

WHAT DRIVES PROGRAM UPTAKE? Looking Beyond Savings to Bundles of Features:

Latest in NEBs and Indirect Impacts

Session: New Territory for Targeted Programs

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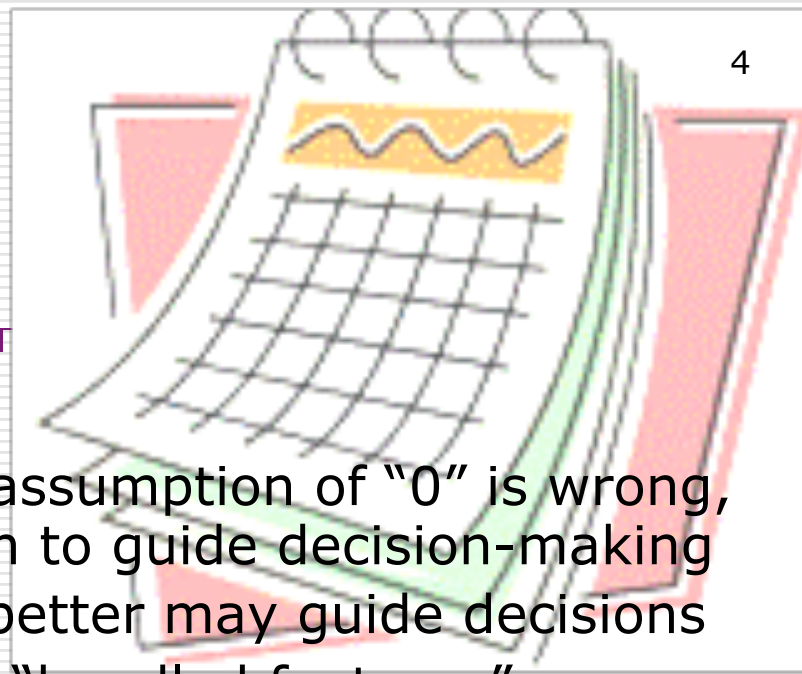
NEB BACKGROUND / REVIEW / CONTEXT

BACKGROUND / HISTORY*



- Energy efficiency programs
 - Programs planned based on energy savings – but range of omitted effects – HTM
 - Energy benefits: Reduced energy use, reduced spending on energy
 - **Non-energy benefits (NEBs):** *aspects of program participation not directly related to reduced energy use*
- Omitted program effects, positive & negative
 - What's in a name...!?, NEB, NEI, NEE, NetNEBs, Omitted Effects, Multiple Effects...
 - 20 years of work in 90 programs (NEBs)

BACKGROUND / HISTORY*



- Motivation
 - Bias/Wrong advice: Implicit assumption of “0” is wrong, B/C bias, Granger, evaluation to guide decision-making
 - Measurement: Ranges and better may guide decisions
 - Mis-understanding: Theory / “bundled features”, positive and negative effects other than energy savings
- Consequences of omission
 - Bias in EE investment, incomplete understanding of participation, ineffective marketing / targeting campaigns
- 20 years of Non-energy benefits (NEBs)
 - Random + arrearage → Low income → HTM
 - Low income policy → broader
- 3 Beneficiaries, drivers (1994-5)
 - Utility, Society, Participants

20 YEARS OF NEBS PROGRESS...*

**Random, theorized lists → Drivers, 3
main beneficiaries / perspectives**

(1990)

1994-1996

**Arrearrages & minimal others →
Tested methods & BPs including HTM**

1996-2002+

**Low income results → Ranges / focus
→ Models & broad 3-perspective
results for varied programs,
measures, portfolios, sectors**

1996 onward

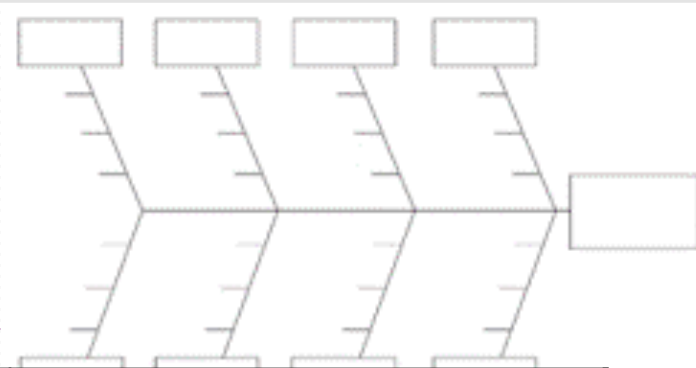
**Applications in Low inc. policy &
mktg → Broad applications incl. C/E**

1996 ... recent

**Skepticism → Improving acceptance;
chicken & egg**

1994, 90+ programs/portfolios in US, int'l, 4 BMP reviews, 50 papers

NEB DRIVERS, 3 BENEFICIARIES



Utility / Ratepayer	Societal	Participant (all)
<ul style="list-style-type: none"> <input type="checkbox"/> Payments / financial <input type="checkbox"/> Debt collection efforts / calls <input type="checkbox"/> Emergencies / insurance <input type="checkbox"/> T&D, power quality, reliability <input type="checkbox"/> Subsidy (LI) <input type="checkbox"/> Other 	<ul style="list-style-type: none"> <input type="checkbox"/> Economic development / job / multipliers <input type="checkbox"/> Tax impacts <input type="checkbox"/> Environmental <input type="checkbox"/> Emissions <input type="checkbox"/> Health <input type="checkbox"/> Water & other resources / utilities <input type="checkbox"/> National security <input type="checkbox"/> Wildlife / Other 	<ul style="list-style-type: none"> <input type="checkbox"/> Payments & coll'n <input type="checkbox"/> Education <input type="checkbox"/> Building stock <input type="checkbox"/> Health <input type="checkbox"/> Equipment service incl. productivity, comfort, maint, etc. <input type="checkbox"/> Other utilities (water, etc.) <input type="checkbox"/> Other (transactions, enviro, psychic, etc.)

