



**PPL Electric Utilities**

PPL Electric Utilities  
Stakeholder Meeting  
Energy Efficiency Programs  
December 13, 2016

# Agenda

- Phase 2 Results (June 2013 – May 2016)
- Phase 3 Status
- Review Possible Changes to the Phase 3 EE&C Plan

# Summary of Phase 2 Results

- Exceeded all savings targets, under the cost budget
  - Portfolio
  - GNE
  - Low-income
- Portfolio is cost effective. Benefit-cost ratio =1.59
- Actual performance (costs, savings, cost-effectiveness) was very close to planned performance
  - By program
  - By customer sector
- Very high customer satisfaction (>89%)
- Program Year 7 Final Annual Report (11/15/16) has the details

# Phase 2 Portfolio Savings (MWh/yr)



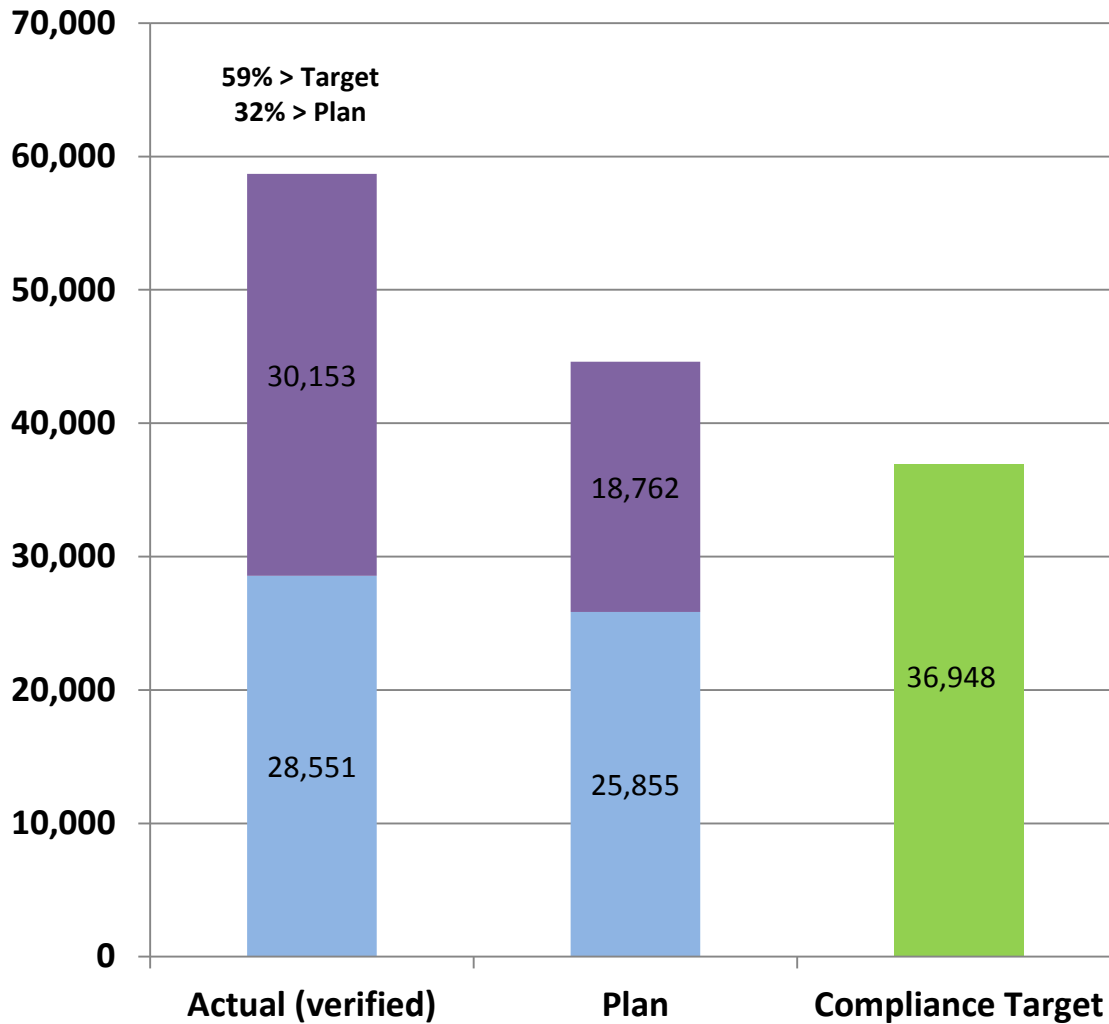
Actual savings are greater than compliance target and plan

