Commercial Sector
2013 Trends: Measures, Markets and Sources of Savings

Prepared by Energy Trust's Commercial Sector

April 2014

EnergyTrust of Oregon

I. About the Analysis of Trends

Source of Data

Data contained in this report comes from Energy Trust's FastTrack project database and was generated using Business Intelligence reports and other methods.

Trend Analysis: Working vs. Reportable Savings Numbers

These analyses are mostly based on working savings numbers, i.e., savings before evaluation factors and T&D losses or credits are applied. Therefore the totals will not be equal to the "reportable" savings totals that are provided to the Board, PUC and utilities.

There are good reasons to run trend analysis with working numbers:

- Evaluation factors change year to year. This change renders savings trends analytically meaningless from the perspective of market response to program offerings.
- We acknowledge that tracking and addressing changes in free ridership and technical realization is important in terms of tuning program outcomes, but these changes are not the primary driver of outcomes. The primary driver of program outcomes is the market's response to opportunities, incentives, etc. The second-most powerful driver of outcomes appears to be major market forces such as the recent recession. This trend analysis focuses on the primary driver of basic program design and delivery.
- Incentive design and incentive budgets are built on working savings, as verified first-year working savings is the basis for incentive payments. Understanding working savings trends is therefore the basis of bottom-up goal setting and incentive budget development, which represents almost two thirds of sector budget.

Due to ongoing improvements in our data structure, we have access to more specific project and measure data in recent years, therefore most of our analysis focused on 2009 through 2013 data trends. Where possible we provided data trends back to 2004.

II. Sources of Savings

Energy Trust's Commercial Sector provides energy efficiency services and incentives to commercial customers, institutional customers and multifamily properties. Primary sector activity is accomplished through three program management (PMC) contracts: Existing Buildings, New Buildings and Multifamily.

PMC contracts deliver savings through prescriptive and custom incentives for equipment retrofits and design upgrades, as well as through some direct install and maintenance measures,

In addition to the PMC-delivered programs, the sector supports Building Operator Certification, Strategic Energy Management, Plug Load Efficiency and Solar Water Heating.

Occasional "mega-projects" represent large opportunities to achieve a great amount of savings but with total incentives above the $500,000 threshold that requires prior board approval. Although these projects are technically categorized as custom projects, they are called out in this analysis because of the large impact on total savings for 2010.

Charts and graphs in the sections below contain results of electric and gas savings analysis, showing the sources of the Commercial sector's 2013 and historical savings. Existing Multifamily was transitioned to Commercial Programs in 2010; prior to that, large existing family sites (5+ units per building) were served by Existing Homes.

A. Commercial Sector Overview

The Commercial Sector has continuously ramped up savings since 2007, with electric savings continuing to climb while gas savings have declined after a peak in 2012. This leveling of gas savings was due to market and programmatic changes that impacted the Existing Buildings and New Buildings programs and is further discussed below.

Operations and maintenance strategies have been an increased focus since 2010 and have increased significantly with the introduction of Strategic Energy Management.

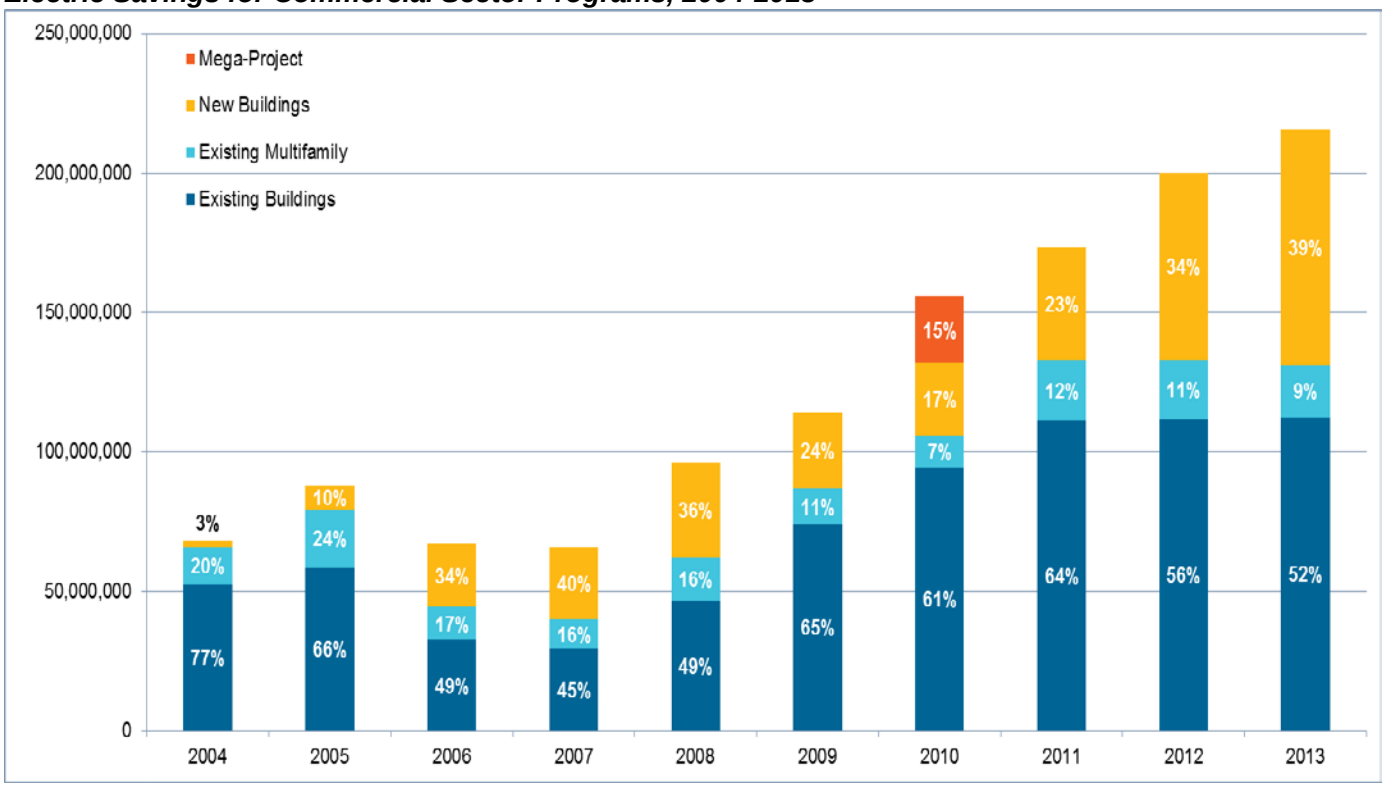
Efficiency baselines have continued to rise due to new codes, past program participation and improvements in standard practices. This has resulted in reduced savings per project across all programs and has required increased enrollment to keep up with growing goals. Overall completed projects more than doubled between 2009 and 2012 with a 7% increase between 2012 and 2013.

Commercial Sector 2013 Accomplishments (Reportable)

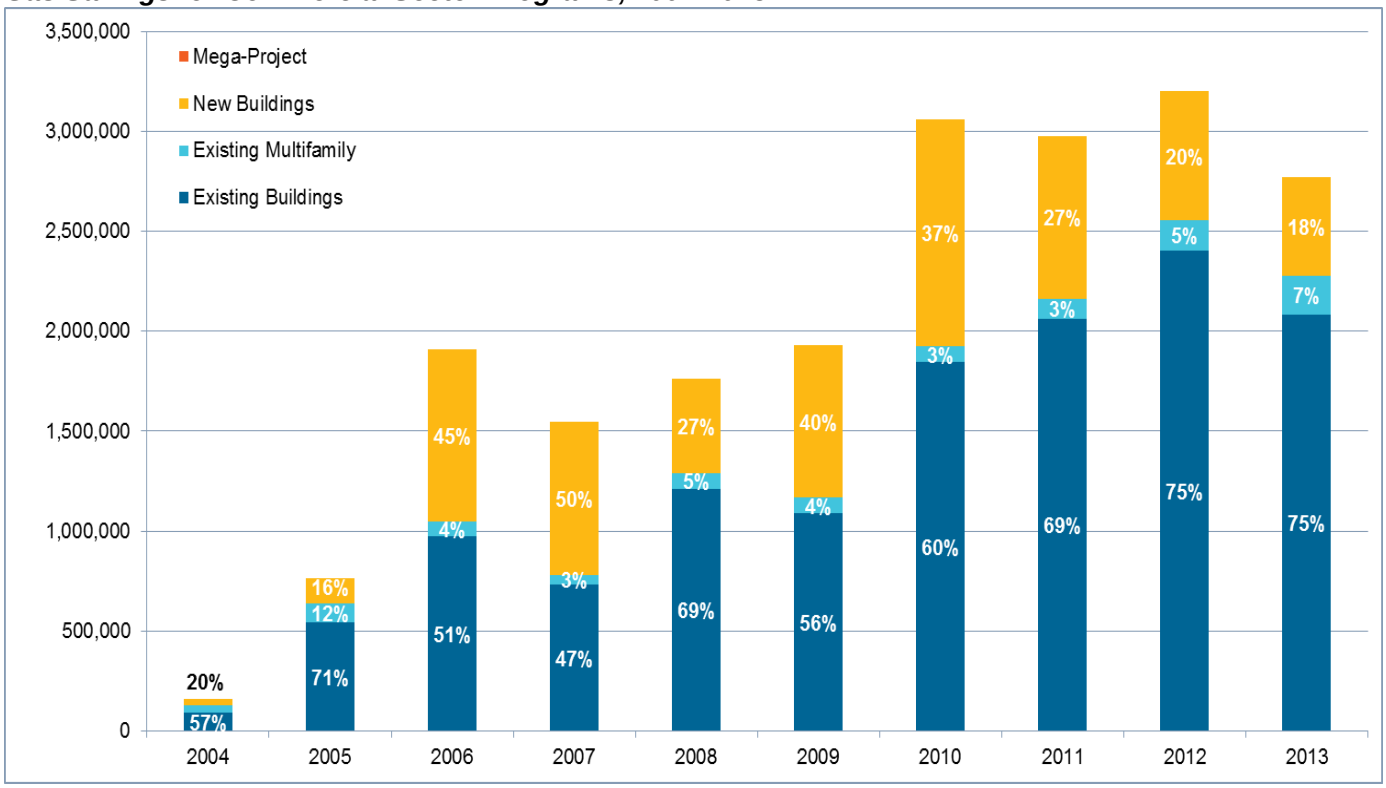
Commercial Sector		PGE	PAC	NWN	CNG
Achievement	2013 Achievement to Date (Rpt kWh or therm)	110,242,554	94,248,881	2,014,862	165,724
	% of Savings Goal	91%	146%	103%	80%

Does not include NEEA savings.

