

2014 True Up: Estimate Corrections and True Up of 2002-2013 Savings and Generation

Introduction

True Up is the annual process used to adjust and correct reported energy savings and renewable generation to reflect the best available information at the time of True Up. The 2014 True Up incorporates evaluation results available prior to June 30th, 2014. In the True Up process adjustments are made to past saving and generation data based on corrections to transaction errors, updated measure assumptions, anticipated evaluation results (for years and programs where there is yet to be an evaluation completed), and actual evaluation results.

The 2014 True Up updates reported energy savings for Energy Trust of Oregon funded activities from 2002-2013, although the majority of 2014 True Up adjustments affect savings claimed after 2010.

The purpose of this 2014 True Up report is to summarize adjustments to Energy Trust savings and generation. The three parts of this report discuss (1) definitions for evaluation results by which savings and generation are adjusted, (2) updates made to Energy Trust data by program and (3) the difference between pre True-Up and post True-Up savings and generation estimates.

Summary

The 2014 True Up introduced adjustments to total annual electric and gas savings reported by Energy Trust of Oregon, but reported renewable energy generation was not affected. Total electric savings from 2002-2013 decreased by 0.52%, from 415.6 aMW to 412.4 aMW, and total gas savings from 2003-2013 increased by 1.29%, from 33.1 million therms to 33.5 million therms.

For 2013, reportable electric savings decreased by 1.56% and reportable gas savings decreased by 0.01%, compared to the savings shown in Energy Trust's 2013 annual report.

The largest changes underlying 2014 True Up adjustments were; (1) updated realization rate results for the Existing Buildings and New Buildings programs for 2011, (2) higher free-rider rates for the Existing Buildings program for 2013, (3) updated assumptions for claiming gas furnace market transformation savings, (4) an updated 'hours of use' assumption for calculating gas hearth savings, (5) revised NEEA savings results for 2012 and 2013, (6) revised installation rates for Build-Your-Own Energy Saver kit measures, and (7) revisions to the Market Transformation model used to claim gas savings for New Buildings.

The annual changes to electric and gas savings are summarized by program in the Results section below. Additionally, there is a series of tables that represent overall changes by sector for each year. Lastly, results from True Up 2014 are shown for each funding utility within Energy Trust's service territory.

Definitions

Working Savings/Generation: The estimate of anticipated results which are practical for data entry by program personnel while approving individual projects. These savings are based upon estimates of typical savings or generation for prescriptive measures and site-specific engineering calculations for custom energy efficiency measures. Transmission and distribution line loss savings are not included in working savings, and no adjustments are made for free riders (FR), who are customers that would have installed the measures absent program influence, or spillover, which represents customers who are influenced by the program but did not take the incentive for an efficiency measure. These adjustments are addressed when developing reportable savings/generation values.

The true-up process does not adjust working savings claimed in the past, but *does* incorporate new information used in true up adjustments by updating working savings on a forward looking basis. Reportable savings and generation only are adjusted through the true up process.

Reportable Savings/Generation: The estimate of savings results that are used to report Energy Trust achievements. Several factors are applied to working savings in order to arrive at reportable savings. Reportable energy savings are adjusted and updated annually through the true-up process based on new information. Realization Rates (RR) are used to adjust the initial engineering estimate; a realization rate of 100% indicates that site savings were as expected, on average. Another adjustment is for market effects, also known as a Net-to-Gross (NTG) ratio. The NTG ratio adjusts for free riders and spillover. The final adjustment, which is applied only to electric savings, is for avoided line and transformer losses.

Free-rider rates are determined through Faster Feedback (FF) which is a short phone survey with a sample of recent program participants to assess satisfaction, understand customer decision making, and gather suggestions for program and process improvements. The survey is generally ten or fewer questions and is customized for each program or measure of interest. The goal of Fast Feedback is to get accurate answers to important questions within two months of program participation and to minimize the burden on survey respondents.

