Agenda

Conservation Advisory Council
Wednesday, November 16, 2016 1:30 pm – 4:30 pm

Address:
421 SW Oak St., #300
Portland, OR 97204

1:30 Welcome and Introductions

1:35 Old Business and Announcements
Oct CAC minutes
2017 CAC schedule

1:40 2017 R2 Budget Changes *(discussion)*

2:40 Residential Air Conditioning Measure Opportunity Scan *(information)*
Energy Trust and Cadmus staff will present and discuss the results of a recent assessment that was performed to try to identify potentially reliable, cost-effective residential air conditioning measures.

3:20 Break

3:30 Residential Sector Assessment Project *(discussion)*
Staff will provide CAC members with information and solicit CAC advice on work underway to update the go to market structure of Residential efficiency efforts.

4:15 Public comment

4:30 Adjourn

The next scheduled meeting of the CAC will be Wednesday February 8, 2017.

Conservation Advisory Council Meeting Notes

October 21, 2016

Attending from the council:
JP Batmale, Oregon Public Utility Commission
Warren Cook, Oregon Department of Energy
Tony Galluzzo, Building Owners and Manager Association
Charlie Grist, Northwest Power Council
Garrett Harris, Portland General Electric
Scott Inman, Oregon Remodelers Association
Don Jones, Pacific Power
Don MacOdrum, Home Performance Guild of Oregon
Lisa McGarity, Avista
Holly Meyer, NW Natural
Jeff Mitchell, Northwest Energy Efficiency Alliance
Tyler Pepple, Industrial Customers of Northwest Utilities
Allison Spector, Cascade Natural Gas

Attending from Energy Trust:
Mike Bailey
Amber Cole
Michael Colgrove
Kim Crossman
Juliett Eck
Sue Fletcher
Mia Hart
Jessica Iplikci
Fred Gordon
Marshall Johnson
Oliver Kesting
Spencer Moersfelder
Jay Olson
Thad Roth
Mariet Steenkamp
Peter West
Mark Wyman

Others attending:
Dave Backen, Evergreen
Holly Braun, NW Natural
Alecia Dodd, Ecova
Jason Jones, Ecova
David Keller
Alan Meyer, Energy Trust board
Amanda Potter, CLEAResult
Bob Stull, CLEAResult

1. Welcome and Introductions

Kim Crossman convened the meeting at 1:30 p.m. The agenda, notes and presentation materials are available on Energy Trust's website at: www.energytrust.org/About/public-meetings/CACMeetings.aspx.

Kim introduced new Conservation Advisory Council members: Allison Spector, Cascade Natural Gas; Lisa McGarity, Avista; and Tony Galluzzo, Building Owners and Manager Association. Kim thanked Jim Abrahamson for his service to the advisory council. Jim is retiring from Cascade Natural Gas.

2. Old business and announcements

The council approved the September meeting notes without comments or changes.

3. 2017 residential changes

Thad Roth presented on proposed residential measure changes in 2017, including the discontinuation of appliance recycling and incentives for CFLs. Appliance recycling is no longer

cost-effective as most units still on the market were manufactured after 1993. The lighting market is changing with the low cost of LEDs, and CFLs will not meet 2017 federal standards.

Don Jones: These changes for appliance recycling and CFLs are consistent with what other states are doing.

JP Batmale: Appliance recycling is a high-profile offering for residential customers. What is the plan for discontinuing recycling?
Amber Cole: The residential sector has a plan for exiting the measure, and a communications plan is in development. Communications to customers will occur after the New Year, highlighting the accomplishments and success of the offering.

4. 2017 R1 budget overview
Peter West presented on the draft 2017 budget and 2017-2018 action plan. The full presentation is available online and includes additional slides with program and utility detail.

> Projected 2016 results are unofficial, but we expect to exceed savings goals for all utilities. Two renewables projects are delayed, which will cause a shortfall for generation goals in 2016. This year, we made an effort to draw down reserves and we reduced reserves by $36.8 million, more than planned.
>
> Energy Trust's 2017-2018 action plans focus on expanding customer participation, supporting new approaches and emerging technology, managing transition to a changing energy landscape, and cultivating efficient and effective operations. The total draft 2017 budget is $201.2 million. It will save 56.88 average megawatts and 7.74 million therms and generate 2.75 aMW.
>
> There may need to be rate adjustments for utilities to meet these budgeted goals. This is the draft budget, and there may be adjustments to the final budget to be approved by the board on December 16, 2016.
>
> The public comment period is open October 26 to November 9. Submit comments to info@energytrust.org.

Don Jones: Avoided costs decreased in Pacific Power's 2013 and 2015 Integrated Resource Plans. If that trend continues, 2017 avoided costs will be even lower. They're stable now, but there could be changes.
Charlie Grist: Avoided costs are not changing in the Northwest Power Council's Seventh Power Plan. It would be worth discussing the mechanics at a later meeting.

Allison Spector: What does expansion and engagement for low- and moderate-income customers look like in 2017?
Peter: We were successful in expanding participation and offerings to low- and moderate-income customers this year, and we plan to continue those efforts next year.
Marshall Johnson: In 2016, our low-income efforts included marketing furnaces in collaboration with NW natural, working with Community Action Partnership of Oregon (CAPO) and Oregon Housing and Community Services to strengthen customer referral services and alignment with utilities on their approaches. As an example, there is a current collaboration in Coos Bay. We are supporting NW Natural and CAPO in helping to convert customers from oil to gas, and we provide our Savings Within Reach incentive to encourage efficient gas heating systems. The goal is to maximize opportunities for income-qualified customers.

Don MacOdrum: Are staffing and administrative costs included in program expenditures?
Peter: Yes, staffing and administrative costs are redistributed through our expenditures chart.

JP: Are the new Production Efficiency customers from transport?
Kim: Most of the growth is in commercial, not Production Efficiency.

Alan Meyer: How is this affecting reserves? Are we further reducing reserves in 2017?
Peter: No, we spent more than planned and need to replenish reserves in some cases in 2017.

Charlie: What percentage of Products savings are from lighting?
Thad: About 85 percent. The remainder of Products savings are from recycling and appliances.