NEB CATEGORIES BY PERSPECTIVES – FROM DRIVERS

Utility	Society	Participant	(res & com'l)
<ul style="list-style-type: none"> • Carrying cost on arrearages • Bad debt written off • Shutoffs • Reconnects • Notices • Customer calls / bill or emergency-related • Other bill collection costs • Emergency gas service calls (for gas flex connector and other programs) • Insurance savings • Transmission and distribution savings (usually distribution) • Fewer substations, etc. • Power quality / reliability • Reduced subsidy payments (low income) • Other 	<ul style="list-style-type: none"> • Economic development benefits – direct and indirect multipliers • Tax effects • Emissions / environmental (trading values and/or health / hazard benefits) • Health and safety equipment • Water and waste water treatment or supply plants • Fish / wildlife mitigation • National security • Health care • Other 	<ul style="list-style-type: none"> • Water / wastewater bill savings • Operating costs (non-energy) • Equipment maintenance • Equipment performance (push air better, etc.) • Equipment lifetime • Shutoffs / Reconnects • Property value benefits / selling • (Bill-related) calls to utility • Comfort • Aesthetics / appearance • Fires / insurance damage (gas) • Lighting / quality of light • Noise • Safety 	<ul style="list-style-type: none"> • Control over bill • Understanding / knowledge • “Care” or “hardship” (low income) • Indoor air quality • Health / lost days at work or school • Fewer moves • Doing good for environment • Savings in other fuels or services (as relevant) • GHG and environmental effects • Negatives

Source: (Skumatz/SERA, 1996 on)

NEB ESTIMATION APPROACHES

NEBs MEASUREMENT – 4 MAIN MEASUREMENT APPROACHES*

Direct Measurement	Secondary + Lit/Meas	Modeling	Survey-Based
<ul style="list-style-type: none"> • → Records, billing data, market info; regression • Utility, arrears, debt, calls, notice, subsidies; broader individ. • Sample size 	<ul style="list-style-type: none"> • → Incremental incidence * valuation • Water savings, insurance, O&M, etc. • Many factors available 	<ul style="list-style-type: none"> • → 3rd party or specialized models • Emissions, Economics • Many straight-forward, but also slippery slope 	<ul style="list-style-type: none"> • → Multiple approaches • Participant effects (HTM) -only option for some <p>Survey options</p> <ul style="list-style-type: none"> • CV (WTP/WTA; open v. bounded) • Relative scaling (LMS, comparative, numeric)

Story of a ferry... then it's academic (HTM, WTP → LMS)

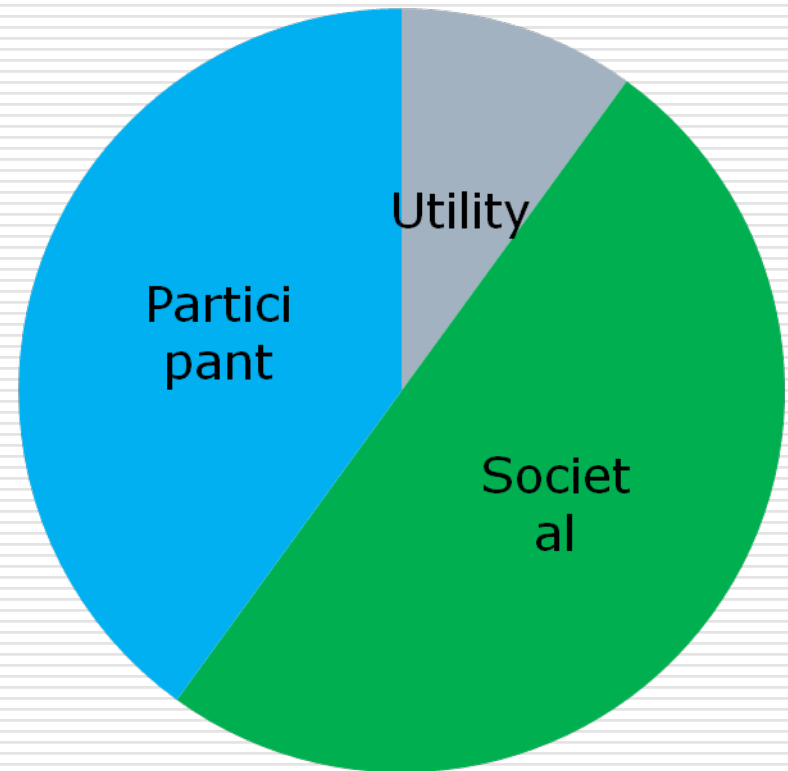
- *Strengths & weaknesses*
- *Balancing precision & practical; non-overlap*
- *Avoid bias, achieve high obs, transferability*
- *False comparisons!?! (Vs. spreadsheets)*
- → Accuracy, consistency, unbiased, large sample...

