Industry and Agriculture Sector
2013 Production Efficiency Trends: Measures, Markets and Sources of Savings

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EnergyTrust of Oregon

I. Analysis of trends in the Industry and Ag Sector

Source of data

Data contained in this report comes from Energy Trust's FastTrack project database and Business Intelligence reports.

Trend analysis: Working savings vs. reportable numbers

These analyses are 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 total provided to the Board, PUC and utilities, which do include evaluation factors.

There are good reasons to run trend analysis with working numbers. Evaluation factors change year to year and these changes can mask underlying 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 suite of offerings available, including services, incentives and channels for delivery, and the market's response to these. The second most powerful driver of outcomes appears to be major market forces such as growth in key sectors like high tech manufacturing or the recent recession. This trend analysis focuses on the primary driver of basic program design and delivery.

II. Sources of Savings

Production Efficiency is organized around and achieves savings through two primary pathways to market: custom and streamlined. Each is targeted to specific industry needs and/or market segments with differing complexity, delivery channels and development timelines.

The custom track is delivered by Program Delivery Contractors (PDCs) acting as energy efficiency account managers for medium to large industries, and making it easy for them to access program services and incentives to drive deep and persistent process efficiencies. The Custom track includes both custom projects and strategic energy management (SEM) offerings. By performing custom analysis and verification of savings for each project, the program has the flexibility to work with large industrial retrofits, unique process improvement projects and emerging technologies and practices. Many custom projects are also supported by technically specialized Allied Technical Assistance Contractors (ATACs), who provide detailed technical studies. SEM offerings are delivered by a pool of Industrial Technical Service Providers (ITSPs).

The streamlined track includes Industrial Lighting and the Streamlined Industrial Initiative. Streamlined projects are delivered through trade ally networks, which are developed and organized by a different set of PDCs. Trade allies are recruited and provided with calculated savings tools and a simplified incentive process. This is effective for standard measures where savings are easily calculated by common formulas with a small number of inputs. It streamlines program participation and reduces the cost of delivery for these measures, providing a cost-effective approach to achieving a higher volume of projects.

A unique source of savings is the so-called "megaproject." Megaprojects are rare and represent opportunities to achieve a great amount of savings but with total incentives above the $500,000 threshold that requires prior board approval. The current megaproject has multiple phases, with savings to be booked over the course of multiple years. The second such booking for the current megaproject occurred in 2013. Although these projects are technically categorized as custom capital projects, they are called out in this analysis because of the massive impact had on total savings for a year as clearly seen in 2005 and 2009.

