

The debate about freeridership in energy efficiency (it isn't wrong, but is wrongheaded

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Overview

Freeridership

- Theory - definition
- Methods
- Policy implication

Stimulate discussion, rather than answer questions

- Straw poll

Not what they used to be

- Freeridership is a long-standing issue in public policy regarding common resources (public goods)
- The nature of public goods:
 1. Non-rivalrous consumption (jointness of supply)
 2. Non-exclusionary
- Freerider:
 - Either consumes more than his fair share,
 - Or pays less than his fair share of costs

Ratepayer-funded programs

- Services and products:
 - Paid for by ratepayers
 - Available to ratepayers
- Not a “public good”
 - Involve economies of scale (some), but are “rivalrous”
 - Are non-discriminatory, but are exclusionary

Freeriders transmuted

Freeriders in rate payer-funded programs:

- A ratepayer participating in a program who would have adopted the measure without the incentive offered by the program

A different problem:

- Prudence:
 - Were expenditures necessary?
 - Was ratepayer money spent wisely?
- Attribution:
 - Were the observed impacts a result of the program?
- Increasingly, “additionality”
 - Incremental effects of ratepayer-funded program

The “net” versus “gross” debate

- Gross savings:
 - Actual – or expected - change is energy consumption
- Net savings:
 - Change is consumption attributable to a programmatic intervention, or:
 - Gross savings purged of non-programmatic effects
- Possible non-programmatic effects:
 - Change in codes and standards
 - Naturally-occurring conservation (free-ridership)
 - Program-induced behavioral effects (spillover)
 - Program-induced supply-chain effects

The measurement challenge

Proving a counterfactual:

- “What would participants have done in the absence of the program”?

Same issue as measurement of savings:

- “How much energy participants would have consumed in the absence of the program?”