- Ranking (Ord. Logit, AHP, rank, conjoint)
- Hedonic Regr
- Other

NEB RESULTS: EXAMPLES

WHICH SOURCES OF NEBS ARE HIGH VALUE?

- Results sample of ~100 programs we've done & lit review
- Which sources dominate?
- Utility 10%; Societal 40-60%, participant 30-50%
- Considerable variation by program, climate, measures



WHICH NEBS ARE HIGHEST VALUE?*



- Utility (10%)
 - Few, low value (arrearages, subsidies)
- Societal (40-60%)
 - Emissions
 - Economic development
 - Potentially health (not well measured yet)
- Participant (30-50%); *(often higher for low income)*

Residential

- Comfort
- Avoid moving / homelessness; home value
- Illness / health
- Ability to pay other bills / savings
- Green

Commercial

- Tenant satisfaction
- Maintenance
- Comfort
- Ability to sell
- Productivity
- Green

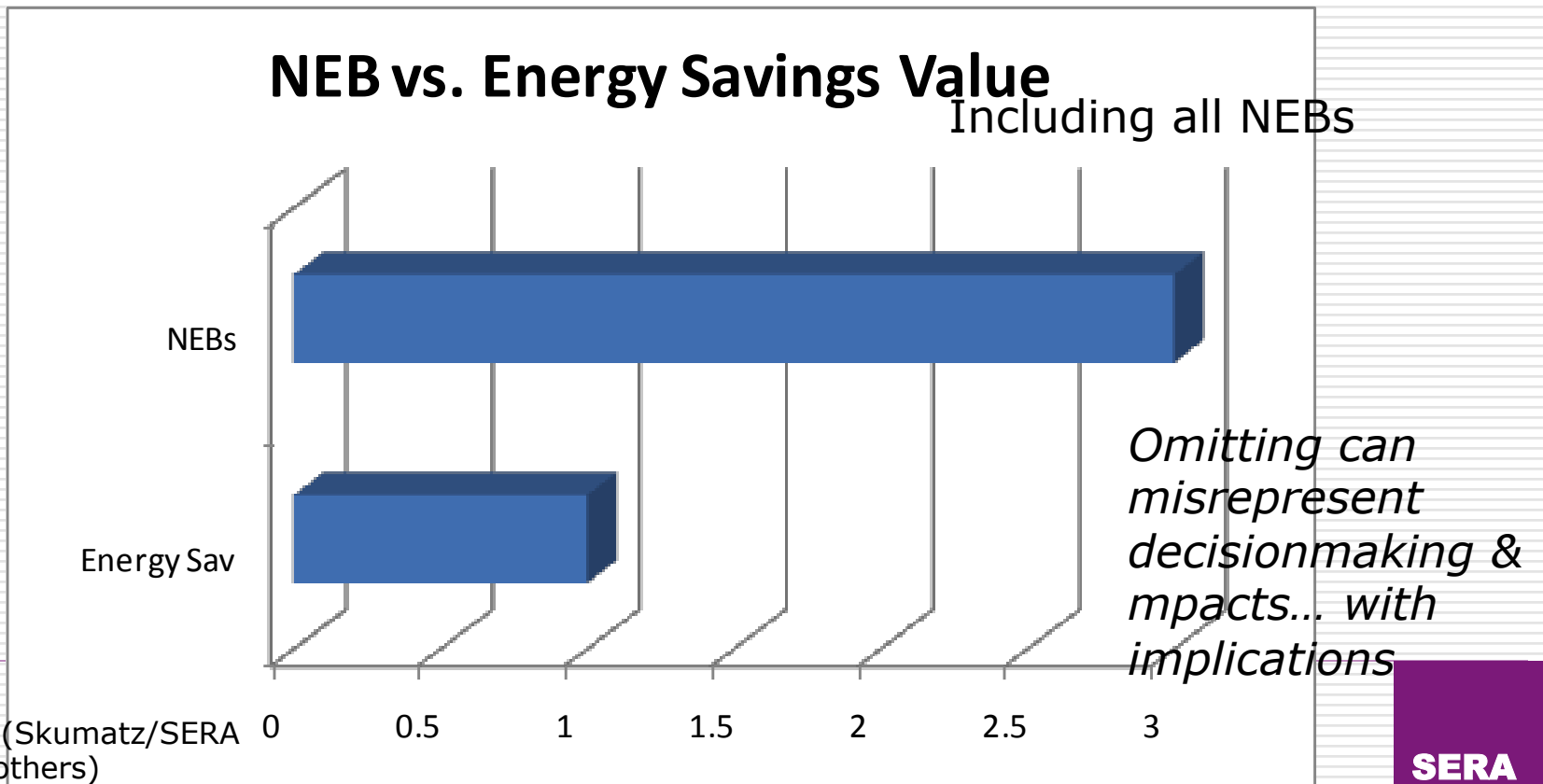
□ Gaps

- Health & safety, peak, infrastructure, security, hardship



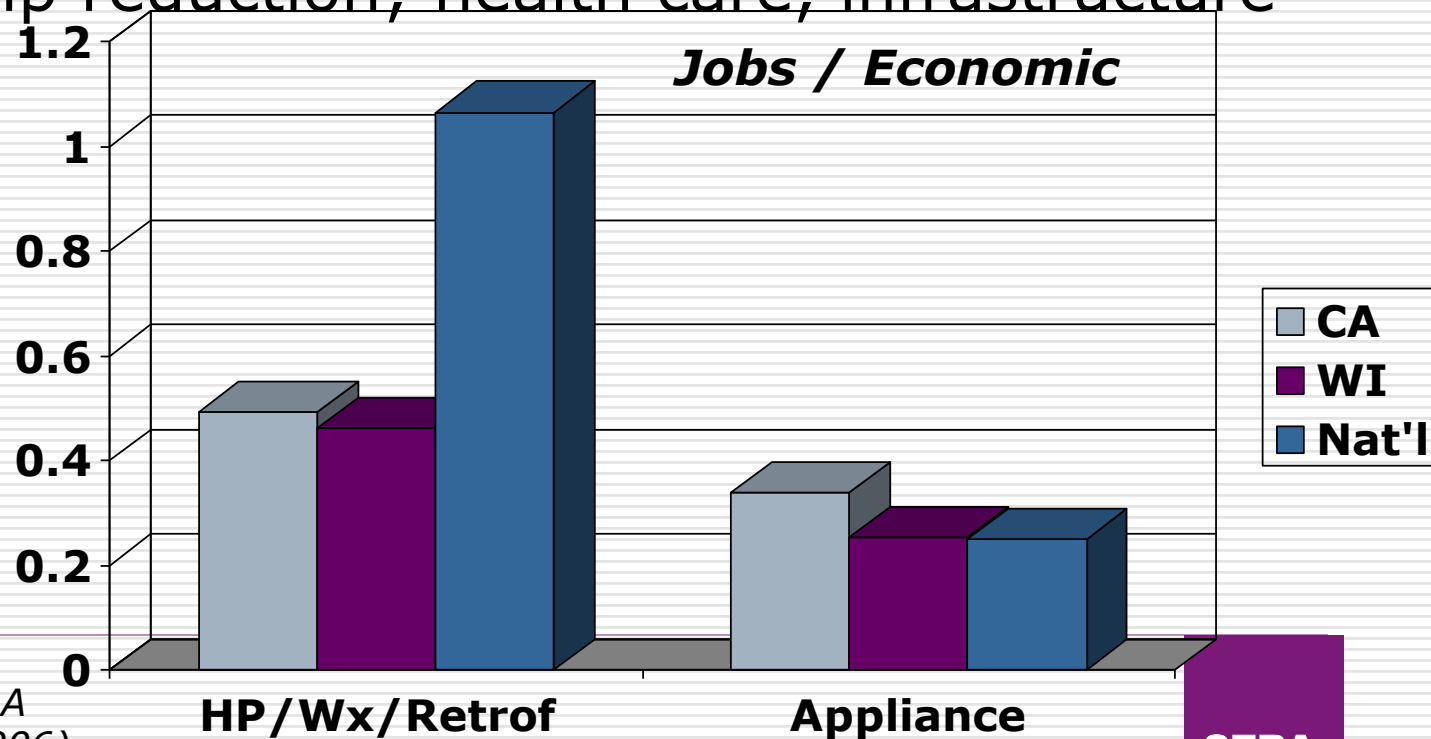
ARE NEBS HIGH VALUE?

- *Energy savings are less than 1/4 of benefits from low income weatherization programs – less than 1/10 for some programs*



SOCIETAL IMPACTS

- Strong economic development performance
- Emissions – vary by generation; much measurement
- Hardship reduction; health care, infrastructure
- Gaps