True Up adjusts reportable savings and generation estimates in different programs for different reasons. These fall into the following categories:

1) *Corrections:* Occasionally, through Energy Trust's routine quality assurance processes, transaction errors are discovered in the database, which require corrections. Individual transaction errors (i.e. typos that affect savings) are usually adjusted immediately and generic

transaction errors (i.e. wrong deemed savings value for a measure) are easily fixed once per year during True Up.

2) *New Data*: Projections are updated based upon improved measure simulations and new data on measure performance.

3) *Anticipated Evaluation Results*: Experience shows that evaluated estimates of savings and generation can be either lower or higher than reportable estimates. Reportable estimates are often based on typical savings for prescriptive measures or “as installed” engineering analysis for custom measures. Impact evaluation uses energy use data and/or improved data on post-installation operation to improve reportable estimates. However, impact evaluations cannot be completed until well after programs finish a year’s activity. This is due to the need to utilize post-installation energy use data. Based upon Board direction in the July, 2004 Strategic Work Session, staff is attempting to anticipate these effects in reportable savings for programs where there is not yet evaluation information available.

4) *Evaluation Results*: Once finalized, evaluations provide the most reliable representation of realized savings, and can replace the refined projections described above in (2) and (3). Evaluation results may change Energy Trust savings estimates for a single year or all prior years. This is dependent upon what other evaluations have already been performed for prior years and whether results seem applicable to prior years (e.g. similar measures, participants, and circumstances.)

Results: Impacts by Program

Working savings for Energy Trust’s commercial and industrial programs are adjusted for reporting to account for market effects by applying an ‘Evaluation Factor’ at the *program level*, while working savings for Energy Trust’s existing homes program are adjusted for market effects at the *measure level*. The evaluation factor applied to a measure or program’s working savings, for any given program year, is calculated as follows;

$$\text{Evaluation Factor} = \text{Realization Rate} * (1 - \text{Freerider Rate} + \text{Spillover Rate})$$

For program years where savings have not been evaluated for free-ridership or energy savings impact (realization rate), an anticipated evaluation result is applied prospectively until actual evaluation results are obtained and savings can be trued up. Anticipated evaluation results are calculated as the savings weighted average of the last three years of evaluated results.

Existing Buildings

Since last year’s True Up, an impact evaluation of the 2011 program year was completed for the Existing Buildings program. The 2014 True Up incorporates the results of that analysis into evaluation factors for 2011, and also in anticipated evaluation factors for 2012-2013 where the average of 2009-2011 impact evaluation results is used prospectively, since an impact evaluation has not yet been completed for those years. In conjunction, the most up-to-date freerider information available, from the 2013 program year, has been incorporated in the 2013 anticipated evaluation factor.

In addition to adjustments based on updated impact evaluation realization rates and 2013 freerider rates, further changes were made to correct errors in savings claimed for multifamily boilers and building tune-up and operation measures recognized between 2010 and 2012. Together these adjustments to savings resulted in a decrease in electric savings 1.5 of million kWh and a reduction in gas savings of 3,300 therms.

Table 1 below describes the evaluations which provide results that have been applied to reportable savings in each program year for the Existing Buildings program;

Table 1: Existing Buildings Evaluations

Program	Year	Source	Type of Adjustment	Notes
Existing Buildings	2002-2010	2002-2010 Impact Evaluations	Evaluation Factor	Closed in Previous True Ups
Existing Buildings	2011	2011 Impact Evaluation	Evaluation Factor	Closed in this True Up
Existing Buildings	2012-2013	2009-2010 Impact Evaluations	Anticipated Evaluation Factor	Realization Rate: 2009-2011 savings wtd. avg.
		2013 Fast Feedback Freerider Rates		Freerider Rate: 2011-2013 savings wtd. avg.