Holly Meyer: What's causing lower savings per bulb?
Peter: It has to do with comparative baselines. LEDs are replacing CFLs, which are already efficient.
Charlie: There's also a huge uptake in bulbs outside of Energy Trust programs.

Holly: Are there metrics for how many new customers we have year by year?
Peter: There are a lot of new industrial customers, but not as many new commercial customers.
Kim: Next year, utility customer information data will allow us to do deeper analysis and show multi-year trends.
Holly: Is that for all customer segments?
Kim: That's still under discussion.
Charlie: Please bring those metrics to a future meeting.

JP: What's driving the 4 percent increase in program delivery costs?
Peter: Project volume is up in the business sector and for new construction. Without investing in good service to customers, we won't get energy savings. We're doing a lot of work directly with customers, and that drives up costs.

Charlie: The economy fluctuates and we have no control. We would like to take advantage of new projects when the economy is good, however our budget is the same. How do you plan for volatility and take advantage of opportunities?
Peter: Reserves account for that lack of control. Budget forecasts are not certain, and we work with utilities to make adjustments so we're not over or under estimating.
Don Jones: The question for customers is do we have the right mix of incentives. Where we set forecasts are still under discussion due to this uncertainty.

Don Jones: On the 2017 utility generation summary in the presentation, I would like to adjust the language for "prior IRP targets."
Peter: We can adjust the presentation in the draft 2017 budget binder for the board meeting.

Don MacOdrum: Does the budget consider city policies or Oregon Public Utility Commission dockets that haven't passed, but could in 2017? For example, the City of Portland's home energy scoring policy or the avoided costs docket.
Peter: Those are considered for the budget since we have to prep for opportunity and adapt to a changing policy landscape. For example, we participate in the City of Portland's commercial benchmarking policy and Commercial Property Assessed Clean Energy pilot. We want to make sure that our programs are leveraged for these opportunities.

5. Public comment
There were no additional public comments.

6. Meeting adjournment

The next scheduled meeting of the Conservation Advisory Council will be on November 16, 2016, from 1:30 p.m. – 5:00 p.m.

Draft 2017 Annual Budget & 2017-18 Action Plan Update

November 16, 2016

Energy Trust of Oregon

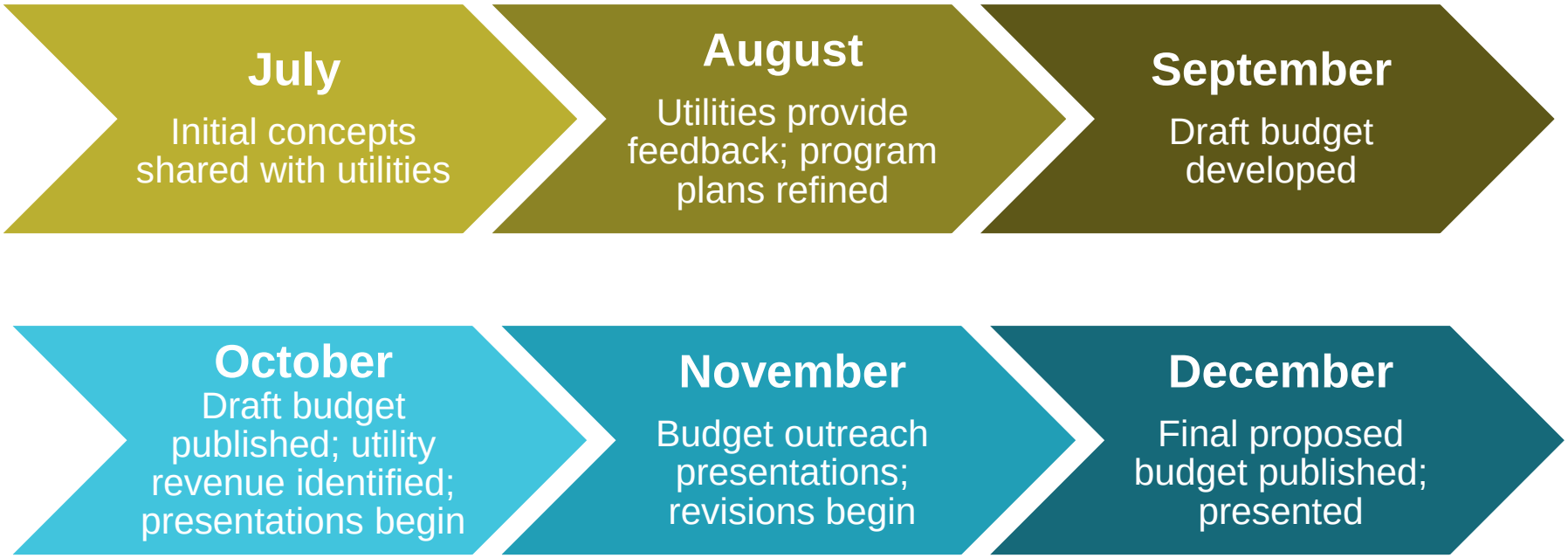
Today's Presentation

- Budget comments themes
- Review of budget process and context
- Changes underway for Final Proposed Budget
- Net to Gross Savings
- Next Steps

Themes from Budget Comments Received

- Support for plans to acquire all cost-effective savings to benefit utility customers
- Concern about revenue increase needed in 2017, resulting from low reserves and high program activity/opportunity
- Stakeholders would prefer earlier forecast of revenue requirements, especially given low available reserves
- Desire for more detail about revenue and reserves in draft budget
- Desire for planning assumptions to have more prominence in the draft budget materials