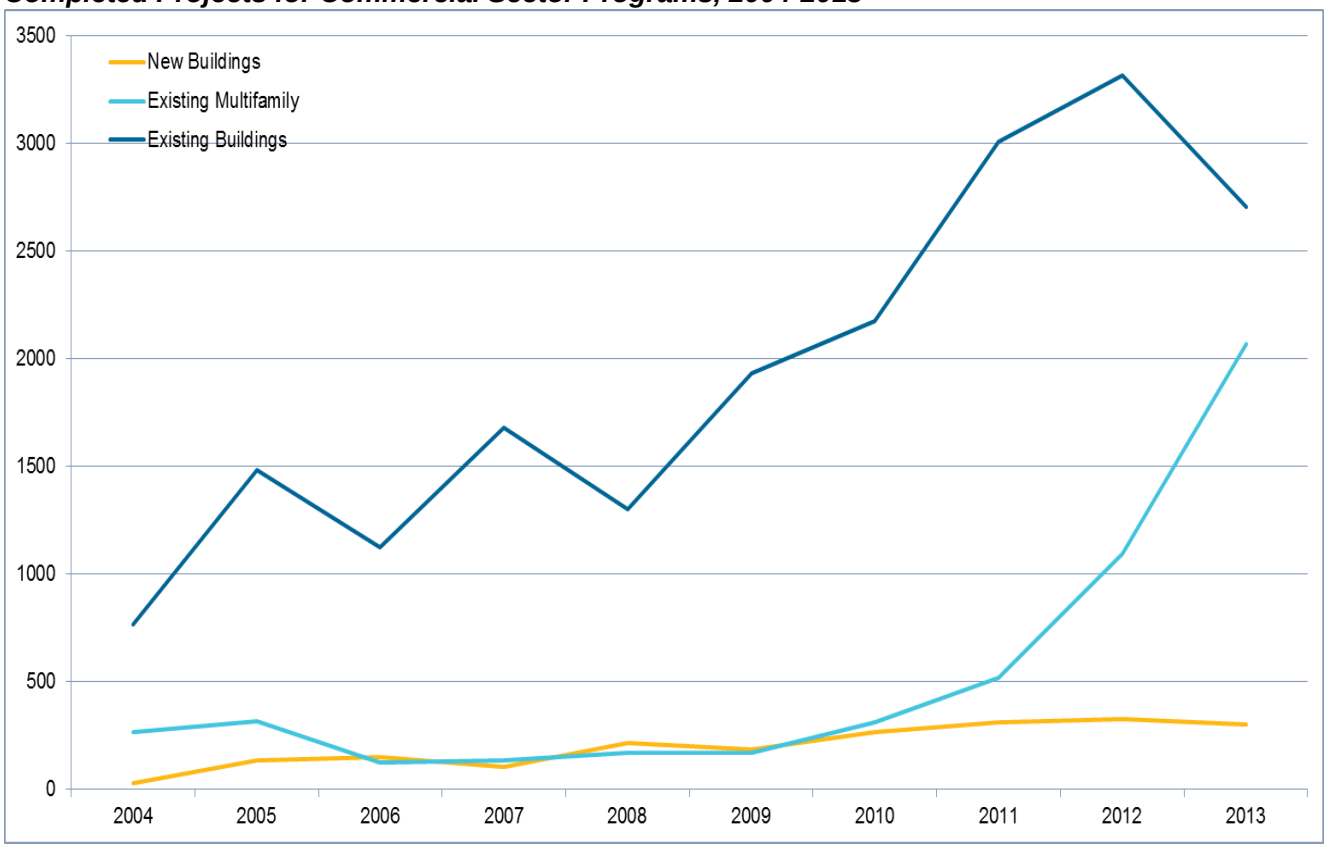
Electric Savings for Commercial Sector Programs, 2004-2013



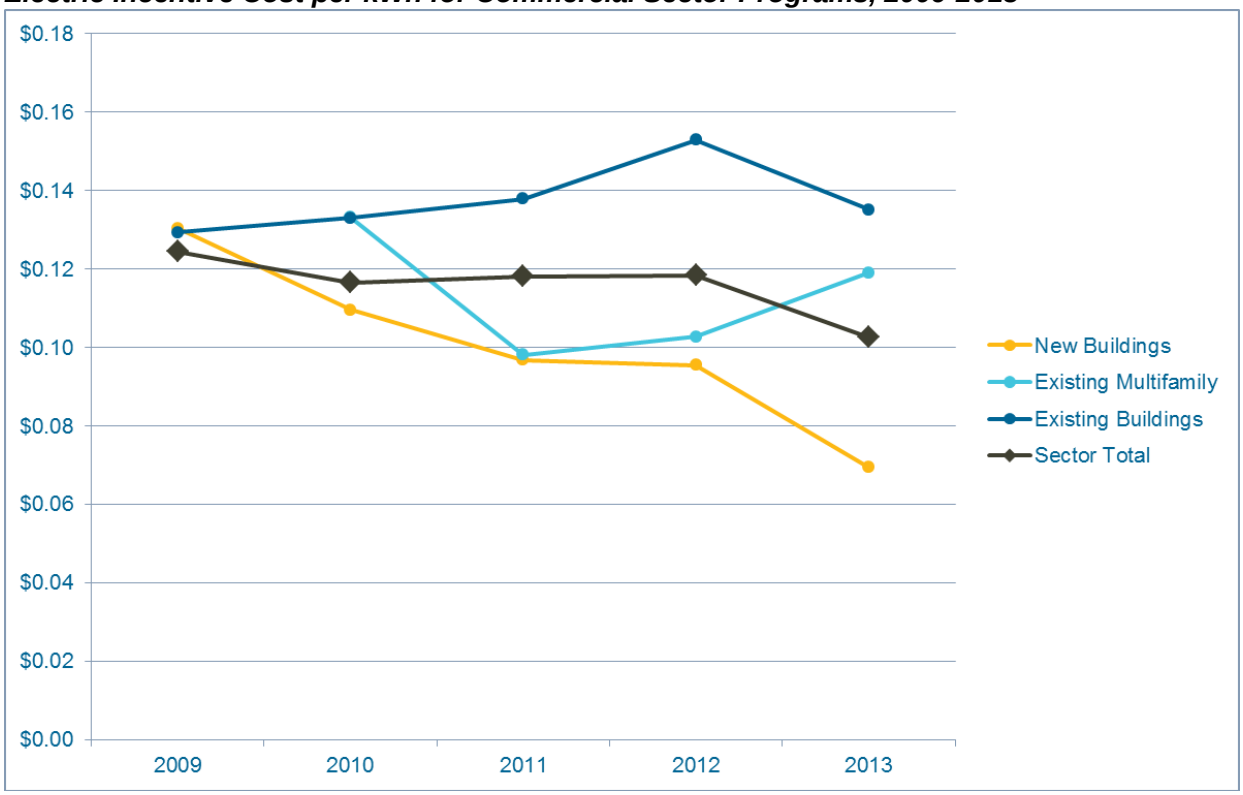
Gas Savings for Commercial Sector Programs, 2004-2013



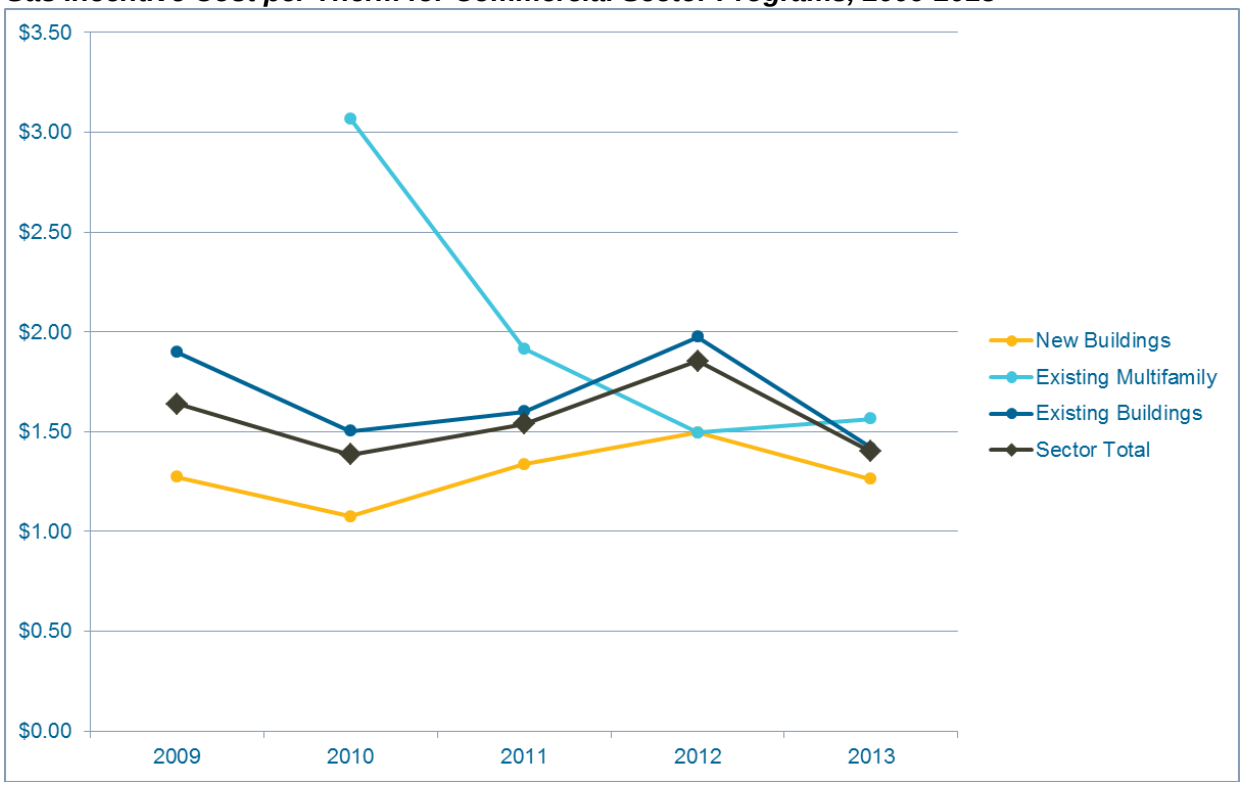
Completed Projects for Commercial Sector Programs, 2004-2013