Tables 2 and 3 describe the components of the evaluation factors that have been applied to reportable savings for 2011-2013, where blue shaded cells indicate anticipated evaluation results;

Table 2: Existing Buildings Evaluation Factor Components- Electric

Existing Buildings- Electric	Realization Rate	Market Effects			Evaluation Factor	Evaluation
		Freerider Rate	Participant spillover	Non-Part. Spillover		
2011	91%	30%	1%	7%	71%	2010-2011 Impact Evaluation
2012	95%*	16%	1%	7%	88%	**Anticipated Results**
2013	95%*	38%	1%	7%	67%	**Anticipated Results**

*2012-2013 realization rates are the average of 2009-2011 evaluation results

Table 3: Existing Buildings Evaluation Factor Components- Gas

Existing Buildings- Gas	Realization Rate	Market Effects			Evaluation Factor	Evaluation
		Freerider Rate	Participant spillover	Non-Part. Spillover		
2011	101%	27%	1%	7%	82%	2010-2011 Impact Evaluation
2012	89%*	18%	1%	7%	80%	**Anticipated Results**
2013	89%*	28%	1%	7%	71%	**Anticipated Results**

*2012-2013 realization rates are the average of 2009-2011 evaluation results

Tables 4 and 5 describe the change in total savings claimed for the Existing Buildings program for the program years 2010-2013, for electric and gas savings, respectively;

Table 4: Existing Buildings Savings Change- Electric

Year	Savings Pre True Up (kWh)	Trued Up Savings (kWh)	Change in Savings
2010	107,394,819	107,394,819	0.00%
2011	109,743,944	101,868,204	-7.18%
2012	130,298,603	125,560,012	-3.64%
2013	117,598,620	106,496,579	-9.44%

Table 5: Existing Buildings Savings Change- Gas

Year	Savings Pre True Up (therms)	Trued Up Savings (therms)	Change in Savings
2010	1,476,817	1,490,264	0.91%
2011	1,292,271	1,556,551	20.45%
2012	1,863,749	1,968,065	5.60%
2013	1,687,502	1,589,369	-5.82%

New Buildings

Adjustments were made to savings for the New Buildings program based on the results of the 2011 Impact Evaluation of the New Buildings program for the program years 2011-2013. No new freerider rate information was introduced to savings for New Buildings program in the 2014 True Up to since the program will not receive any freerider deduction from 2013 forward, due to the twin difficulties of freeridership measurement for new construction and the stringent 2010 building code.

Additionally, the methodology used for calculating gas savings associated with the 2010 code change for commercial buildings, as well as the code compliance assistance provided by the New Buildings program, was updated to better align with the methodology used by NEEA for calculating electric energy savings from the code change. Savings previously claimed were recalculated with the new methodology and adjusted in the 2014 True Up. As a result of this adjustment, electric savings decreased by 2.4 million kWh and gas savings decreased by 99,000 therms across the programs years 2011-2013.

Table 6 describes the evaluation results that have been applied to reportable savings in each program year for the New Buildings program;

Table 6: New Buildings Evaluations

Program	Year	Source	Type of Adjustment	Notes
New Buildings	2002-2010	2002-2010 Impact Evaluations	Evaluation Factor	Closed in Previous True Ups
New Buildings	2011	2011 Impact Evaluation	Evaluation Factor	Closed in this True Up
New Buildings	2012-2013	2009-2010 Impact Evaluations	Anticipated Evaluation Factor	Realization Rate: 2009-2011 savings wtd. avg.
		2013 Fast Feedback Freerider Rates		Freerider Rate: 2011-2013 savings wtd. avg.

Tables 7 and 8 describe the components of the evaluation factors that have been applied to reportable savings for 2011-2013, where shaded cells indicate anticipated evaluation results.

Table 7: New Buildings Evaluation Factor Components- Electric

New Buildings-Electric	Realization Rate	Market Effects			2010 Code Evaluation Factor	Blended Eval. Factor	Evaluation
		Freerider Rate	Participant spillover	2007 Code Evaluation Factor			
2011	93%	34%	1%	62%	94%	80%	2011 Impact Evaluation
2012	95%*	34%	1%	64%	96%	89%	**Anticipated Results**
2013	95%*	0%	1%		96%		**Anticipated Results**

