

Energy Efficiency Program Management

HW&Co. Whitepaper

Spring 2016



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Energy Management & Distributed Energy Energy Efficiency Program Management

Harris Williams & Co. Whitepaper

Spring 2016

Our mission with this paper is to provide an update to our prior report on the Energy Efficiency Program Management sector. Since the publication of our 2010 whitepaper, the program management sector has continued its impressive growth with 2014 budgets approaching \$9 billion, a more than 64% increase from 2009 levels.

While the growth rate for program spending has declined in recent years, energy efficiency has established itself as an important resource for utilities and programs are expected to exhibit continued growth for the next decade. This paper will provide an overview of the sector, program types, services provider by outsourced program management, key drivers, and the competitive landscape for service providers.

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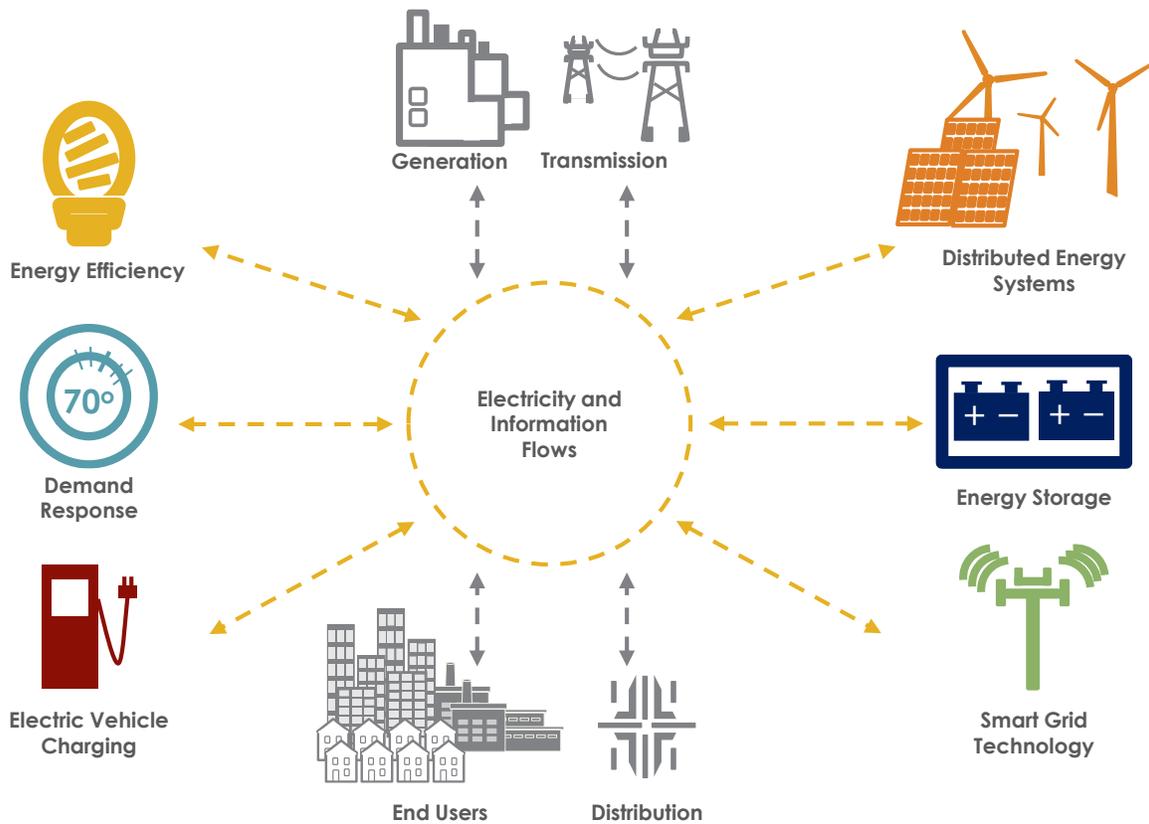
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Harris Williams & Co. Experience

With more than 20 closed transactions across the sector, Harris Williams & Co. has provided sell-side advisory services to some of the market's premier service, equipment, and technology providers.

