*
DR	Enabled Pricing (Non-Res)	1.6	2.3	0.9	2.5
DR	Enabled Pricing (Res)	2.6	2.4	2.4	1.1
DR	Non-Enabled Pricing (Res)	1.9	2.5	2.5	N/A*
DR	Non-Enabled Pricing (Non-Res)	<u>4.5</u>	<u>4.0</u>	<u>1.0</u>	<u>N/A*</u>
	Total Portfolio	2.2	2.9	0.9	3.9

*Assumed participant costs are zero.

Cost Effective Achievable DSM At Entergy Arkansas - Potential Study: Demand Response Programs

DR Measure/Program Type	Existing Program	Sectors Modeled/Covered				
		Residential	Small Commercial	Large Commercial	Industrial	Agricultural
Agricultural Irrigation Load Control	X					X
Direct Load Control	X	X				
Dynamic Pricing without Enabling Technology		X	X	X		
Dynamic Pricing with Enabling Technology		X	X	X		
Interruptible Rate				X	X	

- Existing DR program savings and participation informed by EAI Comprehensive Plan
- Other DR program assumptions informed by 2009 FERC National DR Study
- All DR programs assumed to be “opt-in”
- DR analysis did include reduced reserve margins associated with MISO benefits

Cost Effective Achievable DSM At Entergy Arkansas - Potential Study: AMI Schedule

Total cumulative meter deployments												
	Existing											
	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
EAI	800	3,703	6,606	11,392	21,165	35,824	55,370	74,916	89,575	479,214	753,023	757,495

Yellow shading indicates the years in which each OpCo engaged in full deployment of AMI
 Full Deployment: includes all customer classes except the top 150 Industrials and Cogens
 Years before full deployment include targeted deployments primarily to the Residential Customer class (for simplifying purposes use the residential class only)

Subject to very high uncertainty

- Smart meters are another tool in a utility’s continuing effort to reduce costs to customers and to improve service reliability
- Entergy is not planning widespread deploying of smart meters
- Pilot tests to validate technologies and economics
 - Pilot demand response programs
 - Arkansas - irrigation load control pilot for farmers
 - Beginning very limited, targeted deployments (0-5%)
 - Hard to read, frequent disconnection/reconnection
 - Considering further tests on voltage control
 - Considering developing and offering a pre-pay program
 - Voluntary option for customers to assist with monthly budgeting
 - Eliminates security deposits and late fees

EAI 2012 IRP Development DSM Assumptions

- The Potential Study began in October of 2011.
- Best available information was used to value the energy efficiency potential
 - 2010 cost of capital information.
 - 2011 load forecast
- All the energy efficiency savings beginning in 2007 and concluding in 2011 are included in the base case and projected energy savings based upon Commission approved programs through 2012 are included in the base case.
 - 2012 Energy savings – 128,055 MWH
 - 2012 Demand reductions – 50.7 MW
- Evaluation of DSM in the 2012 EAI IRP
The DSM assumption will be modeled as one of five potential portfolios; the other four portfolios assume supply side resource additions. Each portfolio will be evaluated within each of the four IRP scenarios and the total cost of service for each portfolio will be compared to find the lowest cost portfolio option. This methodology allows for demand side resources to be compared alongside supply side resources for long-term planning of EAI's portfolio mix.

EAI 2012 IRP Development DSM Assumptions

- **Proposed Assumptions for 2012 EAI IRP**
For EAI, which has on-going DSM efforts, the assumptions for long-term planning (IRP) are consistent with programs in EAI's current DSM portfolio assuming a Reference Level of potential as contemplated in the ICF Study.
- The following charts show the underlying DSM assumptions and provide an annual view of DSM Potential and cost for EAI. Note that 2012 DSM Potential is shown at zero because that potential has already been reflected in the four load forecasts developed for the EAI IRP.