*2012-2013 realization rates are the average of 2009-2011 evaluation results

Table 8: New Buildings Evaluation Factor Components- Gas

New Buildings- Gas	Realization Rate	Market Effects			2010 Code Evaluation Factor	Blended Eval. Factor	Evaluation
		Freerider Rate	Participant spillover	2007 Code Evaluation Factor			
2011	92%	32%	1%	63%	93%	66%	2011 Impact Evaluation
2012	96%*	32%	1%	66%	97%	83%	**Anticipated Results**
2013	96%*	0%	1%		97%		**Anticipated Results**

*2012-2013 realization rates are the average of 2009-2011 evaluation results

Tables 9 and 10 describe the change in total savings claimed for the New Buildings program for the program years 2011-2013, for electric and gas savings, respectively;

Table 9: New Buildings Savings Change- Electric

Year	Savings Pre True Up (kWh)	Trued Up Savings (kWh)	Change in Savings
2011	39,706,555	38,959,857	-7.18%
2012	68,038,738	68,920,652	-3.64%
2013	86,892,815	86,759,958	-9.44%

Table 10: New Buildings Savings Change- Gas

Year	Savings Pre True Up (therms)	Trued Up Savings (therms)	Change in Savings
2011	577,573	552,027	-4.42%
2012	550,885	514,292	-6.64%
2013	493,083	460,795	-6.55%

Production Efficiency

Gas and electric savings for the Production Efficiency program for the 2013 program year were adjusted to reflect the freerider rate findings from the 2013 Fast Feedback survey of program participants. No new impact evaluation findings were introduced to savings for the Production Efficiency program in this year's true up.

Table 11 describes the evaluations which provide results that have been applied to reportable savings in each program year for the Existing Buildings program;

Table 11: Production Efficiency Evaluations

Program	Year	Source	Type of Adjustment	Notes
Production Efficiency	2002-2011	2002-2011 Impact Evaluations	Evaluation Factor	Closed in Previous True Ups
Production Efficiency	2012-2013	2009-2011 Impact Evaluations	Anticipated Evaluation Factor	Realization Rate: 2009-2011 savings wtd. avg.
		2013 Fast Feedback Freerider Rates		Freerider Rate: 2011-2013 savings wtd. avg.

Tables 12 and 13 describe the components of the evaluation factors that have been applied to reportable savings for 2012-2013, where shaded cells indicate anticipated evaluation results;

Table 12: Production Efficiency Evaluation Factor Components- Electric

Production Efficiency- Electric	Realization Rate	Market Effects			Evaluation Factor	Evaluation
		Freerider Rate	Participant spillover	Non-Part. Spillover		
2012	94%*	16%	1%	1%	81%	**Anticipated Results**
2013	94%*	20%	1%	1%	77%	**Anticipated Results**

*2012-2013 realization rates are the average of 2009-2011 evaluation results

Table 13: Production Efficiency Evaluation Factor Components- Gas

Production Efficiency- Gas	Realization Rate	Market Effects			Evaluation Factor	Evaluation
		Freerider Rate	Participant spillover	Non-Part. Spillover		
2012	97%*	26%	1%	1%	74%	**Anticipated Results**
2013	97%*	23%	1%	1%	77%	**Anticipated Results**

*2012-2013 realization rates are the average of 2009-2011 evaluation results

Tables 14 and 15 describe the change in total savings claimed for the New Buildings program for the 2013 program year, for electric and gas savings, respectively;

Table 14: Production Efficiency Savings Change- Electric

Year	Savings Pre True Up (kWh)	Trued Up Savings (kWh)	Change in Savings
2013	147,443,389	145,781,617	-1.13%

Table 15: Production Efficiency Savings Change- Gas

Year	Savings Pre True Up (therms)	Trued Up Savings (therms)	Change in Savings
2013	1,049,445	1,014,179	-3.36%

Existing Homes

The 2014 True Up adjusted savings for the Existing Homes program for the years 2010-2013. A large increase in gas furnace market transformation savings for 2012 and 2013 was introduced in this year's true up as a result of recently obtained market information that indicated a larger Oregon gas furnace market compared to what was assumed initially¹. Savings from Opower personal energy reports for 2011, 2012 and 2013 were adjusted downward by a total of roughly 3 million kwh and 172 thousand therms to reflect ongoing improvements and fine tuning of the regression model OPower uses to estimate energy savings and the method used to remove savings attributable to other Energy Trust programs.