- Compliance Target
- Ph I carryover
- Ph 2

# Phase 2 Low-Income Savings (MWh/yr)



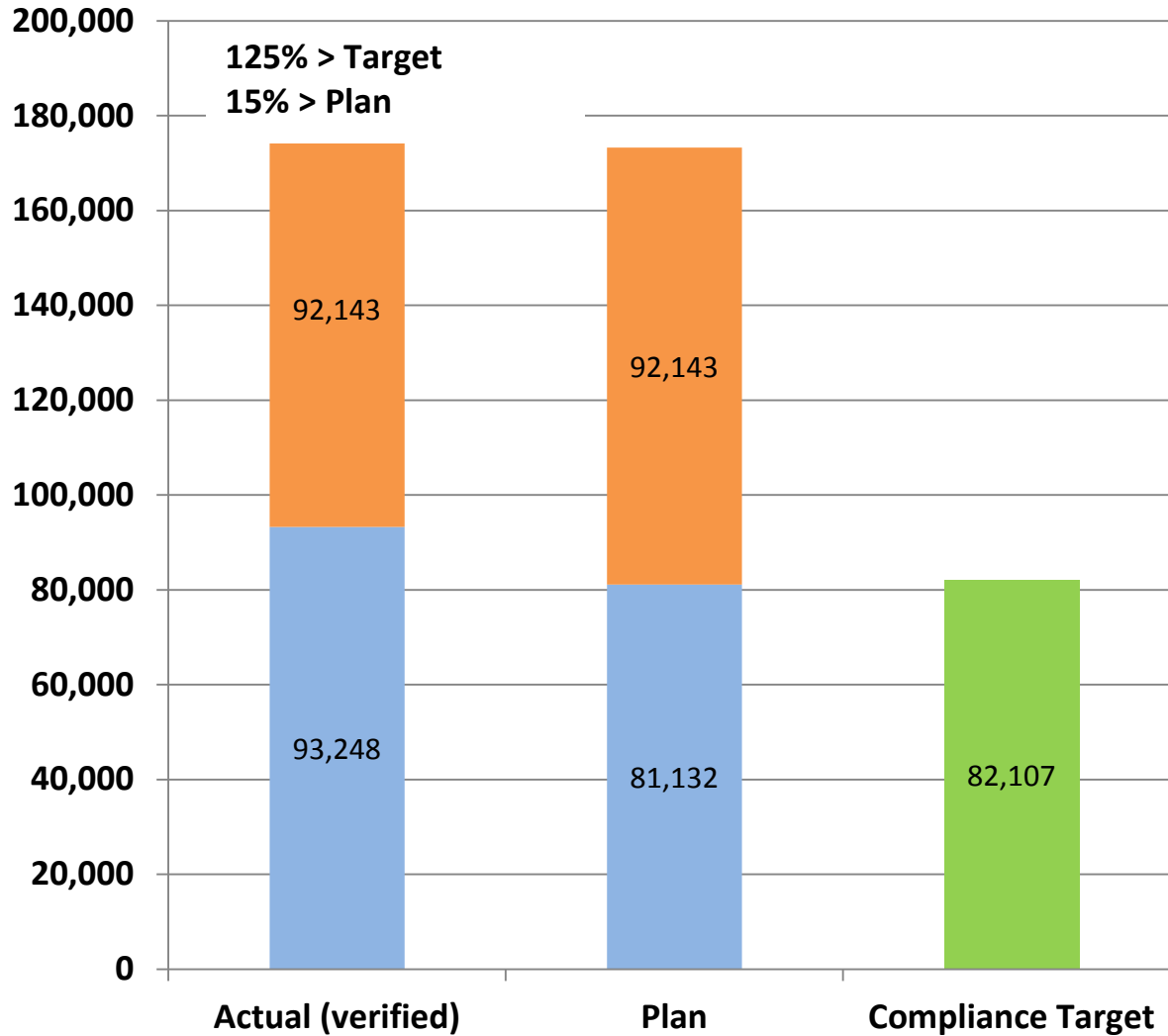
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Actual savings are greater than compliance target and plan