Select Transactions

 has received a minority investment from 	 a portfolio company of  has been acquired by 	 has acquired 	 has been acquired by 	 a portfolio company of  has been acquired by 
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 has been acquired by 	 has been acquired by WESTON PRESIDIO	 has been acquired by 	 completed Series B capital raise	 Energy Monitoring Products a portfolio company of  has been acquired by 
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Overview

Utilities implement energy efficiency programs, also known as demand side management (“DSM”) programs, to manage long-term demand growth economically and comply with legislative and regulatory policies that mandate reduced consumption of electricity and natural gas. Regulatory and legislative bodies create funding mechanisms to support multi-year and multi-jurisdictional efficiency programs. These programs are typically funded by ratepayers (residential, commercial, and industrial utility customers) through utility bills as a nominal fee or as a component of the rate for each unit of energy consumed. In most cases, utilities utilize (and in some states are required to use) non-affiliated independent third-party program management companies to execute the programs and achieve energy savings requirements.

Market Growth

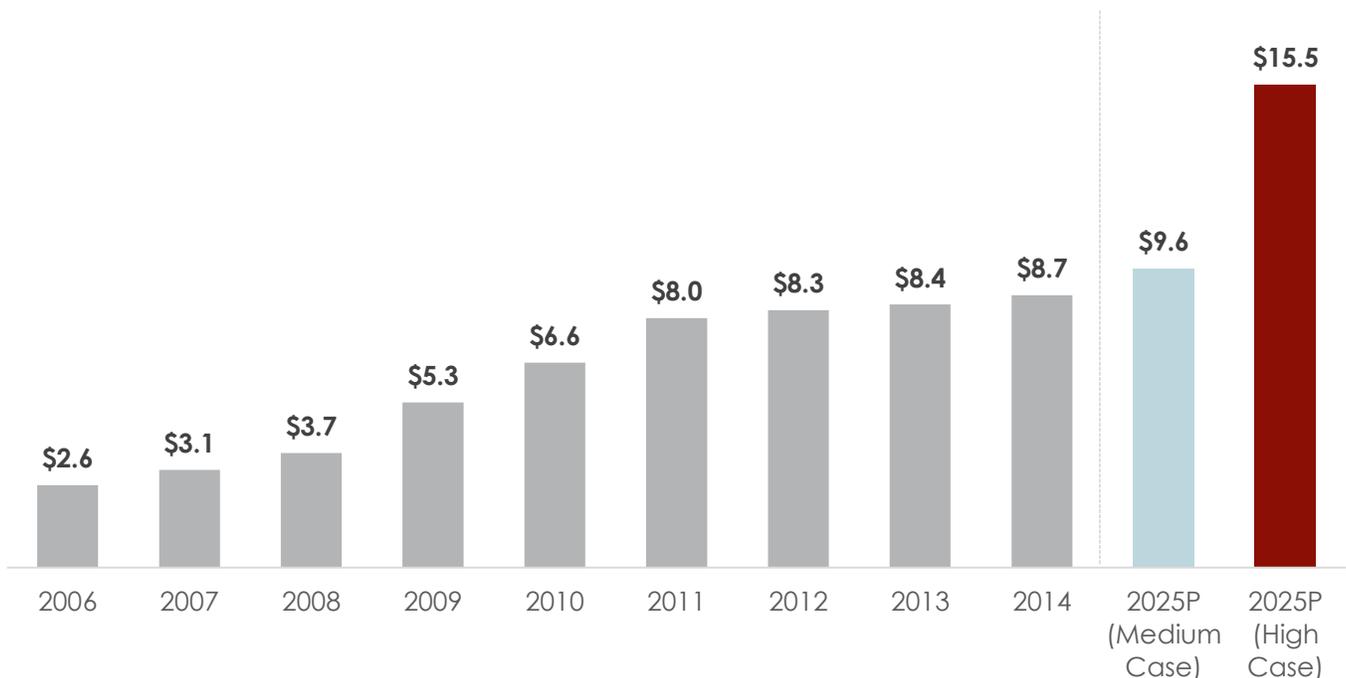
The ratepayer-funded energy efficiency program management industry has continued its steady expansion in the United States. From 2006 through 2010, ratepayer-funded energy efficiency budgets increased from \$2.6 billion to \$6.6 billion, representing a CAGR of 21.3%. From 2010 through 2014, budgets increased more than \$2 billion, representing a CAGR of 7.4% over the period. Over the period, energy efficiency programs have shifted from regulatory compliance programs to increasingly valuable resources for utilities. As a result, utility energy efficiency programs are expected to demonstrate sustained spending levels and growth over the next decade. A Lawrence Berkeley National Laboratory (“LBNL”) estimated these programs may surpass \$15 billion per year by 2025.

