Cost Effectiveness Tests

Customer Energy Solutions
FY 2014

Cost Effectiveness Tests

- Estimate the cost/benefit for programs
- Benefit/Cost > 1 indicates cost effective program
- Standard use across utility energy efficiency programs
- Only as good as data available

Cost Effectiveness Tests

- Participant Test (PT)
- Ratepayer Impact Test (RIM)
- Utility Cost Test (UCT)
- Societal Cost Test (SCT)
- Total Resource Cost (TRC)

Comparison of Tests

Component	PCT	RIM	UCT	Societal	TRC
Energy & capacity avoided costs		Benefit	Benefit		Benefit
Additional resource savings					Benefit
Non-monetized benefits					Benefit
Incremental equipment and installation costs	Cost				
Program overhead		Cost	Cost		Cost
Incentive payments	Benefit	Cost	Cost		
Bill savings	Benefit	Cost			

Note: incentive payments include any equipment and installation costs paid by the program administrator.

Participant Test (PT)

- Evaluates DSM programs from the perspective of the participant
- Compares cost incurred versus benefits received
- Ignores impacts on rates
- Ignores benefit to the Utility or Society

Participant Test (PT)

- Costs =
  - Incremental expenses incurred as a result of participation
    - Customer's investment to install and maintain DSM measure
- Benefits =
  - Reduction in utility bill
  - Incentives paid by the utility
  - Tax benefits received
  - Reduced maintenance/repairs

$$\left[\frac{\text{Savings on Energy Bills} + \text{Financial Incentives}}{\text{Customer Additional Cost Incurred}}\right]$$

Ratepayer Impact Measure (RIM)

- Measures impact on customers bills or rates due to changes in utility revenues due to DSM program
- Also known as non participant's test

Ratepayer Impact Measure (RIM)

- Costs =
  - Program costs including staff administration and equipment costs for utility
  - Incentives paid to customer
  - Decreased revenues for any period when load is decreased
  - Increased supply costs when load increased
- Benefits =
  - Avoided supply side costs of energy and demand (fuel, capacity, and O&M)

$$\left[\frac{\text{Avoided (Fuel + Power Plant Operating \& Maintenance + Capacity Cost)}}{\text{Conservation Program Admin Cost + Financial Incentives + Revenue Losses}}\right]$$

Utility Cost Test (UCT)

- Measures net costs of DSM program as resource option
- Based on costs incurred by the utility
- Excludes net costs incurred by the participant
- Based solely on utility perspective

Utility Cost Test (UCT)

- Costs =
  - Program costs including staff administration and equipment costs for utility
  - Incentives paid to customer
  - Increase in supply costs in which load has been increased
- Benefits =
  - Avoided supply side costs of energy and demand (fuel, capacity, and O&M)

$$\left[\frac{\text{Avoided (Fuel + Power Plant Operating \& Maintenance + Capacity Cost)}}{\text{Conservation Program Admin Cost + Financial Incentives}}\right]$$

Societal Cost Test (SCT)

- Evaluates benefit/cost from a broad societal perspective
- Identical to Total Resource Cost Test with the exception of including environmental externalities
- Externalities financial value is difficult to quantify

Societal Cost Test (SCT)

- Costs =
  - Program costs including staff administration and equipment costs for utility
  - Program costs including equipment costs for participant
  - Increase in supply costs in which load has been increased
- Benefits =
  - Avoided supply side costs (fuel, capacity, and O&M)
  - Avoided environmental or social externalities costs (i.e., climate change costs)
  - Intangible benefits: improved comfort, reduced health cost, aesthetics, etc.
  - Reduced maintenance/repairs

$$\left[\frac{\text{Avoided (Fuel + Power Plant Operating \& Maintenance + Capacity Cost) + Externalities}}{\text{Conservation Program Admin Cost + Customer's Additional Cost Incurred}}\right]$$

Total Resource Cost Test (TRC)

- Measures the net costs of a demand side (DSM) program as a resource option
- Based on the incremental costs of the program including both participant and utility costs
- Summation of benefits and costs of participant and RIM tests
- Most widely used test by regulatory bodies
  - 2012 GSD study reported TRC as Best Practice

Total Resource Cost Test (TRC)

- Costs =
  - Program costs including staff administration and equipment costs for utility
  - Program costs including incremental equipment costs for participant
  - Increase in supply costs in which load has been increased
- Benefits =
  - Avoided supply side costs (fuel, capacity, and O&M)
  - Avoided collection and credit costs
  - Additional resource savings
  - Reduced maintenance/repairs (not quantified)

$$\left[\frac{\text{Avoided (Fuel + Power Plant Operating \& Maintenance + Capacity Cost)}}{\text{Conservation Program Admin Cost + Customer Additional Cost Incurred}}\right]$$

Residential Program Tests

Program	Participant Type	TRC	Utility	Participant	Life Years
Residential					
EES- Appliance Efficiency Program	Customer	1.7	1.9	4.0	15
EES- Home Performance ES - Rebate	Customer	2.1	2.5	2.1	15
EES- Home Performance ES - Loan	Customer	2.6	1.9	15.6	15
EES- Free Weatherization	Customer	0.3	0.3	1.2	10
EES- Clothes Washer Rebate	Customer	1.3	2.8	2.4	10
EES- Refrigerator Recycling	Refrigerator	1.1	2.1	2.5	10
GB- Residential Ratings	Residence	1.6	1.1	3.2	23
GB- Residential Energy Code	Residence	17.0	19.5	109.9	23

Commercial Program Tests

Commercial	Participant Type	TRC	Utility	Participant	Life Years
EES- Commercial Rebate	Customer	3.0	3.9	7.0	10
EES- Small Business	Customer	2.3	3.2	3.5	10
EES- Municipal	Building	7.4	11.3	18.8	10
EES- Multifamily	Apartment Unit	1.3	2.1	1.9	6
GB- Multifamily Ratings	Apartment Unit	24.6	38.5	62.0	18
GB- Multifamily Energy Code	Apartment Unit	1.7	2.1	27.1	18
GB- Commercial Ratings	1000 square feet	23.0	109.8	28.0	20
GB- Commercial Energy Code	1000 square feet	53.8	141.8	78.0	20

Demand Response Program Tests

Program	Participant Type	TRC	Utility	Participant	Life Years
Demand Response (DR)					
DR- Power Partner	Thermostat	4.0	1.0	2.0	7
DR- Cycle Saver	Cycle Saver	7.5	1.3	7.5	10
DR- Power Partner (Comm & Muni)	Thermostat	0.0	1.0	0.1	7
DR- Load Coop	Meter	0.1	1.1	1.9	2
DR- Engineering Support & Thermal Energy Storage	Project	3.0	2.1	13.4	15

Summary

- AE reports benefit/cost tests of TRC, Utility Cost and Participant
- Programs not meeting the minimum 1.0 TRC may have other supporting rationale

Summary

- Because of the depth and breath of the TRC, it is the primary benefit cost test
  - Net cost to society as a resource option
  - Combines all perspectives
    - Participant, rate payer, and utility
  - Regulators require TRC
    - Demonstrates benefit to society and merit of subsidy
  - 3rd party verification as Best Practice Measure

Thank You

QUESTIONS?