Savings for 'build-your-own' Energy Saver Kit (ESK) measures were adjusted to reflect recent installation rate findings from the 2013 Existing Homes process evaluation². Savings for bath aerators and lighting measures in ESKs increased as a result of the updated installation rates, but savings for kitchen aerators and showerheads decreased since the updated rates were lower than what was assumed initially for those measures.

Gas savings claimed for gas furnace market transformation in 2013 was increased substantially in this year's True Up as a result of updated furnace market data that was obtained in 2014 which showed a much larger market volume than was previously anticipated, with a higher proportion of high-efficient gas furnaces being sold than expected. The adjustment to savings for gas furnaces accounted for a 529,069 therm increase in savings of across 2012 and 2013.

Lastly, 2013 freerider rates have been applied to measures that receive a freerider rate deduction. The measures initially received a freerider rate deduction based on the savings weighted average of freerider rates from 2010-2012. Savings decreased by 98,000 kWh and 27,000 therms as a result of the freerider rate update for 2013.

Tables 16 and 17 describe the change in total savings claimed for the Existing Homes program for the program years 2010-2013, for electric and gas savings, respectively;

¹ http://energytrust.org/library/reports/HVAC_Market_Update_140527.pdf

² http://energytrust.org/library/reports/EH_Process_Eval_0414.pdf

Table 16: Existing Homes Savings Change- Electric

Year	Savings Pre True Up (kWh)	Trued Up Savings (kWh)	Change in Savings
2010	30,767,694	30,767,694	0.00%
2011	44,635,803	43,438,057	-2.68%
2012	64,273,547	62,878,925	-2.17%
2013	36,115,329	36,167,555	0.14%

Table 17: Existing Homes Savings Change- Gas

Year	Savings Pre True Up (therms)	Trued Up Savings (therms)	Change in Savings
2010	1,102,848	1,104,207	0.12%
2011	1,202,031	1,124,756	-6.43%
2012	1,671,315	1,879,654	12.47%
2013	1,057,255	1,219,302	15.33%

New Homes and Products

The 2014 True Up adjusted savings for Air Sealing measures claimed in the New Homes and Products program for the 2012 program year due to an incorrect measure configuration.

Tables 18 and 19 describe the change in total savings claimed for the New Homes and Products program for the program years 2012-2013, for electric and gas savings, respectively;

Table 18: New Homes and Products Savings Change- Electric

Year	Savings Pre True Up (kWh)	Trued Up Savings (kWh)	Change in Savings
2012	45,660,439	45,660,439	0.00%
2013	60,943,588	59,438,941	-2.47%

Table 19: New Homes and Products Savings Change- Gas

Year	Savings Pre True Up (therms)	Trued Up Savings (therms)	Change in Savings
2012	784,764	785,825	0.14%
2013	1,022,265	1,022,265	0.00%

Northwest Energy Efficiency Alliance

The 2014 True Up adjusted savings for claimed for the Northwest Energy Efficiency Alliance (NEEA) in the years 2012 and 2013, as a result of updated regional savings information that was released in conjunction with NEEA's 2013 annual report. Electric savings acquired by NEEA on behalf of Energy Trust of Oregon is reported and adjusted at a sector level.

Table 20 describes the change in total savings claimed for NEEA electric market transformation savings over the program years 2012-2013, by program sector;

Table 20: NEEA Savings Change

Year	Sector	Savings Pre True Up (kWh)	Trued Up Savings (kWh)	Change in Savings
2012	Commercial	18,144,988	23,337,955	28.62%
2012	Industrial	4,207,264	4,207,264	0.00%
2012	Residential	39,425,016	39,714,947	0.74%
2013	Commercial	12,692,230	20,332,939	60.20%
2013	Industrial	1,916,928	6,701,620	249.60%
2013	Residential	42,764,905	36,799,799	-13.95%

Results Summary, Impacts by Sector

The following tables summarize the change in reportable electric and gas savings as a result of the 2014 True Up. In tables below, an average megawatt (aMW) means that loads are reduced by an average of one megawatt or 8760 MWh during each year of a measure's estimated useful life. Where units are listed as *MM therms*, this reflects the annual therm savings achieved in each year of a measure's useful life, in millions of therms.