Exhibit 1

U.S. Electric and Gas Efficiency Program Budgets

For the Years Ended December 31, 2006 – 2014 and 2025P¹

(\$ in billions)



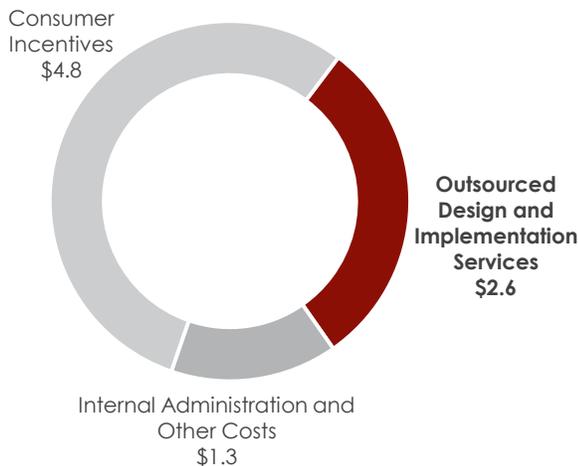
Market Size

In 2014, ratepayer-funded energy efficiency program budgets totaled \$8.7 billion (nearly doubling from the 2009 budget of \$4.4 billion highlighted in our initial report). Approximately 55%, or \$4.8 billion, of program budgets fund incentives for utility customers (for example, a small business owner receiving a rebate for the purchase of an energy efficient HVAC unit). Approximately 30%, or \$2.6 billion of program budgets, are designated to pay for outsourced program services, which largely consist of: (i) program consulting and design, (ii) program management and implementation, and (iii) evaluation, measurement, and verification. Internal administration and other costs account for approximately 15%, or \$1.3 billion, of program budgets. The exhibit below provides a breakdown of spending across the industry.

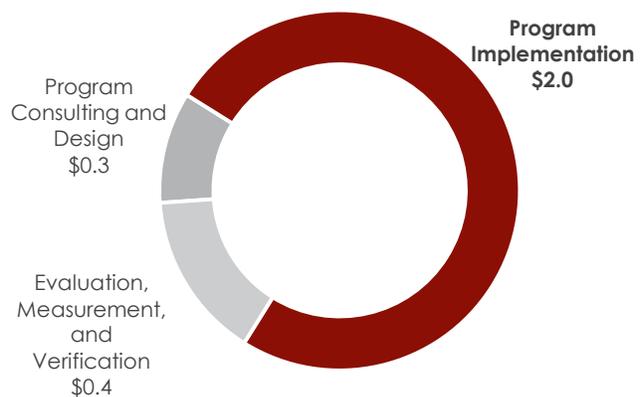
Energy efficiency program managers are hired by utilities to create and implement programs to achieve mandated energy savings targets. Most utilities opt to outsource the implementation of energy efficiency programs for a number of reasons, including: (i) union work rules and compensation structures, (ii) employee skill sets, (iii) the preference of regulators to avoid the bureaucracy associated with utilities, (iv) the preference to spread government funds to companies across a utility service area, and (v) decoupling, which is described on page 8 of this whitepaper.

Exhibit 2
Energy Efficiency Outsourced Program Services
 For the Year Ended December 31, 2014
 (\$ in billions)

U.S. Utilities Energy Efficiency Programs¹
 \$8.7 billion



Outsourced Program Services
 \$2.6 billion

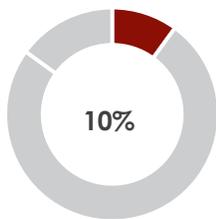


Overview of Outsourced Program Services

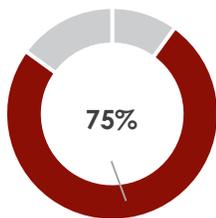
The \$2.6 billion outsourced program services segment of the industry is stratified into the sub-categories/service offerings described below. Utilities typically require that different parties perform each distinct service to avoid conflicts of interest. For example, a utility will rarely want the same service provider designing, implementing, and then measuring and verifying savings for a single energy efficiency program.

