Collecting, Aggregating, and Analyzing Energy Efficiency Savings at a Regional Level – and Beyond?

Lakin Garth, The Cadmus Group

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Energy Efficiency Savings Data

Can looking to the past help us improve our plans for the future?

Six Going on Seven

Project Overview

- Setting:
    - Pacific Northwest (WA, OR, ID, W. MT)

- Scene:
    - Post 6th Plan (2010-2013)

- Actors:
    - Bonneville Power Administration, Cadmus, Milepost Consulting, EES, and Northwest Power and Conservation Council staff

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Background

- Council adopts power plans about every five years

- 6th Power Plan adopted in 2010

- 7th Power Plan to be adopted in 2016

- Power Plan serves as basis for BPA's EE targets

- Other NW utilities base Conservation Potential Assessments (CPAs) on Power Plan (to varying degrees)

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Background, continued

- One Northwest Plan, Many Northwest Planners:

  – Public Power utilities (~ 136)

  – Investor-Owned utilities

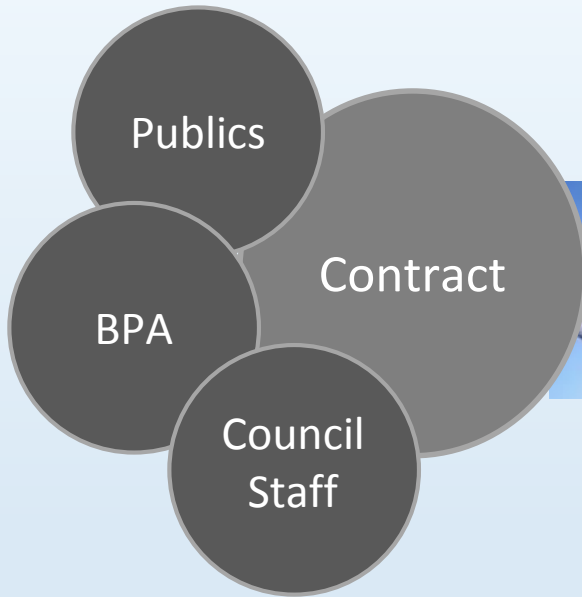 – Energy Trust of Oregon

  – Northwest Energy Efficiency Alliance
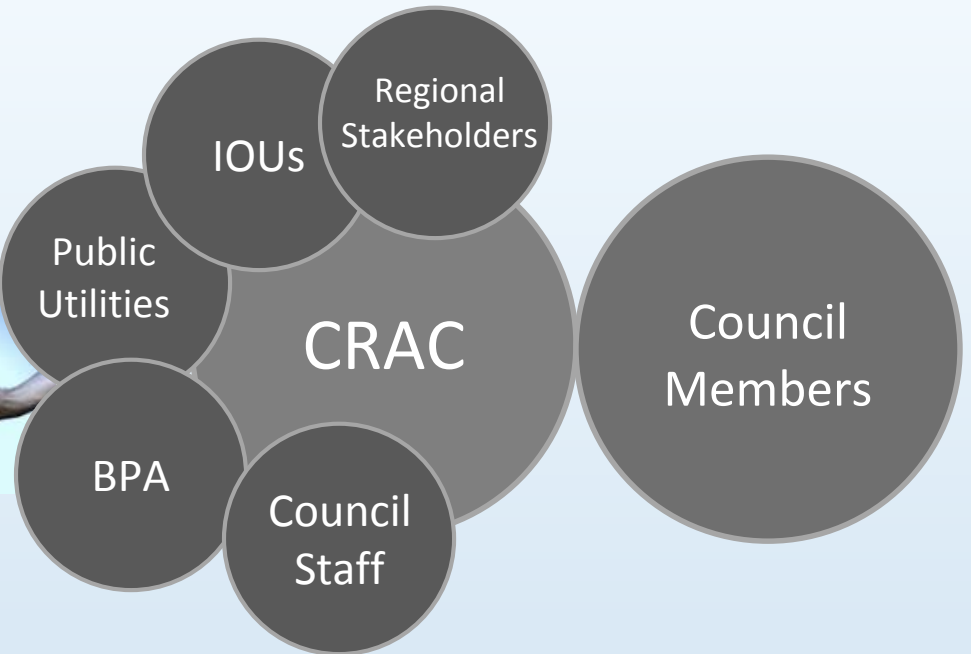
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Project Goals