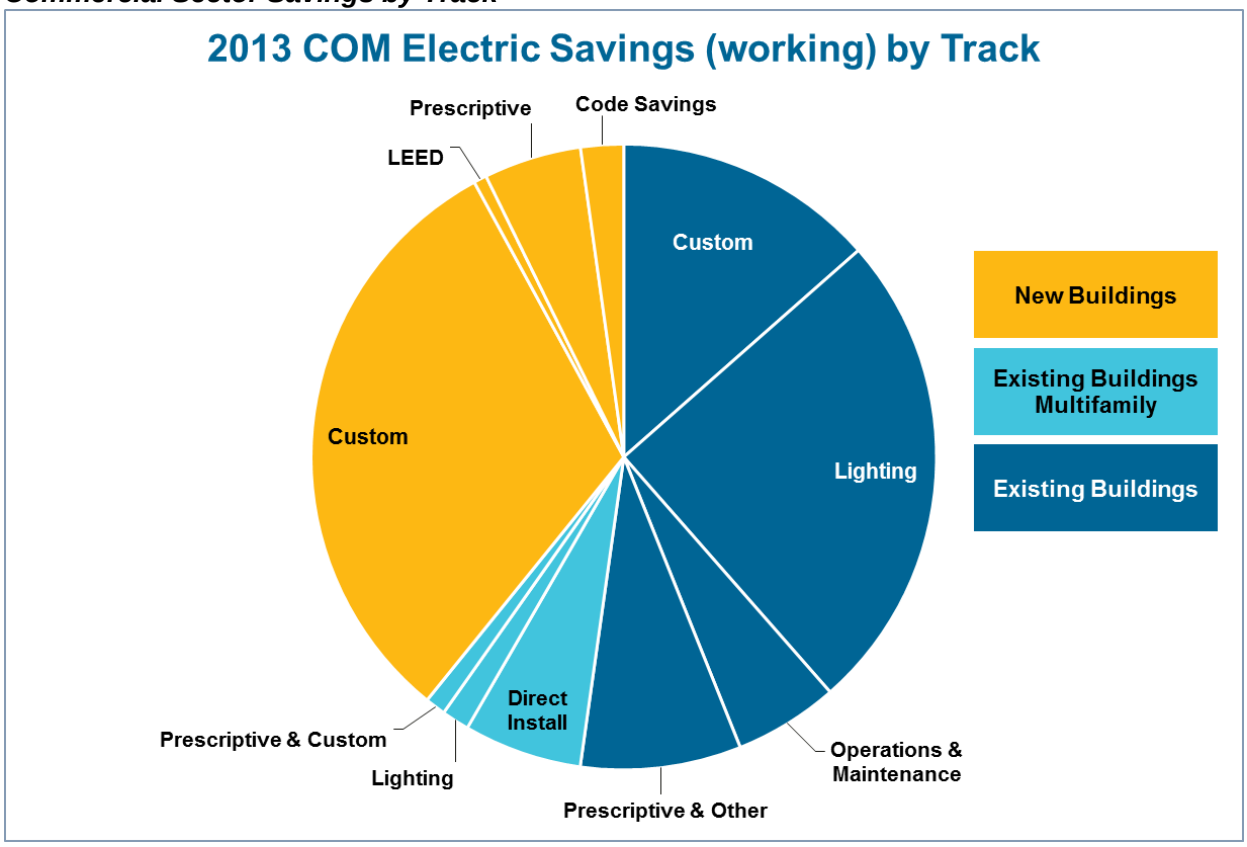
Electric Incentive Cost per kWh for Commercial Sector Programs, 2009-2013

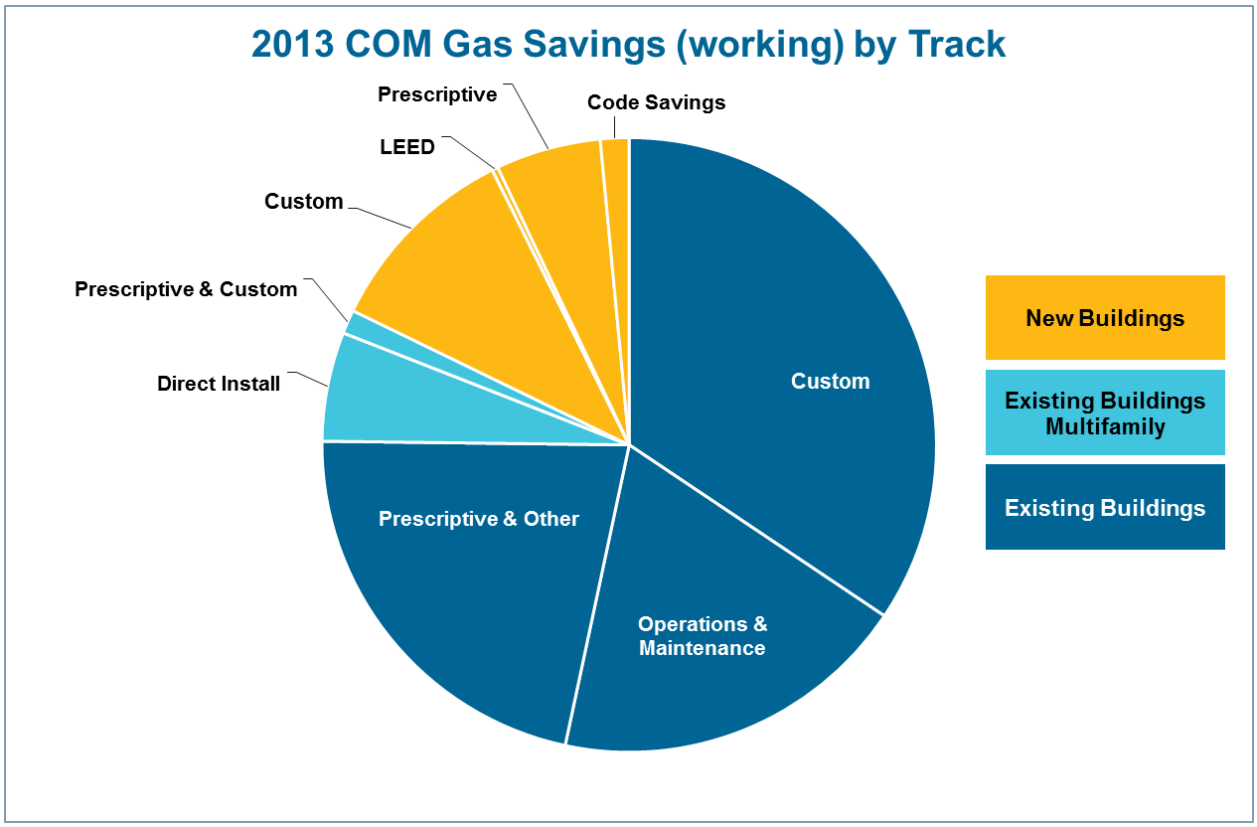


Gas Incentive Cost per Therm for Commercial Sector Programs, 2009-2013



Commercial Sector Savings by Track





B. Existing Buildings

Existing Buildings program design has emphasized:

- A PMC that works with the market to develop projects through key account management and management of a supporting network of Trade Allies and energy engineering firms;
- Strategic Energy Management services targeted to building operations and organizational management;
- Upstream incentives for manufacturers to produce efficient electronics equipment; and
- Building Operator Certification scholarships.

After growing more than 60% between 2009 and 2012, the annual number of projects completed by Existing Buildings fell off in 2013. Rapid growth occurred in 2011 and 2012 as a result of two custom and lighting bonuses that were run in Fall 2011 and Spring 2012 in order to offset impacts from the sunset of Oregon's Business Energy Tax Credit in April 2011. These bonuses resulted in significant numbers of completed projects in 2011 and 2012 but the lack of a bonus or incentive increases in 2013 resulted in a reduction in completed projects and claimed electric and gas savings. First-year incentive costs for electric and gas savings have remained relatively stable with slight increases due to bonus offerings and increased base incentives. The exception to this trend is in the Operations and Maintenance track which trended down in 2013 as a result of the growing impact of very cost-effective SEM savings.

The program continues to work with the large customers that have historically implemented projects with significant savings but the reduced supply of these projects has necessitated that Existing Building work actively to recruit and complete projects for small and medium-sized customers to continue to achieve robust savings goals. Over time the program has increased incentives and invested more in outreach and operations to increase the number of sites that the program serves but with fewer savings realized per site.

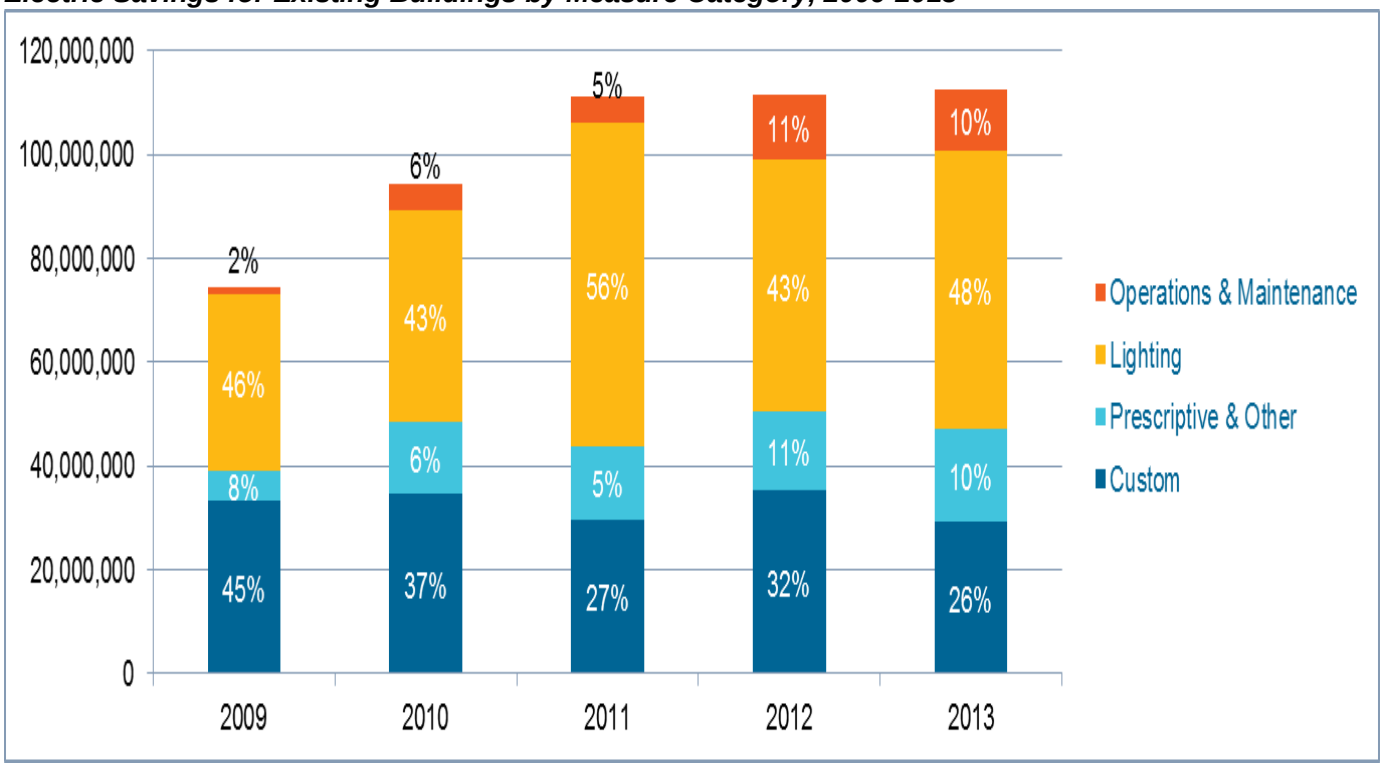
Custom projects are an important contributor to the total annual savings achieved for the program. Large individual custom projects have the ability to bring in a substantial portion of the electric and gas savings achieved in a given year. Annual fluctuations in custom projects savings result from the program's year-by-year ability to identify and close a few key custom projects.

