



The Power to Make a Difference

PPL Electric Utilities
Act 129 Energy Efficiency & Conservation Plan
Stakeholder Meeting
October 18, 2011



Agenda

- Housekeeping Items
- Portfolio Results
- Status of Programs
- Changes to EE&C Plan
- Suggestions for Post-2013 EE&C
- Net-to-Gross Method
- Q&A and Open Discussion... *but feel free to ask questions during each presentation*
- Stakeholder Survey



Portfolio Results (Pete Cleff)



Portfolio Results

- Portfolio results are for installations recorded through 9/30/11 unless noted otherwise
- Savings are recorded when the rebate application is processed, the rebate is paid, and the program CSP completes its batch download process into PPL EU's tracking system
- There could be up to an 8-week lag between the rebate application receipt date and when savings are reported in PPL EU's tracking system



Program Year 2 Portfolio Results

- Preliminary Annual Report for Program Year 2 (ends 5/31/11) submitted to the PA PUC 7/15/11 and is posted on PPL EU's stakeholder website
- Reported savings = 533,536 MWh/yr
- May 2011 1% compliance target (verified savings) = 382,000 MWh/yr
- Verified savings will be known in November and included in the Final PY 2 Annual Report on 11/15/11
- As long as the realization rate (verified savings / reported savings) is greater than 72% (very likely), verified savings will exceed the 1% compliance target



Portfolio Results as of 9/30/11

- Reported energy savings to date = 679,485 MWh/yr
 - Approximately 70% is from lighting (CFLs, lighting retrofits, etc.)
- Budgeted energy savings to date = ~600,000 MWh/yr
- May 2013 EE&C Plan target (1,366,000 MWh/yr) is very challenging
 - Energy savings must average ~35,000 MWh/yr per month during the remaining 20 months
 - Actual savings averaged ~ 32,000 MWh/yr per month since January 2010
 - “Low hanging fruit” and retroactive projects are dwindling
 - The economy is very challenging and is not conducive to discretionary spending (such as energy efficiency), especially for small C&I customers



Portfolio Results as of 9/30/11

- Approximately 258,000 participants (rebate applications) excluding CFLs
- Approximately 1 million participants including CFLs
 - Based on 8 CFLs per participant as estimated by PPL Electric's independent evaluator through surveys



Portfolio Costs as of 8/31/11

- Portfolio costs are projected to be within budget at completion
- The budget is tight
- \$66 million incentives paid
- \$105 million total expenditures



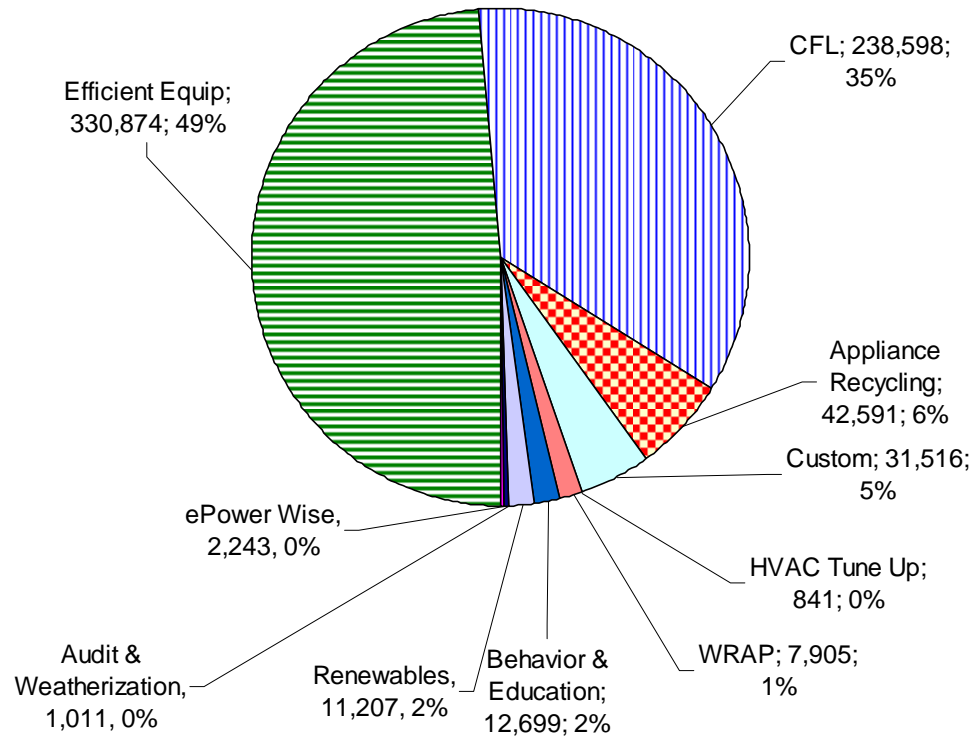
Portfolio Peak Load Reductions as of 9/30/11

- Portfolio peak load reductions at completion are expected to be very close to the September 2012 compliance target. Very little “cushion”:
 - Peak load contributions from energy efficiency measures are less than originally anticipated because of planning assumptions and changes to the TRM
- There will be no demand response (direct load control, load curtailment) reductions until the summer of 2012
- Only the peak load reductions June – September 2012 count toward compliance
- Energy efficiency measures that contribute peak load reductions must be installed by 6/1/12 to count (i.e. measures must be installed by the end of Program Year 3). Measures installed 6/1/12 – 9/30/12 count only for the peak hours after the installation date.
- We will not know the applicable 100 peak hours or the total amount of the reductions (average over the 100 peak hours) until the summer is over