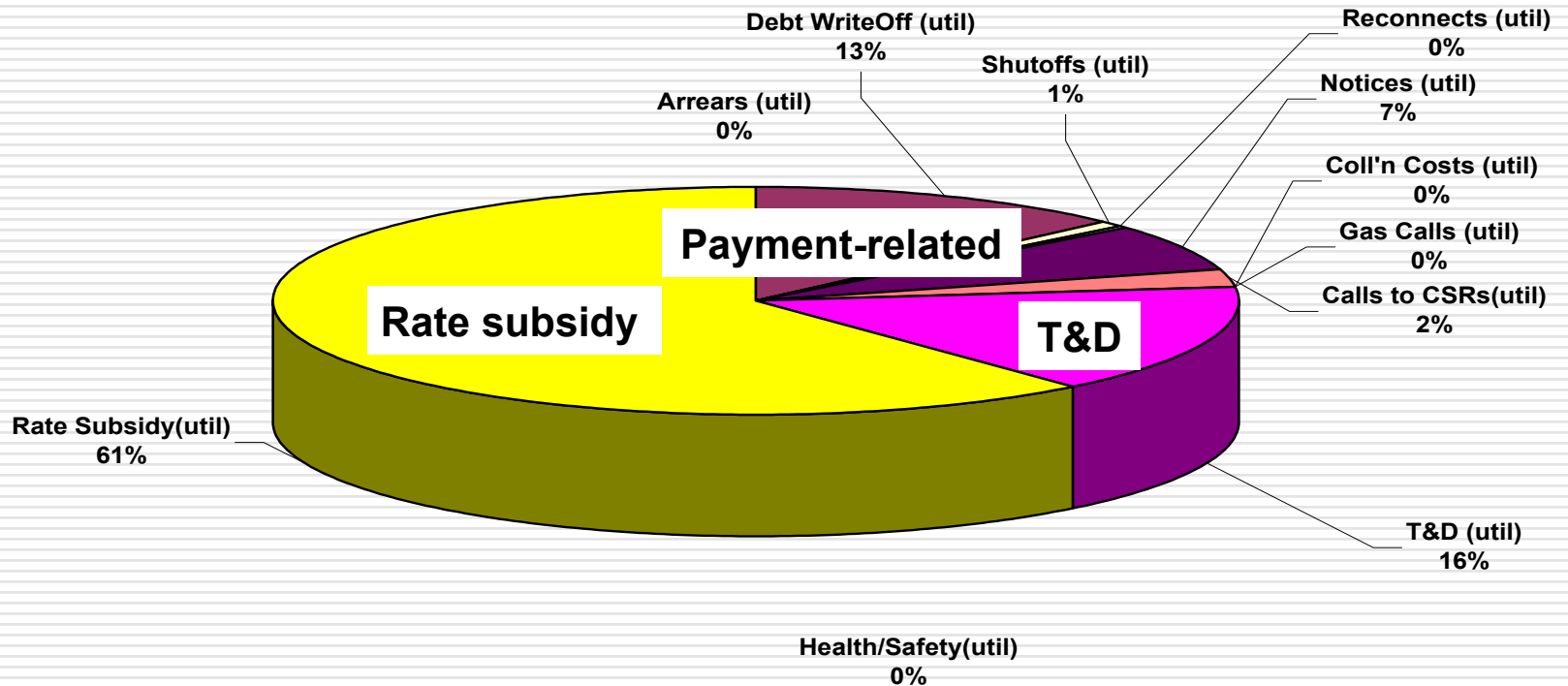


(Source: Skumatz /SERA
ECEEE 2007, ACEEE 2006)