A. Electric Sources of Savings

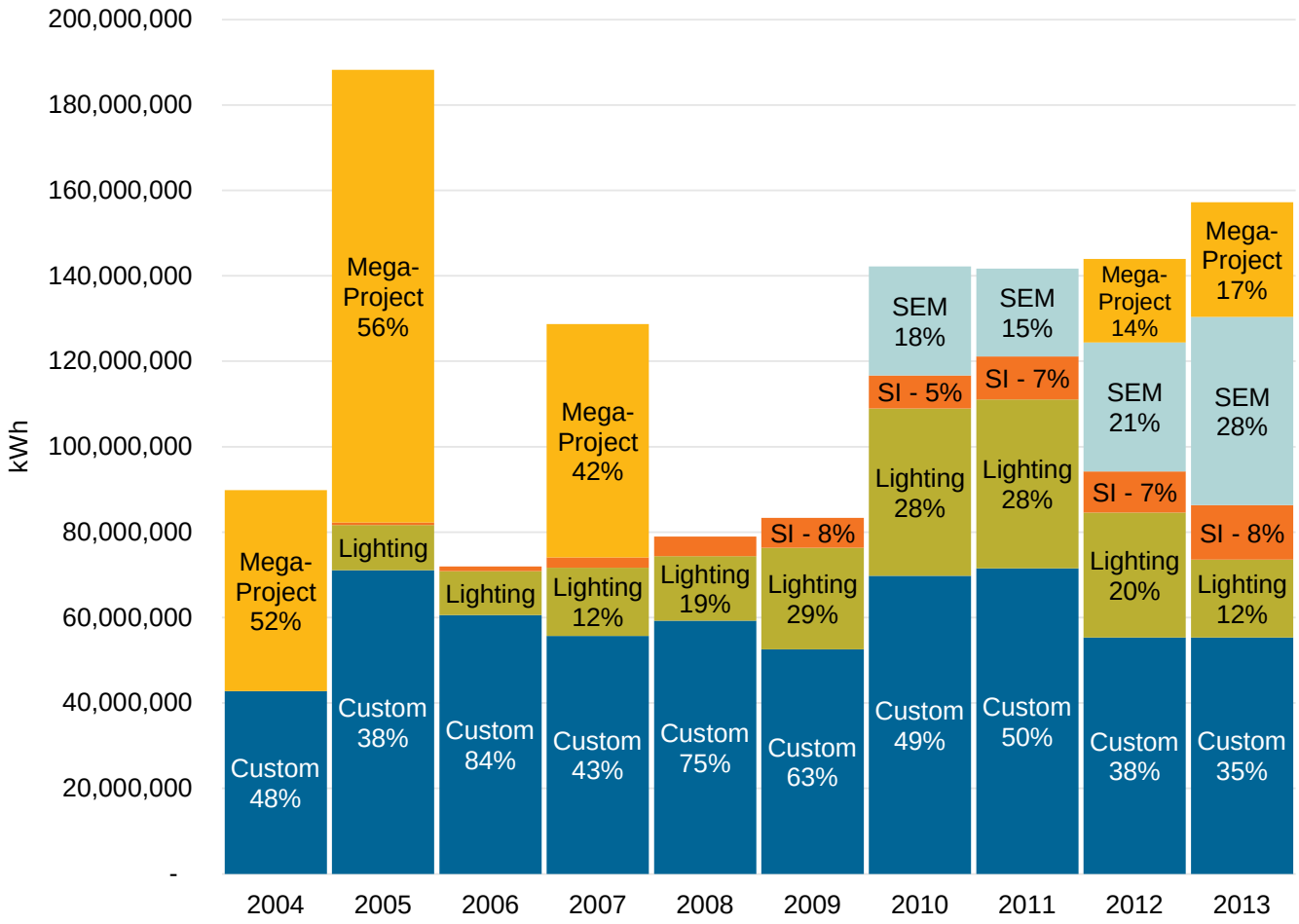

Figure 1: Electric sources of savings from 2004 – 2013 (working kWh)

- The diversification of offerings since 2008 has helped the program round out its portfolio as the contribution of savings fluctuates between offerings. In 2013, the savings from a megaproject and increased savings from SEM more than compensated for decreased savings from industrial lighting projects.
- Industrial lighting savings almost doubled between 2009 and 2010, and the level of lighting savings was maintained in 2011 through deployment of the 2011 Fall Bonus. Although a greater majority of lighting projects took advantage of a bonus in 2012, a lower project volume and decreased savings per project resulted in a 26 percent drop in savings from 2011. Program staff attribute this drop to the 2011 Fall Bonus which pulled projects that otherwise would have completed in 2012 into 2011.This trend continued in 2013, decreasing by more than 50% compared to 2012. Market conditions, in particular the phasing out of the BETC tax credit, have changed the value proposition for lighting projects. To reverse this trend, custom lighting incentives have been increased as of January 2014.