Energy Savings by Program as of 9/30/11

Reported Gross Energy Savings (MWh/yr)
by Program Through 9/30/11

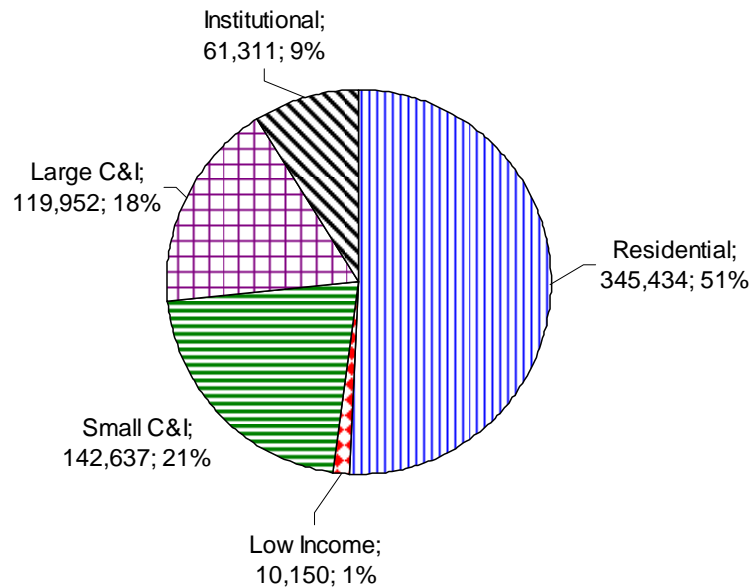


Legend: Program name; reported savings MWh/yr; % of total savings by program

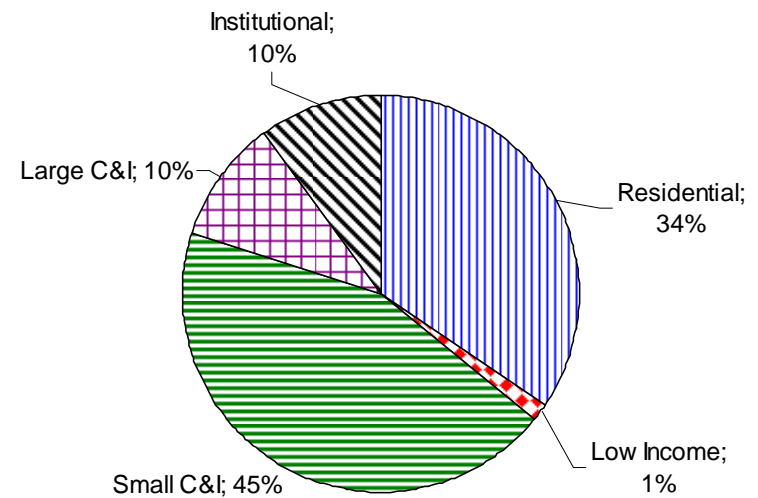


Energy Savings by Customer Sector as of 9/30/11

Reported Gross Energy Savings By Customer Sector (MWh/yr) Through 9/30/11



Energy Savings By Customer Sector Current EE&C Plan



Low-income includes only the participation in low-income programs. Estimated low-income participation in non low-income programs will be available November 2011.



Energy Savings by Customer Sector as of 9/30/11

Customer Sector	Reported Savings as of 9/30/11 (MWh/yr)	~Verified Savings (assumed at 85% realiz. rate)* MWh/yr	EE&C Plan at Completion (MWh/yr)	% of Plan Achieved
Residential	345,434	293,619	469,558	63% AHEAD
Low-Income	10,150	8,628	19,775	46% BEHIND
Small C&I	142,637	121,241	602,782	20% BEHIND
Large C&I	119,952 ~ 220,000 w/ projects in pipeline	101,959 ~ 187,000 w/ pipeline	139,811	73%; 134% w/ pipeline AHEAD
Gov't, Non-Profit, & Schools	61,311	52,114	135,054	39% BEHIND

* The actual realization rate for PY 2 will be available November 2011



Remaining Funds (\$ millions) as of 8/31/11

Customer Sector	Plan	Actual*	Remaining (Plan – Actual*)
Residential & Low-Income	\$85.4	\$53.1	\$32.3
Small C&I	\$74.3	\$24.8	\$49.5
Large C&I	\$29.3	\$19.7	\$9.6
Institutional	\$22.8	\$8.2	\$14.6
TOTAL	\$211.9	\$105.8	\$106

Direct program costs only. Excludes common costs.

* Excludes projects with a reservation. Includes committed funds for Direct Load Control and Load Curtailment contracts.



Questions about Portfolio Results?



Status of Programs (Joe Mezlo)



The Programs

Program Name	Residential	Low Income	Small C&I	Large C&I	Institutional	Estimated Benefit-Cost Ratio (Plan)	Launch Date
1 Efficient Equipment Incentive	■	■	■	■	■	2.6 - 3.3	1/2/10 - 4/15/10
2 Residential Audit and Weatherization	■					1.2	5/1/10
3 Compact Fluorescent Lighting	■	■	■	■	■	4.8	1/2/10
4 Appliance Recycling	■	■	■	■	■	9.8	11/9/09
5 ENERGY STAR New Homes	■					1.4	tbd
6 Direct Load Control	■	■	■		■	0.2	1/1/11
7 Time of Use Rates	■	■	■	■	■	3.2 - 3.6	6/1/10
8 Low-Income WRAP		■				0.8	11/1/09
9 E Power Wise		■				1.4	3/1/10
10 C&I Custom Incentive	■		■	■	■	2.3 - 3.0	3/1/10
11 HVAC Tune-Up			■	■	■	5.8	4/1/10
12 Load Curtailment			■	■	■	0.7	1/1/11
13 Renewable Energy	■				■	1.0 - 1.5	3/1/10
14 Energy Efficiency Behavior & Education	■	■	■	■	■	3.7	3/1/10

Portfolio benefit-cost ratio = 2.8

■ Primary customer target
 ■ Eligible customers



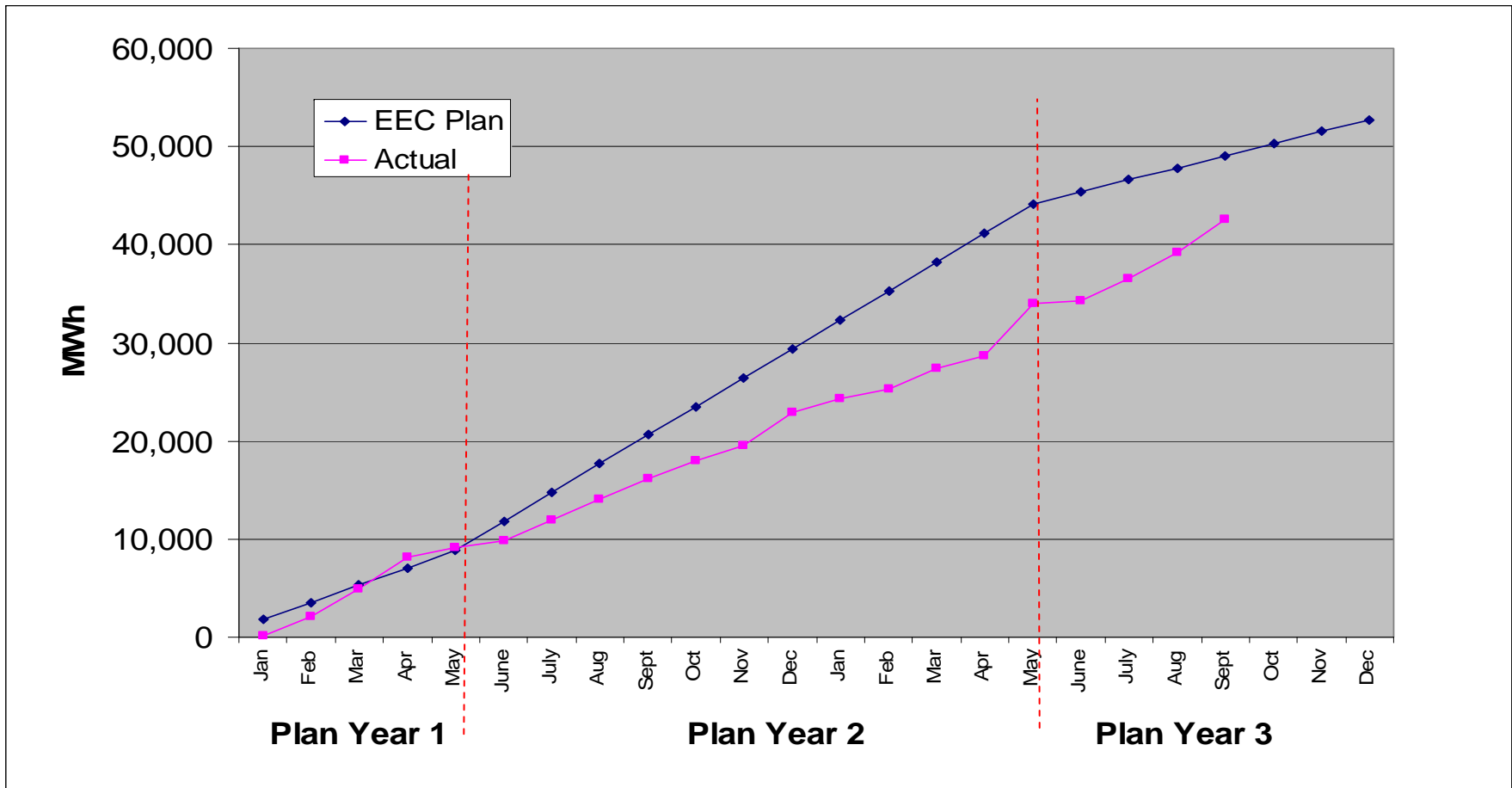
Program Status- Appliance Recycling

- Fewer # of units and behind target for savings
- Slightly under budget
- Changes to 2011 TRM and changes proposed to 2012 TRM reduce savings per unit recycled
- Harvest rate over-estimated in Plan
- Cost per kWh saved increases due to lower savings per unit