- Conduct a technical review of regional savings achievements toward the 6th Power Plan

- Conduct research on questions posed by BPA, its customer utilities, and other stakeholders

- Supplement Council staff analysis by providing data on where energy savings occurred during the development of the 7th Power Plan

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Technical Analytics

- Publics
- BPA
- Contract
- Council Staff

Policy Decisions

- IOUs
- Regional Stakeholders
- Public Utilities
- CRAC
- BPA
- Council Staff
- Council Members

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Our Vision

- Collect detailed data to better understand the regional accomplishments

- Compare accomplishments to targets

- Use data to inform development of the next plan
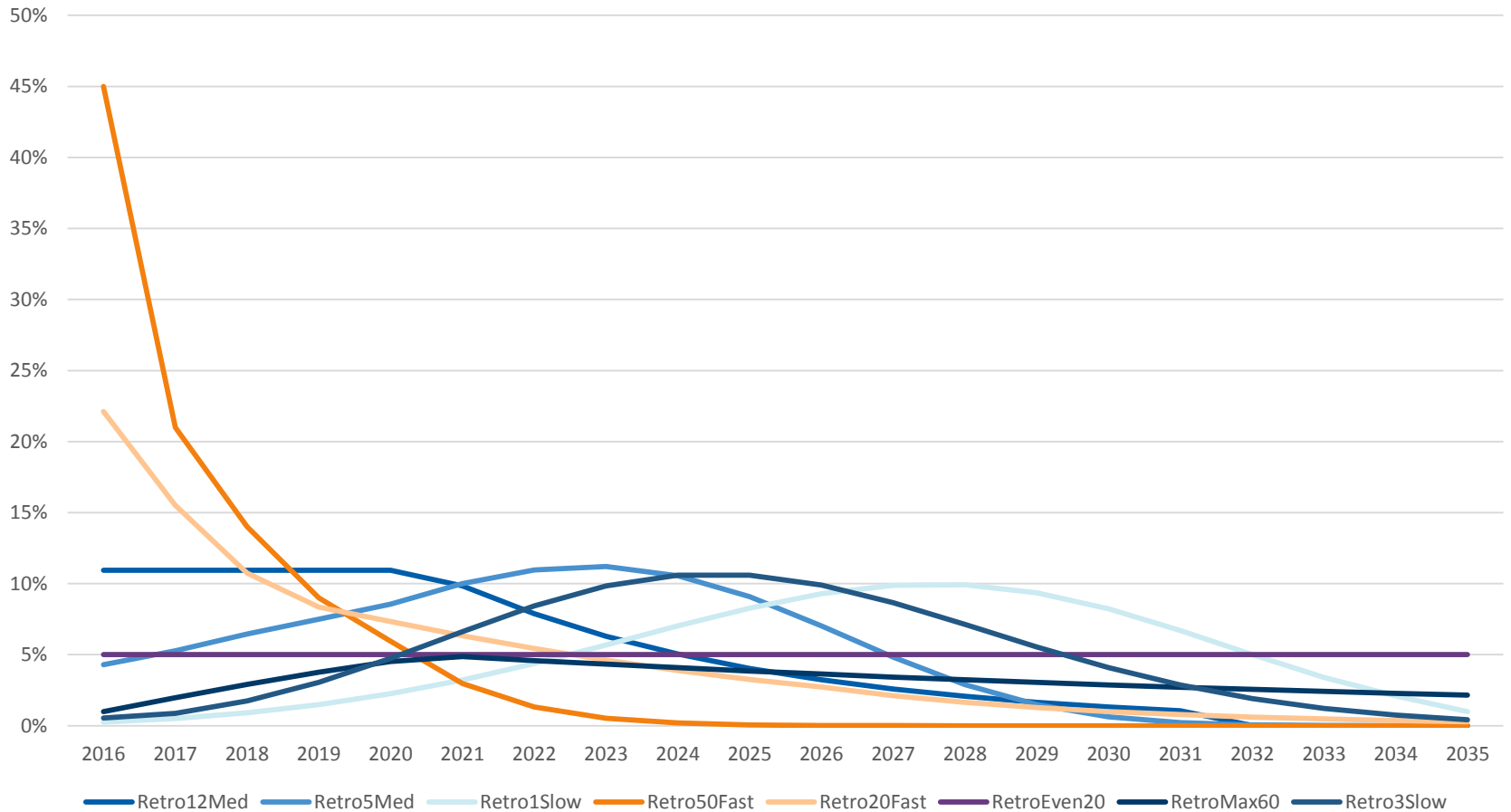
- Build confidence in setting ramp rates + targets

