

2015 True Up Report

Corrections of 2002-2014
Savings and Generation

Introduction

True Up is the annual process used to adjust and correct previous years' energy savings and renewable generation to reflect the best available information. The True Up process adjusts past savings and generation 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)
- evaluation results (finalized prior to June 30th 2015)

This 2015 True Up document adjusts reportable Energy Trust savings from **2010-2014**. The majority of adjustments affect savings and generation claims after 2012. This report does **not** cover 2015.

This report contains three sections that describe (1) definitions of terms used in this report, (2) savings adjustments and impacts by program, and (3) the difference between pre-True Up and post-True Up savings and generation by sector.

Summary

The 2015 True Up resulted in adjustments to Energy Trust's reportable annual electric and gas savings reported. The 2015 True Up did not result in any adjustments to reported renewable energy generation totals. Total electric savings from 2002-2014 increased by 0.3 percent, from 470 aMW to 472 aMW, and total gas savings from 2003-2014¹ decreased by 0.8 percent, from 39.1 million therms to 38.8 million therms.

2014 reportable electric savings increased by 2.0 percent and 2014 reportable gas savings decreased by 2.3 percent compared to the savings shown in Energy Trust's 2014 Annual Report.

The largest changes underlying 2015 True Up adjustments were;

- Realization rate adjustments from the 2012 Existing Buildings Impact Evaluation
- Adjustments related to 2014 freerider rate estimates for Existing Buildings, New Buildings, and Production Efficiency programs
- Updated NEEA savings results for 2013 and 2014
- Savings revisions for Greenhouse measures
- Adjustments to 2014 refrigerator recycling savings based on updated weighting of pre/post 1993 fridges
- Adjustments to 2014 fireplace savings based on an update to the baseline

The annual changes to electric and gas savings are summarized by program in the Results section below. Additionally, there are a series of tables that represent overall changes by sector for each year. Lastly, results from the 2015 True Up are shown for each funding utility within Energy Trust's service territory starting on page 15.

¹ Energy Trust's electric programs began in 2002 and gas programs began in 2003

Definitions

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. Only reportable savings and generation are adjusted through the True Up process. New evaluation information used in True Up is incorporated in working savings estimates by updating measure savings and realization rate assumptions on a forward looking basis.

Reportable Savings/Generation: The estimate of savings results that are used when reporting 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. The factors applied to working savings in order to calculate reportable savings include;

- *Realization Rates (RR)* are used to adjust the initial estimate of savings; a realization rate of 100% indicates that site savings were as expected, on average.
- *Net to Gross Ratio (NTG):* Another adjustment is for market effects and is known as a Net-to-Gross (NTG) ratio. The NTG ratio adjusts for free riders and spillover.
- *Line Losses:* The final adjustment, which is applied only to electric savings, is for avoided line and transformer losses. Line losses are 10% for residential and commercial measures and 6% for industrial measures.

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:

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

Free-rider rates are determined through Fast 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 adjustments 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.

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. A program year is 'closed' when evaluation results and freerider rates specific to a given program year have been applied to savings in that program year, rather than the anticipated evaluation/ freerider results that are applied before evaluations of that program year are complete.

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

Existing Buildings

Since last year’s True Up, an impact evaluation of the 2012 Existing Buildings program year was completed. The 2015 True Up incorporates the results of the 2012 impact evaluation into the final evaluation factors applied to 2012 savings for the Existing Buildings program, and also in the anticipated evaluation factors for 2013-2016 since impact evaluations have not yet been completed for those years. Additionally, 2014 freerider rate estimates have been included in anticipated evaluation factors for 2014-2016.

Total electric savings from 2012-2014 for the Existing Buildings program decreased by 3.1 million kWh as a result of the 2015 True Up adjustments and total Existing Buildings gas savings for the same time period decreased by roughly 200,000 therms.