Budget and action plan development process



Projected 2016 Savings Results by Utility

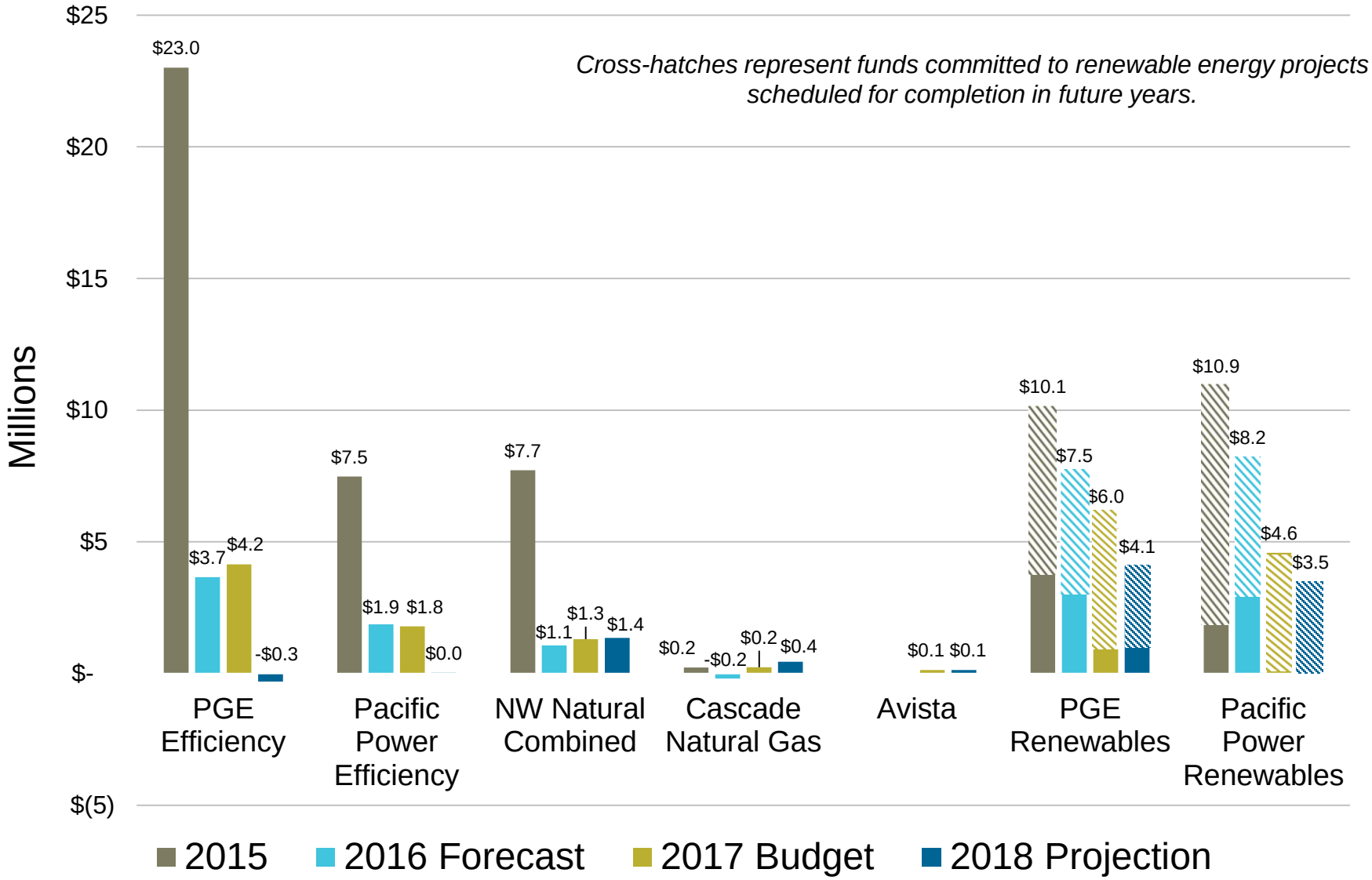
	Budgeted 2016 Savings Goal (Net) aMW or MMTh	Budgeted 2016 Levelized Cost Per kWh or therm	Projected 2016 Savings (Net) aMW or MMTh	Projected % of 2016 Savings Goal (Net)	Projected 2016 Levelized Cost Per kWh or therm
PGE (Efficiency)	33.66	2.9¢	35.31	105%	2.9¢
Pacific Power (Efficiency)	21.42	3.0¢	22.65	106%	2.7¢
NW Natural (Oregon)	5.25	32.3¢	5.64	107%	30.8¢
NW Natural (Washington)	0.27	33¢	0.33	124%	41¢
Cascade Natural Gas	0.47	41.1¢	0.53	113%	32¢

MMTh: million annual therms
aMW: average megawatts

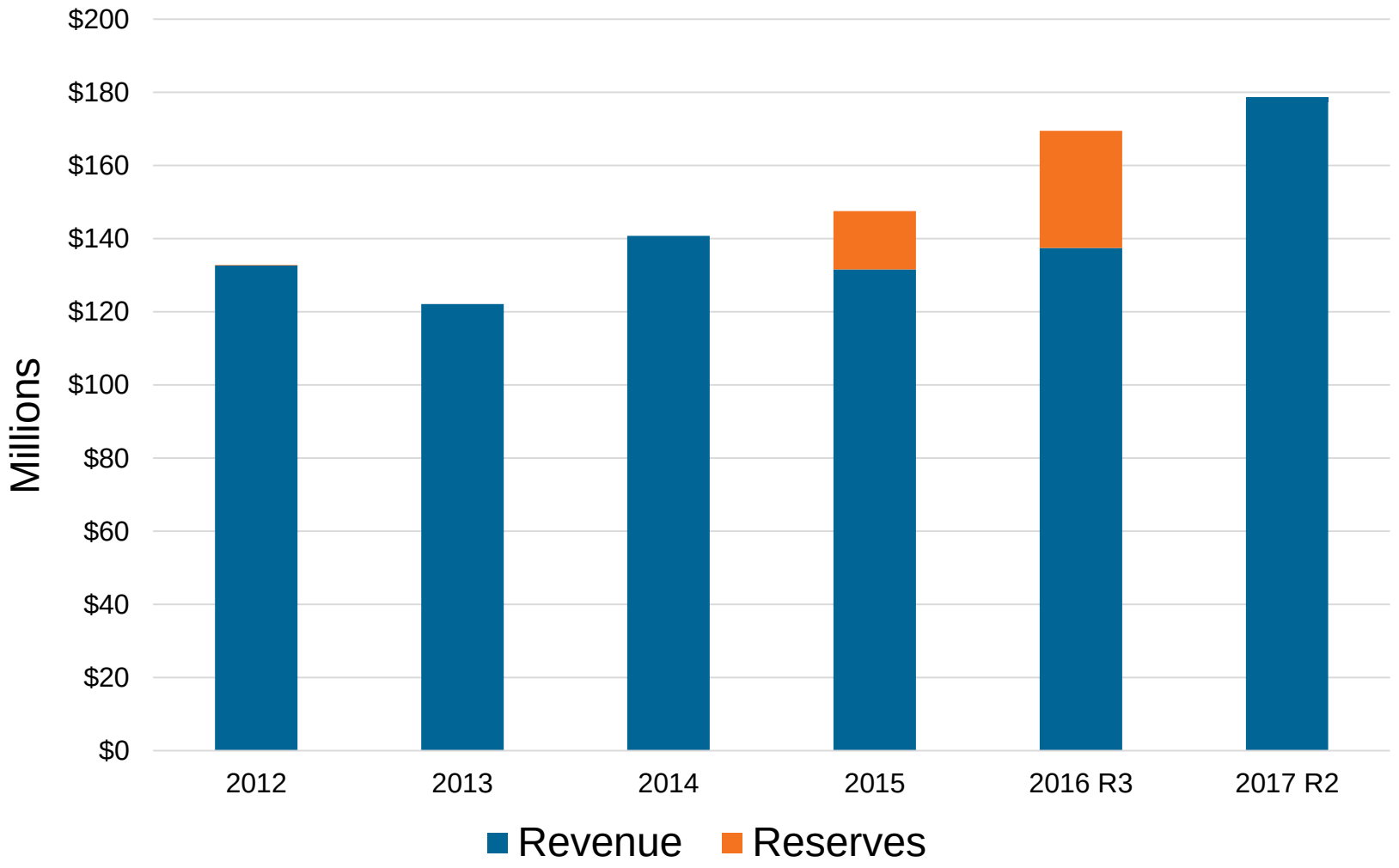
Context Driving 2017 Savings & Expenditures