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Data Limitations

- Previously, annual regional savings collected at sector level

- Via Council's Regional Conservation Progress Report

- Used to report relative to Plan targets

- Limited data availability hampers understanding of:

  - Areas of success and struggle

  - Measure rates of acquisition (ramp rates)

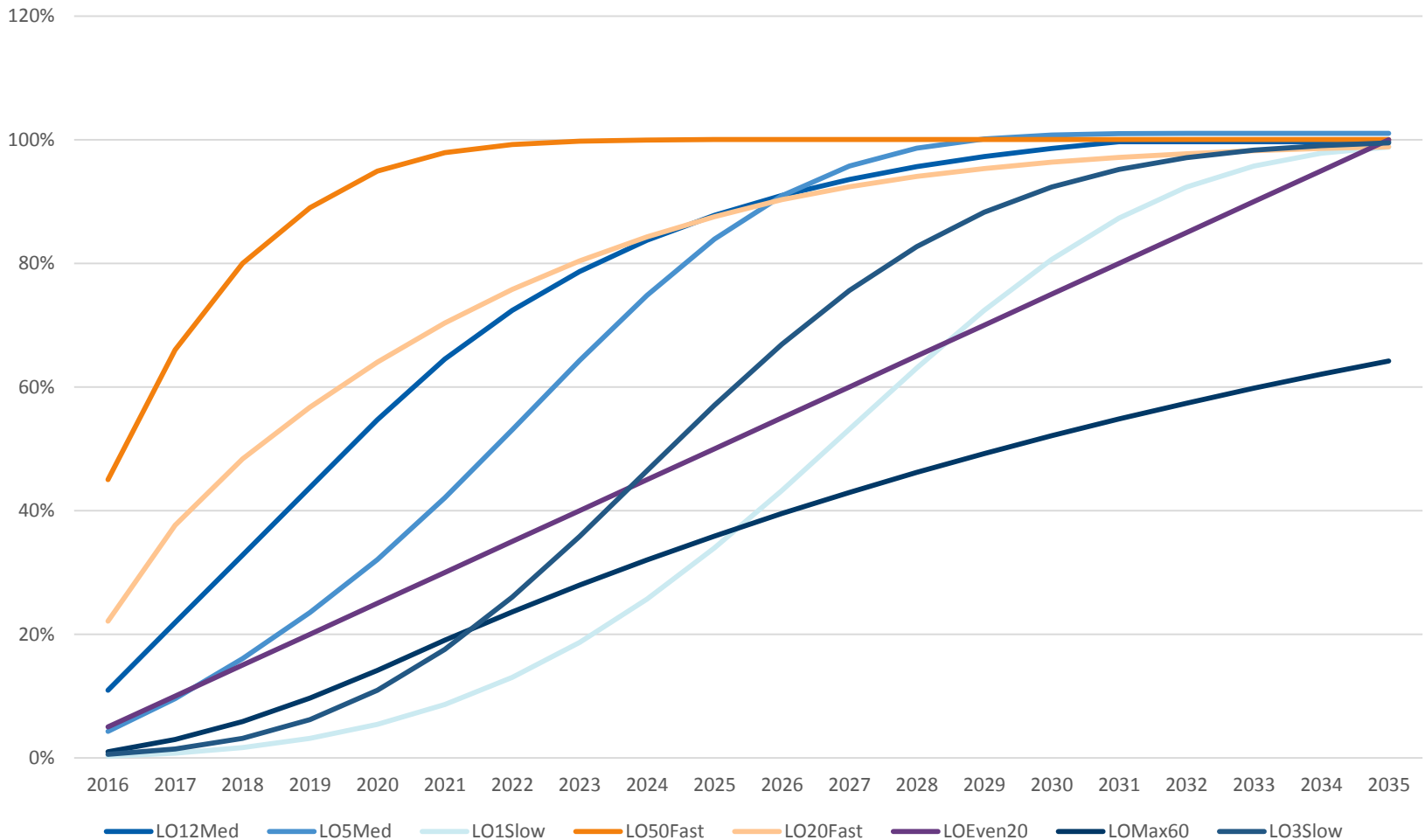 - Updates to regional supply curves based on past accomplishments (saturations)