Tables 21 and 22 below describe the change to total reportable savings claimed for Energy Trust of Oregon, by sector, for the program years 2002-2013;

Table 21: Electric Savings Impact 2002-2013

Sector	Pre True Up Savings (MM therms)	Trued Up Savings (MM therms)	Change (MM therms)	Percent Change
Commercial	144.77	143.35	-1.42	-0.98%
Industrial	131.49	131.85	0.36	0.28%
Residential	138.34	137.23	-1.11	-0.80%
Total	414.6	412.4	-2.16	-0.52%

Table 22: Gas Savings Impact, 2003-2013

Sector	Pre True Up Savings (MM therms)	Trued Up Savings (MM therms)	Change (MM therms)	Percent Change
Commercial	14.03	14.19	0.17	1.19%
Industrial	3.73	3.70	-0.04	-0.95%
Residential	15.29	15.59	0.30	1.93%
Total	33.05	33.48	0.43	1.29%

Results Summary by Utility

The following tables show the final, reportable annual savings results from the 2014 True Up for each Oregon utility provider within Energy Trust service territory;

Table 23: Portland General Electric Savings (aMW), 2002-2013

Sector	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	Total
Commercial	3.95	4.03	4.24	5.18	3.92	3.78	5.57	7.11	10.47	10.98	14.35	13.09	86.67
Industrial	1.81	0.89	1.17	14.22	2.85	3.75	2.86	4.49	8.77	8.92	10.16	12.71	72.61
Residential	3.61	3.84	5.32	5.01	6.94	8.37	8.22	5.71	7.31	8.51	10.48	9.27	82.61
Total	9.37	8.76	10.74	24.42	13.71	15.90	16.66	17.31	26.54	28.41	34.99	35.07	241.89

Table 24: Pacific Power Savings (aMW), 2002-2013

Sector	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	Total
Commercial	1.94	1.73	3.14	2.41	1.69	2.05	2.74	3.10	8.12	7.95	10.52	11.30	56.68
Industrial	1.62	2.68	8.66	5.96	4.98	4.00	3.83	3.51	7.06	6.55	5.68	4.69	59.24
Residential	2.11	2.64	3.61	3.36	4.60	6.31	5.51	3.57	5.29	5.33	6.45	5.84	54.63
Total	5.67	7.05	15.41	11.73	11.27	12.36	12.08	10.18	20.47	19.84	22.65	21.83	170.54

Table 25: Northwest Natural Savings (MM therms), 2003-2013

Sector	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	Total
Commercial	0.002	0.08	0.44	1.29	1.15	1.10	1.10	2.01	1.89	2.32	1.89	13.27
Industrial	0.00	0.00	0.00	0.00	0.00	0.01	0.19	0.54	1.03	0.62	0.96	3.35
Residential	0.61	0.92	0.95	0.95	1.13	1.34	1.20	1.39	1.58	2.52	2.12	14.71
Total	0.61	1.00	1.39	2.24	2.28	2.45	2.49	3.94	4.49	5.46	4.97	31.33

Table 25: Cascade Natural Gas Savings (MM therms), 2005-2013

Sector	2005	2006	2007	2008	2009	2010	2011	2012	2013	Total
Commercial	0.00	0.05	0.02	0.05	0.07	0.20	0.22	0.16	0.16	0.93
Industrial	0.00	0.00	0.00	0.00	0.05	0.05	0.09	0.10	0.06	0.34
Residential	0.00	0.02	0.13	0.12	0.13	0.07	0.11	0.15	0.12	0.85
Total	0.00	0.08	0.15	0.17	0.25	0.32	0.42	0.40	0.34	2.12