B. Gas Sources of Savings

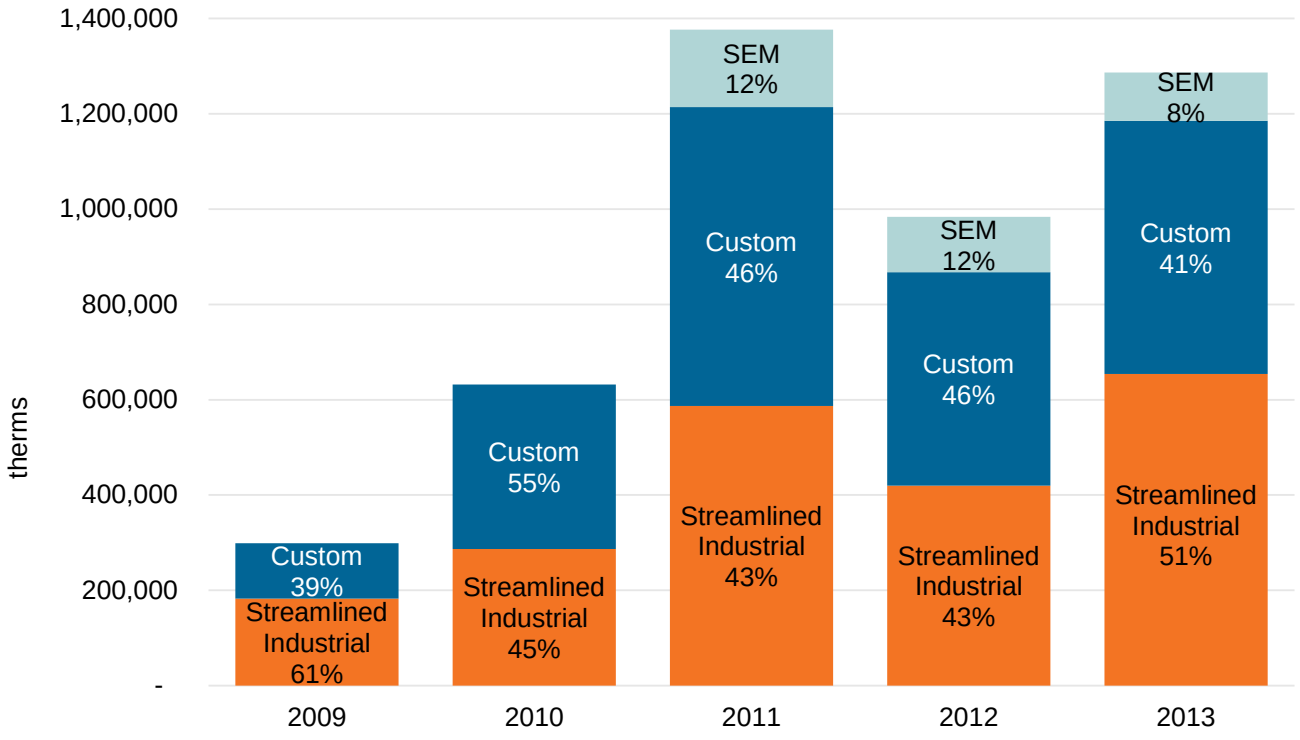

Figure 2: Gas sources of savings from 2009 – 2013 (working therms)

- 2013 Gas savings are split roughly 50/50 between the Custom and Streamlined tracks. Total savings from streamlined projects increased by more than 50% compared to 2012, largely driven by greenhouse projects.
- SEM continued to garner gas savings in 2013, Most SEM participants had historically been larger industries, and therefore Transport customers, who are ineligible for gas services and incentives. In recent years, one to three SEM participants per year have been eligible, and are the source of those SEM gas savings. Savings in 2013 were on par with 2012 SEM gas savings, but came from 9 participants, most of whom are small industries that participated in the CORE pilot.
- Annual gas savings by track is up and down, year to year, as the majority of savings in both tracks come from a fairly small number of large projects. There was a 25% increase in gas savings from 2012 to 2013. Industrial natural gas outcomes are heavily influenced by the shifting completion dates of a small number of large projects. In 2011, the program saw the completion of a few big projects that affected the savings. In 2012, a couple of large projects pushed at the last second from 2012 to an expected completion in 2013. In 2013, the savings were back up as the pushed 2012 projects completed and combined with the rest of the program activity for the year.