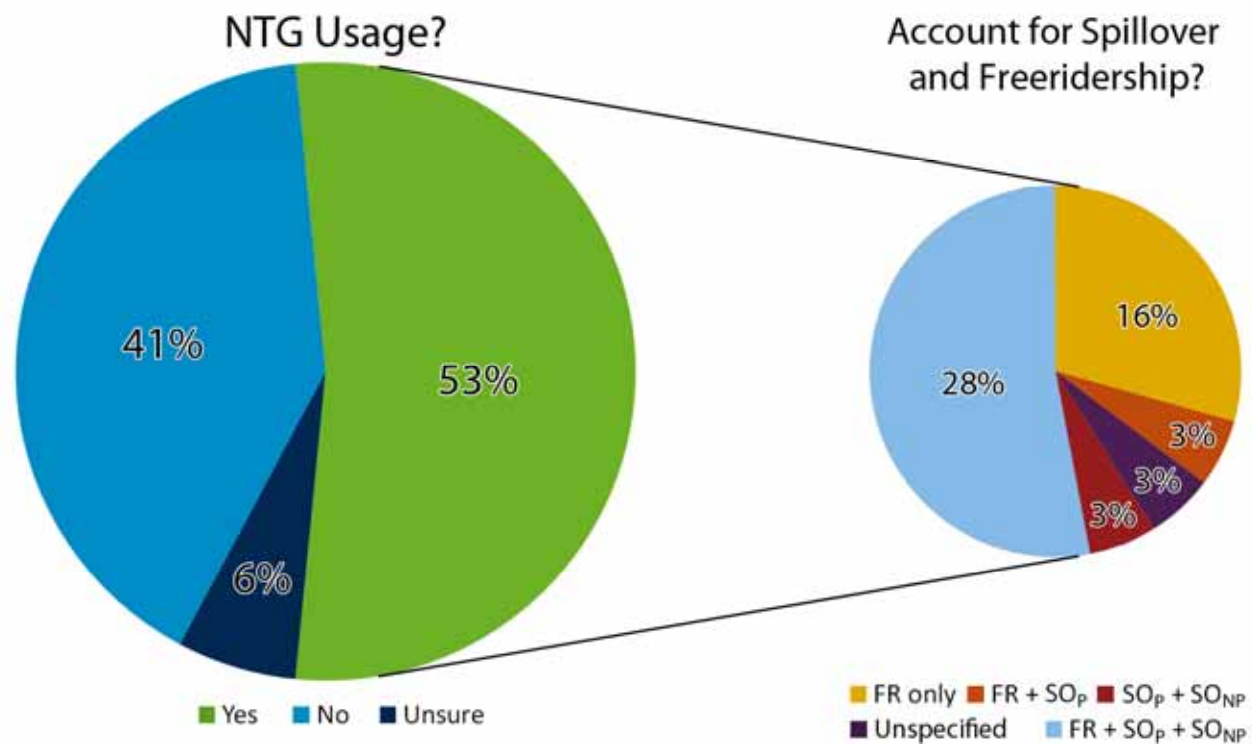
Baseline is the common issue

- For consumption
- For behavior

Measurement methods

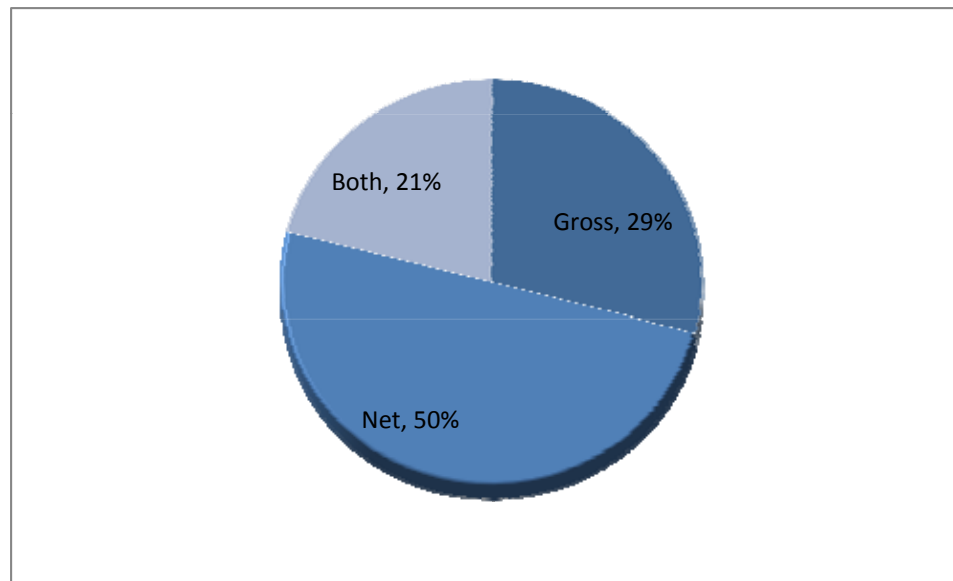
- Direct method: statistical “quasi-experimental” design – difference of differences:
 - Addresses physical and behavioral factors simultaneously
 - Finding a perfect control group is tricky
- Indirect method: adjusted gross savings:
 - Uses surveys to adjust gross savings for non-programmatic factors
 - Exposes the results to bias:
 - Social desirability
 - Confusing programmatic and non-programmatic effects
 - Scoring and weighting of results can be subjective

Freeriders in 32 places



ACEEE survey agrees

- States reporting “gross” or “net” savings (n=39)



- 44% adjust saving for spillover effects

Other observations

Freeridership may be applied at the program or measure level (7 jurisdictions)

In one state NTG is only applied to appliance recycling

In many jurisdiction where only freeridership is taken into account, factoring in spillover will likely move NTG ratios close to 1.0

The preponderance of cases where only freeridership is assessed suggests an asymmetrical treatment of spillover and freeridership effects

In the many cases where NTG is calculated, it is applied only prospectively for planning purposes

The TRC dilemma

Total Resource Cost Test			
Status	Without Program	With Program	Incremental Difference
Energy Savings	Energy Savings X %Freeridership	Savings X (1 + %Spillover)	Savings X (1 - %Free Ridership + %Spillover)
Costs	Installed Measure Costs X %Freeridership	Installed Measure Costs X (1 + %Spillover) + Utility Administrative Costs	Utility Administrative Costs + Installed Measure Costs X (1 - %Freeridership + %Spillover)

NTG according to CPUC

- Folding in NTG on the cost side of the equation
- CPUC 2007 Clarification Memo:
- TRC Costs = $PRC + NTG * PC + (1 - NTG) * INC$
 - PRC = program administrator costs
 - PC = participant device costs (*before* INC is received)
 - NTG = net-to-gross ratio
 - INC = incentive costs - only dollar benefits
- Modified the original method by adding a “transfer incentive recapture”