	Actual as of 8/31/11	Plan Year 3 Target	Total Plan Target
Appliances Recycled	27,996	45,480	69,615 (adjusted to 57,366)
Reported Gross Savings (MWh/yr)	39,236	42,048	114,761 (76,460)
Program Cost (\$1000)	3,467	5,732	9,082



Program Status- Appliance Recycling





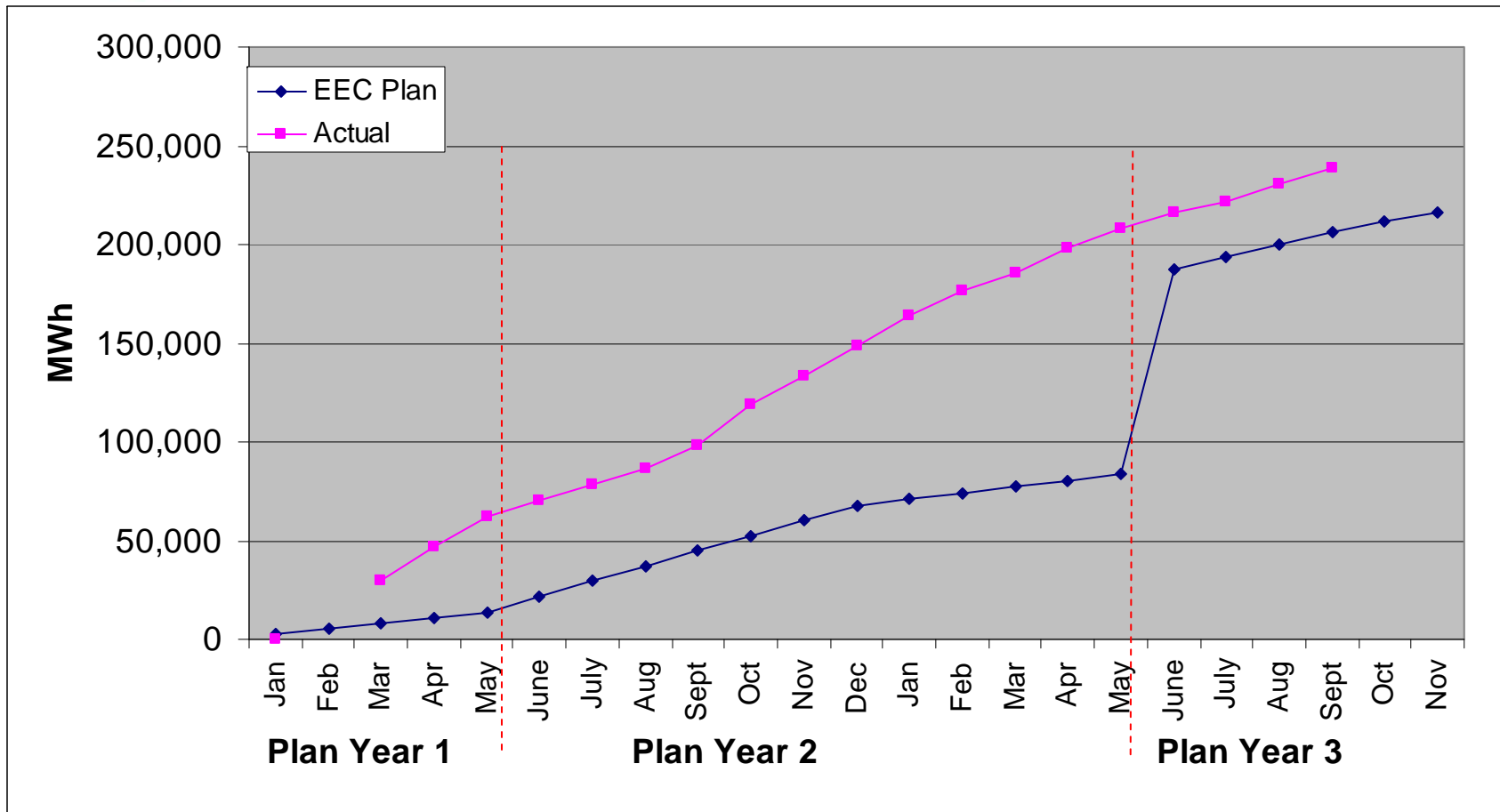
Program Status- CFL

- Over 400 participating retail stores at the peak. Currently more than 200
- Ahead of target, under budget
- Target to be increased within budget as part of proposed changes
- More emphasis on specialty bulbs and emerging technology such as LEDs

	Actual as of 8/31/11	Plan Year 3 Target	Total Plan Target
CFLs	4,927,016	4,863,340	7,125,000
Reported Gross Savings (MWh/yr)	230,759	199,395	292,137
Program Cost (\$1000)	7,835	10,014	17,712