Prescriptive projects are also an important contributor to annual savings goals, especially on the gas side. In 2013 the program increased activity to engage Trade Allies with an emphasis on food service vendors on the gas side. This focus was especially necessary in light of Roof-top Tune-ups producing fewer gas savings than the program expected in 2013.

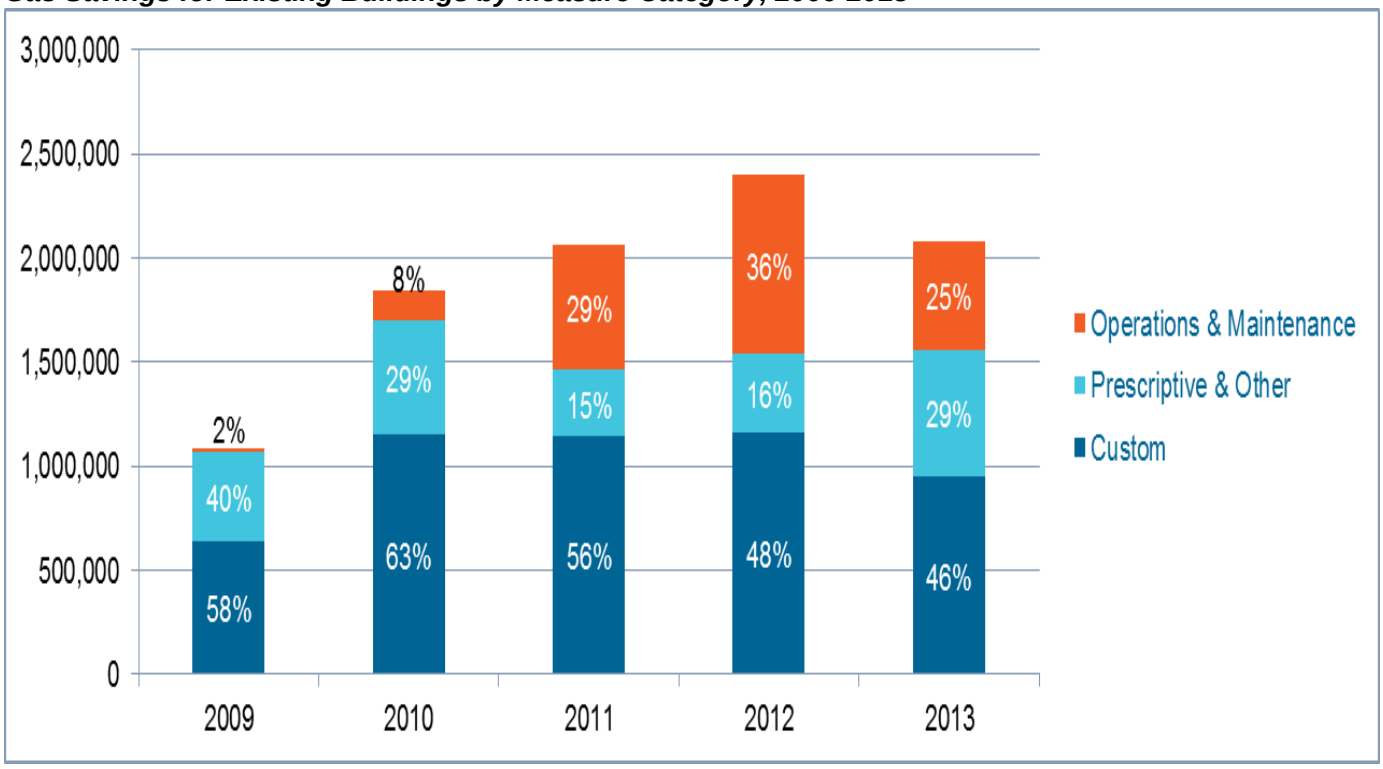
Lighting savings have been an important savings contributor on the electric side. The number of lighting savings per project has trended down over time and the program has had to bring in more projects to achieve high savings goals. The program expanded incentive offers for LEDS that resulted from the growing availability of reliable and cost-effective LEDs which led to new project opportunities in 2013.

Operations and Maintenance savings have been comprised primarily of Roof-top Tune-up projects and SEM projects. In 2013 Energy Trust discontinued the Roof-top Tune-up offering in response to evaluation feedback that demonstrated that the effort would not result in the cost-effective savings that we had expected. SEM activity in 2013 contributed significant electric savings in 2013 and made up for the reductions in gas savings from discontinuing Roof-top Tune-ups.

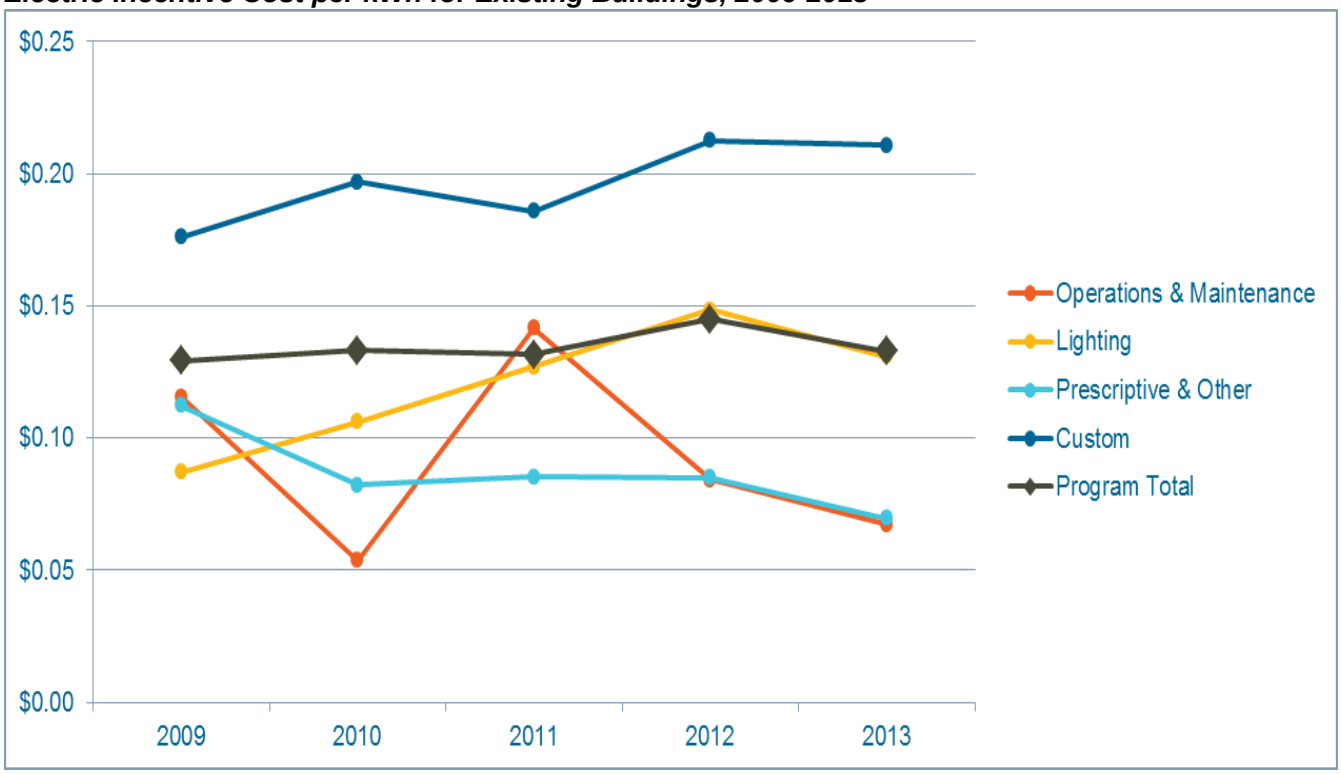
Electric Savings for Existing Buildings by Measure Category, 2009-2013