Exhibit 3
Energy Efficiency Outsourced Program Services
Key Services Descriptions

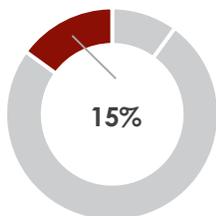
Program Consulting and Design



Program Implementation



Evaluation, Measurement, and Verification



- Defines the key elements, policies, and procedures that will govern the program, including eligibility for participation, the magnitude of incentive payments, and the requirements related to measurement and verification.
- Estimates the program's expenditures and establishes savings targets.
- Develops a written plan that serves as a guide for program implementation.
- Implement efficiency measures to deliver the required savings within a specified budget and timeline.
- Market the utility program(s) to end users to raise awareness and drive participation.
- Perform engineering assessments and facility studies to generate energy savings for utility customers.
- Self-perform or sub-contract installation of energy efficiency projects.
- Execute the day-to-day administrative functions of the efficiency program, including processing and documenting the payment of program incentives, tracking the program's total estimated energy savings, and answering questions utility customers may have about the program.
- Utilities typically hire third parties to measure the energy savings related to a particular program to verify that requisite savings were in fact achieved.
- Provides information that allows utilities to assess program results and improve the credibility of data used in future planning and program design processes.
- Most program implementation providers do not perform evaluation, measurement, and verification services due to the small relative size of the market and the inherent conflicts of interest with its core design and implementation business.

Key Players



Overview of Energy Efficiency Program Categories

Utilities implement a wide range of individual efficiency programs for residential and commercial and industrial (“C&I”) end users. The exhibit below provides an overview of representative program types by category.

Exhibit 4

Energy Efficiency Program Categories Representative Programs by Type

Residential Programs

- **Behavioral efficiency.** These programs utilize online engagement, benchmarking, and audit tools to provide greater end user visibility into energy use and potential savings and ultimately influence energy consumption behavior.
- **Rebate.** Individual programs across product categories such as appliances, electronics and lighting incentivize the adoption of newer, more energy efficient technologies.
- **Prescriptive.** Programs designed to encourage the sale, purchase, and installation of specific equipment to enhance residential energy efficiency. Equipment categories include HVAC, insulation, pool pumps, water heaters, and windows.
- **Whole home audits.** Designed to provide a comprehensive assessment of a home’s energy consumption and potential for energy savings.
- **Whole home direct install.** Pre-approved measures, often a kit, installed at time of audit or directly by the customer. Measures typically include lighting, low-flow showerheads, weather stripping, etc.
- **Whole home retrofit.** Implementation of energy efficiency projects or upgrades identified in a comprehensive whole home audit, such as HVAC systems upgrades
- **Low income.** Programs, such as affordable housing weatherization, aimed at lower income households often through pre-determined eligibility requirements.

Commercial & Industrial Programs

- **Audit.** Energy assessment performed at end user facility to identify opportunities for energy savings.
- **Custom.** Delivery of site-specific energy savings projects identified through detailed energy assessment and review.
- **Prescriptive.** Designed to encourage the purchase and installation of pre-approved C&I measures (e.g., CFL or LED bulbs). These programs are not customized or differentiated by sector.
- **Self direct.** Efficiency programs designed and executed by the end user (often a third-party) for large C&I customers that utilize DSM program funding.
- **Other.** Other programs include incentive programs for performance contract, retro-commissioning of existing commercial facilities, commissioning of new construction, and programs focused on the government, non-profit and MUSH (municipalities, universities, schools, and hospitals) markets.