- Stronger economy, driving project volume
- Increased savings opportunity with booming new construction markets
- More challenging business case for some customers, driving delivery cost

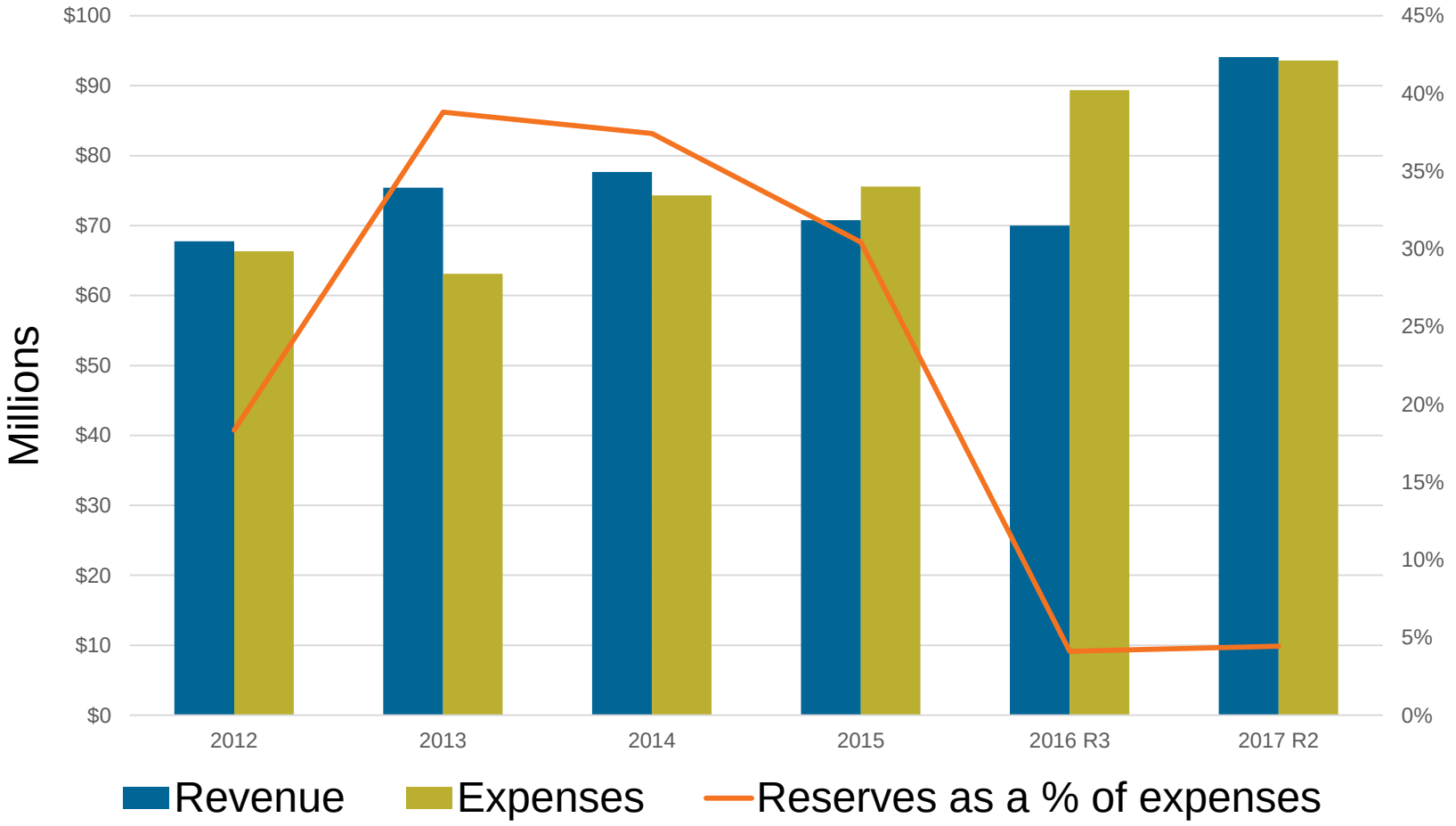
Projected Year-End Reserves



Historical Funding of Efficiency Expenditures



Revenue, Expense & Reserves - PGE Efficiency



Context Summary

- Surpassing 2016 goals with low levelized cost
- Strong economy and new construction market led to more savings opportunity in 2017, driving up savings goals and expenditures
- Success bringing down reserves in 2015 and 2016 led to minimal or no revenue increases for two years, while savings and expenditures increased
- As a result, revenue needs are significantly higher in 2017 compared to 2016 and 2015
- 2017 savings goals are high and levelized costs remain low – a good story

