Clothes Washer Recycling

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Presentation Overview

Objective: Seeking TF approval of draft work paper

- Measure Description
- Work Paper Methodology
- Results
- Issues and Concerns
- Questions or Comments

Measure Description

Base Case

Top-loading clothes washer w/ center agitator

- Transferred to secondary market & remains in use at recipient household

Measure Case

Top-loading clothes washer w/ center agitator recycled

- Diverted from secondary market

Measure Description

- **Units:** per unit

- **Measure Application and Delivery Type**
  - Early Retirement (ER)
  - Downstream
  - Potential midstream option

- **Eligibility**
  - Climate Zones: All
  - Building Types: Single Family & Multi-Family Residential (common area laundry)

- **Target Market**
  - Households that are replacing a working, top-loading clothes washer w/ center agitator

- **Market Potential**
  - 205,000 working top-loaders w/ center agitators replaced annually

Measure Description

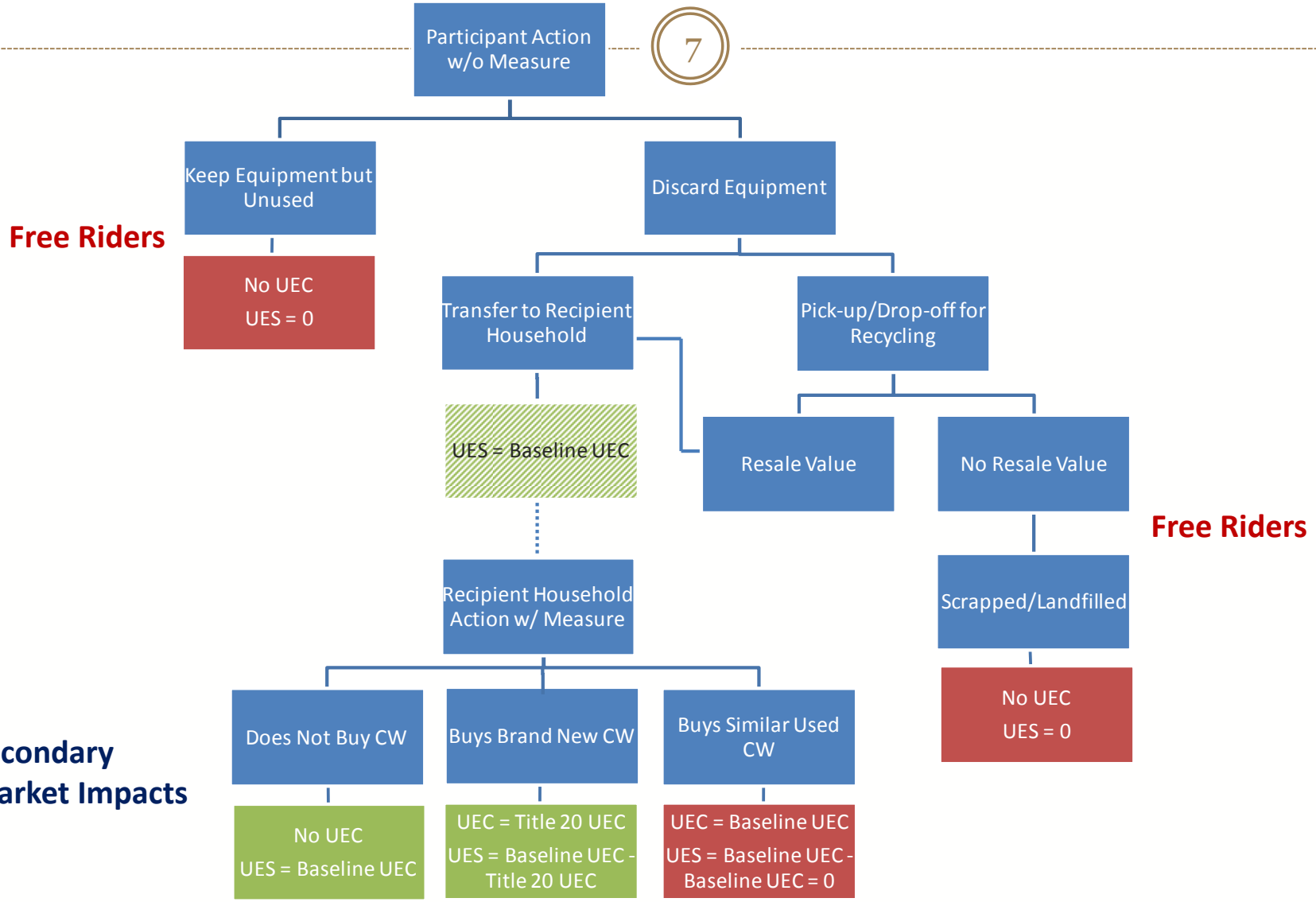
- **Measure Costs**
  - Baseline cost (material + labor): $0
  - Measure cost: $0
  - Incremental cost: $0
- **RUL**
  - 3.67 years (DEER RUL ID: Appl-EffCW)
- **NTG**
  - 0.7 (DEER NTGR ID: All-Default<=2yrs)
- **Gross Savings Potential**
  - Statewide: 11,000 kW, 53 million kWh, 2.4 million therms
    - Assumes 100% participation of eligible households; Distribution: 95% SFm/MFm In Unit, 5% MFm Common Area