- Ph 2 (LI in gen'l resid)
- Compliance Target
- Ph 2 (LI)

# Phase 2 GNE Savings (MWh/yr)



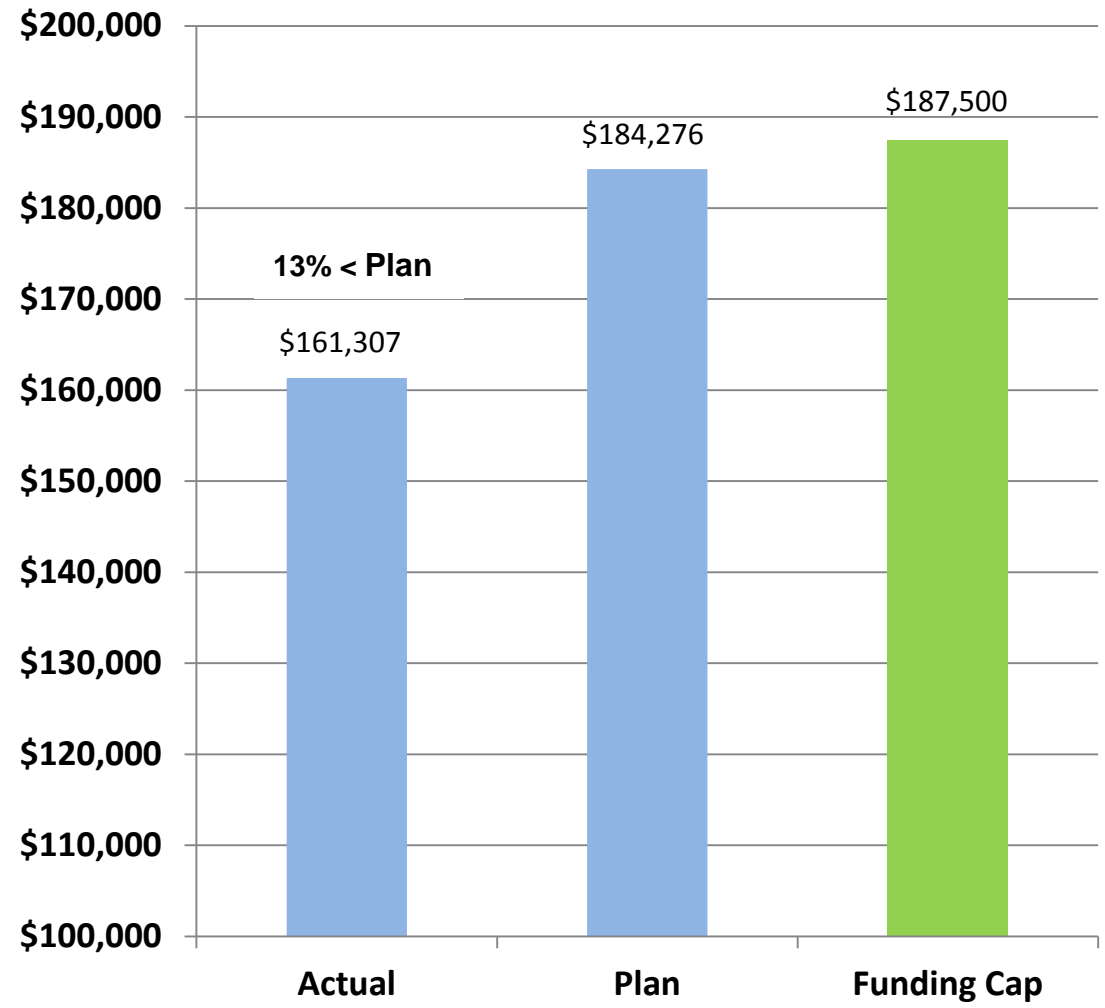
Actual savings are greater than compliance target and plan