Program Status- CFL





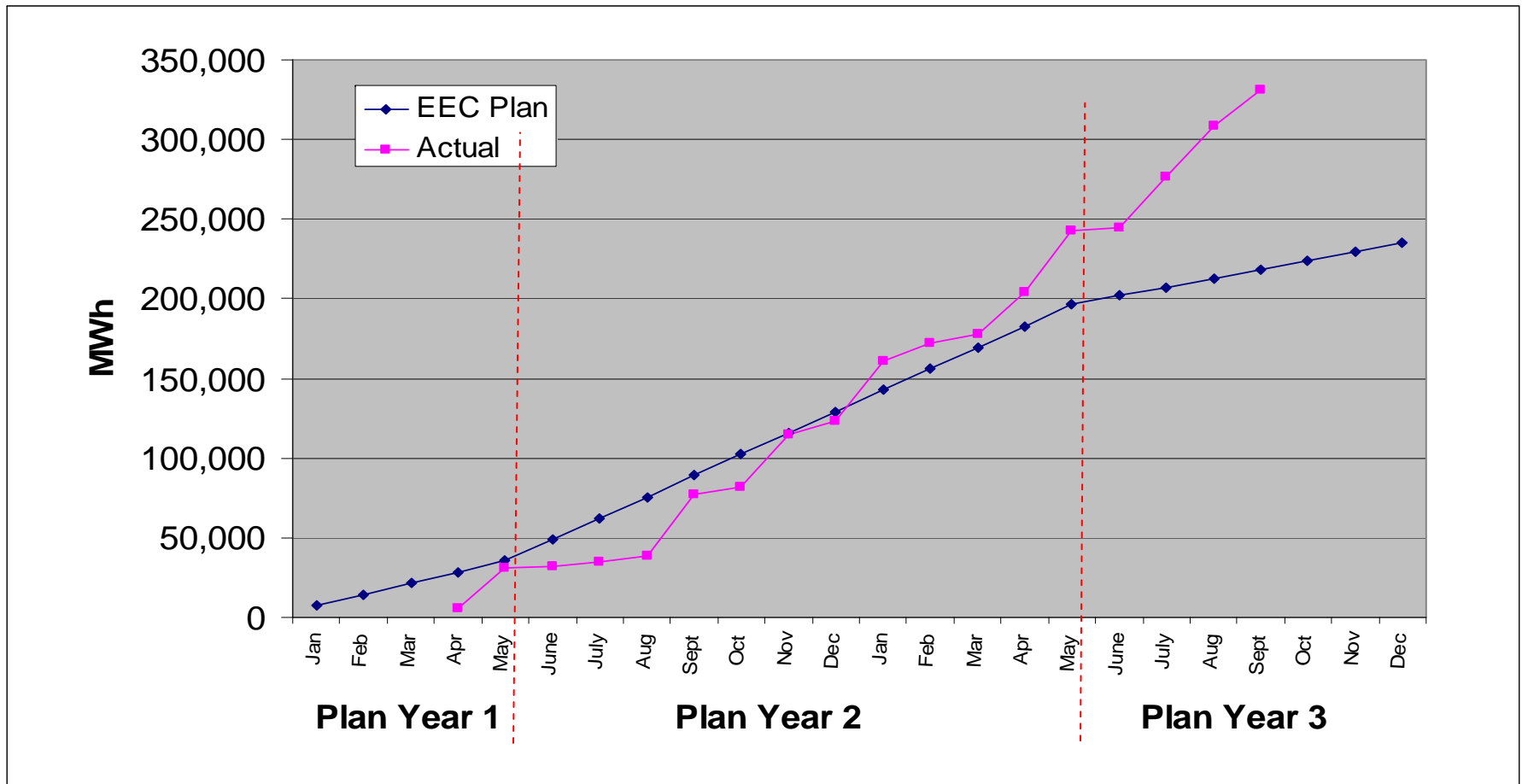
Program Status- Energy Efficiency Rebates

- Launched December 2009 for residential; March 2010 - April 2010 for C&I
- Ahead of target for residential but will be throttled to control pace
- Ahead of target for large C&I (including projects in the pipeline) and nearing the 2013 target for MWh/yr and \$ budget. Large C&I projects are waitlisted due to proximity to 2013 target for MWh/yr and \$ budget.
- Behind target for small C&I
- Extensive marketing since September 2010 focused on small C&I and GNI

	Actual as of 8/31/11	Plan Year 3 Target	Total Plan Target
Number of rebates paid	172,150	NA	NA, but about 3.8 million measures
Reported Gross Savings (MWh/yr)	308,504	361,700	715,875
Program Cost (\$1000)	40,475	51,874	88,934



Program Status- Energy Efficiency Rebates





Program Status- Energy Assessment & Weatherization

- Launched May 2010
- Behind target
- Direct mail and marketing campaigns in September 2010 and 2011
- 38 BPI auditors participating in the program
- 238 customers installed weatherization measures to date (16%)

	Actual as of 8/31/11	Plan Year 3 Target	Total Plan Target
Number of participants	1,022 surveys 465 audits	2,366 surveys 801 audits	5,940 4,752 surveys 1,188 audits
Reported Gross Savings (MWh/yr)	974	2,695	5,961
Program Cost (\$1000)	860	1,603	2,658



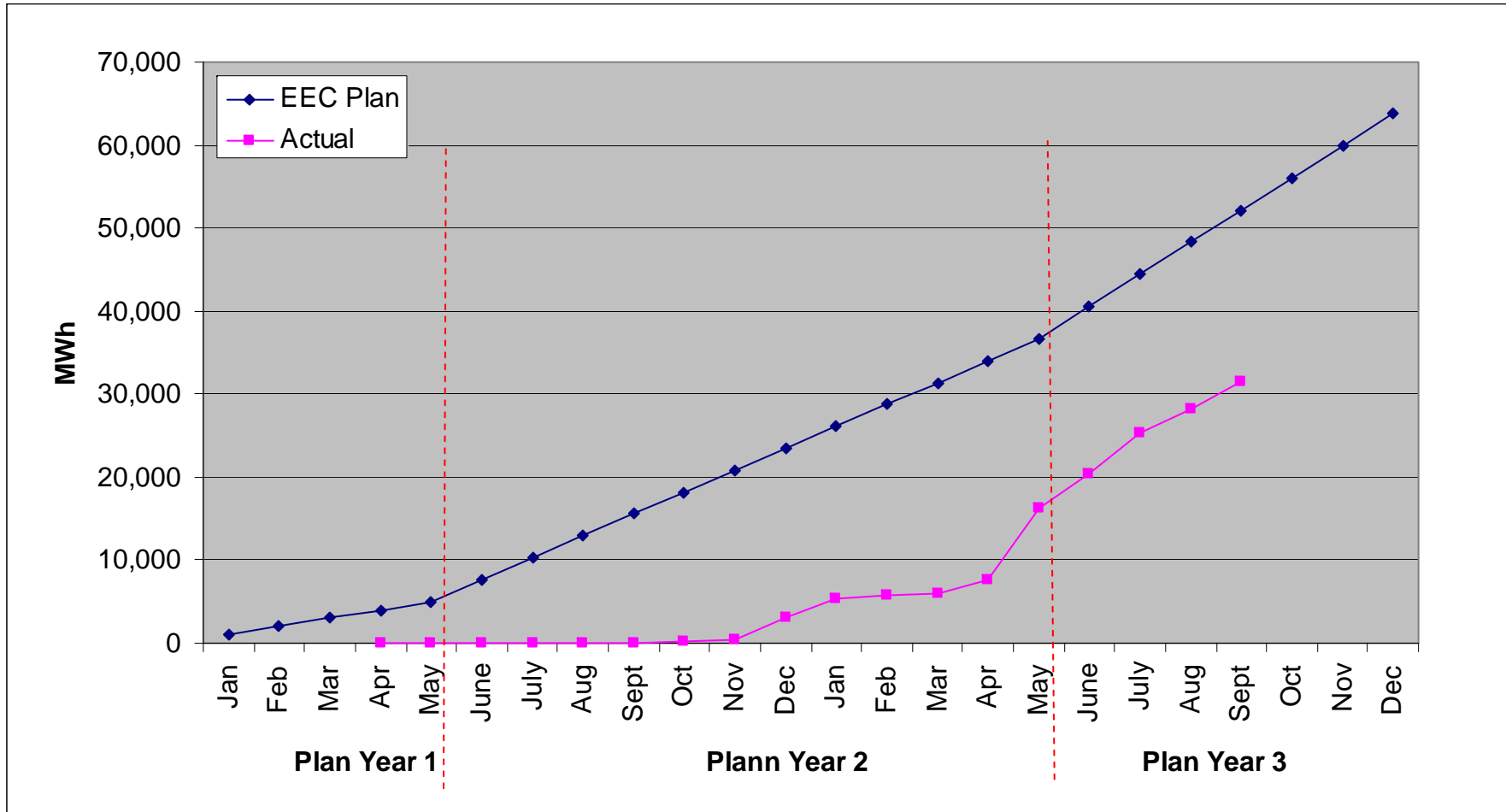
Program Status- Custom Incentives

- Launched March 2010
- Behind target due to long lead times for projects to be completed and verified
- Approximately 73 projects and 62,394 MWh/yr in the pipeline (“projects in progress”)
- Including projects in the pipeline, nearing the 2013 target for MWh/yr and \$ budget for the large C&I sector. Likely to close to Large C&I late 2011.
- Small C&I and Institutional Customer will continue to be funded for the foreseeable future