Summary of changes

Changes underway to energy efficiency budget

Savings Draft (R1) to Final Proposed (R2)

- Focused primarily on cutting administration, program support and near-term planning-related efforts
- Expenditures reduced about $2.7 million from
- Very small reductions in electric savings from:
  - » Aligning to updated measure analyses
  - » Updated projections in Industrial Efficiency
- Small changes to gas savings from:
  - » Revised analyses of market potential for large projects for NWN
  - » Minor revision to CNG for updated measure analyses
  - » Reduction in Avista reflecting revised understanding potential

R2 savings change summary

	2017 R1 Savings	2017 R2 Savings	Total Change	% Change
PGE (aMW)	35.2	35.0	-0.2	-0.8%
Pacific Power (aMW)	21.6	21.4	-0.2	-1.0%
NW Natural-Oregon (MMTh)	6.5	6.2	-0.3	-4.5%
NW Natural-Washington (Th)	281,841	282,539	698	0.2%
Cascade Natural Gas (Th)	569,405	563,862	-5,543	-1.0%
Avista Gas (Th)	341,286	318,332	-22,954	-6.7%
Total Electric (aMW)	**56.9**	**56.4**	**-0.5**	**-0.8%**
Total Gas (MMTh)	**7.7**	**7.4**	**-0.3**	**-4.3%**

aMW: average megawatts
MMTh: million annual therms
Th: annual therms

Columns may not total due to rounding

R2 expenditures change summary

	2017 R1 Expenses ($ Million)	2017 R2 Expenses ($ Million)	Total Change	% Change
PGE	94.6	93.6	- 1.0	- 1.0%
Pacific Power	56.2	55.8	- 0.4	- 0.8%
NW Natural (Oregon)	25.2	23.9	- 1.3	- 5.1%
NW Natural (Washington)	2.1	2.1*	0*	0.8%
Cascade Natural Gas	2.5	2.5*	0*	-0.6%
Avista Gas	1.0	0.9	-0.1	- 7.6%
Total Electric	**150.8**	**149.4**	**- 1.4**	**- 0.9%**
Total Gas	**30.7**	**29.3**	**- 1.3**	**- 4.4%**

**Changes round to $0*

Columns may not total due to rounding

2017 Utility Savings & Generation Summary

	2016 Budget Savings (Net) aMW or MMTh	2017 Budget Savings (Net) aMW or MMTh	IRP target for 2017 (Net) aMW or MMTh	2017 Budget ($ Million)	2017 Budget Levelized Cost Per kWh or therm
PGE (Efficiency)	33.66	34.97	31.87*	$93.61	3.0¢
Pacific Power (Efficiency)	21.42	21.43	19.94*	$55.80	2.9¢
NW Natural (OR)	5.25	6.25	4.40*	$23.89	30.6¢
NW Natural (WA)	0.27	0.28	0.26*	$2.08	55.9¢
Cascade Natural Gas	0.47	0.56	0.36*	$2.47	34.0¢
Avista	-	0.32	0.32	$0.90	19.8¢

MMTh: million annual therms
aMW: average megawatts

** Energy Trust IRP targets submitted to utilities for inclusion in their current IRP filings. Additional savings opportunities have been identified above these targets and are under consideration for future IRP acknowledgment proceedings.*

Net and Gross Savings

	2017 Budget Savings (Net) aMW or MMtherms	2017 Budget Savings (Gross*) aMW or MMtherms
PGE	34.97	39.17
Pacific Power	21.43	23.82
NW Natural (OR)	6.25	7.06
NW Natural (WA)	0.28	0.28
Cascade Natural Gas	0.56	0.64
Avista	0.32	0.33

- OPUC requested Energy Trust begin reporting net and gross savings totals (net savings are equivalent to Energy Trust's reportable savings)
- Provides holistic view of savings acquisition
- Aligns with regional and national reporting

* *Gross savings represent all savings from program participants, regardless of whether they are free-riders.*

Budget Outreach Schedule

October & November

RAC/CAC presentations Oct. 21

Draft budget online, Oct. 26

Board of Directors, Nov. 2

Public webinar, Nov. 4

Public comments due Nov. 9

Comments reviewed, final adjustments

RAC/CAC updates, Nov. 16

OPUC public meeting, Nov. 22

December

Final proposed budget online, **Dec. 7**

Board of Directors, **Dec. 16**

Action on Final Proposed 2017-18 Budget and Action Plan

+ **www.energytrust.org/about/budget**
Send comments to info@energytrust.org

Discussion and Feedback

- What questions do you have?
- What information needs clarification?
- Other feedback?

+ www.energytrust.org/about/budget
+ Final Proposed Budget will be posted on December 7

Thank You

info@energytrust.org
1.866.368.7878

Budget Savings Realization Factors (SRAF)

Table shows only those programs where SRAFs are changed from prior budget year. Programs not shown have unchanged SRAFs.

		2016				2017			
	Program	Realization Rate	Free-Rider Rate	Spillover	**SRAF**	Realization Rate	Free-Rider Rate	Spillover	**SRAF**
Electric	Existing Buildings	98%	-25%	8%	**81%**	98%	-31%	8%	**75%**
	Multifamily*	100%	-17%	1%	**84%**	100%	-18%	1%	**83%**
	New Buildings	95%	0%	1%	**95%**	93%	0%	1%	**94%**
Gas	Existing Buildings	88%	-24%	8%	**74%**	89%	-30%	8%	**69%**
	Multifamily*	100%	-42%	1%	**59%**	100%	-43%	1%	**58%**

**Multifamily is part of Existing Buildings Program. SRAF is reported separately here.*




Air Conditioning Measure Opportunities Scan

Cost Effectiveness Results

Aquila Velonis, Cadmus

Spencer Moersfelder, Energy Trust of Oregon

November 16, 2016

Project Description

Energy Trust released an RFP to pre-qualified pool of Planning and Evaluation Contractors