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

Table 1: Existing Buildings Evaluations

Program	Year	Source	Type of Adjustment	Notes
Existing Buildings	2002-2011	2002-2011 Impact Evaluations	Evaluation Factor	Closed in Previous True Ups
Existing Buildings	2012	2012 Impact Evaluation	Evaluation Factor	Closed in this True Up
Existing Buildings	2013-2014	2010-2012 Impact Evaluations	Anticipated Evaluation Factor	Realization Rate: 2010-2012 savings wtd. avg.
		2012-2014 Fast Feedback Freerider Rates		Freerider Rate: 2012-2014 savings wtd. avg.

Tables 2 and 3 describe the components of the evaluation factors that have been applied to reportable savings for 2012-2014, 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		
2012	95%	16%	1%	7%	87%	2012 Impact Evaluation
2013	98%	38%	1%	7%	69%	*Anticipated Results
2014	98%	24%	1%	7%	82%	*Anticipated Results

* 2013 and 2014 realization rates are the average of 2010-2012 impact 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		
2012	79%	18%	1%	7%	71%	2012 Impact Evaluation
2013	88%	28%	1%	7%	71%	**Anticipated Results**
2014	88%	28%	1%	7%	71%	**Anticipated Results**

* 2013 and 2014 realization rates are the average of 2010-2012 impact evaluation results

Tables 4 and 5 describe the change in total savings claimed for the Existing Buildings program for the program years 2012-2014, 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
2012	125,560,012	124,506,031	-0.84%
2013	106,496,579	108,584,370	1.96%
2014	134,743,439	130,573,638	-3.09%

Table 5: Existing Buildings Savings Change- Gas

Year	Savings Pre True Up (therms)	Trued Up Savings (therms)	Change in Savings
2012	1,968,065	1,826,791	-7.18%
2013	1,589,369	1,589,369	0.00%
2014	1,815,593	1,765,528	-2.76%

New Buildings

Adjustments to reportable savings for some ‘custom’ New Buildings projects installed in 2013 and 2014 were applied in the 2015 True Up. The corrections were required due to these projects not receiving an anticipated evaluation factor adjustment when they were initially recorded in Energy Trust’s data systems. Projects of this type will receive the correct anticipated evaluation factor going forward.

Savings for New Buildings Multifamily in-unit clothes washers from 2013-2014 were also revised in the 2015 True Up to reflect an update per unit savings estimate for this measure. The updated savings, which were slightly lower than the original savings amount, were announced in 2012 but the savings being recorded in Energy Trust’s data systems were not updated correspondingly. The per unit savings value that will be claimed going forward for in-unit clothes washers has been updated to reflect the correct savings.

As a result of 2015 True Up adjustments to the New Buildings program, total electric savings from 2012-2014 decreased by almost 150,000 kWh and total gas savings for the same time period decreased by nearly 10,000 therms.

No new freerider rate information was introduced for the New Buildings program in the 2015 True Up. Further, the New Buildings program will not receive any freerider deduction from 2013 forward due to the twin difficulties of free ridership measurement for new construction and the stringent 2010 building code.

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	2002-2011	2002-2011 Impact Evaluations	Evaluation Factor	Closed in Previous True Ups
New Buildings	2012-2013	2009-2011 Impact Evaluations	Anticipated Evaluation Factor	Realization Rate: 2009-2011 savings wtd. avg.

Tables 7 and 8 below show the components of the evaluation factors that have been applied to reportable savings for 2012-2014 for the New Buildings program, where blue shaded cells indicate anticipated evaluation results;

Table 7: New Buildings Evaluation Factor Components- Electric

New Buildings- Electric	Realization Rate	Market Effects			2007 Code Evaluation Factor	2010 Code Evaluation Factor	Blended Eval. Factor	Evaluation
		Freerider Rate	Participant spillover					
2012	95%	34%	1%	63%	95%	88%	*Anticipated Results	
2013	95%	0%	1%	n/a	95%	95%	*Anticipated Results	
2014	95%	0%	1%	n/a	95%	95%	*Anticipated Results	

* 2012-2014 realization rates are the average of 2009-2011 impact evaluation results