- Compliance Target
- Ph I carryover
- Ph 2

# Phase 2 Portfolio Costs (\$1000)



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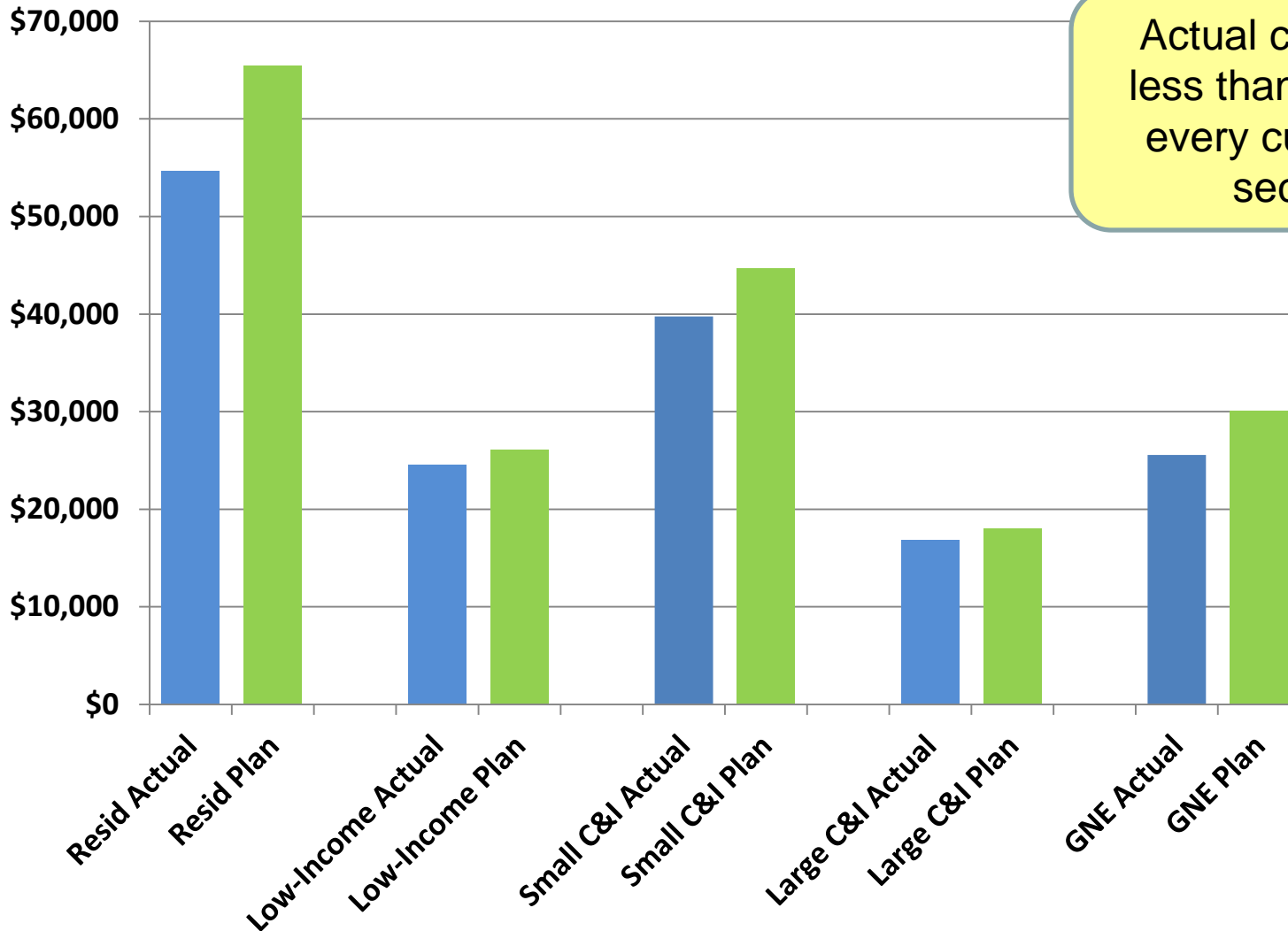
Actual costs are less than the funding cap and plan