C. Program Volume

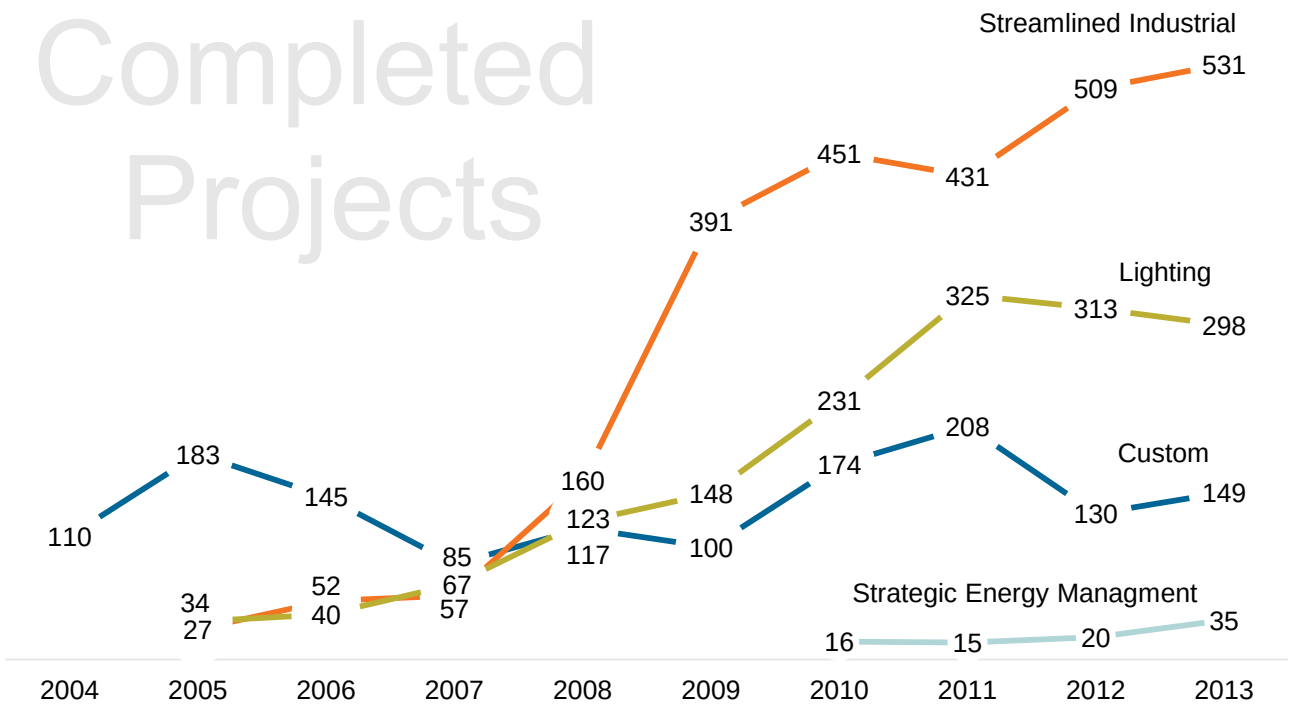

Figure 3: Project counts by sources of savings, 2004 – 2013

- Production Efficiency's project volume increased substantially from 2008 to 2013, primarily due to the ongoing development of the Trade Ally delivered streamlined tracks.
    - Savings also doubled during this same time period, but while the smaller streamlined savings projects are cost effective, the increase in savings is attributed largely to development and growth in a small number of more complex, custom offerings such as SEM.
    - The increased project volume comes with a good problem: As an internally managed program, staff are challenged to actively seek efficiencies and other administrative improvements in order to be able to manage and process the increasing number of projects.

III. Systems and Measures

Prescriptive measures for industrial energy uses, such as wall insulation, nozzle replacements for irrigation or thermal curtains for greenhouses, are relatively few. While many industrial systems are common, the application of these systems, including their configuration, settings and potential for savings are unique from plant to plant. Custom and calculated approaches to analysis allow the program to work with the diverse array of measures possible at manufacturing plants. Looking at individual measures is therefore not a very useful way to view trends, but looking at the industrial systems addressed by measures tells us a bit more.

Note that “Multi-System” is a measure category referring to savings from SEM, a comprehensive and strategic approach to tuning operations, focused on behavior and operational changes that affect multiple systems. Multi-system SEM savings are determined through developing regression models of energy intensity, at the meter level, rather than employing end use measure level analysis.