UTILITY NEBS

EXAMPLE: LOW INCOME WX

Utility NEBs for Template Program

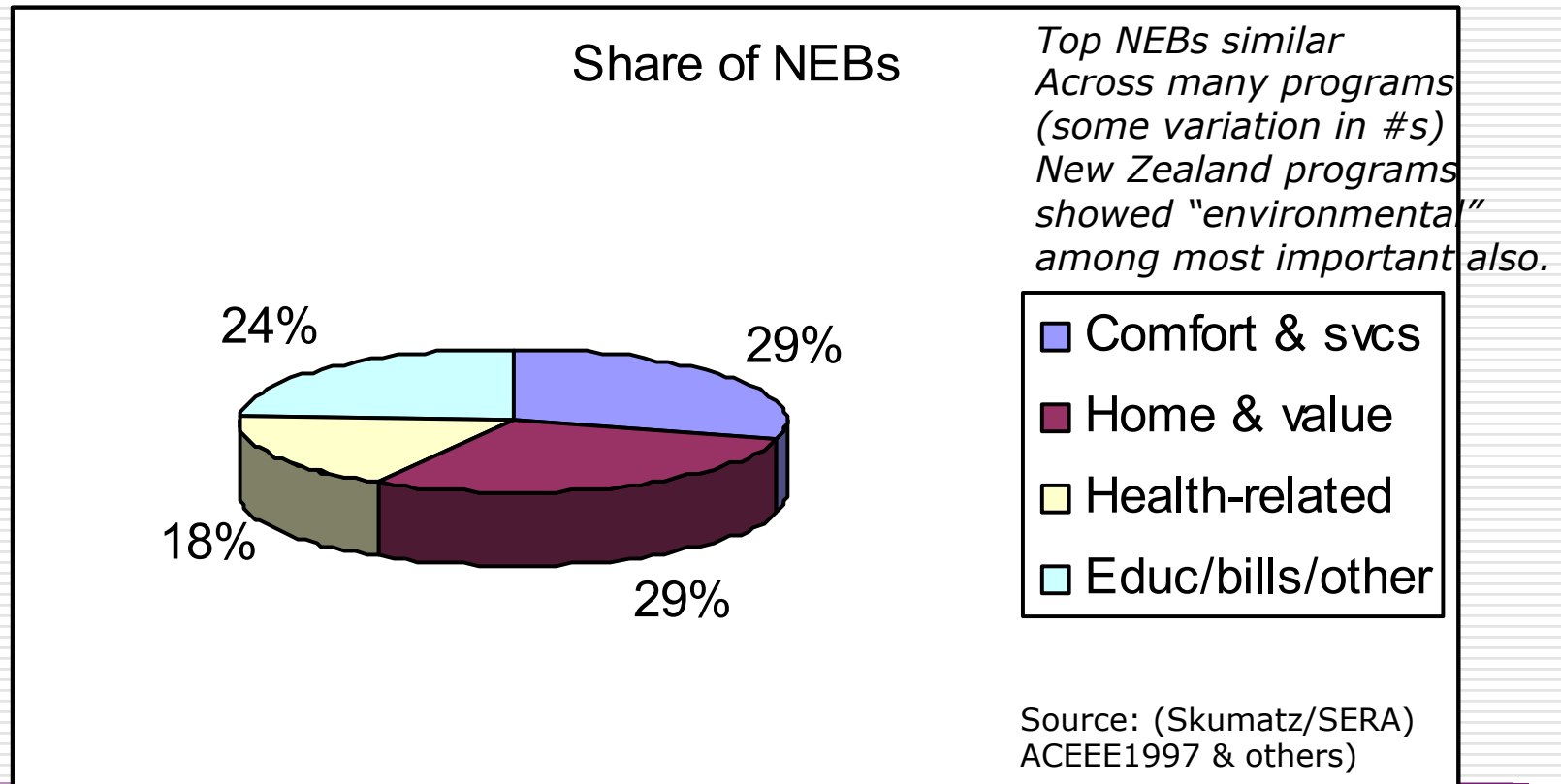


MODELS

Source: Skumatz Economic Research Associates research

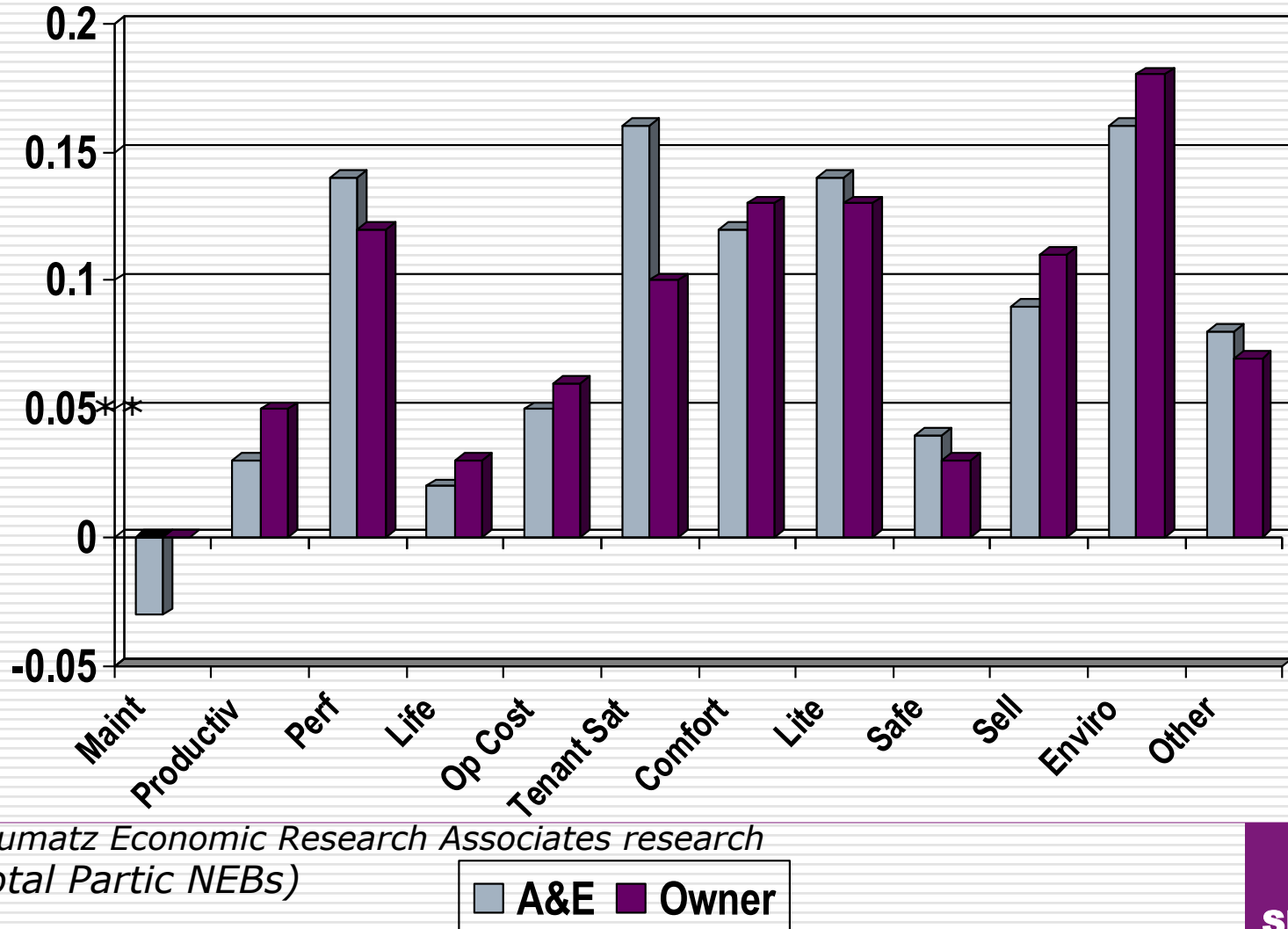
WHICH PARTICIPANT NEBS ARE HIGH VALUE?

□ Example Participant NEBs breakdown



*IMPLICATIONS: Maintenance as a barrier -- \$ amount to get to "neutral", not just score (\$ and distribution)
Owners had higher NEB total, and would have taken higher investment in new technology (education vs. fear of losing bid)*