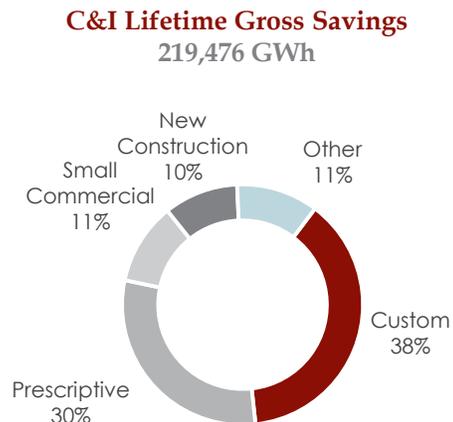
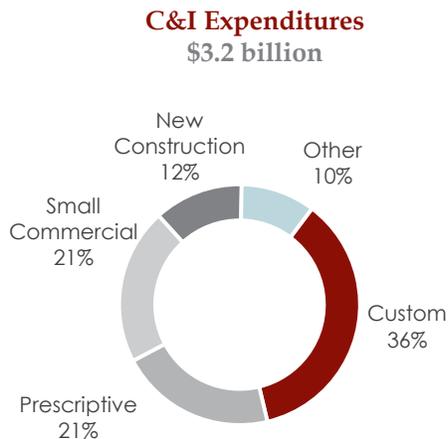
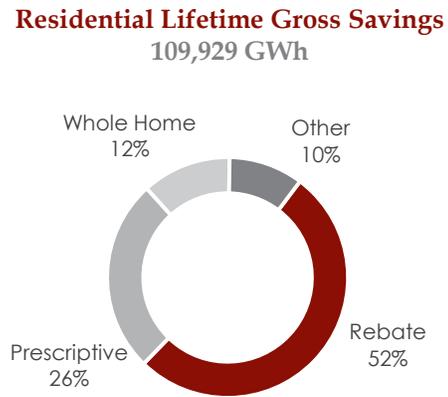
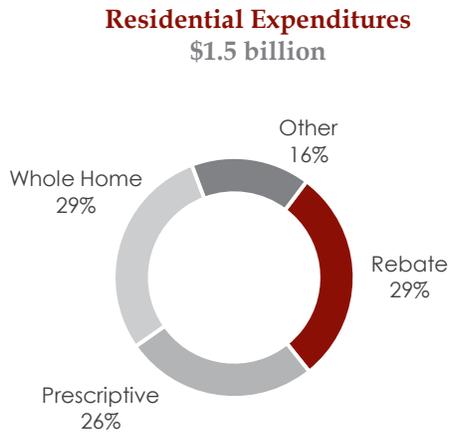
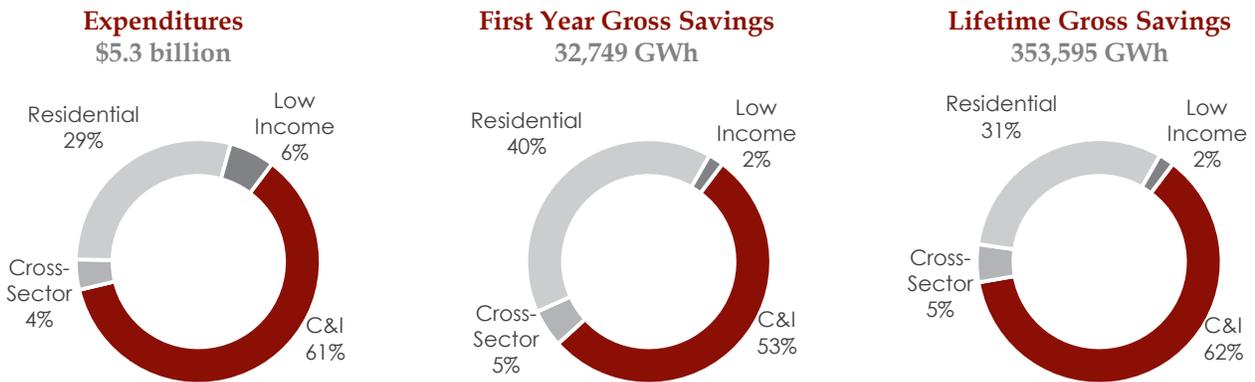
Cross-Sector Programs

- **Codes and standards.** Administrator may engage in activities designed to advance the adoption, application or compliance level of building codes and end use energy performance standards.
- **Market transformation.** Programs aimed at broadening the market for energy efficient technologies and products, such as manufacturer incentives for more efficient products or time-of-purchase incentives to increase the cost-competitiveness of new technologies.
- **Marketing, education, and outreach.** Stand-alone programs to increase the awareness of energy efficiency, such as in-school water and energy efficiency programs with prescriptive kits.

Energy Savings by Program Type

In 2014, LBNL released a study on the cost of energy savings for utility funded efficiency programs based on an analysis of their DSM Program Impacts Database. The study analyzed cumulative program spending from 2009 through 2011 from more than 1,700 utility programs across 31 states and more than 100 program administrators. A summary of spending and energy savings data by program type and category is provided below.