	Actual as of 8/31/11	Plan Year 3 Target	Total Plan Target
Number of projects	Tech studies 68 Projects 189	850	2,842
Reported Gross Savings (MWh/yr)	28,152	75,988	140,459
Program Cost (\$1000)	3,739	14,660	20,598



Program Status- Custom Incentive





Program Status- Low Income WRAP

- Launched November 2009
- Behind target for energy savings but on target for number of jobs completed

	Actual as of 8/30/11	Plan Year 3 Target	Total Plan Target
Number of participants	4,200	Single Family = 5,940 Multi Family = 4,230 Total = 10,170	23,590
Reported Gross Savings (MWh/yr)	5,489	8,366	18,695
Program Cost (\$1000)	9,169	12,935	28,657

- Estimated number of multi-family customers who received Act 129 WRAP services = 788
- Estimated number of CFLs distributed to WRAP customers = 69,137
- Estimated rate class breakdown of multi-family participants = 100% residential



Program Status- E Power Wise Low-Income

- Launched March 2010
- Ahead of target
- 23 Community-Based Organizations participating
- Estimated number of CFLs distributed to E Power Wise customers = 9,298
- Estimated savings of CFLs distributed to E Power Wise customers = 423 MWh/yr
- Program expected to exhaust budget in first half of 2012

	Actual as of 8/31/11	Plan Year 3 Target	Total Plan Target
Number of kits	4,649	3,224	9,659
Reported Gross Savings (MWh/yr)	2,071	3,164	4,133
Program Cost (\$1000)	460	590	681



Program Status- HVAC Tune-up

- Launched April 2010
- Behind target
- Over budget (front-loaded costs for contractor recruiting and training)
- Due to the tune-up tool diagnostic limitations and contractor service requirements, most of the tune-up work takes place in spring and fall
- PPL EU and the CSP are exploring alternative implementation methods

	Actual as of 8/31/11	Plan Year 3 Target	Total Plan Target
Number of units serviced	522	872	5,770
Reported Gross Savings (MWh/yr)	839	1401	22,176
Program Cost (\$1000)	761	804	1,347



Program Status- Renewable Energy

- Launched March 2010
- Closed 5/10 for residential PV and 8/10 for government, non-profit and institutional (GNI) PV
- GSHP for residential closed 1/31/11
- Reservation process for GNI GSHP is in place for remaining funds (about \$900K)

	Actual as of 8/31/11	Plan Year 3 Target	Total Plan Target
Number of participants	1,713 total (136 PV, 1,577 GSHP)	840 total (40 PV, 800 GSHP)	1,260 (60 PV, 1,200 GSHP)
Reported Gross Savings (MWh/yr)	11,596	12,327	18,490
Program Cost (\$1000)	3,911	3,789	5,581



Program Status- Load Curtailment

- Customer recruitment is in progress
- No curtailments until summer 2012 (except for testing)

	Actual as of 8/31/11	Plan Year 3 Target	Total Plan Target
Number of MWs enrolled	0	300 MW for 50 hrs equiv. to 150 MW for 100 hrs	300 MW for 50 hrs equiv. to 150 MW for 100 hrs
Reported Gross Peak Reduction (MW)	0	0	150 MW (for 100 hrs)
Program Cost (\$1000)	515	4,665	14,661



Program Status- Direct Load Control

- Awarded January 2011
- Customer enrollment started 4/1/11
- Some DLC in summer 2011 for testing and measurement & verification. Only the DLC in summer 2012 counts toward compliance.

	Actual as of 8/31/11	Plan Year 3 Target	Total Plan Target
Number of participants enrolled	16,763	50,800	50,800
Reported Gross Peak Reduction (MW)	0	0	33
Program Cost (\$1000)	2,813	7,857	10,620



Program Status- Education & Behavior

- Targets residential customers with annual use greater than 18,000 kWh
- Reports compare their use to neighbor's use
- Control group-participant group used to calculate savings
- Savings from other Act 129 programs are 'scrubbed' from the calculation
- Less than 1% drop out rate

	Actual as of 8/31/11	Plan Year 3 Target	Total Plan Target
Number of Participants	105,000	100,000	100,000
Reported Gross Savings (MWh/yr)	12,699	25,000	18,100
Program Cost (\$1000)	1,083	2,100	2,830



Program Status- New Home Construction

- Recommend dropping the program as part of upcoming EE&C Plan changes. More on that later.
- New home starts remain extremely low due to the poor economic conditions
- Savings are lower than expected due to new building code requirements raising the baseline

	Actual as of 8/31/11	Plan Year 3 Target	Total Plan Target
Number of Participants	0		1,930
Reported Gross Savings (MWh/yr)	0		5,211
Program Cost (\$1000)			2,731



Program Status- Time of Use Rates

- Program to be dropped as part of upcoming EE&C Plan changes.
- PA PUC has determined that peak load reductions and/or energy savings (if any) cannot count toward Act 129 EE&C since TOU is a default supply program/rate.



Questions About Program Status?

Short Break?



Changes to the EE&C Plan Under Consideration (Pete Cleff)



Changes to EE&C Plan

- Please refer to the handout “Summary of Changes to Act 129 EE&C Plan” for a list of changes
- Most of the changes have little-to-no impact on cost or savings and will not be discussed in detail today unless desired by stakeholders
- If stakeholders have any questions or concerns about the minor changes, please contact us via e-mail (pdcleff@pplweb.com) or phone (610-774-4530) no later than October 25, 2011



Changes to EE&C Plan

- PPL Electric will file a Petition approximately October 31, 2011 to request PUC approval of the changes
- Single Petition (minor and “non minor” changes in 1 petition)
- The PUC’s decision is expected ~ February assuming the PUC does not require hearings and there are no major objections received from public comments



Reasons for Changes

- Implement Technical Reference Manual changes
- Improvements such as
 - More cost-effective use of program funds
 - Better align rebates to the savings
 - New measures and delivery mechanisms for customers
 - Reach customers and allow them to implement projects more quickly and effectively
- True-up original planning assumptions to reflect actuals and revised forecasts
- Discontinue measures that met plan projections earlier than expected or are no longer viable



Impact of Changes

- PPL Electric is currently updating the EE&C Plan to reflect the changes summarized on the next few slides
- We do not expect the projected portfolio cost to change
- We expect total energy savings to decrease but still exceed the compliance target with a reasonable, but lower than existing, “cushion” for uncertainty (such as after-the-fact adjustments by the independent evaluator or the SWE)
- We expect total peak load reductions to decrease but still meet the compliance target with very little “cushion.”
- We expect minor changes in projected cost by customer sector
- We expect very little impact on portfolio cost-effectiveness
- Reclassification of ~ \$14 million from “incentives” to “EDC/CSP direct program costs” per the August TRC Order. These costs are for materials and services provided for free to low-income WRAP and e-PowerWise participants.