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Retrofit Ramp Rates

Legend: Retro12Med, Retro5Med, Retro1Slow, Retro50Fast, Retro20Fast, RetroEven20, RetroMax60, Retro3Slow

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Lost Opportunity Ramp Rates

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Project Phases

- *Phase 1:* Collecting, mapping, analyzing, and presenting 2010-2012 energy efficiency savings data

- *Phase 2:* Market research

- *Phase 3:* Estimates of regional demand savings

- *Phase 4:* Collecting, mapping, analyzing, and presenting 2013 EE savings & cost data

- *Phase 5:* Review draft 7th Plan supply curves and build summary workbook for program planners

Analytic Process

Data Collection	Data Cleaning	Data Mapping
Request and pleas for data to publics, IOUs, Energy Trust, and NEEA Thanks!	Extract relevant data, remove gas or fuel conversion savings, no adjustments to savings	Unify all data, map similar measures, overcome differences, address issues

| Database Development	Data Analysis	Presentation
Compile all data in one location, updated over time, Microsoft Access	Linked database to an MS Excel workbook	Results to BPA internal and external audiences, including Council's CRAC

Data Collection

We Requested:

- Measure-specific savings data
- Market transformation savings

Participating Utilities Provided:

- Sector, end-use, category and measure-specific EE savings data

Varied Reporting Styles:

- Wide range of granularity
- Different classification systems

135 PUBLIC UTILITIES (OUT OF 136)

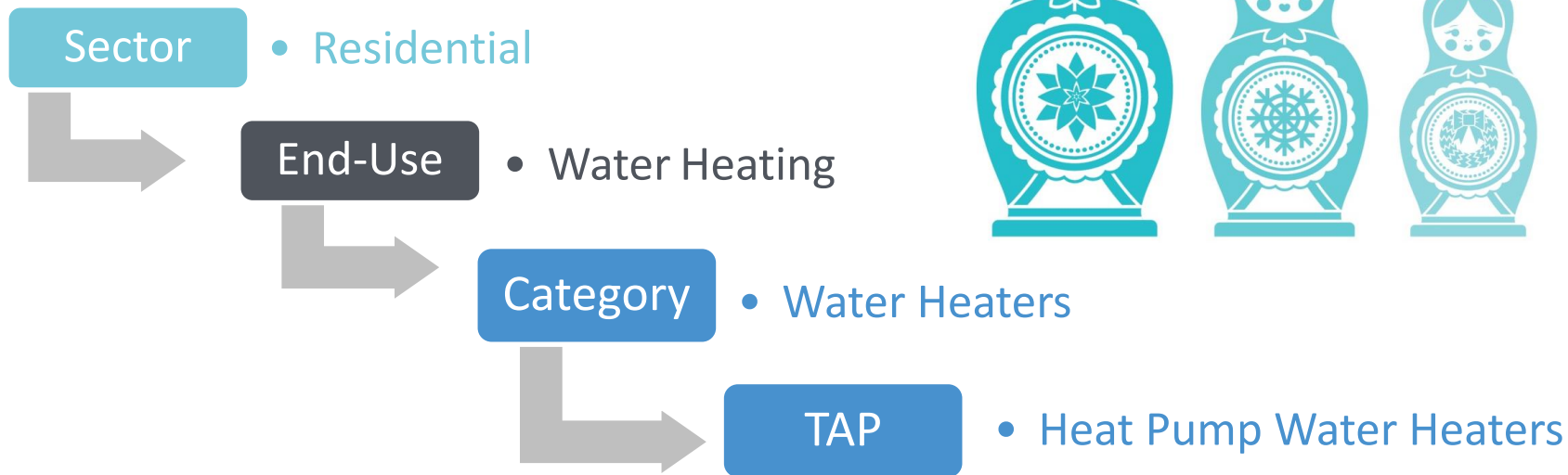5 INVESTOR OWNED UTILITIES (OUT OF 6)