EAI 2012 IRP Development : DSM Programs

ICF Potential Study – Six Bundled Loadshapes

Bundle	Type	Programs
1	DR	Interruptible Rate Direct Load Control Agricultural Irrigation Load Control
2	EE	Retrocommissioning Commercial New Construction Energy Star Homes Commercial Custom C&I Prescriptive
3	DR	Non-enabled Dynamic Pricing Enabled Dynamic Pricing
4	EE	City Smart Residential Lighting and Appliances Industrial
5	EE	Small Commercial Agricultural Energy Solutions Benchmarking Home Energy Solutions
6	EE	Mobile Homes Multifamily Arkansas Weatherization Residential Cooling Solutions



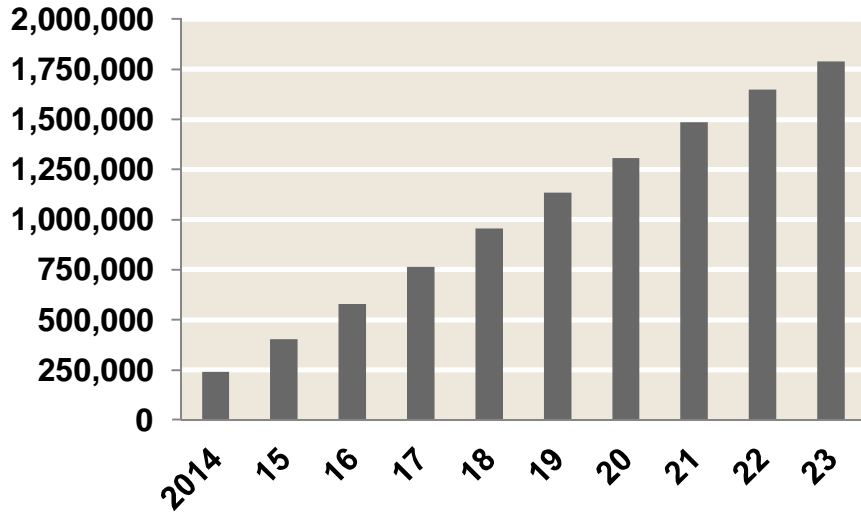
IRP DSM Portfolio – Single Aggregated Loadshape

Type	Programs
DR	Interruptible Rate Direct Load Control Agricultural Irrigation Load Control
EE	Non-enabled Dynamic Pricing Enabled Dynamic Pricing Retrocommissioning Commercial New Construction Energy Star Homes Commercial Custom C&I Prescriptive City Smart Residential Lighting and Appliances Industrial Small Commercial Agricultural Energy Solutions Benchmarking Home Energy Solutions Mobile Homes Multifamily Arkansas Weatherization Residential Cooling Solutions

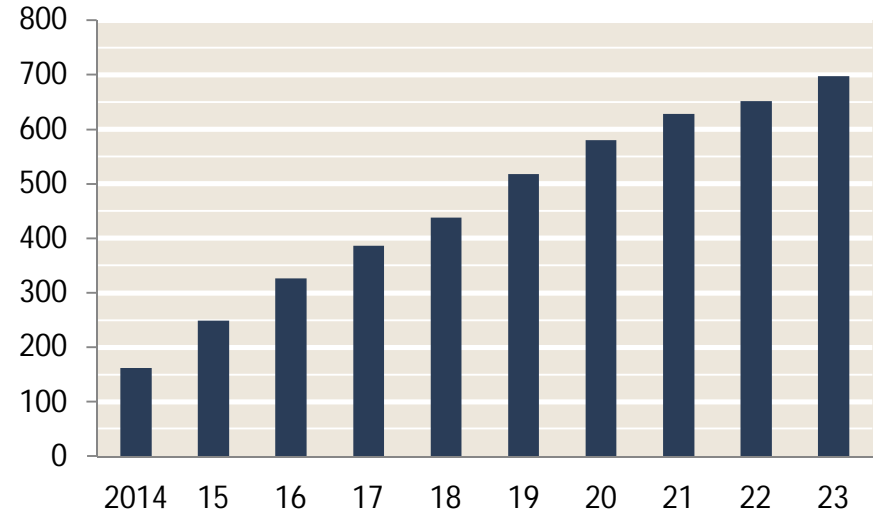
Hourly DSM impacts in 2012 of the ICF Potential Study are subtracted from the hourly DSM impacts in all subsequent years of the EAI IRP DSM load shape.