Summary of Changes

1. Eliminate TOU program from EE&C Plan
2. Eliminate New Homes Program
3. Add a C&I CSP
4. Reduce projected savings/participation of small C&I sector
5. Add C&I Direct Install delivery mechanism
6. Add direct mail option for ePower Wise kit distribution
7. True-up projections of direct and common costs
8. Reforecast HVAC Tune-up
9. Change the measure life and EM&V Plan for Behavior and Education Program
10. Change projected participation and savings for Appliance Recycling Program
11. Consolidate cost categories (CSP labor, materials, & supplies)
12. Add ductless heat pumps as an eligible measure
13. Add and modify measures in the CFL program (including residential LEDs) and change name of program to Residential Lighting Program
14. Add C&I LED lighting



Summary of Changes

15. Add PTAC and PTHP as eligible measures (packaged terminal heat pump and air conditioner)
16. Add heat pump water heaters to WRAP and adjust savings
17. True-up projections of peak load reductions from energy efficiency measures
18. Change eligibility requirements and rebate for programmable thermostats (see item 51 which subsequently eliminates this measure)
19. Change rebate and estimated participation level for refrigerators
20. Change eligibility requirements for LED traffic lights
21. Change eligibility requirements for Lighting Power Density Reduction (New Construction Lighting)
22. Change estimated participation level for room air conditioners
23. Change eligible motor efficiencies & rebates
24. Change residential LED lighting eligibility
25. Clarify rebate caps
26. Change projected participation for heat pump water heaters



Summary of Changes

27. Change rebate for Custom Program technical studies
28. Change rebate for de-lamping
29. Change eligibility requirements for maximum number of air conditioners in Appliance Recycling Program
30. Increase projected participation/savings for Large C&I within budget to reflect committed projects
31. Increase projected participation/savings for CFL program within budget
32. Discontinue rebate for dehumidifiers
33. Discontinue rebate for ENERGY STAR® light fixtures
34. Discontinue rebate for scanners, printers, and all other office equipment
35. Discontinue rebate for water coolers
36. Close residential portion of renewable energy program earlier than expected
37. Close GNI PV portion of Renewable Energy Program earlier than expected
38. Discontinue the rebate for dishwashers and clothes washers
39. Discontinue rebate for time clocks



Summary of Changes

40. Change eligibility requirements for heat pumps and central air conditioners
41. Transfer funds from efficient equipment program to custom program within the Large C&I customer class
42. Change rebate structure for T5, T8, high performance T8 lighting
43. Change occupancy sensor rebate
44. Discontinue rebate for demand control defrost
45. Discontinue rebate for chiller pipe insulation
46. Change eligibility requirement for C&I wall & ceiling insulation
47. Change eligibility requirement for T5 and T8 light fixtures
48. Revise HVAC Tune-up incentives & implementation mechanism
49. Discontinue rebate for cooling tower two-speed fan motor
50. Clarify eligibility requirement for display cases
51. Discontinue rebate for programmable thermostats (supersedes item 18 previously implemented)
52. Clarify eligibility for Energy Assessment & Weatherization Audit rebate
53. Change classification of WRAP and ePower Wise measure costs and incentives



Suggestions for Post-2013 Act 129 EE&C (Tom Stathos)



Post-2013 EE&C

- Act 129 requires the PUC to set new compliance targets by November 2013 if programs are cost-effective (presumably at a statewide level)
- Obviously, that is too late to launch new programs in June 2013 (when the current EE&C programs end)
- Ideally, need ~1 year lead time to develop new EE&C Plan, approve the new EE&C Plan, design new programs, award contracts, and implement new programs
- Therefore, it is critical to know the post-2013 targets and rules by June 2012



Post-2013 EE&C

- The PUC recognizes this lead time and has significantly advanced its process to determine post-2013 reduction targets
- Baseline study and market potential study to be completed by March 2012 (instead of November 2013) are key parts of that process



Post-2013 EE&C

- PPL EU supports continuing Act 129 EE&C post-2013 with some regulatory changes. No legislative changes are required.
- Reasonable energy reduction targets that have a sound technical and economic basis (market potential study results)
 - Overall targets
 - Set-aside energy reduction targets for low-income and institutional (government, schools, and non-profits)
 - Cost constraints & inflation
 - It will be increasingly more difficult and more costly to get additional savings over time, especially if targets are based on net savings (currently, targets are based on gross verified savings)
 - Changes in the TRM, codes, standards, efficiency “baselines”, etc., especially lighting (EISA) which is currently ~75% of the savings will erode post-2013 savings opportunities



Post-2013 EE&C

- No peak load reduction target or a lower peak load reduction target that has a sound technical and economic basis
 - Target based only on cost-effective, incremental peak load reductions above those provided by the competitive market
 - Consider direct load control, peak load contribution from energy efficiency measures, conservation voltage control, etc.
 - Exclude load curtailment type programs available through curtailment service providers, EGSs, and PJM.
 - Reasonable peak load reduction target that has a sound technical and economic basis (market potential study)
 - Improve the rules for determining when peak load reductions are required (the 100-hour issue)



Uncertainty

What if post-2013 targets and rules are not known by mid-2012?

- EE&C assumptions impact EDC operational planning, load forecasting, and revenue forecasting for periods after 6/1/13
- Can over-compliance from current EE&C Plan be “banked” to apply post-2013? If not, EDCs will have to stop current programs as soon as they reach compliance targets, even if money remains and additional savings are possible.
- Programs will “go dark”, possibly for a year or more.
- Loss of expertise and market momentum
- More costly to re-start
- Uncertainty with Trade Allies, retailers, CSPs reduces the likelihood they will commit to PA and be ready to restart programs



Questions about Post-2013 EE&C?



Net-to-Gross

(Pete Cleff and/or Anne West)



Net-To-Gross

- PUC's August 2011 TRC Order requires EDCs to review net-to-gross (NTG) method with stakeholders and submit the method to the PUC/SWE for approval
- Today, we'll describe NTG and the method to estimate it
- Gross verified savings are the basis for compliance 2009 – 2013
- Net verified savings are currently estimated to determine the effectiveness of programs and to identify where program changes are warranted (market transformation, adjust rebates, discontinue a measure/program, etc.)



What Do We Mean By “Savings”

Type of Savings	Unit Energy Savings	Number of Units	Adjustments
Reported Gross (Ex Ante - unverified)	Varies*	Claimed	None
Corrected “TRM Adjusted” Gross (Ex Ante – unverified)	per TRM or Custom	Claimed	Correcting reported values to agree with TRM methods or data errors
Verified Gross (Ex Post - evaluated)	Actual	Observed	Actual installations, actual equipment, operating conditions (e.g., EFLH, climate zone, size, ratings, etc.)
Net Savings (Ex Post)	Actual	Observed	Freeridership and spillover

*Can be determined from a fully stipulated value in the TRM, from planning assumptions, calculations using a TRM algorithm (some stipulated values and some variables), or from a custom measure protocol (pre & post metering, billing regression analysis, modeling, etc.).