Exhibit 5
Analysis of Spending and Energy Savings for Electric Energy Efficiency Programs
 Cumulative for the Years Ended December 31, 2009 - 2011



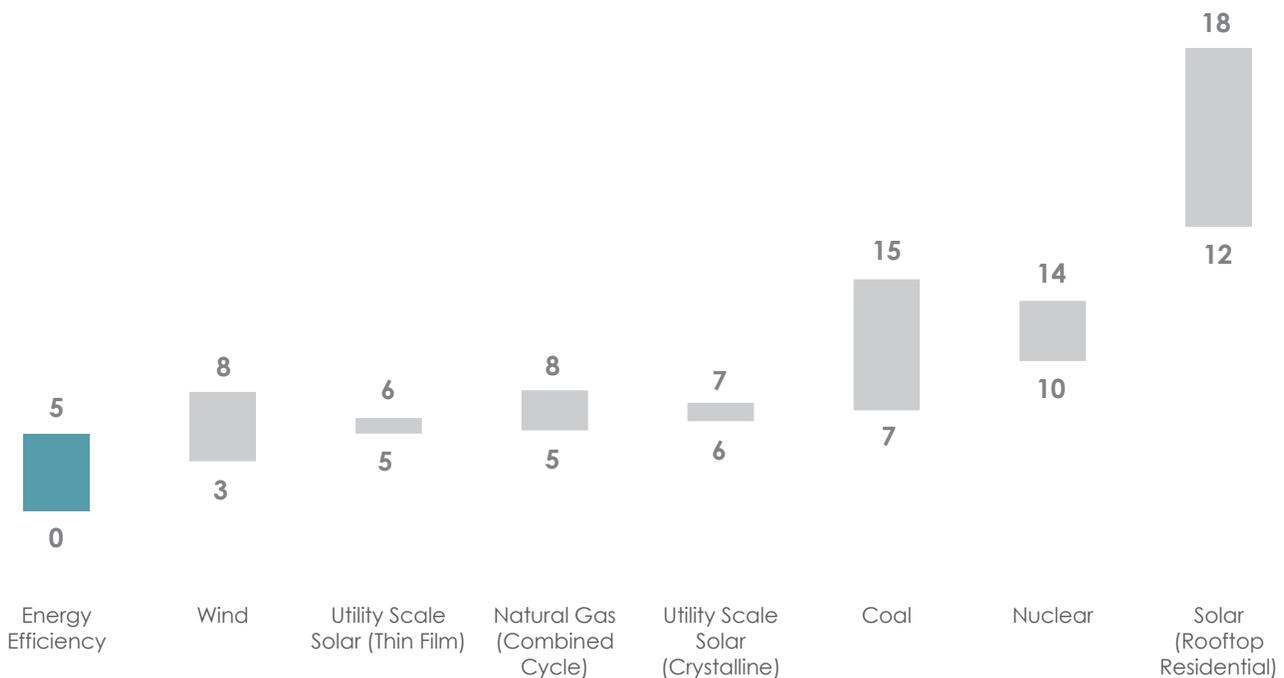
Greater Reliance on Energy Efficiency Resources

In recent years, energy efficiency programs have evolved from regulatory compliance initiatives to demand side management resources for utilities. Energy efficiency has a stable price profile, is the lowest cost energy resource, and mitigates fuel price volatility risk. A study by the ACEEE noted that energy efficiency programs were able to achieve energy savings at an average cost of \$0.025 per kilowatt hour, which is significantly lower than the costs associated with new power generation resources.

Additionally, energy efficiency programs reduce the strain on generation and transmission and distribution (“T&D”) capacity in a manner that is easy to implement, highly cost effective, and environmentally sensitive (efficiency is a zero emissions resource). As an alternative to new power plant construction, the reduction of electricity consumption through demand response initiatives also has the potential for significant cost-avoidance. The Brattle Group estimates that a 5% reduction in peak demand may eliminate the need for more than 600 peaking plants, representing potential savings of \$30 billion.

Exhibit 6
Unsubsidized Levelized Cost of Energy
 As of November 2015
 (Cents per kwh)

Energy efficiency represents the lowest cost energy resource with a stable price profile and its “invisibility” to eliminate the extensive siting, permitting, and compliance processes required for other resources.