A. Electric

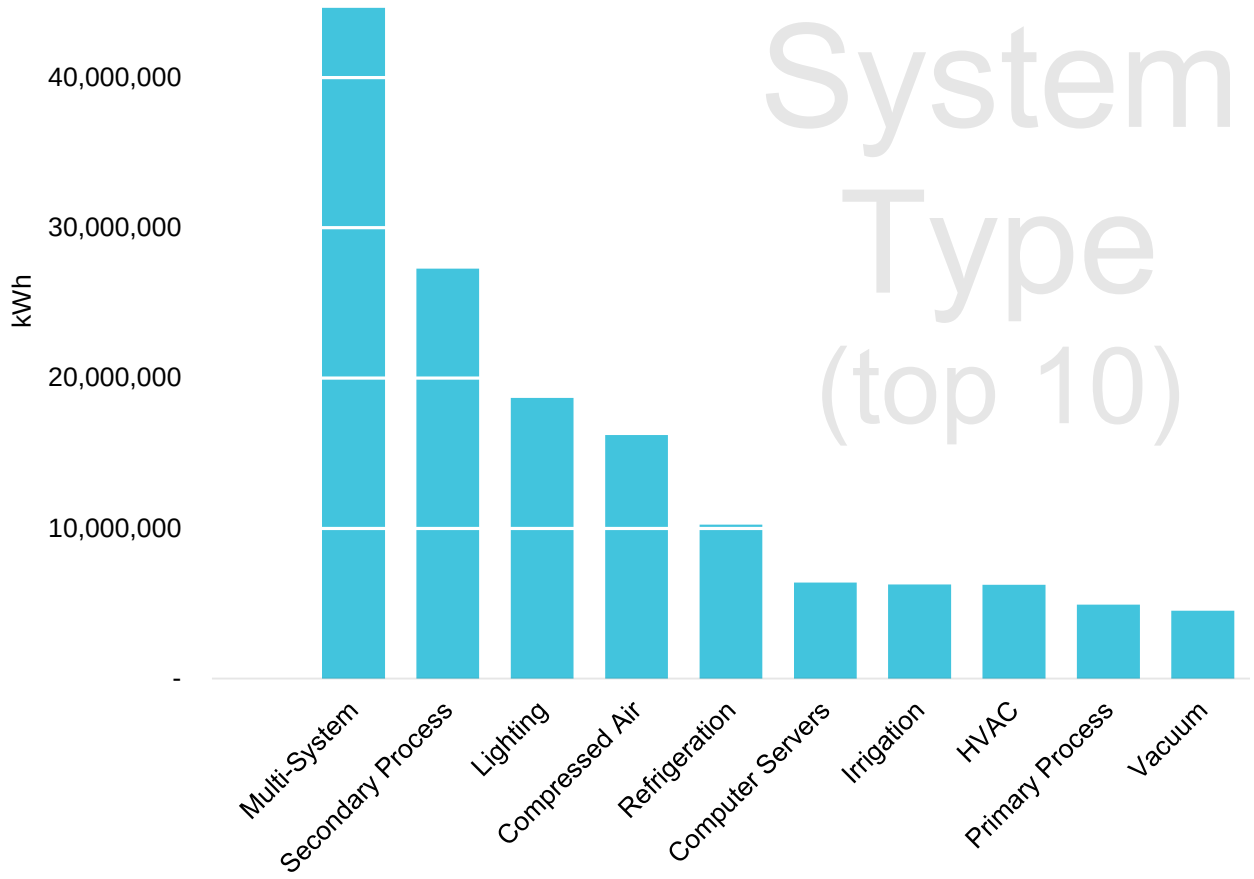

Figure 4: Electric savings from measures associated with the top 10 industrial systems in 2013 (working kWh)

- Multi-system efforts from SEM engagement represented 33% of electric savings in 2013 and averaged 25% of all working electric savings over the past 4 years. SEM practices can be applied in

any types of industries, and SEM engagements average 5-8% total site energy savings, so SEM multi-system measures may have the broadest technical potential.

- Lighting and compressed air are also common to almost all manufacturers, and these measures provide a strong base of savings for the program, delivered both through the streamlined tracks and through the custom track for more complex compressed air projects. While the portion of savings from lighting measures has been going down each of the past 3 years, over the past 4 years efficient lighting systems provided on average 25% of annual savings. Compressed air systems have ranged widely up and down from 9 percent to 25% of annual electric savings over the past 4 years, averaging 15 percent over that period.