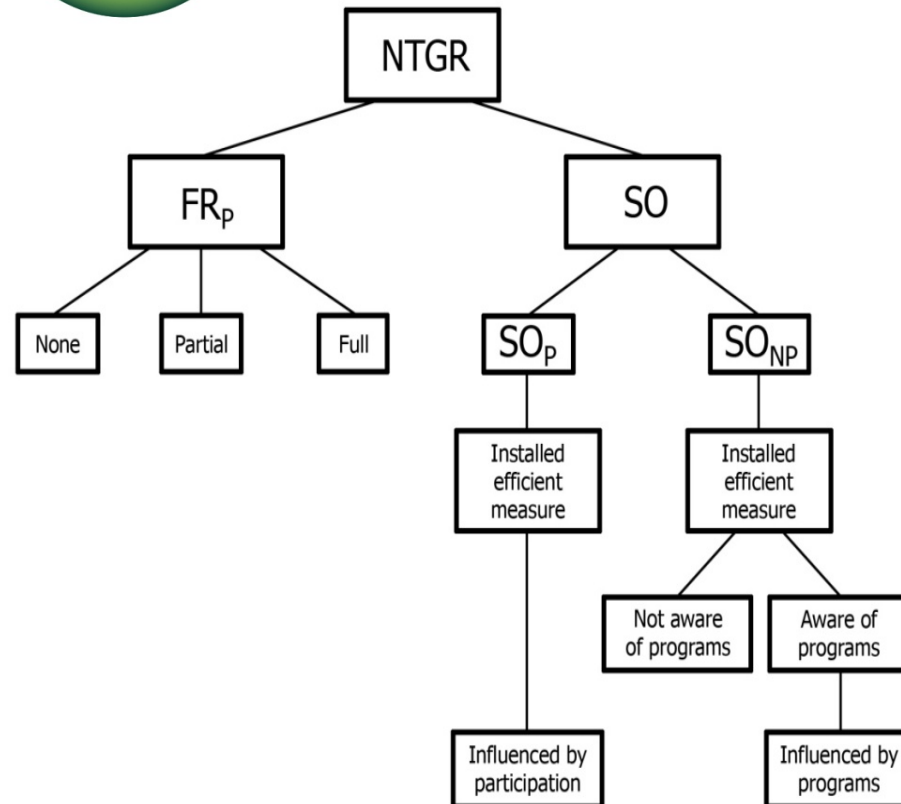


Definition and Components of NTG Ratio

- Net Savings: the portion of verified gross savings attributable to the energy efficiency program
- Net savings = verified gross savings times the NTG ratio (NTGR)
- Major components of the NTGR are
 - Free-ridership (FR)
 - Spillover (SO)



Definition and Components of NTGR



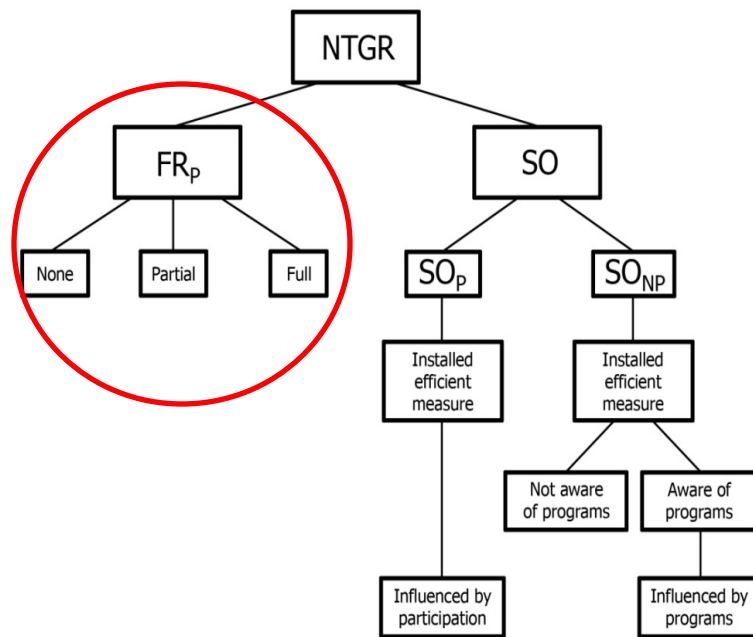
NTGR: The net-to-gross ratio and its components are usually expressed as fractions:

$$NTGR = (1 - FR) + SO_D + SO_{ND}$$

Calculating NTGR: Data is collected through surveys of a representative sample of participants and eligible customers who did not participate.



Free-ridership



Free-ridership examines whether the participants would have purchased and installed the same equipment in the absence of the program. That is, would they have installed:

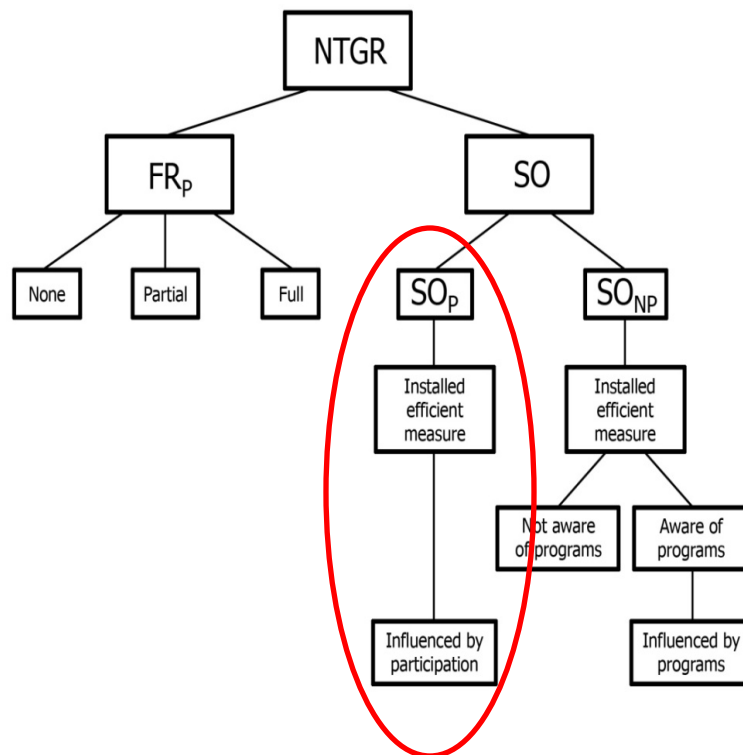
- the same thing,
- at the same time,
- in the same quantity,
- with the same efficiency,
- without the rebate.



Participant Spillover

Residential and Commercial Participants

SO_p surveys determine whether participants installed energy-efficient measures outside of the program, without a rebate, and were influenced by the program. The participant spillover survey answers three primary questions:



- **Measure adoption.** Since participating in the program being evaluated, has the participant installed additional energy-efficient equipment or measures that were not rebated through a program?
- **Quantity.** How much or how many measures were installed?
- **Attribution.** How influential was the program in the participant's decision to install additional energy-efficient measures?