Table 8: New Buildings Evaluation Factor Components- Gas

New Buildings- Gas	Realization Rate	Market Effects			2007 Code Evaluation Factor	2010 Code Evaluation Factor	Blended Eval. Factor	Evaluation
		Freerider Rate	Participant spillover					
2012	95%	32%	1%	66%	96%	82%	*Anticipated Results	
2013	95%	0%	1%	n/a	96%	96%	*Anticipated Results	
2014	95%	0%	1%	n/a	96%	96%	*Anticipated Results	

* 2012-2014 realization rates are the average of 2009-2011 impact evaluation results

Tables 9 and 10 describe the change in total reportable savings claimed for the New Buildings program for the program years 2012-2013, 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
2012	68,920,652	68,539,250	-0.55%
2013	86,759,958	86,798,755	0.04%
2014	46,012,882	46,205,621	0.42%

Table 10: New Buildings Savings Change- Gas

Year	Savings Pre True Up (therms)	Trued Up Savings (therms)	Change in Savings
2012	514,292	514,292	0.00%
2013	460,795	455,426	-1.17%
2014	675,940	672,219	-0.55%

Production Efficiency

The 2015 True Up introduced adjustments to Production Efficiency program savings based on freerider rate findings from the 2014 Fast Feedback survey of program participants. Final 2014 freerider rate findings had the effect of decreasing both gas and electric savings for 2014 compared to the anticipated freerider rate that was applied initially. No new impact evaluation results were included in the adjustments made to Production Efficiency program savings in this year's True Up.

Reportable gas savings for greenhouse thermal curtains, IR poly film, and under-bench heating from 2010-2014 were adjusted as a result of updates made to the per unit savings estimates for those measures in 2015, which apply retroactively starting in 2010. Savings for greenhouse thermal curtains were decreased from 0.27 to 0.23 therms/sf. Savings for greenhouse IR poly film were decreased from 0.49 to 0.41 therms per/sf and savings for under-bench heating was increased from 1.20 to 1.25 therms/sf.

As a result of 2015 True Up adjustments, reportable electric savings for 2014 alone were reduced by nearly 11 percent (1.98 aMW), and reportable gas savings for 2010-2014 were reduced by 2 percent (89,000 therms).

Table 11 below describes the evaluations which provide results that have been applied to reportable savings in each program year for the Production Efficiency 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	2012-2014	2009-2011 Impact Evaluations	Anticipated Evaluation Factor	Realization Rate: 2009-2011 savings wtd. avg.
		2012-2014 Fast Feedback Freerider Rates		Freerider Rate: 2012-2014 savings wtd. avg.

Tables 12 and 13 show the components of the evaluation factors that have been applied to reportable savings for 2012-2014, 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
2014	94%	32%	1%	1%	66%	*Anticipated Results

* 2012-2014 realization rates are the average of 2009-2011 impact 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
2014	97%	21%	1%	1%	79%	*Anticipated Results

* 2012-2014 realization rates are the average of 2009-2011 impact evaluation results

Tables 14 and 15 describe the change in total annual savings claimed for the Production Efficiency program as a result of 2015 True Up adjustments, 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
2014	161,762,637	144,385,863	-10.74%

Table 15: Production Efficiency Savings Change- Gas

Year	Savings Pre True Up (therms)	Trued Up Savings (therms)	Change in Savings
2010	589,814	585,776	-0.68%
2011	1,118,507	1,104,930	-1.21%
2012	720,068	707,371	-1.76%
2013	1,014,179	993,963	-1.99%
2014	1,015,456	976,563	-3.83%

Existing Homes

Electric savings for heat pump water heaters (HPWHs) were updated for the 2014 program year to align with the most up-to-date savings estimates for HPWHs, which are slightly higher than the previous estimates. This led to a small increase in 2014 electric savings for the Existing Homes program of roughly 6,000 kWh.