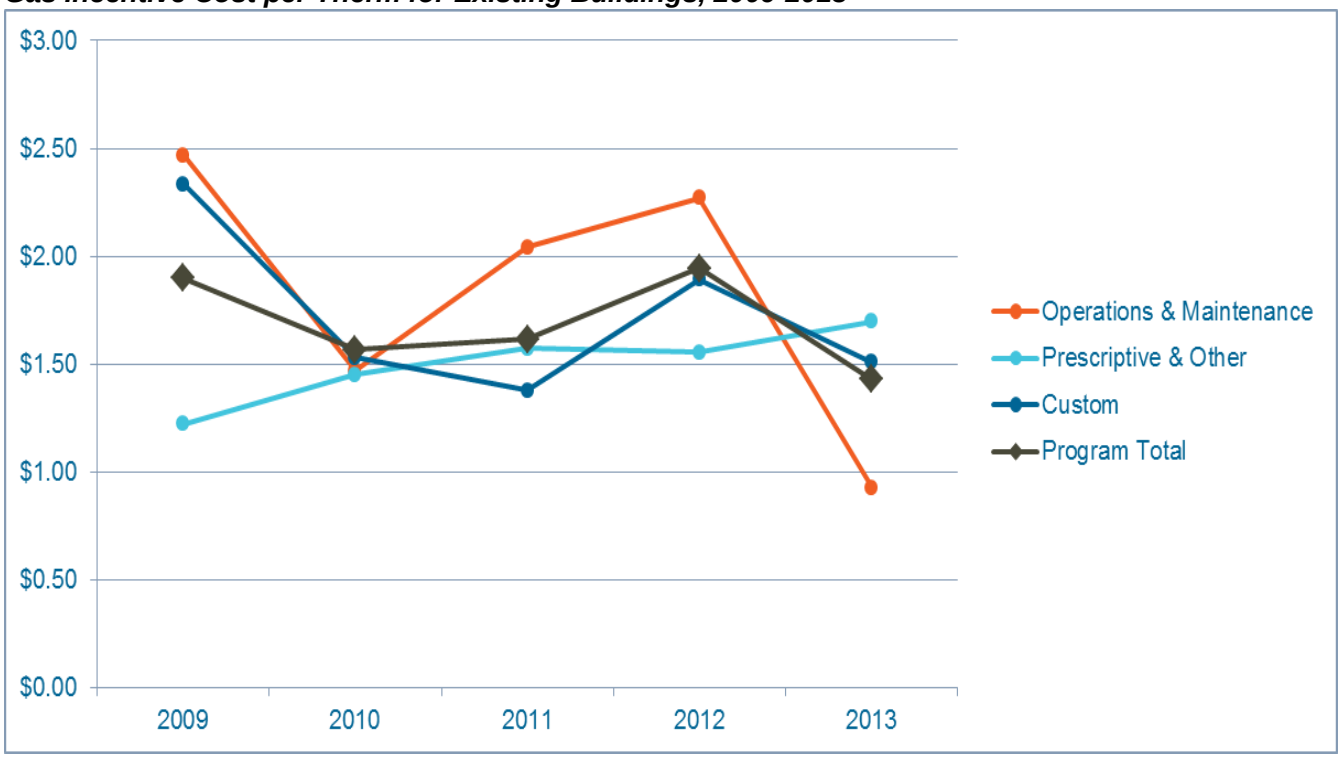
Gas Savings for Existing Buildings by Measure Category, 2009-2013



Electric Incentive Cost per kWh for Existing Buildings, 2009-2013



Gas Incentive Cost per Therm for Existing Buildings, 2009-2013



C. Existing Multifamily

Since the transition to the Commercial Sector in 2010, savings have increased in every utility territory, with goals continuing to grow annually. Cascade Natural Gas goals were added for the program in 2013.

The program design emphasizes:

- Long-term key customer relationship management with multifamily property managers and owners to provide the variety of our offerings to all buildings in their portfolios;
- A Custom offering including analytical services for non-prescriptive measures;
- Involving equipment distributors through mid-stream incentives to capture and influence the replacement market;
- Instant savings measures, including showerheads, faucet aerators and efficient lightbulbs through direct install in tenant spaces.

In 2013 the program incorporated Small Multifamily, including individual condo owners, assisted living and campus living. The addition of these sectors led to growth in gas direct install opportunities compared to previous years.

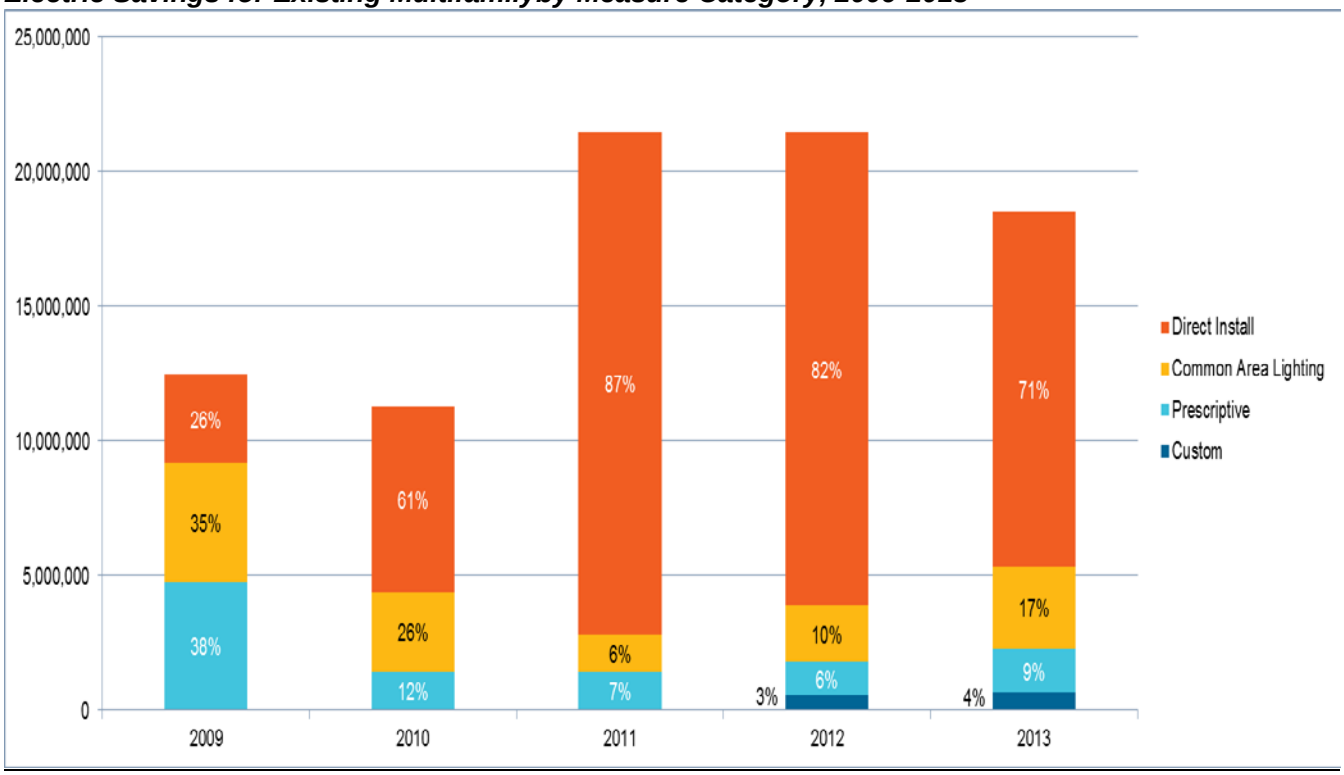
Major market conditions impacting program design include: historically low vacancy rates impacting owner/managers willingness to implement energy efficiency; perceived high water and sewer rates in Portland metro area creating an interest in efficiency; new multifamily construction acceleration forcing existing facilities to upgrade to compete; and renter/landlord split incentives making it necessary for the program to serve tenants at little/no cost to property owners/managers.

Existing Multifamily served over 1,650 sites in 2013 – up from around 1,000 served in 2012 (As a result of Instant Savings Measure installation and midstream incentives).

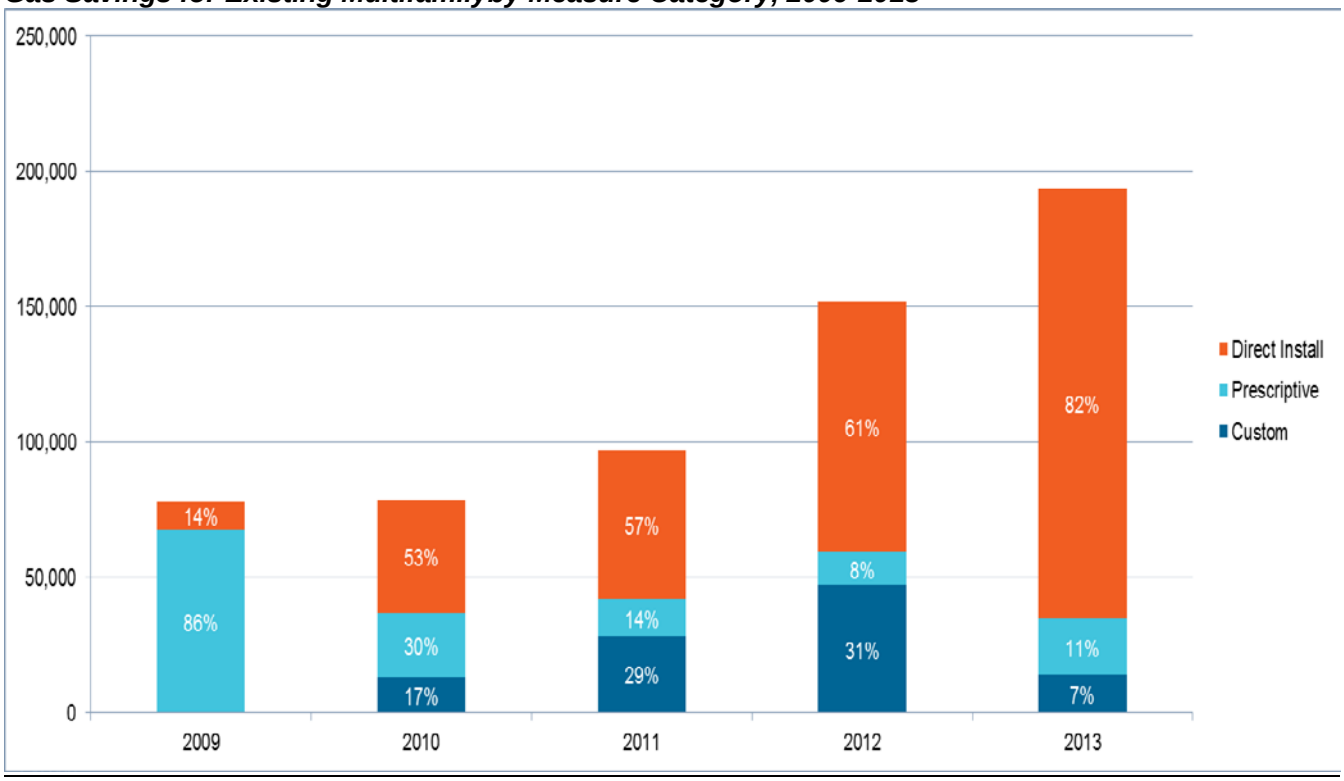
First year incentive costs for gas savings have fallen sharply as a result of the drop in the number of weatherization projects resulting from changes in the Oregon Business Energy Tax Credit program and an increased number of instant savings measures and custom measures that have a much lower first-year cost.