~ \$800k remaining Ph 2 costs for evaluation

# Phase 2 Customer Sector Costs (\$1000)



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Actual costs are less than plan for every customer sector



# Phase 2 Customer Sector Summary

Actual savings > Plan for each customer sector. Portfolio is cost-effective. Lower acq. cost than Plan. Great participation.

Sector	Phase 2 Verified Energy Savings (MWh/yr)	Phase 2 Planned Energy Savings (MWh/yr)	Ph 2 TRC Benefit-Cost Ratio	Phase 2 Actual Costs (\$1,000) <sup>(3)</sup>	Ph 2 Program Acquisition Cost (\$/Annual kWh) <sup>(3)</sup>	Phase II Participants
<b>Residential</b>	241,566	229,739	2.13	\$54,660	\$0.23	776,766
<b>Low-income</b>	28,551 <sup>(2)</sup>	25,885 <sup>(1)</sup>	0.92	\$24,502	\$0.86	157,195
<b>Small C&amp;I</b>	217,743	190,446	2.10	\$39,756	\$0.18	39,216
<b>Large C&amp;I</b>	117,629	102,126	1.72	\$16,822	\$0.14	427
<b>Gov't/Non-Profit</b>	93,248	81,132	0.94	\$25,567	\$0.27	3,789
<b>Total</b>	698,736	629,328	1.59	\$161,307	\$0.23	977,393

1. Excludes 18,762 MWh/yr. L-I savings in general residential programs that count toward the L-I compliance target.

2. Excludes 30,153 MWh/yr. L-I savings in general residential programs that count toward the L-I compliance target and includes the LED giveaway component of Residential Retail.

3. Includes Direct and Common Costs.

# Ph 2 Program Summary

Savings exceeded or were very close to Plan for all programs. Acceptable NTGRs. Benefit-cost ratios were generally > Plan.

Program	Phase 2 Verified Energy Savings (MWh/yr)	Phase 2 Planned Energy Savings (MWh/yr)	Phase 2 Net-to-Gross Ratio	Phase 2 TRC Benefit-Cost Ratio	Phase 2 Actual Cost (\$1,000)	Ph 2 Program Acquisition Cost (\$/Annual kWh)	Phase 2 Participants
Appliance Recycling	25,012	25,224	0.72	3.68	\$4,026	\$0.16	26,784
Resid Retail	206,018	191,863	0.69	3.75	\$25,960	\$0.13	624,277
Resid Home Comfort	18,649	15,268	0.61	0.66	\$10,330	\$0.55	14,770
Resid Behavior & Education	39,078	30,749	1.00	2.50	\$2,463	\$0.06	126,290
Low-income WRAP	11,832	10,411	1.00	0.75	\$16,538	\$1.40	10,273
Low-income Behavior & Education	10,622	8,280	1.00	0.65	\$1,523	\$0.14	87,376
Low-income EPowerWise	5,933	5,611	1.00	3.16	\$1,237	\$0.21	11,546
Prescriptive Equipment	303,542	253,466	0.82	1.50	\$54,268	\$0.18	7,863
Custom	56,852	62,793	0.54	1.32	\$7,373	\$0.13	207
Student & Parent Education	13,397	15,628	1.00	2.05	\$5,345	\$0.40	67,732
Multifamily	6,488	6,885	0.78	1.52	\$2,172	\$0.33	141
Continuous Energy Improvement	4,697	3,150	1.00	1.25	\$993	\$0.21	45
School Benchmarking	-	-	-	-	\$370	-	89
<b>Total</b>	698,736 <sup>(3)</sup>	629,328	0.77 <sup>[1]</sup>	1.59	\$161,307 <sup>[2]</sup>	\$0.23 <sup>[2]</sup>	977,393