+ NEEA
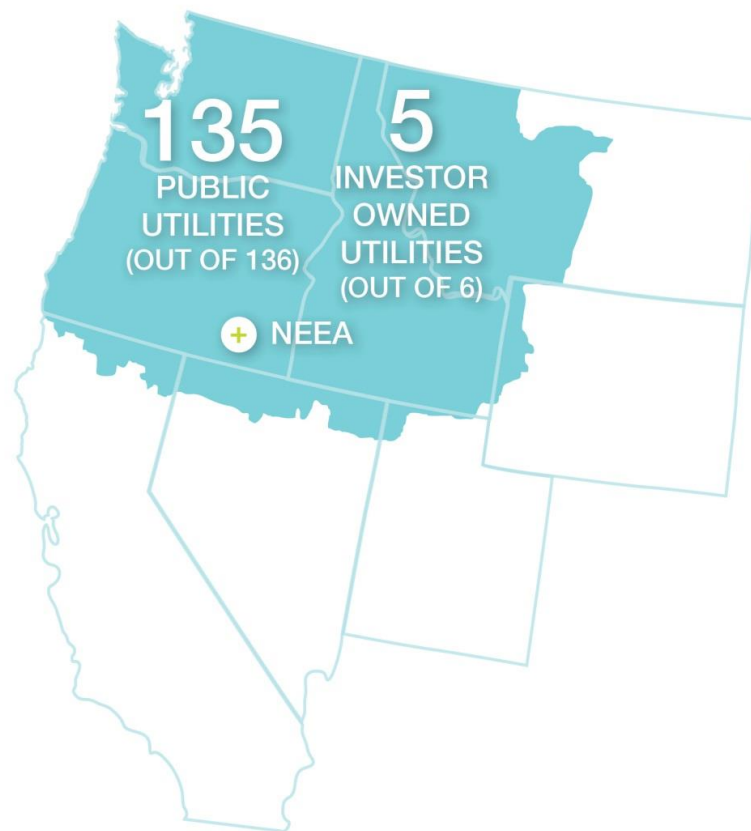
Data Mapping

Mapping Analysis

- Data are mapped to common end-uses and measure categories
- Mapping allows all the utilities' data to be summarized in one data set
- Requires a consistent set of naming parameters
- Employed BPA's internal measure taxonomy

Measure Taxonomy

Sector → • Residential

End-Use • Water Heating

Category • Water Heaters

TAP • Heat Pump Water Heaters

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Mapping Measure Savings by Sector

Residential:

Straightforward

Mostly deemed

Detailed

Fairly consistent

Commercial:

Challenging

Some deemed; mostly custom

Less detailed

Many "unknowns"

Industrial:

Very challenging

Few deemed; mostly custom

Scant detail

Unknowns

Agricultural:

Less challenging

Many deemed, some custom

Good detail

Fewer unknowns

Results

Successes:

Summarized savings by:

- Year,
- Sector,
- End Use,
- Measure Category,
- Some specific measures, including:

  - DHPs, HPWH, Industrial EM

Difficulties:

Answering detailed questions such as:

- What % of commercial lighting is interior, exterior, controls?
- What % of residential lighting is CFLs vs. LEDs?

Outcomes

Successes:

Merged regional data at a detailed level

Compared achievements relative to targets

Viewed regional acquisition rates

Viewed gaps between targets and savings

Data used to:

Inform baseline assumptions

Adjust available potential

Inform ramp rate assumptions

Support effective CRAC participation

In a Perfect World, We Would…

1. Eliminate poorly labeled data

2. Describe custom projects with greater detail

3. Create discrete measures, not "multiple measures"

4. Employ a hierarchical taxonomy of measure labeling

5. Consistently employ accurate measure counts

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Lessons Learned

- Having a hierarchical "taxonomy" is critical

- More measure detail is preferable (but costly)

- Accurate quantities help power planning efforts

- Differences in baseline assumptions – hard to assess

- Rearview mirror improvements are difficult

Additional Resources

Project Website:

http://www.bpa.gov/EE/Utility/toolkit/Pages/Six-Going-On-Seven.aspx

Phase 1 Results CRAC Presentation:

http://www.nwcouncil.org/energy/crac/meetings/2014_11/

Phase 4 Results CRAC Presentation:

http://www.nwcouncil.org/energy/crac/meetings/2015_03/