Gas savings from fireplaces (hearths) claimed in 2014 were also updated in the 2015 True Up in order to reflect an update to fireplace unit savings that came as a result of a 2013 study of the fireplace market that provided updated baseline efficiency information. The result was a decrease in gas savings for 2014 of 3.55 percent, or about 39,000 therms.

Tables 16 and 17 below describe the change in total savings claimed for the Existing Homes program for the 2014 program year, for electric and gas savings, respectively:

Table 16: Existing Homes Savings Change- Electric

Year	Savings Pre True Up (kWh)	Trued Up Savings (kWh)	Change in Savings
2014	44,816,295	44,822,017	0.01%

Table 17: Existing Homes Savings Change- Gas

Year	Savings Pre True Up (therms)	Trued Up Savings (therms)	Change in Savings
2014	1,085,454	1,046,896	-3.55%

New Homes and Products

The 2015 True Up revised 2014 electric savings for refrigerator recycling measures downwards slightly in order to reflect the actual weighting of pre/post 1993 vintage units that was observed during the 2014 program year, rather than the *anticipated* pre/post 1993 weighting that was applied initially in 2014, and which was based on older 2013 data. No adjustments were made to gas savings in the New Homes and Products program during the 2015 True Up.

In total, 2015 True Up adjustments decreased reportable electric savings for the New Homes and Products program by 266,000 kWh.

Table 18 below shows the change in total electric savings claimed for the New Homes and Products program for 2014 as a result of True Up adjustments;

Table 18: New Homes and Products Savings Change- Electric

Year	Savings Pre True Up (kWh)	Trued Up Savings (kWh)	Change in Savings
2014	74,383,498	74,117,386	-0.36%

NEEA

2013 and 2014 savings for NEEA were revised in the 2015 True Up as a result of updated savings estimates reported by NEEA for those years. Savings for all NEEA sectors were increased for 2014, with the total increase amounting to more than 3.6 aMW. However, 2013 savings in commercial and industrial initiatives increased, while savings for residential initiatives decreased compared to initial estimates. NEEA savings for 2013 were increased by 0.1 aMW in total.

According to NEEA internal savings reports, increases in 2014 savings were driven by better-than-expected results from Oregon's battery charger standards initiative, a revision to the service territory allocation for Drive Power and updates to the local program share of the CFL lighting savings estimate. 2013 updates were reported to be driven by additional television savings from small screen TVs, an updated service-territory allocation for the drive-power motors initiative that increased savings for the industrial sector, and a decrease in savings from multifamily codes as a result of changes to the methodology and data sources used to calculate multifamily code savings.

NEEA's savings revisions for 2013 and 2014 also included, as always, updated savings estimates for other NEEA initiatives based on final market data and updated service-territory allocations.

Tables 19 and 20 below shows the change to total reportable electric savings claimed for NEEA market transformation initiatives by sector for 2013 and 2014, respectively;

Table 19: 2013 NEEA Electric Savings Change

Sector	Savings Pre True Up (kWh)	Trued Up Savings (kWh)	Change in Savings
Commercial	20,332,939	20,949,023	3.03%
Industrial	6,701,620	7,424,719	10.79%
Residential	36,799,799	36,354,517	-1.21%

Table 20: 2014 NEEA Electric Savings Change

Sector	Savings Pre True Up (kWh)	Trued Up Savings (kWh)	Change in Savings
Commercial	11,017,332	12,135,586	10.15%
Industrial	1,526,879	3,224,918	111.21%
Residential	33,963,212	44,822,017	31.97%

Results: Impacts by Sector

The following tables summarize the changes in total annual electric and gas savings for 2002-2014 as a result of 2015 True Up adjustments. 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, stated in millions of therms.