C&I NEW CONSTRUCTION

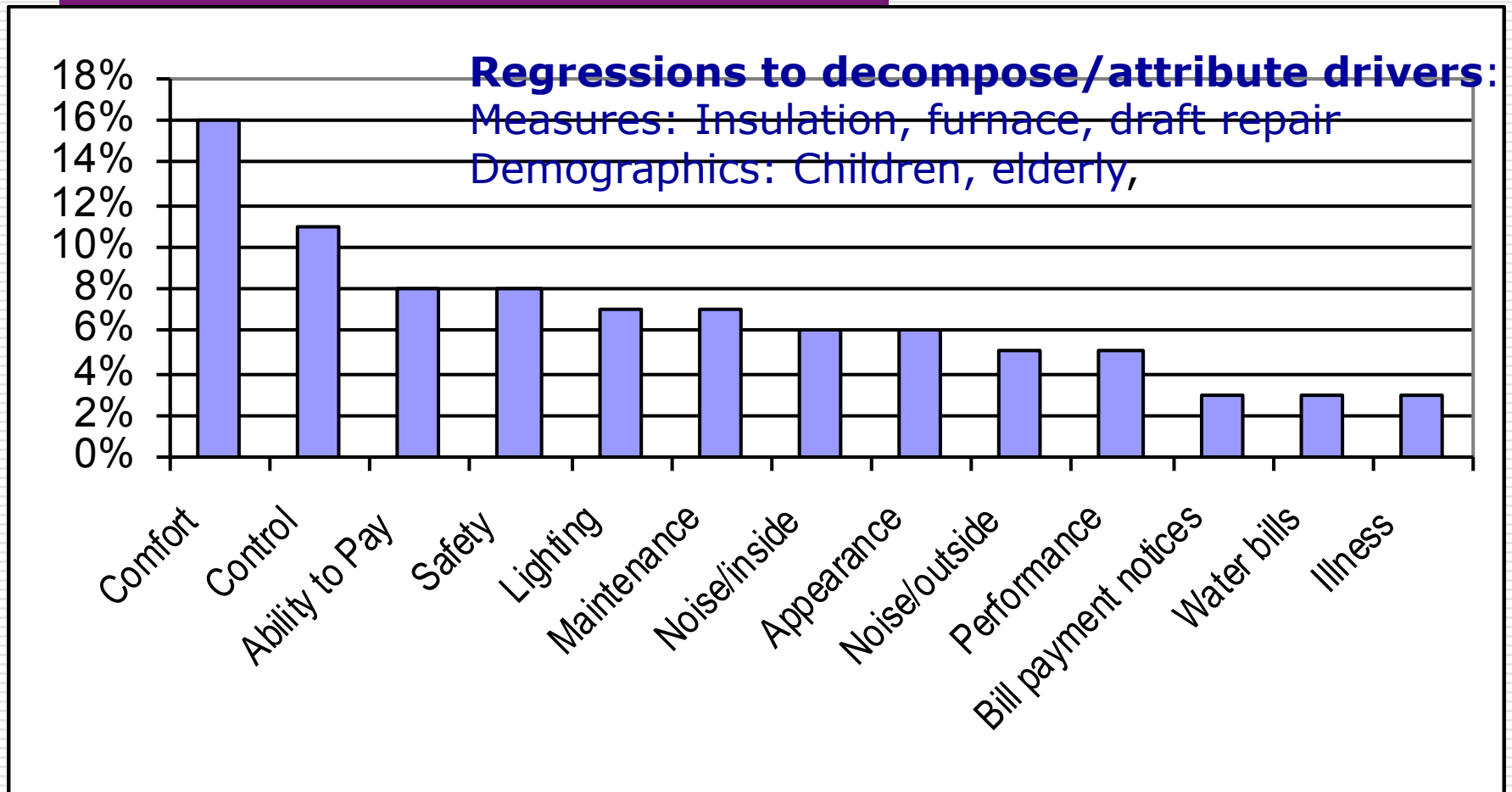


Source: Skumatz Economic Research Associates research
(Pct of Total Partic NEBs)

A&E Owner

TOP NEBS FOR WX PROGRAM

(Percent of total survey-based participant NEBs)



RESULTS FROM C&I PROGRAMS

	Lighting	High performance New construction	New Construction	Tech assistance	Boilers
NEB\$	75-90%	About 100%	90-110%	75-90%	110%
Top NEBs	Enviro, other op costs, perf, lighting, comfort, safety	Comfort, quality of light, tenant satisf, eqpt perf, product- ivity, enviro, sell/ lease	Enviro, Tenant satisf, performance, comfort, lite	Enviro, other op costs, perf, lighting, comfort, safety	Features/ controlfootpri nt, performance, tenants, noise
Neg	Maint, labor, light (not net negative)	Cost, maintenance	Maintenance	Maint, labor, light (not net negative)	Lifetime
Actor info	A&E higher value than owners	A&E less positive than owners	A&E >owners, Part > NP	A&E higher value than owners	Vendors strong, Participants much higher

Source: Skumatz Economic Research Associates research

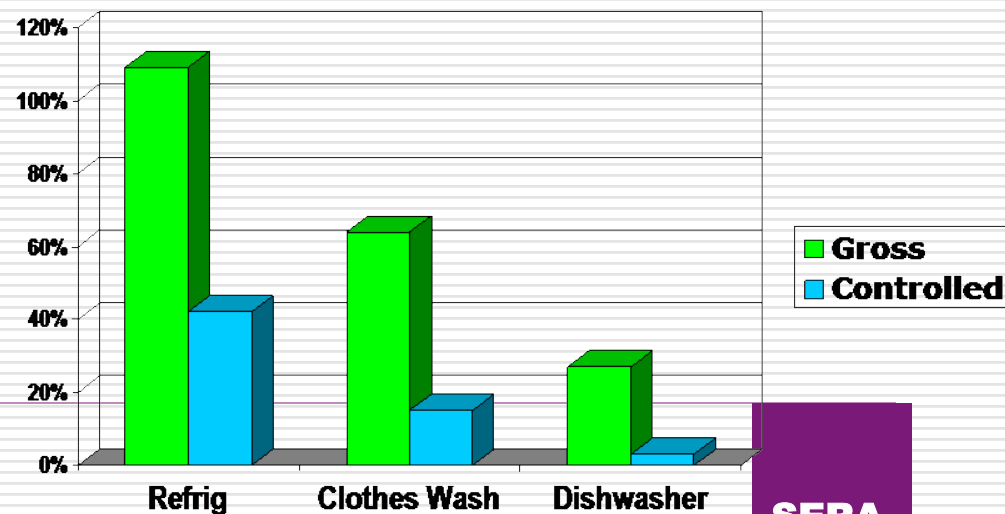
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OTHER PROGRAMS*