The program has increased the proportion of more expensive savings from prescriptive and custom tracks but this is offset by a decrease in costs for common area lighting and instant savings measures. This has resulted in a relatively stable first year incentive cost for electric savings.

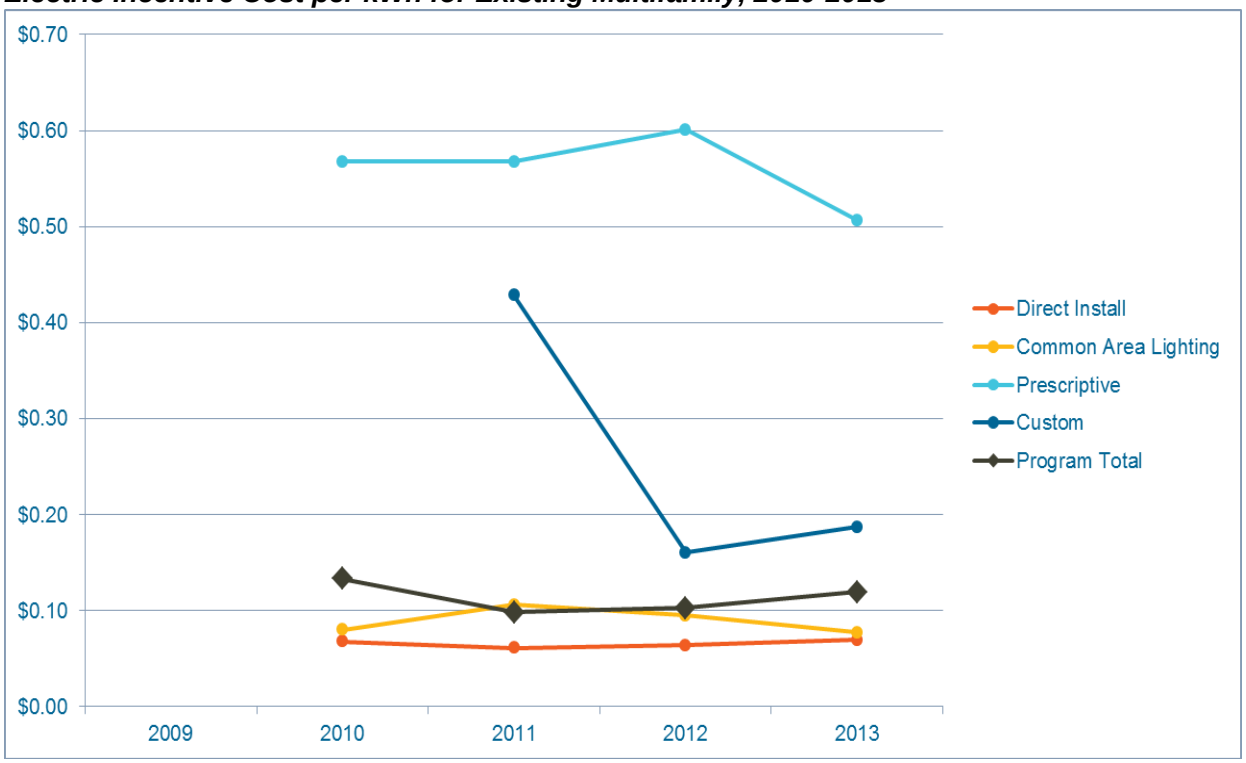
Electric Savings for Existing Multifamilyby Measure Category, 2009-2013



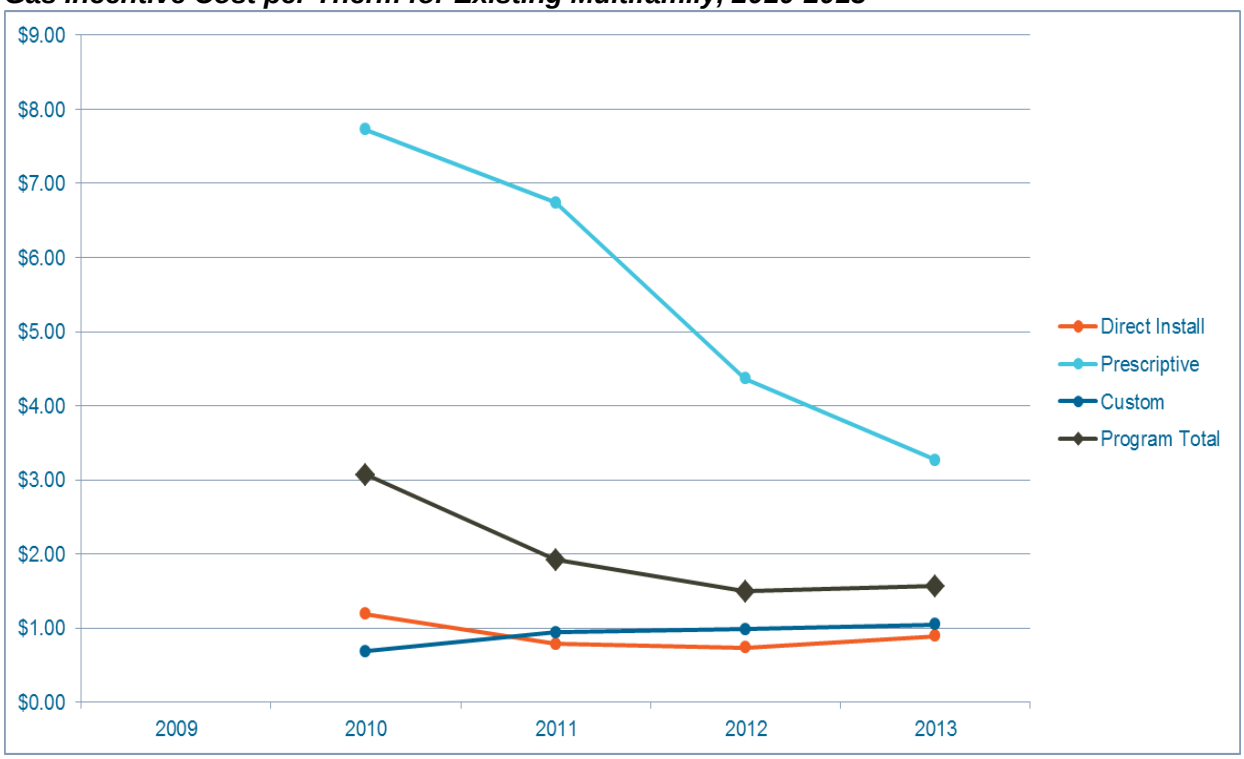
Gas Savings for Existing Multifamilyby Measure Category, 2009-2013



Electric Incentive Cost per kWh for Existing Multifamily, 2010-2013



Gas Incentive Cost per Therm for Existing Multifamily, 2010-2013



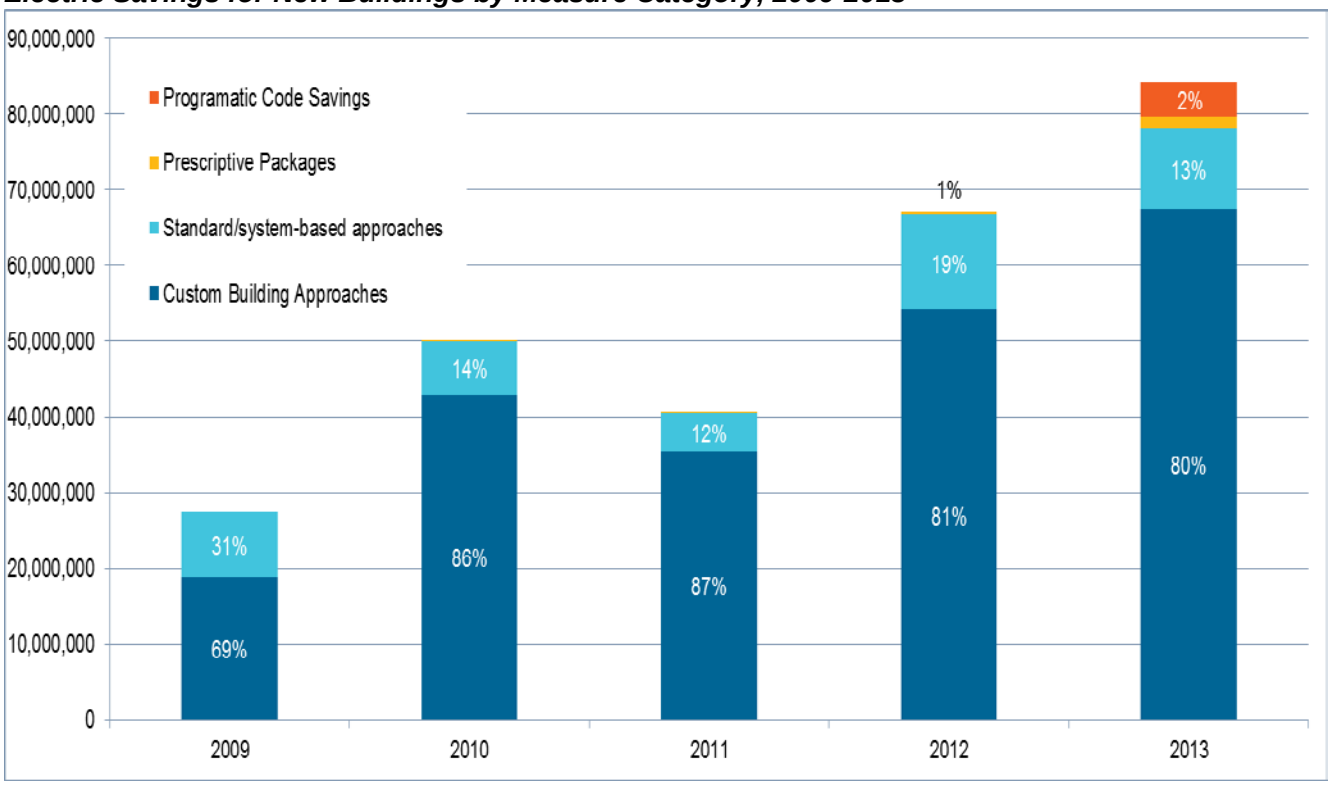
* ***2010 was the first year that Multifamily was implemented as an independent program through the Commerical Sector.***