1. Weighted by program savings for NTG Ratio

2. Includes portfolio common costs (\$28,709) not assigned to a specific program

3. Includes adjustment for residential and L-I energy efficiency behavior and education double-counted savings of - 3,385 MWh/yr

# Some Phase 2 Highlights



- Over 2.3 million LED bulbs through PPL's programs. Very broad reach throughout the service territory, including all types of retailers (big box, home improvement, independents, Goodwill, etc.)
- PY7 had the highest customer satisfaction (89%) since launching programs in 2010
- 89% of participants read their home energy report and > 70% believe is accurate. Both of these are very high nationally
- 40% of low-income home energy report recipients heard about LIHEAP for the first time through their home energy report. Great uplift to increase awareness of other low-income programs
- The longer period of time that customers get a home energy report, the more they save
- Recipients of home energy reports had 12% greater participation in other energy efficiency programs (compared to the control group) with 6% greater savings from those programs

# Lessons Learned- DeFacto Heating Pilot



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- Difficult to find eligible customers
- Screened > 2,000 customers but only 33 were eligible
- 11 of the 33 homes participated (budget limit for the pilot)
- Ineligible due to access to natural gas, oil heat still working, income > 150% FPIG
- Average savings per home = ~4,000 kWh/yr (usage of new system compared to electric space heaters)
- Average direct cost (material + labor) per project was \$13,600 compared to an expected cost of \$7,000. More zones (4-5) than assumed + upgrades to electric service
- High energy savings but very costly to retrofit new equipment
- The cost/annual kWh saved is > \$3.50 compared to \$0.23 portfolio and \$0.86 for low-income sector programs overall
- Program is not scalable or feasible in Phase 3 because of high cost

# Phase 3 Status- Overall

- Phase 3 programs launched on time
- Very smooth transition from Phase 2 for customers and trade allies
- Slower ramp-up for savings than planned but no change to Phase 3 savings forecast
- The single points of contact for energy efficiency products and services are working well for residential, non-residential, low-income, and multifamily.

# Jessica Diehl

## Residential Program Manager

# Phase 3 Status- Residential



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- All residential programs have launched
- Single CSP and point of contact for customers & trade allies
- New residential website, online customer portal, ways to save, online energy assessment, personalized recommendations for residential
- Improved communication of application and rebate status
- Faster rebate processing
- Enhanced trade ally network with an advisory group to better serve contractors and their customers
- More-holistic view of the customer across all programs/measures to encourage a more comprehensive approach (multiple measures/whole building)

# Phase 3 Status- Residential



- On target with > 6,500 refrigerators/freezers recycled since June
- > 24,000 school children received energy efficiency education and kits through the Student Education program. 882 teachers at 204 schools across the territory (37% low income).
- Favorable comments on redesigned Home Energy Reports
- LED bulb sales are great
  - > 1 million in first 6 months (compared to 2 million in last 2 years)
  - Very broad reach throughout the service area and retailers-- big box, home improvement, independents, Goodwill, grocery, shopping clubs, etc.
  - Diverse mix of standard and specialty bulbs (reflectors, candelabra, filament, decorative, globes, etc.)
  - Online sales channel for LEDs through Costco and Amazon (coming soon)
  - Instant discounts for LED fixtures coming soon