Purpose: Identify potentially cost-effective residential air conditioning (AC) measures using current Avoided Costs

Findings:

- **Central AC and Window AC not cost-effective in majority of Energy Trust territory**
- **Packaged Terminal AC prospectively cost-effective for Multifamily new construction**

Methodology

METHODOLOGY
Assessed cost effectiveness of 12 residential AC scenarios by:

Segment
New and existing housing stock
Equipment type
Measure efficiency
NW cooling zone: CZ1, CZ2, and CZ3

Where reasonable, applied liberal assumptions for savings and incremental costs

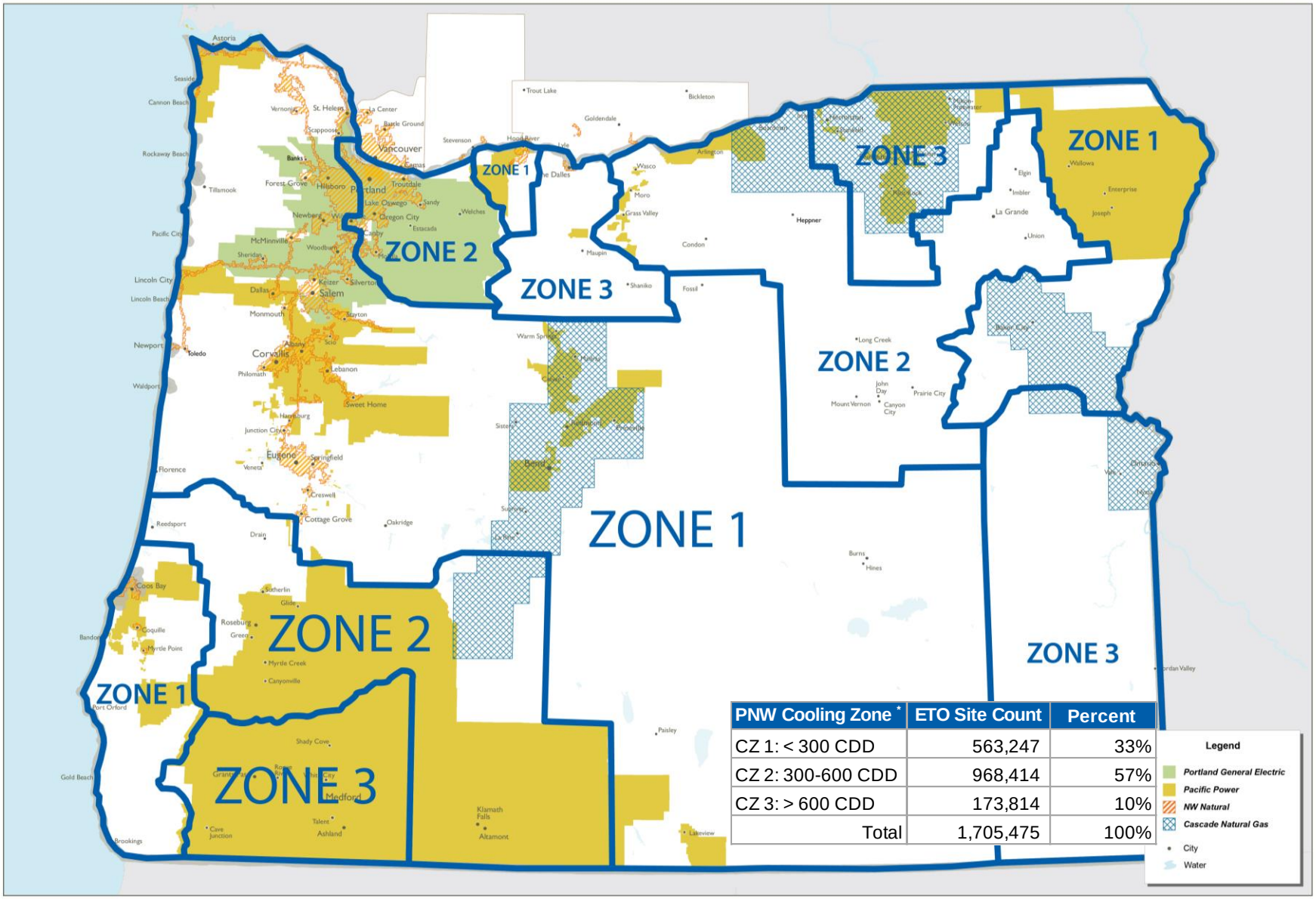
Cost-Effectiveness Measure Scenarios

Measure Iteration	Segment	Housing Stock	Equipment Type	Channel	Scenario
1	Single Family	Existing Construction	Window Unit A/C	Retail	Incremental Upgrade
2					Early Retirement (Retrofit)
3			Central A/C	Contractor	New Purchase
4					Early Retirement (Retrofit)
5		New Construction	Central A/C	Contractor	New Purchase
6	Multifamily	New Construction	PTAC	Contractor	New Purchase
7		Existing Construction	Window Unit A/C	Retail	Incremental Upgrade
8					Early Retirement (Retrofit)
9	Manufactured Homes	Existing Construction	Window Unit A/C	Retail	Incremental Upgrade
10					Early Retirement (Retrofit)
11			Central A/C	Contractor	New Purchase
12					Early Retirement (Retrofit)

Energy Trust Service Territories

1.866.368.7878
energytrust.org

EnergyTrust of Oregon



PNW Cooling Zone *	ETO Site Count	Percent
CZ 1: < 300 CDD	563,247	33%
CZ 2: 300-600 CDD	968,414	57%
CZ 3: > 600 CDD	173,814	10%
Total	1,705,475	100%

* NWPPC Cooling Zones based 2010 census and TMY 3 weather data

Scan Findings Central AC

For Existing and New Single Family, and Existing Manufactured Central AC

Equipment Upgrade		Early Replacement
Only CZ3 Central AC iterations to be cost effective **CZ3's TRC 1.01 - 1.28**	**CZ1 and CZ2 not cost effective** **CZ1's TRC 0.32 - 0.41** **CZ2's TRC 0.63 - 0.75**	**Iterations not cost effective in any CZ** **CZ1 through CZ3's TRC 0.10 - 0.49**