D. New Buildings

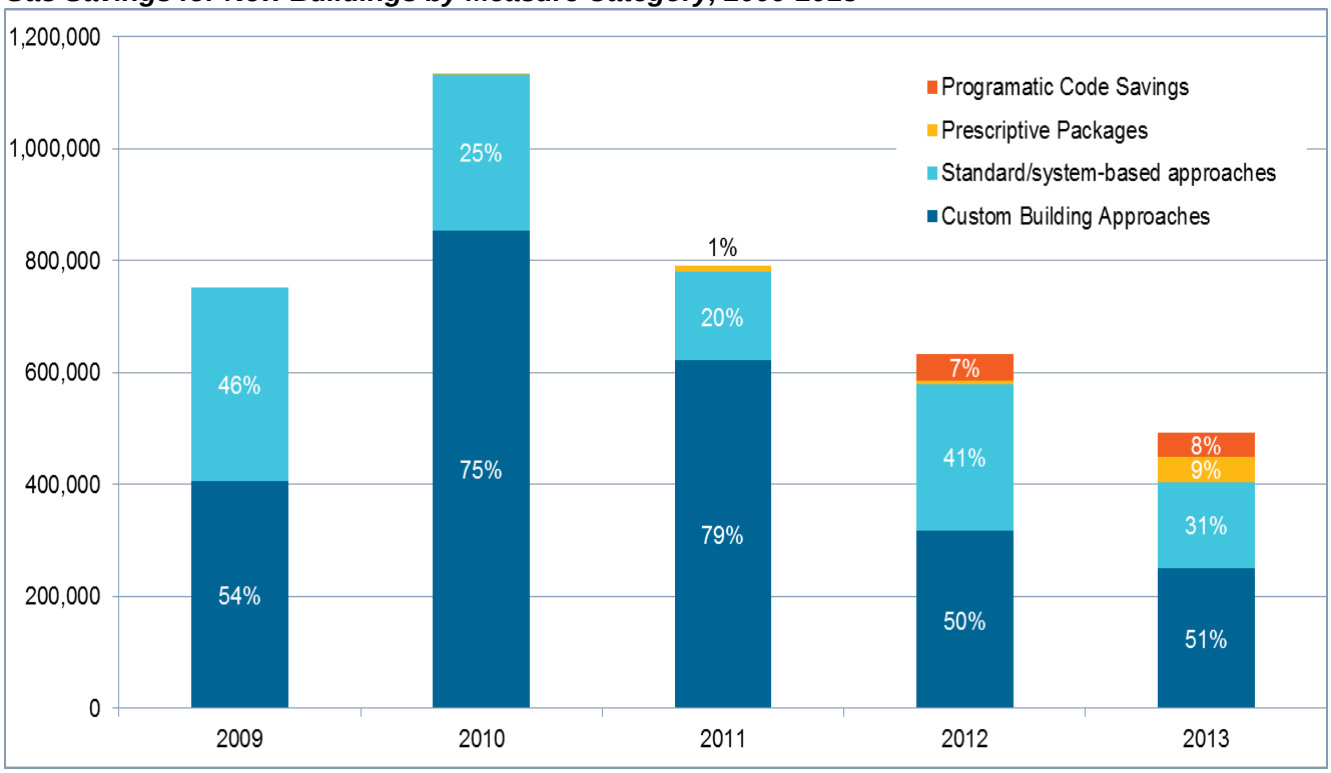
The New Buildings program provides incentives for energy-efficient design and equipment to support construction of high-performance commercial new buildings and major renovations of all sizes and types. New Buildings electric savings continued to grow in 2013 with exceptional savings coming from a few large projects. Electric incentive cost per kWh declined in 2013 due to lower cost savings for market solutions, highly cost-effective savings from large data centers and the ability to claim code savings for market transformation efforts. Gas savings declined in 2013 as a result of several large projects shifting into 2014. Gas incentives per therm remained relatively consistent with a reduction in cost for market solutions. Program strategies for 2013 included:

- Providing early design assistance, plan reviews, and incentives to drive deeper energy savings strategies.
- Supporting code improvement and adoption by providing design reviews and code compliance advice as well as supporting future code changes.
- Introducing the new market solutions offering to help small projects under 70,000 square feet achieve deeper energy-savings through standard tiered incentive packages for restaurants, groceries, multifamily, office, schools and retail.
- Implementing a more robust regional outreach strategy through increased presence in Southern, Eastern and Central Oregon to raise awareness and spur activity in Pacific Power and Cascade Natural Gas territory.
- Continuing the rollout of the solar-ready initiative, targeting design professionals with solar design incentives with the goal of designing buildings for easier installation of solar electric systems.
- Continuing support for deep retrofit projects.

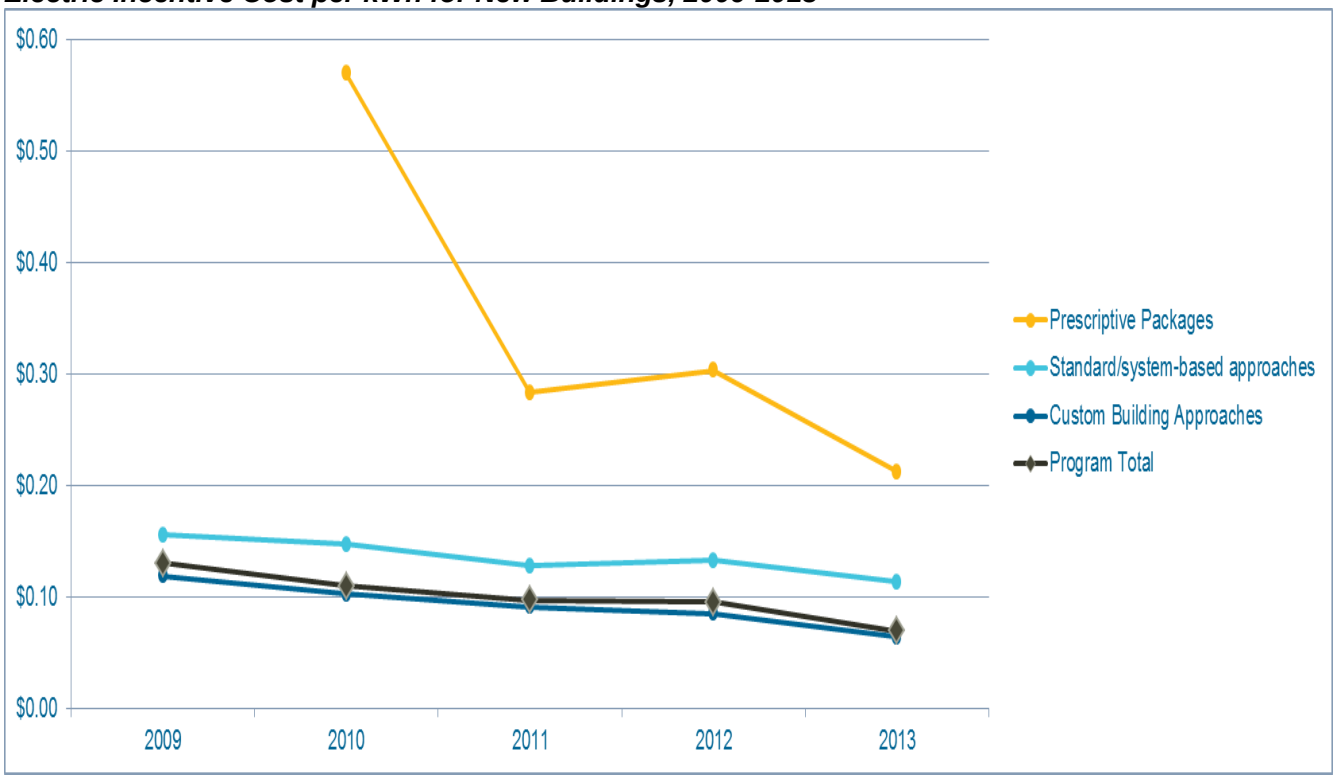
Electric Savings for New Buildings by Measure Category, 2009-2013



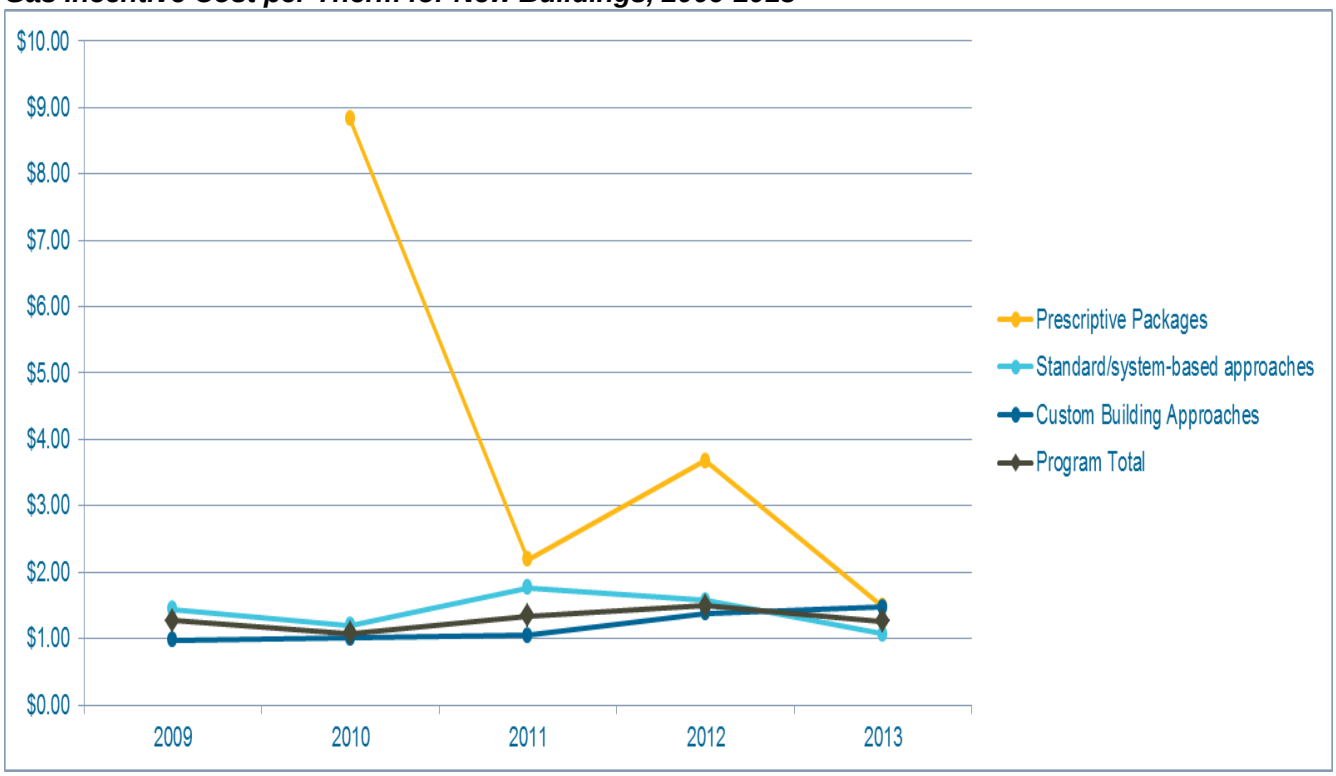
Gas Savings for New Buildings by Measure Category, 2009-2013



Electric Incentive Cost per kWh for New Buildings, 2009-2013



Gas Incentive Cost per Therm for New Buildings, 2009-2013



III. Measures and Technologies

Following are some trends in measures and technologies, by program.