Untapped Potential

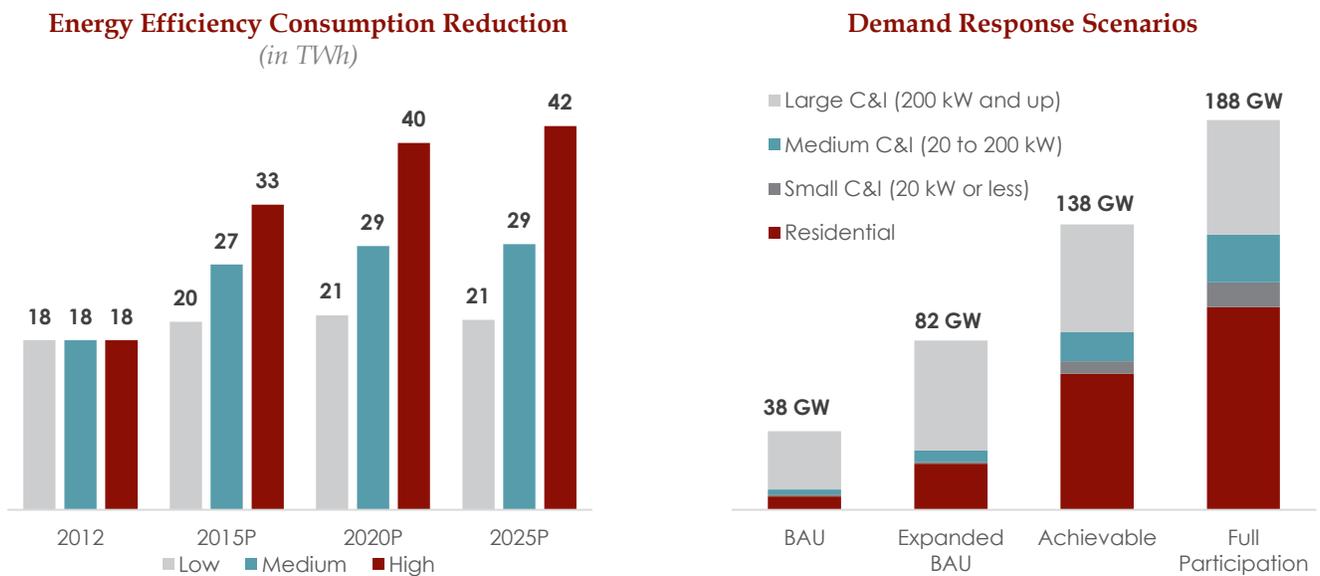
While energy efficiency programs have exhibited significant growth in recent years, the programs are still in the early stages relative to their long-term potential. In a study analyzing projected spending and savings from energy efficiency programs, LBNL projects incremental annual electricity savings from utility rate-payer funded programs to exceed 28.8 TWh by 2025. Achievement of these savings will require continued growth in energy efficiency investments.

The Federal Energy Regulatory Commission’s (“FERC”) National Assessment of Demand Response Potential estimates that demand response programs could generate nearly 188 GW of potential peak demand reduction by 2019. The Brattle Group estimates the energy savings through 2030 from DR programs could exceed \$65 billion through the implementation of advanced metering infrastructure, dynamic demand response pricing, and new demand response technologies in the U.S.

The potential for energy savings accelerates when energy efficiency and demand response resources are integrated into a single program. While utilities have historically siloed their energy efficiency and demand response operations due to discrete regulations and funding mechanisms, the combination of these resources into integrated demandside management (“IDSMS”) programs is becoming more common. Increasing customer awareness of the cost benefits and utility acceptance of the operational effectiveness of integrated programs are driving near-term IDSMS market growth, and the upside potential is large. Navigant Research projects IDSMS spending to grow from \$40 million in 2016 to \$1.2 billion in 2025 as technical, policy, and economic barriers continue to diminish.

The chart on the right details the potential of demand response initiatives outlined in the FERC assessment under several different cases: (i) business as usual (“BAU”); (ii) expanded BAU; (iii) achievable participation; and (iv) full participation. BAU considers the amount of DR that would take place if existing and currently planned DR programs continued unchanged over the next ten years.

Exhibit 7
Energy Efficiency and Demand Response Resource Potential



Alignment of Utility Incentives

In return for their quasi-monopolistic franchises, state-regulated utilities are obligated to provide energy to consumers at a fixed per unit rate. The underlying concept of utility ratemaking is to set rates at a level that allows the utility the opportunity to collect from customers total revenues (revenue requirements) equal to its cost of providing service, including a reasonable rate of return on invested capital. With rates set by the formula above, a utility’s income has historically been highly correlated with sales volume. Given that energy efficiency programs are focused on reducing energy consumption (e.g. utility volume), investor-owned utilities face financial challenges when implementing mandated programs. Utility incentives are aligned with energy efficiency investments through three primary mechanisms:

- **Direct cost recovery.** Regulator-approved cost recovery through rate cases, system benefit changes, and tariff rider / surcharges.
- **Fixed cost recovery.** Decoupling and lost revenue adjustment mechanisms to assist in the recovery of the marginal revenue associated with fixed operating costs.
- **Performance incentives.** Provide utilities with the ability to earn a rate of return on efficiency investments that achieve energy savings goals though also subject utility to potential penalties for unachieved goals.