B. Gas

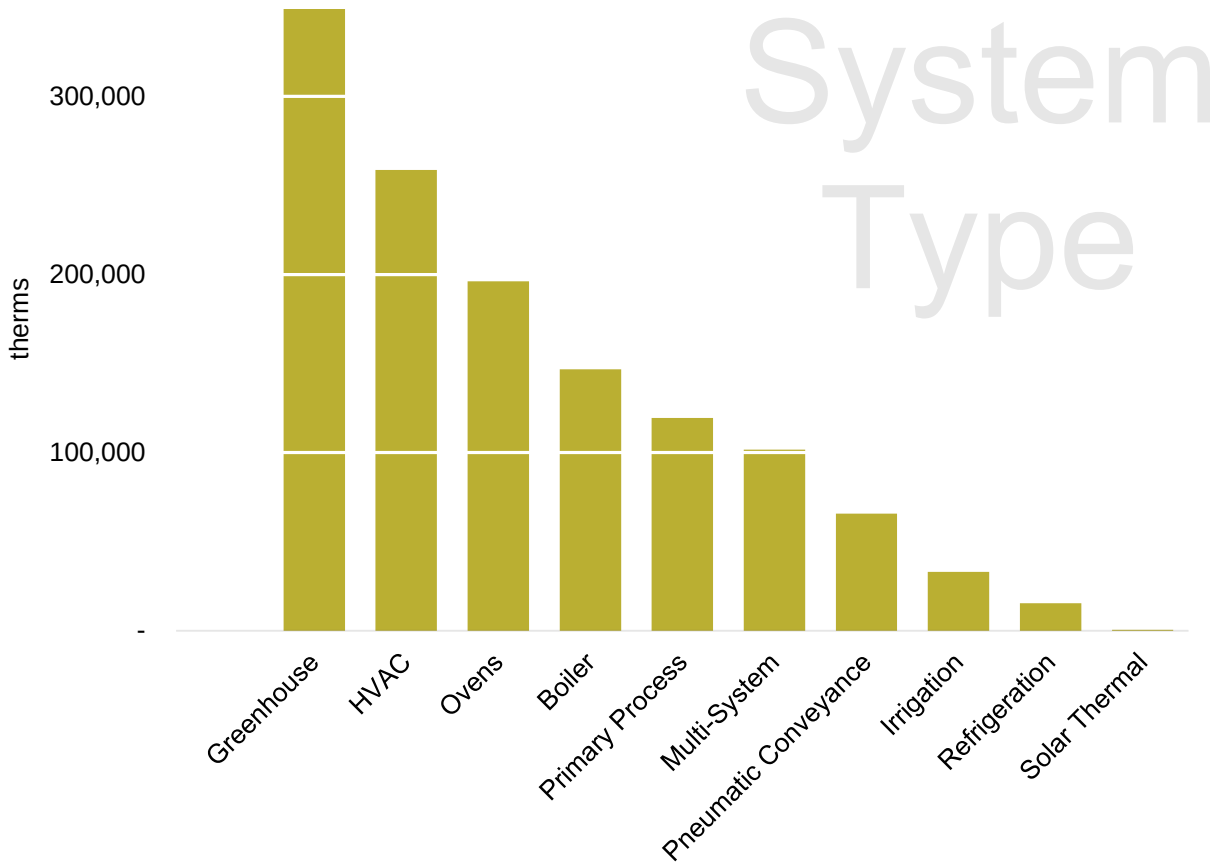

Figure 5: Gas savings from measures associated with industrial systems in 2013 (working therms)

- Greenhouse systems have been the biggest source of gas savings since the program started claiming therms in 2008, providing on average twenty five percent of annual therms, and twenty seven percent of therm savings in 2013.

IV. Industry Sectors

Oregon's manufacturing base is diverse, and the program has made terrific inroads over the past 6 years to broaden beyond the wood products and pulp & paper industry that represented the majority of program savings from 2003 – 2007.