EAI 2012 IRP Development : Incremental Utility-Sponsored DSM Potential Forecast

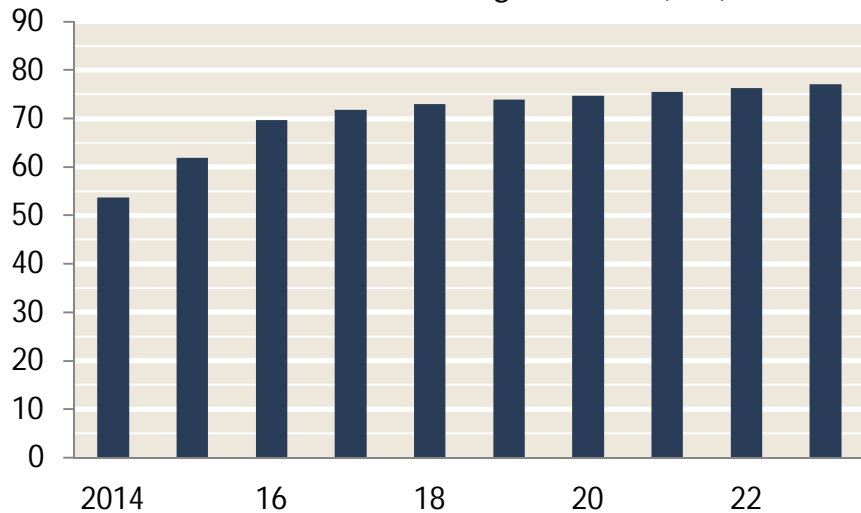
*Annual Energy Savings (MWh)**



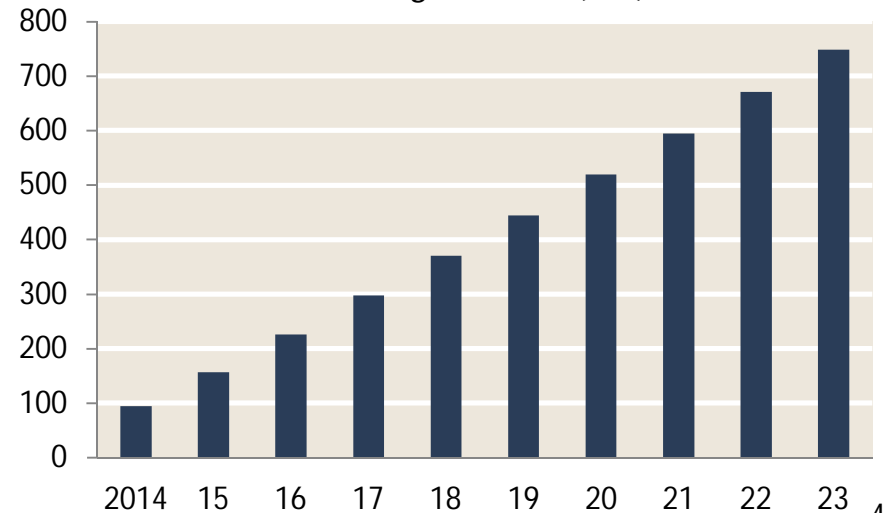
Peak Reduction (MW)*



Annual DSM Program Cost (\$M)



Cumulative Program Cost (\$M)



*In order to obtain specified benefit in a given year spending from 2012 through that year is required.

EAI 2012 IRP Development : Miscellaneous

- The remaining driver in the achievement of the energy efficiency potential is tariff driven savings that must have new technology installed to communicate such energy cost with customers and measure the results of customer usage.
- Presently Entergy Arkansas is thinking AMI technology is the preferred technology, and Entergy Arkansas has matured in our thinking of the roll out of AMI technology to a more measured point of view to ensure the technology can be proven to deliver promised results.
- None of the energy efficiency potential study demand reduction associated with the AMI technology was included in the IRP.

Energy Efficiency and the Future at EAI

- ASPC Targets have not been established beyond 2013. Based upon Commission orders EAI anticipates annual Energy Efficiency targets to be at least 0.75% of annual sales post NTG adjustments.
- Avoided cost have decreased significantly resulting in several of the existing programs to become non-cost effective, though the portfolio of programs continue to be cost effective.
- EAI is anticipating to file a portfolio of programs for 2014 through 2016 sometime in 2013. EAI is awaiting EM&V results to inform next portfolio filing; however, with information known today, EAI would plan to file the same programs with some modifications for measure changes and more coordination with over lapping gas utilities, minor adjustments in marketing and increased budgets to meet the potential 0.75% per year reduction targets.

NEXT STEPS

- Continue with EAI Suite of comprehensive programs, have independent Evaluation, Measurement and Verification completed and capture lessons learned to improve next phase of DSM implementation for 2014 through 2016.
- Continue to move forward with the development and implementation of enabling technologies (AMI / Smart Grid) at a measured pace to ensure technology can deliver energy efficiency results.