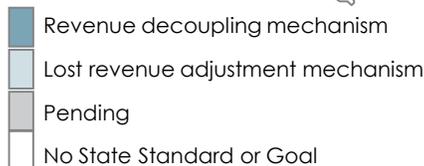
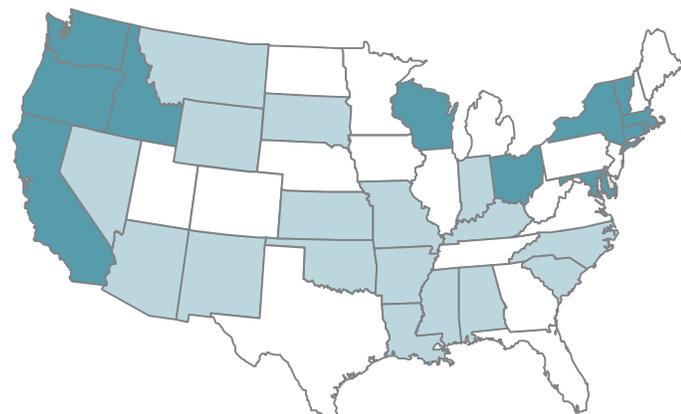
Exhibit 9

Federal and State Energy Efficiency Initiatives

As of December 2014

States with Decoupling Policies

Summary of State Regulatory Frameworks



Incentive Mechanism	# of States	Pending
Lost Revenue Recovery	19	0
Revenue Decoupling	14	1
Performance Incentives	29	2

Competitive Landscape

While the market has seen some consolidation in recent years, the competitive landscape for outsourced energy efficiency program services providers remains diverse and highly fragmented. Companies in the sector include large, independent program managers; divisions of multinational corporations; software and technology companies; and small, regional service providers.

Exhibit 10 Industry Participants

Company	Ownership	Implementation						End Market	
		Design	Market Segmentation	Customer Acquisition	Service Delivery	M&V	Reporting	Residential	C&I
Accenture	Public	✓				✓			✓
AM Conservation	Private		✓	✓	✓		✓	✓	✓
Ameresco	Public	✓	✓	✓	✓	✓	✓	✓	✓
A-Tec Energy	Private		✓	✓	✓	✓	✓	✓	✓
Chicago Bridge & Iron	Public		✓	✓	✓		✓		✓
CLEAResult	Private	✓	✓	✓	✓		✓	✓	✓
Comverge	Private		✓	✓	✓		✓	✓	
DNV Kema	Private	✓				✓	✓	✓	✓
E Source	Private						✓	✓	✓
Engie (Ecova)	Public		✓	✓	✓		✓	✓	✓
Energy Solutions	Private		✓	✓	✓		✓		✓
EnergySavvy	Private								
Enernoc	Public								✓
Enovity	Private	✓	✓	✓	✓	✓	✓		✓
Franklin Energy	Private		✓	✓	✓		✓		✓
GDS Associates	Private	✓	✓	✓	✓	✓	✓	✓	✓
Honeywell	Public		✓	✓	✓		✓	✓	
ICF International	Public	✓	✓	✓	✓	✓	✓	✓	✓
kW Engineering	Private	✓	✓	✓	✓	✓	✓		✓
Leidos	Public	✓	✓	✓	✓	✓	✓	✓	✓
LIME Energy	Public		✓	✓	✓		✓		
Lockheed Martin	Public		✓	✓	✓		✓	✓	✓
Mad Dash Field Services	Private				✓		✓		✓
Matrix Energy Services	Private		✓	✓	✓		✓		
Michaels Energy	Private	✓	✓	✓	✓	✓	✓	✓	✓
Nexant	Private	✓	✓	✓	✓	✓	✓	✓	✓
Opinion Dynamics	Private					✓		✓	✓
OPower	Public		✓	✓			✓	✓	✓
Performance Systems Development	Private	✓	✓	✓	✓	✓	✓	✓	
Silver Spring Networks	Public		✓	✓			✓	✓	
SmartWatt	Private								
Tendril	Private		✓	✓			✓	✓	
The Cadmus Group	Private	✓				✓		✓	✓
The Weidt Group	Private	✓				✓	✓		✓
TRC	Public	✓	✓	✓	✓		✓		✓
Willdan	Public		✓	✓	✓				✓

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