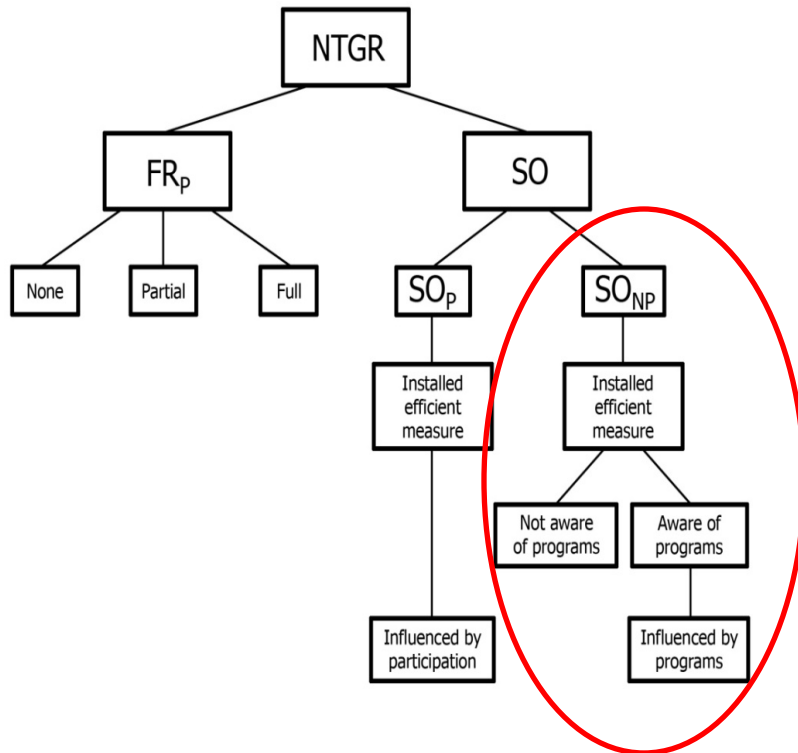


Non-participant Spillover

Residential and Commercial Non-participants

SO_{NP} surveys assess three key factors, which taken together will identify customers and measures that contribute to SO:

- **Measure adoption.** The purchase and installation of energy-efficiency measures without participating in a PPL Electric program.
- **Awareness.** Knowledge of the PPL Electric programs and measures they offer.
- **Attribution.** Whether the purchase was influenced by a PPL Electric program(s).

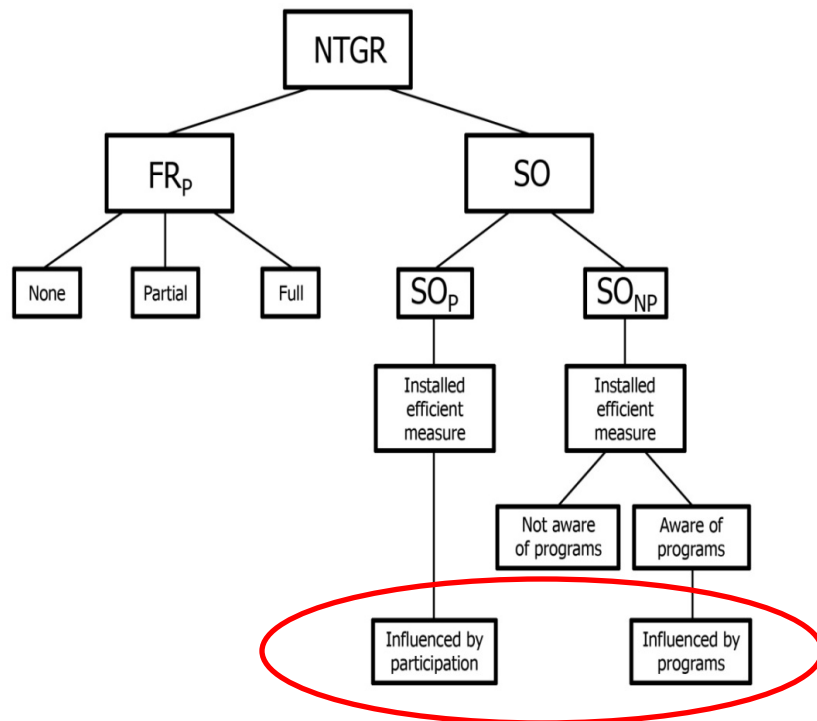




Spillover Savings Example

Calculating Savings Attributable to Spillover

- **Measure adoption.** Identify measures where savings are known (deemed in the TRM or determined through evaluation).
- **Avoid double counting.** Remove measures already rebated by cross-referencing with PPL Electric's databases.
- **Awareness.** Remove nonparticipants who were not aware of programs.
- **Attribution.** Select measures where the respondent said the program was highly influential in their decision to install the measure without a rebate.





Things to Keep In Mind

- NTG determination is part art, part science
- Relies on participant (customer/trade ally) and nonparticipant surveys
- Survey design is critical. Wording of survey questions and timing of survey are important
- The program design, marketing, delivery channel, maturity, and other market effects influence FR and SO
- NTGR can vary significantly between programs and from year to year
- Often, a program can influence market practices (upstream market effects) such as the SEER level of stocked heat pumps, home building practices, and the availability of products without the consumer's knowledge. This can influence their survey responses (i.e. the program influenced their decision on a particular product but the customer did not know it) and the NTGR, but this is difficult and costly to estimate.
- If utility programs are successful and influence market practices (transform the market), the NTGR naturally declines over time (get "worse") as market transformation increases. When compliance targets are based on net savings, utilities must spend additional funding to meet their compliance targets as NTGR declines.



For those who like equations

Estimate the total savings attributable to freeridership and spillover:

$$NTGR = \frac{\text{Gross Verified Savings} - \text{FR Savings} + \text{SO Savings}_{\text{Part}} + \text{SO Savings}_{\text{Nonpart}}}{\text{Gross Verified Savings}}$$

Freeridership: $kWhFR = p_{FR} * \text{Gross Verified Program Savings}$

Participant spillover: $SO_P = N_P * \frac{\sum_{i=1}^n \text{Spillover Savings}_i}{n_{\text{Part}}}$

Program spillover attributable to participants: $\text{Total kWhSO}_P = N_P + kWhSO_P$

Nonparticipant spillover: $\text{Total kWhSO}_{NP} = N_{NP} * \frac{\sum_{i=1}^n \text{Spillover Savings}_i}{n_{\text{Nonpart}}}$

Where, N and n represent the number of customers in the population and the survey sample, respectively.



Estimated Cost to Determine NTGR

- Costs to determine the NTGR include these broad task categories:
 - methods development;
 - survey development;
 - data collection;
 - data analysis; and
 - reporting
- Estimated cost to determine the NTGR is \$350,000 to \$500,000 (preliminary estimate) for the current 4-year EE&C Plan. Possibly more to estimate “upstream market effects”



Sample Survey Questions

Free-ridership

- **Already Ordered or Installed.** When you first heard about the program/rebate from PPL Electric for the [MEASURE], had you already purchased the [MEASURE]?
- **Planning to Purchase.** When you first heard about the program/rebate from PPL Electric, had you already been planning to purchase, or had you already begun collecting information about the [MEASURE]?
- **Would Have Installed Without Rebate.** Without a rebate from PPL Electric, would you still have purchased the exact same [MEASURE] for your home?
- **Same Efficiency.** Without the rebate, would you have still purchased a [MEASURE] that was just as energy efficient, more efficient, or less efficient?
- **Planning to Install Soon.** Without the rebate, would you have bought the [MEASURE] sooner, at about the same time, later in the same year, in one to two years, in three to five years, or five or more years later?
- **Same Quantity.** Without the rebate, would you have still purchased and installed the same number of [MEASURE]?



Questions about net-to-gross?



Stakeholder Survey

- Please complete the paper survey before you leave
- We are trying to improve the survey response rate so we are changing the survey delivery method
- No longer will send the survey via e-mail
- We value your input and incorporate it into stakeholder meetings



Additional Information

- www.pplelectric.com/e-power
 - Program descriptions, details, rebate amounts, qualifications, and enrollment forms
 - Stakeholder Information
 - Click on E-power links, then Act 129 EE&C Stakeholder Info.
- Stakeholder coordination and feedback:
Peter Cleff- pdcleff@pplweb.com ; 610-774-4530