Scan Findings Window AC

For Existing Single Family, Multifamily, and Manufactured Home Window AC

TWO APPROACHES

ENERGY STAR® and RTF Tonnage Adjustment

ENERGY STAR

CZ1: TRC 0.51
CZ2: TRC 1.02
CZ3: TRC 1.55
Weighted by CZ: TRC 0.90

RTF Tonnage Adjustment

CZ1: TRC 0.37
CZ2: TRC 0.73
CZ3: TRC 1.27
Weighted by CZ: TRC 0.67

Scan Findings Package Terminal AC

For New Construction Multifamily Package Terminal AC

All zones cost effective using federal standard

TRC ranging from 1.00 – 2.26

Weighted by CZ of Energy Trust territory

TRC 1.46

Central AC Conclusions

As a prescriptive standalone central AC measure:

Not cost effective in CZ1 or CZ2 for any scenario

Cost effective in CZ3 using liberal incremental cost assumptions

- Very difficult to administer regional program offerings
- Stopped further investigation

Window AC Conclusions

Not cost effective in CZ1 for any scenario

Energy Trust more aligned with RTF assumptions - CZ2 not cost effective

NEEA RPP working on this measure ~ $10 upstream program

Uncertainty in window AC full load hours

Would require extensive evaluation resources

Package Terminal AC Conclusions

Initial screen found all zones cost effective

Energy Trust will further explore PTACs in new multifamily settings

- New Buildings program will model with consideration to Oregon building codes
- Re-evaluate cost effectiveness
- Review program and measure eligibility requirements to assess viability of delivery

Q & A




Spencer Moersfelder, Energy Trust of Oregon
Planning Manager
Office (503) 445-7635
spencer.moersfelder@energytrust.org

Aquila Velonis, Cadmus
Senior Associate, Energy Services
Office (503) 467-7156
aquila.velonis@cadmusgroup.com

Addendum Slides

Data Sources

- Savings: RTF workbooks (CAC) and ENERGY STAR/RTF (RAC)
  - Existing home CAC consumptions assumed poor insulation from SEEM represented regional cooling zone 1, 2, 3
  - RAC ENERGY STAR EFLH (higher than other data sources)
- Incremental costs: DOE's Technical Support Documents or TSDs (CAC) and on-line research (RAC)
  - TSDs had lowest incremental cost compared to 3 other sources
- Life Times: Used the median EUL from various sources (DOE's TSD, DEER 2014, NEEP, TRMs and ENERGY STAR)
- Used “Energy Trust of Oregon Cost Effectiveness Calculator 2017 v1.2” to rank each measure by TRC

Central AC Cost-Effectiveness Inputs

Central AC Scenario	Savings Range by Efficiency-Level and Cooling Zone 1-3	Savings Source	Incremental Cost Range by E-Level	Incremental Cost Source
Single Family New Construction	56 - 367 kWh	RTF supporting workbook "NewConstructionSingleFamilySEEM94 Runs_OR_2_2-AC_baseline.xlsm"	$190 - $511	DOE's TSD - Residential Central Air Conditioners and Heat Pumps. August 2015. Table 8.4.3
Single Family Existing Construction	94 - 653 kWh	RTF supporting workbook "SEEMruns_SingleFamilyExistingASHPC onversion_May2015"	$351 - $843	DOE's TSD - Residential Central Air Conditioners and Heat Pumps. August 2015. Table 8.4.3
Single Family Early Replacement	134 - 787 kWh	RTF supporting workbook "SEEMruns_SingleFamilyExistingASHPC onversion_May2015" and RBSA Single Family Table 63	$1,906 - $2,248	Net present value of DOE's TSD - Residential Central Air Conditioners and Heat Pumps. August 2015. Table 8.4.3
Manufactured Home Existing Construction	80 - 558 kWh	RTF supporting workbook "ResMHExistingHVAC_v3_2.xlsm" conversion calculation	$300 - $721	DOE's TSD - Residential Central Air Conditioners and Heat Pumps. August 2015. Table 8.4.3
Manufactured Home Early Replacement	115 - 673 kWh	RTF supporting workbook "ResMHExistingHVAC_v3_2.xlsm" conversion calculation and RBSA Single Family Table 63	$1,629 - $1,921	Net present value of DOE's TSD - Residential Central Air Conditioners and Heat Pumps. August 2015. Table 8.4.3

We assumed a 15 year measure life for this analysis based five sources: DEER 2014, DOE's TSD, NEEP Measure Life Report, Technical Reference Manuals and ENERGY STAR.

Window AC Cost-Effectiveness Inputs

Window AC Scenario	Savings Range by Cool Zone 1, 2, and 3	Savings Source	Incremental Cost	Incremental Cost Source
Single Family, Multifamily, and Manufactured Existing Construction	ENERGY STAR: 17 - 55 kWh RTF: 13 - 44 kWh	ENERGY STAR Room Air Conditioner Calculator / Tonnage adjustment of RTF "SEEMruns_SingleFamily ExistingASHPConversion _May2015"	$39	Average of On-line Retailers
Single Family, Multifamily, and Manufactured Early Replacement	ENERGY STAR: 19 - 60 kWh RTF: 15 - 52 kWh	ENERGY STAR Room Air Conditioner Calculator / Tonnage adjustment of RTF "SEEMruns_SingleFamily ExistingASHPConversion _May2015"	$111	Net Present Value of Average of On-line Retailers

We assumed a 10 year measure life for this analysis based three sources: DEER 2014, NEEP Measure Life Report, and ENERGY STAR.

Package Terminal AC Cost-Effectiveness Inputs

Package Terminal AC Scenario	Savings Range by Cool Zone 1, 2, and 3	Savings Source	Incremental Cost	Cost Source
Multifamily New Construction	53 - 120 kWh	RTF supporting workbook "ResMFEstarHomes2012_v1.2"	$80	DOE's TSD - Packaged Terminal Air Conditioners and Packaged Terminal Heat Pumps. July 2015. Table V-4

We assumed a 15 year measure life for this analysis based three sources: DEER 2014, DOE's TSD, and Technical Reference Manuals.