A. Electric

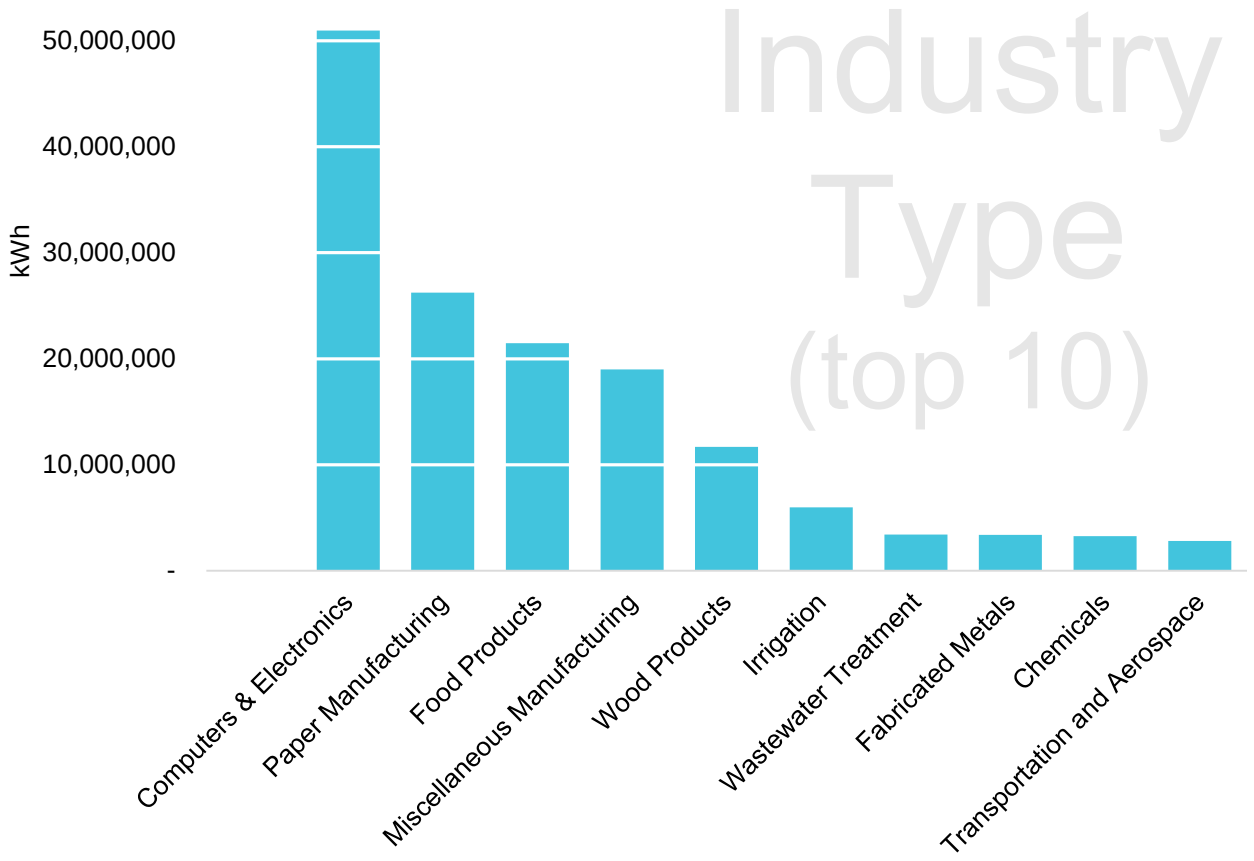

Figure 6: Electric savings from the top 10 industry types that participated in 2013 (working kWh)

- The high tech industry has long been recognized as the industry with the greatest electric savings potential, yet the program had difficulty making inroads in years past. Over the past five years actions taken to establish relationships and foster efficiency at this small number of large sites have paid off, and realized savings is now tracking in alignment with the technical potential. .
- Savings from paper manufacturing surged in 2013, after three years of a sharp downward trend in savings. Steady completion of a constant stream of mid-sized projects at the small number of remaining plants combined with a very successful SEM effort in 2013 at a single large plant tripled the contribution of electric savings from this sector compared to 2012.
- Food products had a small increase of savings in 2013. The sector has been holding steady at about 15% of annual electric savings for the past four years, and also consistently ranks as a top contributor of industrial gas savings.

- Wood products continued a precipitous 3 year trend of decreasing electric savings, in 2013 providing only eight percent of the program's total. Prior to 2011, wood products represented 25 – 50% of program electric savings per year. This reduction was particularly felt in Southern and Eastern Oregon, where this industry has historically dominated. The program made up for the decline in electric savings from the wood products sector through the increase in savings in high tech manufacturing. This shift appears to be reflective of much larger market changes and the impacts of the recession in 2009-2011 on the wood products industry. A bright spot is that small and medium sized wood products manufacturers have been an ongoing source of gas savings.