# Chris Schoemaker

## Low-income Program Manager

# Phase 3 Status- Low Income

- Eliminated the WRAP backlog from Phase 2 (~1,700 projects waitlisted when funding was full)
- Great coordination between Act 129 and LIURP WRAP
- More participation from affordable, multi-family housing
- Need to better define eligibility requirements and incentives for new construction, affordable MF housing projects
- Much faster application process and scheduling
- In the planning stages for “community EE&C”
- Slower WRAP ramp-up than planned but no change to Phase 3 savings forecast
- Still expect to double the number of participants per year, increase the savings per job, and reduce the cost/kWh saved compared to Phases 1 & 2

# John Kucher

## Non-residential Program Manager

# Phase 3 Status- Non-Residential

- All non-residential programs and measures have launched
- New non-residential website
- Online, streamlined application and rebate process
- Faster rebate processing
- Enhanced trade ally network
- Launched midstream delivery channel for non-residential lighting
- More-holistic view of the customer across all programs/measures to encourage a more comprehensive approach (multiple measures/whole building)
- More-personalized service, including on-site energy audit/guidance
- Much more interest in CHP than expected, especially for GNE

# Sean Pressmann

## Demand Response Program Manager

# Phase 3 Status- Demand Response



- Striving for 115 MW to meet the 92 MW compliance target
- The DR program implementer (C-Power) is recruiting participants across the service territory
- Cross-promotion with non-residential energy efficiency programs when possible
- DR website: [www.pplelectric.com/businessrebates](http://www.pplelectric.com/businessrebates) > rebates by type > demand response
- 844-422-8129

# Status of Phase 3 Settlement Items

- Review general content of home energy reports with stakeholders
  - See handout
  - Initial customer feedback is favorable
- Status of baseboard electric heat thermostat pilot
- Review WRAP marketing efforts with stakeholders
- Describe WRAP coordination with gas companies
- Multi-family stakeholder meeting with PHFA, PA Housing Alliance, and others completed 10/19
  - Coordination is on-going
  - Many projects and leads directly from this meeting
- Evaluate a pilot for residential demand response using smart thermostats and review the recommendations in early PY9
- Evaluate business energy analyzer software

# Possible Changes to Phase 3 EE&C Plan



- Add residential behavioral demand response
  - Additional DR to address evaluation uncertainties (limited use of CBLs; more-extensive regression analysis to determine DR verified savings)
  - Least costly method to add DR... just some additional messaging before and during DR events
- Add residential direct load control to the DR Program
  - Dynamic, fast response DR for the portfolio, especially C&I load curtailment participants fail to deliver during an event
  - No change in total cost or MWs for DR
  - Reallocate ~\$1.5 - \$2.5 million and ~10 - 15 MW of the 115 MW from Large C&I/Small C&I/GNE to Residential
  - Cycle residential air conditioners 4 hours per event, up to 6 events per year.



# Possible Changes to Phase 3 EE&C Plan



- Flexibility to offer incentives/enhanced incentives for localized energy efficiency and demand response
  - Likely no change to overall savings or cost
- Add non-electric water heaters (switching from electric to high-efficiency non-electric)
  - Omission
  - No impact on savings or costs
  - Maximum of 250 units across all customer sectors

# Possible Changes to Phase 3 EE&C Plan



- Combine non-residential efficient equipment and custom into a single program
  - More customer demand than expected for custom projects
  - Customers and trade allies only see “eligible measures”, not “programs” today
  - All measures in the 2 existing programs would be available within one program-- Some measures would require custom M&V methods, some would have standard M&V per TRM
  - A single program provides much more flexibility to implement on-going changes in customer preferences (measures) without costly and time consuming EE&C Plan changes to reallocate costs & savings between programs (with no impact to customer sectors)
  - Do not expect a change in the distribution of costs and savings for customer sectors (Small C&I, Large C&I, and GNE)
  - Will maintain separate budgets Small C&I, Large C&I, and GNE within the single program

# Questions



# Contact Information



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