Central AC Cost-Effectiveness Results

Number	Measure	TRC BCR
1	New_SingleFamily_AC_SEERbase13-SEERee15_CZ1	0.41
2	New_SingleFamily_AC_SEERbase13-SEERee15_CZ2	0.75
3	New_SingleFamily_AC_SEERbase13-SEERee15_CZ3	1.19
4	New_SingleFamily_AC_SEERbase13-SEERee16_CZ1	0.38
5	New_SingleFamily_AC_SEERbase13-SEERee16_CZ2	0.69
6	New_SingleFamily_AC_SEERbase13-SEERee16_CZ3	1.09
7	New_SingleFamily_AC_SEERbase13-SEERee18_CZ1	0.35
8	New_SingleFamily_AC_SEERbase13-SEERee18_CZ2	0.64
9	New_SingleFamily_AC_SEERbase13-SEERee18_CZ3	1.01
10	Existing_SingleFamily_AC_SEERbase13-SEERee15_CZ1	0.38
11	Existing_SingleFamily_AC_SEERbase13-SEERee15_CZ2	0.74
12	Existing_SingleFamily_AC_SEERbase13-SEERee15_CZ3	1.28
13	Existing_SingleFamily_AC_SEERbase13-SEERee16_CZ1	0.35
14	Existing_SingleFamily_AC_SEERbase13-SEERee16_CZ2	0.68
15	Existing_SingleFamily_AC_SEERbase13-SEERee16_CZ3	1.18
16	Existing_SingleFamily_AC_SEERbase13-SEERee18_CZ1	0.32
17	Existing_SingleFamily_AC_SEERbase13-SEERee18_CZ2	0.63
18	Existing_SingleFamily_AC_SEERbase13-SEERee18_CZ3	1.09

Early replacement: none of the iterations were cost effective (TRC 0.08 – 0.38)

Window AC Cost-Effectiveness Results

Number	Measure	ENERGY STAR TRC	RTF TRC
1	Existing_SingleFamily_WAC_CEERbase10.9-CEERee12.0_CZ1	0.51	0.37
2	Existing_SingleFamily_WAC_CEERbase10.9-CEERee12.0_CZ2	1.02	0.73
3	Existing_SingleFamily_WAC_CEERbase10.9-CEERee12.0_CZ3	1.55	1.27
7	Existing_Multifamily_WAC_CEERbase10.9-CEERee12.0_CZ1	0.51	0.37
8	Existing_Multifamily_WAC_CEERbase10.9-CEERee12.0_CZ2	1.02	0.73
9	Existing_Multifamily_WAC_CEERbase10.9-CEERee12.0_CZ3	1.55	1.27
13	Existing_ManufacturedHome_WAC_CEERbase10.9-CEERee12.0_CZ1	0.51	0.37
14	Existing_ManufacturedHome_WAC_CEERbase10.9-CEERee12.0_CZ2	1.02	0.73
15	Existing_ManufacturedHome_WAC_CEERbase10.9-CEERee12.0_CZ3	1.55	1.27

Early replacement: none of the iterations were cost effective (TRC 0.15 – 0.60)

Package Terminal AC Cost-Effectiveness Results

Number	Measure	TRC BCR
1	New_Multifamily_PTAC_EERbase11.0-EERee12.8_CZ1	1.00
2	New_Multifamily_PTAC_EERbase11.0-EERee12.8_CZ2	1.59
3	New_Multifamily_PTAC_EERbase11.0-EERee12.8_CZ3	2.26

Residential Sector Assessment

Residential Sector Assessment Topics

Project overview and timeline

Analysis completed and results

Remaining analysis

Discussion

Project Overview and Timeline

How can we change program structure to maximize savings and reduce delivery costs?

Phase 1
Assessment, Recommendation

- Identify challenges and opportunities
- Analyze options
- Recommend new program design to board in **Feb. 2017**

Phase 2
Transition Planning

- Plan transition to new program design
- Solicit new Existing Homes program management contract via RFP in **March 2017**

Outcome of Phase 1 likely to impact RFP

Phase 3
Transition

- Transition to new program design beginning **Jan. 2018**

Analysis Completed:
Sector Strategic Plan 2015-2019

Identified challenges facing the sector in 2015

- Economics of key measures are challenged
- Program structure doesn’t align with resource potential
- Significant changes expected for lighting and showerheads

Analysis Completed: Residential Savings Assessment

Electric savings

- Expected to decline by 50% by 2019
- Will impact the Products program disproportionally

Gas savings

- Declines currently less dramatic
- Uncertain about current measure exceptions

Analysis Completed:
Energy Savings Projections

Can residential programs be cost-effective given lower projected savings?

- Projected forecast savings for current program structure
- Compared to current costs

Results

- Products program savings would be dramatically reduced

Analysis Completed:
Review of Program Management Structure

Identified tasks that cross programs

- Program management
- Program delivery
- Marketing

Identified measures that cross programs

- Lighting (EH, P)
- Showerheads (all)
- HVAC (EH, NH)
- Water heating (all)
- Thermostats (EH, P)

Analysis Remaining: Evaluate alternative approaches to current structure

How can we structure residential programs to

- Align program structure with future savings
- Increase flexibility to identify and target new savings opportunities
- Achieve all cost-effective conservation

Discussion

What other program structures should we consider?

What opportunities and pitfalls should we be aware of?

Engagement

Staff

- ✓ Regular meetings residential sector staff
- ✓ Nov. all staff presentation
- ❑ Jan. all staff presentation

Board of Directors

- ✓ May 2016 Strategic Planning Retreat
- ✓ Sept. 2016 budget presentation
- ✓ Nov. 2016 board meeting
- ❑ Potential committee engagements
- ❑ Feb. 2017 recommendation

OPUC

- ❑ Nov. 2016 coordination meeting

Conservation Advisory Council

- ✓ July 2016 presentation
- ✓ Sept., Oct. 2016 budget presentations
- ❑ Nov. 2016 presentation
- ❑ Feb. 2017 presentation

Utilities

- ✓ Oct. 2016 coordination meetings

Management Team

- ❑ Dec. 2016 recommendation

Additional engagement planned with these and other audiences after Feb. 2017