APPENDIX

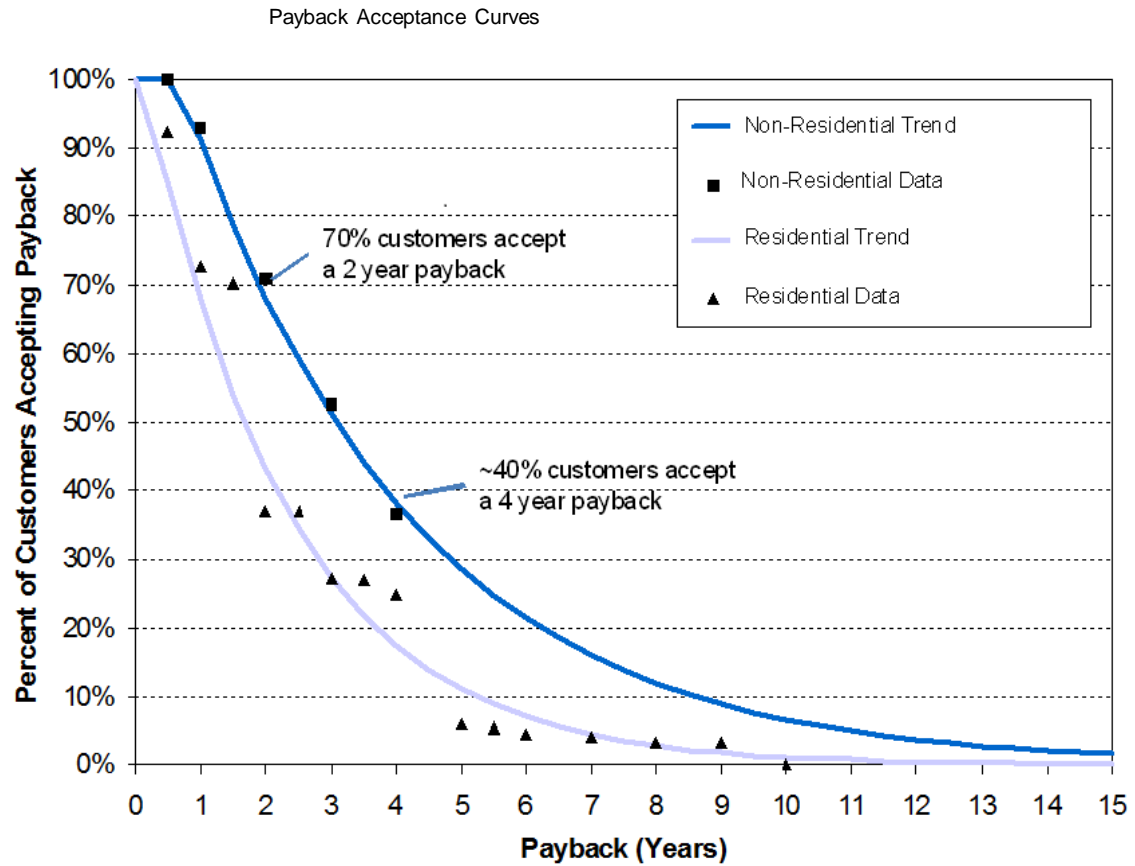
Participation Approach A – illustrative example

Measure Information

Program Name	ENERGY STAR Air Conditioning
Measure ID	16
Sector	Residential
Sub-Sector	SingleFamily&Duplex
End Use	HVAC
Technology Type	AC/Gas Heat
Efficient Measure	Central AC Replacement
Efficient Measure Definition	SEER 15
Base Measure Definition	SEER 13
Unit Name	ton

Incentive Calculations	Value	Source/Calculation
Residential retail electricity rate-kWh	\$0.09	Utility
Residential retail capacity charge-kW	\$0.00	Utility
Residential retail gas rate-therm	\$0.85	Utility
Base Measure Life	15	Deemed Savings
Total Incremental Cost	\$238.00	Deemed Savings
Annual kWh Savings	417.33	Deemed Savings
Annual kW Summer-Peak Savings	0.12	Deemed Savings
Annual Gas Savings	0	Deemed Savings
Annual Bill Savings	\$37.91	Annual Energy Savings by Participant
Pre-rebate payback	6.3	Total Incremental Cost/Annual Bill Savings
<i>Incentive Assumptions</i>		
Minimum Incentive Level	25%	Reference case assumption
Maximum Incentive Level	75%	Reference case assumption
Post-rebate Payback Target	2	Reference case assumption
Incentive as % of Incremental Cost	68%	MAX(MIN(Minimum Incentive Level, 1-Post-rebate Payback Target /Pre-rebate payback))
Incentive	\$162.18	Incentive as % of Incremental Cost X Total Incremental Cost
Post-rebate payback	2	(Total Incremental Cost-Incentive)/Annual Bill Savings

Participation Approach A - cont.