B. Gas

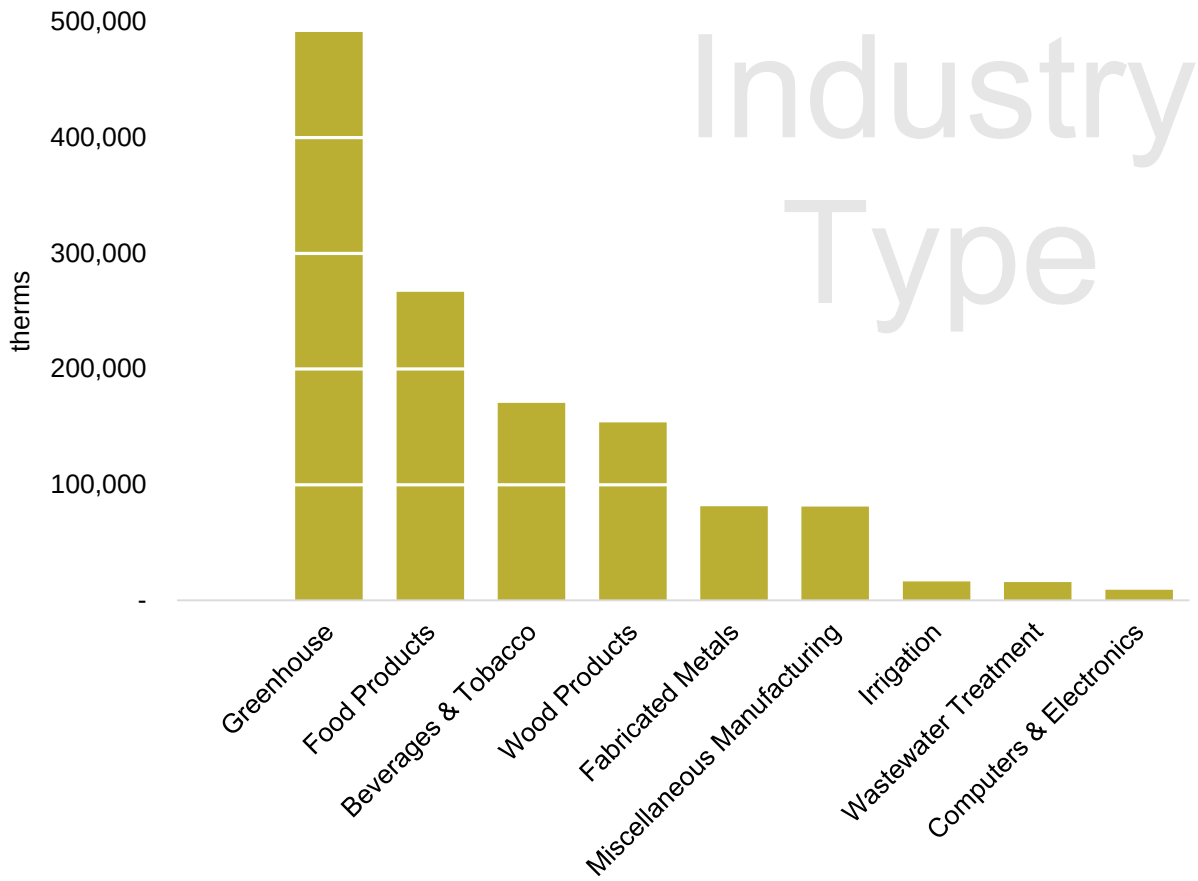

Figure 7: Gas savings from industry types that participated in 2013 (working therms)

- Greenhouses, seen both as an industry sector and system type, garnered 38% of gas savings in 2013, followed by Food Products with 21%, Both sectors have consistently been the top performers for industrial gas savings since 2009, although annual savings by sector varies considerably year to year.

- A new sector that broke through into third place in 2013 is Beverages and Tobacco. Re-dubbed the "fun sector" by staff and PDCs, gas efficiency projects at coffee roasters and bottling microbrewers are moving, with six projects completed in 2013 representing 13% of gas savings. Although many of these projects are relatively small, they are often replicable and the culture of these companies is oriented towards sustainability so they are enthusiastic participants.