Work Paper Methodology: Baseline

- Baseline data collection
  - Metering data of non-ENERGY STAR clothes washers from 2006-2008 High Impact Measure (HIM) Report
  - Likely conservative as age of clothes washers recycled through measure > 7-9 years
  - Example: Refrigerator ARP average age = 20 years; EUL = 14 years

- Baseline methodology
  - Per cycle energy consumption weighted according to 2009 RASS DHW/dryer fuel share
  - Multiplied by annual cycles (SFm: 295 / MFm: 1241) from DOE TSDs to get annual baseline UEC

Work Paper Methodology: Net Savings Eval.



Work Paper Methodology: Measure

- Measure data collection – *(Source: WO35 report & NREL UMP Refrigerator Recycling Evaluation Protocol)*
  - Measure UEC weighted by recipient household action w/ measure
  - Three scenarios
    - Does not purchase clothes washer
    - Purchases brand new (Title 20) clothes washer
    - Purchases similar, used clothes washer
- Measure methodology
  - Scenario 1: No UEC
  - Scenario 2: UEC = Title 20 UEC
    - Per cycle energy usage from DOE TSD – top-loading standard effective 3/7/15
    - Weighted according to RASS DHW/dryer fuel share; DHW/dryer usage converted from kWh to therms
    - Multiplied by annual cycles (SFm: 295 / MFm: 1241) from DOE TSDs to get annual UEC

Work Paper Methodology: Measure

- Measure methodology (cont'd)
  - Scenario 3: UEC is equivalent to Baseline UEC
  - Weights for each scenario from *NREL UMP Refrigerator Recycling Eval. Protocol*
    - Half of recipient households purchase an alternate unit
      - Half purchase new standard efficiency unit (Title 20)
      - Half purchase similar used unit
    - Half of recipient households do not purchase an alternate unit
  - Average weighted Measure UEC
    - Scenario 1 (No Purchase): 50% * No UEC
    - Scenario 2 (Purchase New Title 20): 25% * Title 20 UEC
    - Scenario 3 (Purchase Similar Used Unit): 25% * Baseline UEC

Work Paper Methodology: Measure

- Gross Unit Energy Savings (UES)
  - *Baseline UEC – Measure UEC*
  - Baseline UEC – [(0.5*0)+(0.25*Title 20 UEC)+(0.25*Baseline UEC)]
- Net Savings
  - Excludes savings that would come from units that would have been recycled in the absence of the program
  - NTG = 0.7 (default)
- CFL Interactive Effects Factors & peak kW factor
  - Follows approach in existing PG&E high efficiency clothes washer WP

Results

	Annual Gross Unit Energy Savings Whole Building	
	Single Family	*Multi-Family (common area)*
Peak Demand (kW)	PG&E: 0.0683 SCE: 0.0636	PG&E: 0.2652 SCE: 0.2471
Electric (kWh)	315.1	1395.2
Gas (therm)	13.6	81.2

Issues and Concerns

Abstract Review Comments from the Cal TF

- ✓ Understand use of 2nd clothes washer in household
  - No additional info from AHAM – no energy savings claimed
- ✓ Cover multi-family uses
  - Included in analysis
- ✓ Look at DEER methodology for existing ARPs & existing clothes washer WPs
  - Used to inform new methodology

Issues and Concerns

Abstract Review Comments from the Cal TF

- ✓ How should recycling of units that were incented previously be accounted for?
  - Not accounted for in existing ARP
  - Early IOU incentive programs possibly included a few top-loaders w/ center agitators
  - Savings on incented clothes washers only need to be realized for 5 years
    - Add program restriction on age (difficult to implement): ≥ 5 years old
    - Unlikely that units < 5 years old would be recycled
- ✓ Finalize gas savings using IOU-specific data
  - 2009 RASS pop. weighted fuel share – PGE, SCG, SCE
- X Develop rough TRC, PAC estimates
- X Account for actual age of recycled units
- ☐ Develop partnerships w/ water utilities – in progress

Issues and Concerns – Other Comments

Abstract Review Comments from CPUC Energy Division Staff

- ✓ Account for differences in dryer & clothes washer saturation
  - 2012 CLASS: Dryer – 77% vs. Clothes Washer – 78.9%
  - Small difference
- X Need for additional research into secondary market
  - Data to be collected through implementation and EM&V
- ✓ Consideration of embedded energy savings not approved for existing WPs
  - Removed from analysis

Additional Data Needs

- Data to be collected during implementation
  - Clothes washer nameplate info (manufacturer's name, model number, serial number)

- Measurement and Evaluation needs
  - Metering data of sample clothes washer units participating in program to support baseline UEC
  - Participant/non-participant surveys to determine free ridership and secondary market impacts

Questions or Comments?