NTG – a numeric example

Number of participants	4
Number of freeriders	1
Freeridership (FR)	25%
Spillover (SO)	0%
NTG	$1 - .25 = .75$
Installed measure cost (PC)	\$100
Utility incentives	\$50
Utility administrative cost (PRC)	\$20 per participant
Energy savings per participant (S)	2000 units
Avoided cost (AC)	\$0.10 per unit
Measure life (N)	1 year (t=1)

The difference

- TRC - no freeriders:

- $[4*2000*0.1] / [(4*20) + (4*100)]$

- $B/C = \$800/\$480 = 1.7$

- TRC - the old way:

- $[4*2000*(1-0.25+0)*0.1] / [(4*20) + (4*100*(1-0.25+0))]$

- $B/C = \$600/\$380 = 1.6$

TRC – CPUC Memo

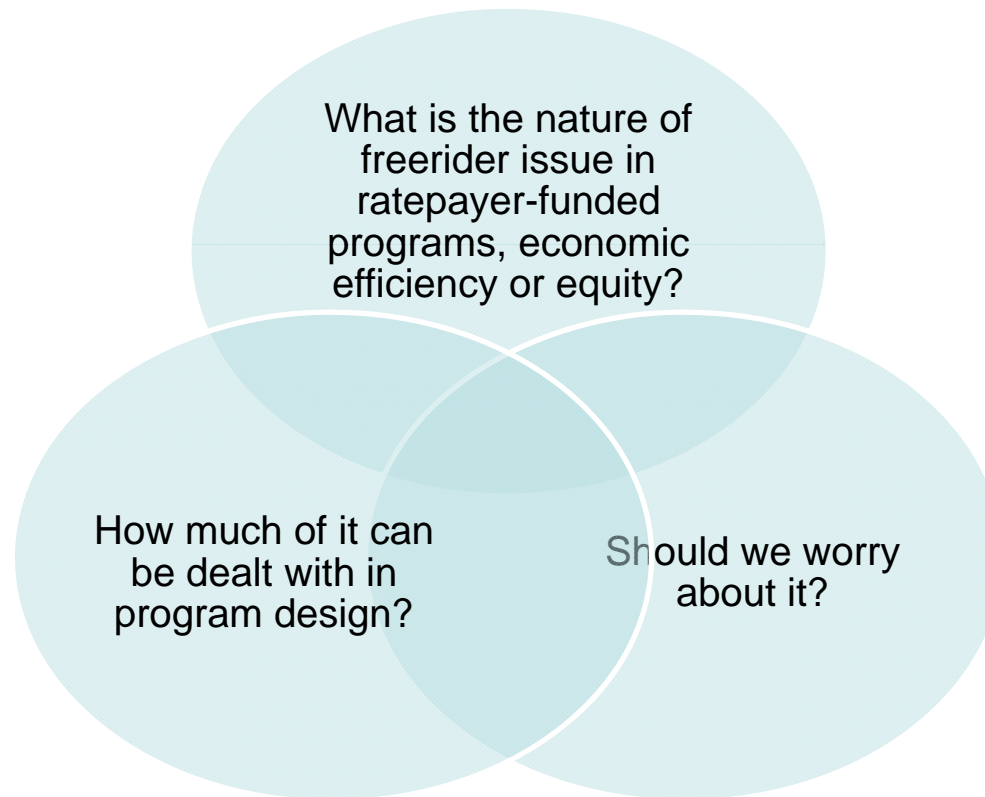
$$[4*2000*(1-0.25+0)*0.1] / [(4*20) + (4*100*(1-0.25+0)) + (1-.75)*4*50]$$

$$B/C = \$600/\$380 = 1.4$$

Where things stand

- The concept is ambiguous
 - Meaning – even spelling – of freeriders
 - Definition and components of NTG
- Measurement is a challenge
 - All NTG components are hard to measure, especially non-participant spillover and market effects
 - Measurement can be expensive
 - Methods are imprecise
 - Results are subject to interpretation
- Policy implications are debatable
- Treatment in TRC is questionable

What now? Three questions



Straw poll

What should be the basis for reporting savings?

- Gross
- Net

What elements of NTG should be researched?

- Freeridership
- Spillover
- Induced market effects

What is an appropriate level of effort (% of evaluation budget) for estimating NTG?

- < 25%
- > 25%

What is the best method for estimating NTG?

- Surveys
- Statistical analysis
- Both (Hybrid)
- None of the above

Questions, Comments?

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