Tables 21 and 22 below describe the change to total annual reportable savings claimed by Energy Trust of Oregon for the years 2002-2014;

Table 21: Electric Savings Impact 2002-2014

Sector	Savings Pre True Up (aMW)	Trued Up Savings (aMW)	Change in Savings (aMW)	Percent Change
Commercial	165.24	165.06	-0.18	-0.11%
Industrial	150.49	148.78	-1.71	-1.13%
Residential	154.71	157.95	3.24	2.09%
Total	470.45	471.79	1.35	0.29%

Table 22: Gas Savings Impact 2002-2014

Sector	Savings Pre True Up (MMtherms)	Trued Up Savings (MMtherms)	Change in Savings (MMtherms)	Percent Change
Commercial	16.68	16.48	-0.20	-1.20%
Industrial	4.71	4.62	-0.09	-1.90%
Residential	17.74	17.70	-0.04	-0.22%
Total	39.14	38.81	-0.33	-0.84%

Results: Impacts by Utility

Lastly, the following tables show final reportable annual savings and generation totals, for each of the utilities in Energy Trust's service territory, after the 2015 True Up adjustments were implemented;

Table 22: Portland General Electric savings (aMW), 2002-2014

Year	Commercial	Industrial	Renewables	Residential	Total
2002	3.95	1.81	0.00	3.61	9.37
2003	4.03	0.89	0.02	3.84	8.78
2004	4.24	1.17	0.01	5.32	10.75
2005	5.18	14.22	0.42	5.01	24.84
2006	3.92	2.85	0.03	6.94	13.74
2007	3.78	3.75	46.84	8.37	62.74
2008	5.57	2.86	1.84	8.22	18.50
2009	7.11	4.49	0.55	5.71	17.86
2010	10.47	8.77	0.96	7.31	27.50
2011	10.98	8.92	1.08	8.51	29.49
2012	14.24	10.16	2.51	10.48	37.39
2013	13.25	12.76	1.87	9.24	37.13
2014	13.97	10.93	0.72	12.30	37.91
Total	100.69	83.59	56.86	94.87	336.01

Table 22: Pacific Power savings (aMW), 2002-2014

Year	Commercial	Industrial	Renewables	Residential	Total
2002	1.94	1.62	0.00	2.11	5.67
2003	1.73	2.68	14.27	2.64	21.32
2004	3.14	8.66	0.08	3.61	15.49
2005	2.41	5.96	0.04	3.36	11.77
2006	1.69	4.98	1.96	4.60	13.23
2007	2.05	4.00	0.08	6.31	12.45
2008	2.74	3.83	31.47	5.51	43.55
2009	3.10	3.51	2.12	3.57	12.30
2010	8.12	7.06	2.42	5.29	22.88
2011	7.95	6.55	0.40	5.33	20.24
2012	10.46	5.68	2.37	6.45	24.96
2013	11.45	4.73	1.00	5.82	22.99
2014	7.60	5.92	1.67	8.48	23.66
Total	64.37	65.19	57.88	63.08	250.53

Table 22: NW Natural savings (MMtherms), 2002-2014

Year	Commercial	Industrial	Residential	Total
2003			0.61	0.61
2004	0.08		0.92	1.00
2005	0.44		0.95	1.39
2006	1.29		0.95	2.24
2007	1.15		1.13	2.28
2008	1.10	0.01	1.34	2.45
2009	1.10	0.19	1.20	2.49
2010	2.01	0.54	1.39	3.94
2011	1.89	1.01	1.58	4.47
2012	2.19	0.61	2.52	5.32
2013	1.89	0.94	2.12	4.95
2014	2.21	0.94	1.97	5.11
Total	15.34	4.24	16.68	36.25

Table 22: Cascade Natural Gas savings (MMtherms) 2002-2014

Year	Commercial	Industrial	Residential	Total
2006	0.05		0.02	0.08
2007	0.02		0.13	0.15
2008	0.05		0.12	0.17
2009	0.07	0.05	0.13	0.25
2010	0.20	0.05	0.07	0.32
2011	0.22	0.09	0.11	0.42
2012	0.15	0.10	0.15	0.40
2013	0.16	0.06	0.12	0.33
2014	0.23	0.04	0.14	0.41
Total	1.15	0.38	1.00	2.53