A. Existing Buildings

Lighting and lighting controls have been the primary driver of electric savings from 2009 thru 2013. Fluctuations were driven by bonuses and market promotions. The upward trend in 2013 is the result of the program dedicating more resources to lighting and the emergence of more cost-effective LED applications.

Savings from building controls and custom HVAC have grown steadily from 2009-2012 with a decline in 2013. These tend to be projects with significant savings and a few projects can have a significant impact on the annual achieved program savings.

Custom variable frequency drives (VFDs) have resulted in significant savings for the program with some variation from year to year. Larger VFD projects can also yield significant savings and project opportunities vary.

Existing Buildings has been working to expand Strategic Energy Management (SEM) to diversify offerings and to work with larger and established participants to help them further maximize their energy savings. This effort is paying off with SEM now contributing significant electric savings and even more gas savings in 2013 after a successful first year in 2012.

Gas savings measure categories tend to be “lumpier” over time than electric savings due to the size of these projects. Custom building controls, boilers and custom HVAC are all measure types that can lead to large projects. The availability of these projects in a given year will have a marked effect over the total annual program savings.

Fluctuations in numbers of appliances and insulation measures have varied based on market opportunity and program effort. The larger gas savings posted from appliances in 2013 is the result of the program working with kitchen equipment vendors to promote and sell this equipment to commercial kitchens.

Key measures for Existing Buildings, 2009-2013

Electric (Working kWh)					
Reporting Group	**2009**	**2010**	**2011**	**2012**	**2013**
Lighting & Lighting Controls	45,186,813	43,580,864	66,262,741	51,267,909	56,174,879
Building Controls	5,381,448	10,724,769	14,773,528	18,813,027	13,671,331
Custom HVAC	1,680,338	3,619,868	6,503,805	9,595,324	8,551,260
SEM	0	0	0	5,299,318	8,307,882
Custom VFD	2,584,953	4,440,554	1,083,295	1,427,427	5,636,002
Gas (Working Therms)					
Reporting Group	**2009**	**2010**	**2011**	**2012**	**2013**
Building Controls	124,457	229,410	573,931	515,512	451,402
SEM	0	0	0	126,942	360,587
Appliances	67,692	35,019	27,223	130,477	291,243
Boiler	238,457	377,342	222,535	361,062	246,924
Custom HVAC	185,134	78,980	249,035	259,973	209,538

B. Existing Multifamily

Savings from instant savings measures (ISMs) such as CFLs and water saving devices peaked in 2011 on the electric side when more comprehensive strategies (custom, common area lighting, midstream promotions) began to provide future growth in savings.

Savings from ISMs on the gas side continue to grow and were the primary savings source over the past four years. The introduction of the Custom Track and key customer engagement strategies to identify multi-year opportunities within portfolios has led to gas savings more than tripling from 13,000 therms in 2010 to 47,000 therms in 2012. The custom track saw a three year growth trend in savings stop in 2013 due in part to several significant custom projects shifting into 2014. Due to changes in Oregon state energy tax credits, Existing Multifamily has seen minimal savings from weatherization and windows measures in recent years compared to prior years when this measure was eligible for tax credits up to 35 percent of project cost.

Key measures for Existing Multifamily, 2009-2013

Electric (Working kWh)					
Measure Group	**2009**	**2010**	**2011**	**2012**	**2013**
CFL ISMs	1,485,391	2,794,872	7,387,559	7,764,098	6,755,805
Water Saving Devices	1,807,659	4,110,253	11,271,756	9,783,800	6,433,313
Common Area Lighting	4,394,029	2,992,989	1,394,476	2,116,373	3,087,887
Windows	3,239,445	615,683	687,352	666,140	821,759
Custom	2,177	0	7,423	561,741	668,244
Gas (Working Therms)					
Measure Group	**2009**	**2010**	**2011**	**2012**	**2013**
Water Saving Devices	10,605	41,968	54,936	92,658	159,256
Custom	0	13,196	28,448	47,207	14,118
Boilers	45,478	5,850	1,989	1,556	11,388
Windows & Insulation	14,719	14,575	4,174	3,212	3,553
Windows	11,593	12,274	3,352	993	2,971

C. New Buildings

Custom Whole Building projects made up the largest portion of electric savings in 2013 due to completion of several large enterprise data centers. HVAC, lighting and water heating equipment continue to be strong sources of electric and gas savings. HVAC electric savings increased significantly in 2013 also due to data center activity. LEED savings continued to decline as interest in LEED certified projects appears to have peaked around 2009 and 2010. Custom gas savings declined as fewer hospital projects are being built as the market slowed investment while waiting for changes from healthcare reform. Gas savings from prescriptive packages expanded significantly as the market solutions offering ramped up.

Key measures for New Buildings, 2009-2013

Electric (Working kWh)					
Measure Group	**2009**	**2010**	**2011**	**2012**	**2013**
Custom	98,242	820,863	20,234,394	29,655,512	32,251,531
HVAC	4,429,584	2,103,244	4,805,579	4,895,937	21,152,739
Lighting	8,860,942	8,217,540	6,154,914	14,571,779	12,061,243
Commercial Equipment	1,480,589	1,560,113	2,394,800	4,306,534	4,233,937
LEED	11,823,955	11,276,835	5,409,556	7,447,466	1,361,881
Gas (Working Therms)					
Measure Group	**2009**	**2010**	**2011**	**2012**	**2013**
HVAC	262,509	276,716	110,531	254,463	246,810
Water Heating/Saving	142,170	127,944	52,206	76,627	90,618
Commercial Equipment	8,744	25,190	52,165	65,839	37,816
Prescriptive Packages	0	1,333	0	3,112	30,933
Custom	13,488	53,729	284,986	40,705	16,810

IV. Market Sectors

Following are some trends in how market sectors have been served, by program.

A. Existing Buildings

Existing Buildings is designed to provide services to all market sectors and all building sizes. The program has evolved to expand its reach by encouraging larger customers to do more in their buildings and to reach smaller customers and customers in rural areas of the state. The program uses a direct outreach and customer relationship approach to serve large customers. Existing Buildings also strives to serve smaller customers through coordination with utility outreach representatives and working with trade allies and vendors.

Offices represent the largest potential market in terms of square footage in Energy Trust service territory and the electric and gas savings realized from this sector are commensurate with the relative opportunity.

Retail is a significant source of electric savings through lighting and refrigeration opportunities. Warehouses also yield substantial savings from lighting projects. Hosptials made up a significant portion of electric savings in 2013, however, this is a reduction from the electric and gas savings that hospitals have yielded in the past.

Education has yielded substantial electric and gas savings because of the diversity of measure opportunities that range from lighting, HVAC and controls. Energy Trust has been working actively with ODOE through a Cool Schools partnership to continue tp expand savings from K-12 schools.

Key Markets by Savings for Existing Buildings, 2013

Electric Savings (kWh)	
Office	22,970,298
Retail	19,277,010
Education	11,243,374
Warehouse	7,183,777
Hospital	4,799,644

Gas Savings (therms)	
Education	691,224
Office	358,875
Restaurant	304,897
Assembly	141,268
Gym/Athletic Club	69,698

B. Existing Multifamily

The sector with the majority of savings on the electric side and the second largest contributor on the gas side was market rate, which is the largest tracked sector within the program as it contains all non-subsidized multifamily apartments or housing.

The largest savings contributor on the gas side and send second largest on the electric side is the assisted living market segment. Assisted Living contains multifamily housing specifically for seniors as well as facilities that offer limited assistance and supervision for those living with disabilities.

The third largest segment on the electric and the fourth on the gas side is the affordable segment, which covers all income subsidized properties and developments. The remaining savings came through home owners associations, campus living and a new addition in 2013 that refers to individually owned and upgraded units within a larger multifamily structure which is called attached residential owner.

Key Markets by Savings For Existing Multifamily 2013

Electric Savings (kWh)	
Market Rate	12,520,321
Assisted Living	2,732,505
Affordable	2,306,892
Homeowners Association	656,503
Attached Residential Owner	118,862

Gas Savings (therms)	
Assisted Living	112,789
Market Rate	45,206
Campus Living	25,295
Affordable	8,920
Attached Residential Owner	772

C. New Buildings

Data centers were a significant source of highly cost-effective savings in 2013 and are well represented in the pipeline for completion in 2014-2015. In response to the growth of data centers in Oregon over the past several years, a market that is not directly addressed through state energy codes, New Buildings launched a data center offer to address a wide range of opportunities to save energy in facilities ranging from 10 kW to server “farms” drawing power in excess of 10 MW.

As the economy strengthens, New Buildings is assisting a growing number of industrial projects. New Buildings typically assists with the building shell, while Production Efficiency supports manufacturing processes and equipment.

Small buildings, defined as 70,000 square feet or less, represent a relatively large portion of projects. Many commercial properties served by Energy Trust are less than 20,000 square feet. To better serve the most common types of small commercial buildings, New Buildings developed and began offering market-specific packages with tiered incentives for restaurant, multifamily, office, school, retail and grocery building types.

Total project enrollments in New Buildings have increased, in particular multifamily and schools (indicated below as *education*).

Key Markets by Savings for New Buildings, 2013

Electric Savings (kWh)	
Data Center	51,665,644
Retail	7,767,406
Multifamily	5,004,505
Grocery	4,633,911
Office	2,596,818

Gas Savings (therms)	
Education	105,484
Multifamily	104,427
Office	83,039
Other Industrial	47,339
Restaurant	28,517