Participation Approach A - cont.

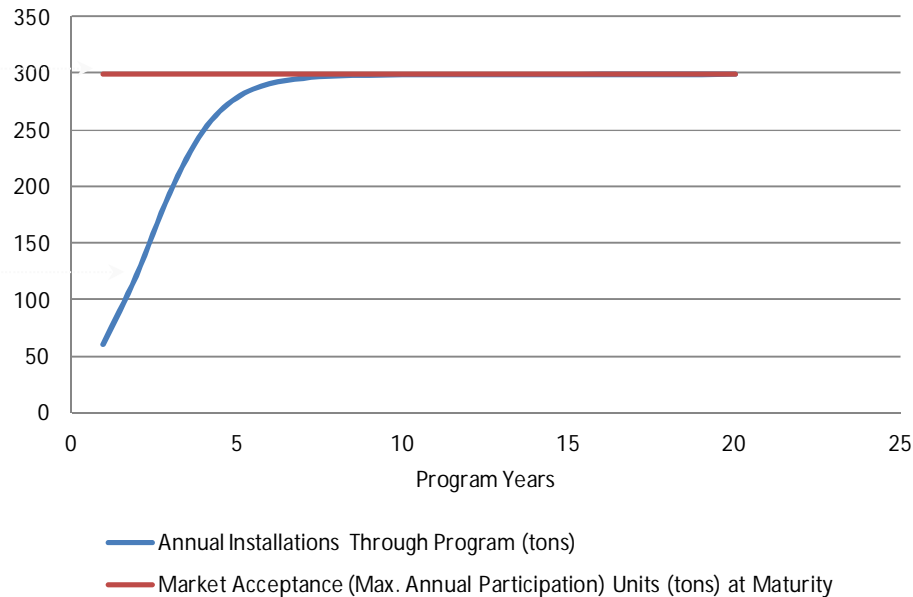
Applicability Factors	Value	Source/Calculation
Share of Single Family & Duplex Dwellings	87%	Utility
Measure Units per Sub-Sector Unit	3	Average size of unit (3 tons)
Applicability	32%	Percent of homes with AC/Gas Heat
Feasibility/Distribution	18%	ICF
Not Yet Adopted	100%	For ROB=100% For Retrofit=(1-Saturation of Efficiency Technology)
Annual Replacement Eligibility	7%	For ROB=1/Measure Life For Retrofit=100%

Program Assumptions	Value	Source/Calculation
Payback acceptance formula coefficient "a"	1.22	ICF market research
Payback acceptance formula coefficient "b"	-0.29	ICF market research
Customer stated payback acceptance	68%	Payback acceptance = 1.22 Years * exp(post rebate payback * b)
Program Market Acceptance Rate	30%	ICF program assumption
Ramp-up Rate	5	ICF program assumption
Ramp-up Shape	100%	ICF program assumption
Program Start Year	2012	
Program Implementation Period (Years)	20	
<i>First Year Participation Estimates</i>		
Maximum Annual Market Share (Smax)	20.4%	Program Market Acceptance Rate X Customer stated payback acceptance
First Year Share of Installations (So)	4.1%	Maximum Annual Market Share (Smax)/Ramp-up Rate

Participation Approach A-cont.

Maximum estimated annual installations

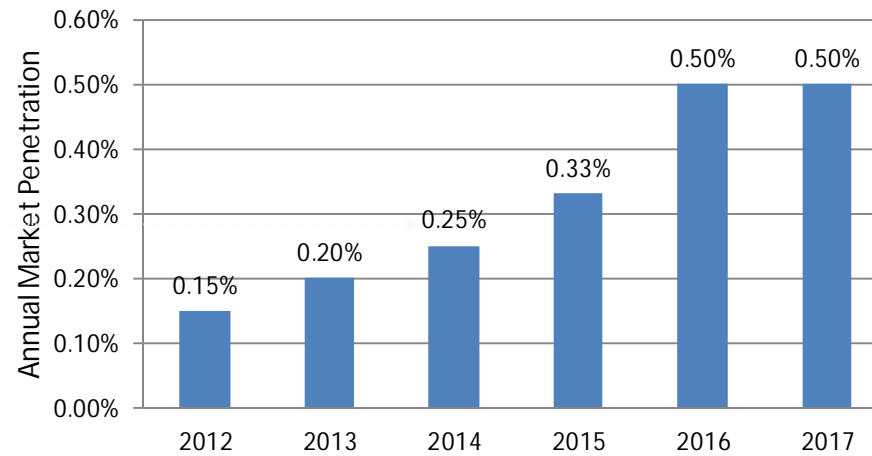
“S-curve” – participation ramps up to maximum annual installations



Participation Projections	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2031
Number of Residential Customer	141,609	144,537	145,094	145,309	145,352	145,323	145,276	145,230	145,170	145,111	145,060	144,952
<i>Average Annual Residential Growth Rate (2012 to 2031)</i>	<i>0.0143%</i>											
Single Family & Duplex Customers	123,766	126,326	126,344	126,362	126,380	126,398	126,416	126,434	126,452	126,471	126,489	126,670
Customers with A/C and Gas Heat	39,732	40,554	40,560	40,565	40,571	40,577	40,583	40,589	40,594	40,600	40,606	40,664
Not Yet Adopted Efficient Measure	39,732	40,554	40,560	40,565	40,571	40,577	40,583	40,589	40,594	40,600	40,606	40,664
Total Measure Units (tons)	119,196	121,661	121,679	121,696	121,714	121,731	121,748	121,766	121,783	121,801	121,818	121,993
Feasibility (tons)	21,455	21,899	21,902	21,905	21,908	21,912	21,915	21,918	21,921	21,924	21,927	21,959
Failing Feasible Units, Units Eligible for Replacement (tons)	1,430	1,460	1,460	1,460	1,461	1,461	1,461	1,461	1,461	1,462	1,462	1,464
Units reporting acceptable payback		994	995	995	995	995	995	995	995	996	996	997
<i>Market Acceptance Units at Maturity</i>		<i>298</i>	<i>298</i>	<i>298</i>	<i>298</i>	<i>299</i>	<i>299</i>	<i>299</i>	<i>299</i>	<i>299</i>	<i>299</i>	<i>299</i>
Annual Participation (%)		4.1%	8.3%	13.3%	17.0%	19.0%	19.9%	20.2%	20.4%	20.4%	20.4%	20.4%
Annual Installations (tons)		60	121	194	249	278	291	296	298	298	299	299
Cumulative Installations (tons)		60	180	374	623	901	1192	1487	1785	2083	2382	4470

Participation Approach B – illustrative example

Home Energy Solutions



Annual market penetration estimates manually entered

Based on

- Current Entergy program performance
- The EAI Comprehensive Program Plan
- ICF program experience

Participation approach by program

	Modeled Program Name	Relevant Sector(s)	Type	EAI Comprehensive Program?	Participation Approach
1	Residential Lighting and Appliances	Residential	EE	Yes	A
2	Residential Cooling Solutions	Residential	EE	Yes	A
3	Home Energy Solutions	Residential	EE	Yes	B
4	Energy Efficiency Arkansas	Residential	EE	Yes	B
5	AR Weatherization	Residential	EE	Yes	B
6	Benchmarking	Residential	EE	Yes	B
7	ENERGY STAR Homes	Residential	EE	Yes	B
8	Mobile Homes	Residential	EE	Yes	A
9	Multifamily	Residential	EE	Yes	A
10	C&I Prescriptive	C&I	EE	Yes	A
11	City Smart	Government	EE	Yes	B
12	Commercial Custom	C&I	EE	Yes	B
13	Small Commercial	Small Commercial	EE	Yes	A
14	Agricultural Energy Solutions	Agricultural	EE	Yes	A
15	Direct Load Control	Residential	DR	Yes	B
16	Agricultural Irrigation Load Control	Agricultural	DR	Yes	B
17	Commercial New Construction	Commercial	EE	No	A
18	Retrocommissioning	Commercial	EE	No	B
19	Industrial	Industrial	EE	No	A
20	Interruptible Rate	Large C&I	DR	No	B
21	Enabled Pricing (Non-Res)	Commercial	DR	No	B
22	Non-Enabled Pricing (Non-Res)	Commercial	DR	No	B
23	Enabled Pricing (Res)	Residential	DR	No	B
24	Non-Enabled Pricing (Res)	Residential	DR	No	B