- Motors – Footprint more valuable
- Military – Mission, save a job, environment
- Real time pricing – knowledge / control
- Commercial program negatives: maintenance
- Various appliances (revealed analysis)
 - Features, noise,
 - O&M
- Student & retail
 - Daylighting
- Low income
 - Hardship
- Etc, etc.

Source: SERA research



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OTHER PROGRAMS *

- Analyzed commercial recycling program
 - Changed collection & containers
- Surveys, interviews, focus groups
- NEBs value: 6:1 to 13:1!
- Highest value NEBs:
 - Clean
 - Safe (sex/pee/drugs; cops)
 - Alley usage / tourists
 - Business loading
 - Many others
- Virtually ALL indirect
- C/B neg to positive



Source: SERA research

***WHEW – HOLD
EVERYTHING...***



WHY do we CARE!!!?

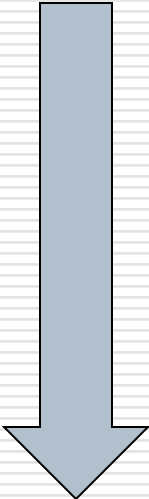
ADJUSTED PAYBACKS – ADDING ONLY PARTICIPANT EFFECTS



- Gross payback: 5.6 yrs → 2.5
- Net payback excl. FR: 9.0 yrs → 4.0
- B/C incl all partic NEBs: 0.9 → 1.9
- B/C adj for FR: 0.55 → 1.2

- Affects: program targeting, measures, disconnects, outreach, investment, efficiencies...
- Can use to maximize bang for the buck and minimize investment per “uptake”.

NEBS USES / APPLICATIONS

	Utility	Participant	Societal	ACCURACY NEEDED
Portfolio dev'p	Yes	Yes	Yes	
Program refinem't	Yes	Yes	Yes	
Marketing		Yes	*	
B/C internal cust		Yes	*	
B/C Tests	Yes	Yes	Yes	
Utility Incentives / rewards, supply, etc.				

(*) these reflected in participant indirectly
 Multiple actor interviews provide robust inferences

METHODS TO INCLUDE NEBs IN REGULATORY TESTS

	Maximize DSM opportunities & feedback	Minimize Regulatory Risk	Minimize Evaluation Cost
Adder			
Readily Measurable			
Hybrid			
All NEBs			

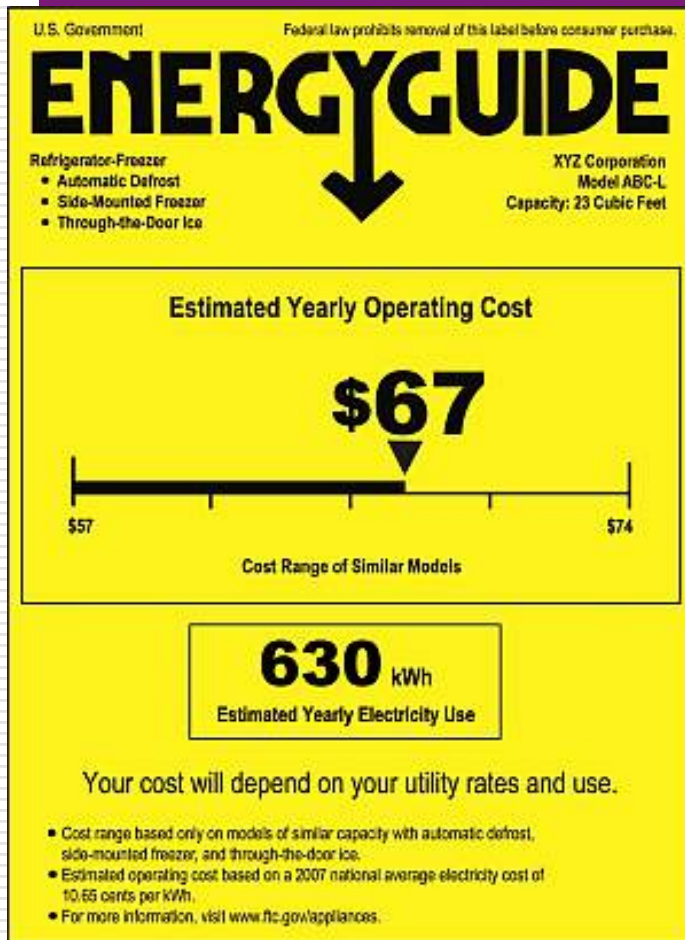
WHY ELSE SHOULD WE CARE?



Effective Selling of EE (What I Learned from Tide™)



BUY ME? COMPELLING? EFFICIENCY MIS-MARKETED NOW



VS.



Which do you notice in the marketplace?

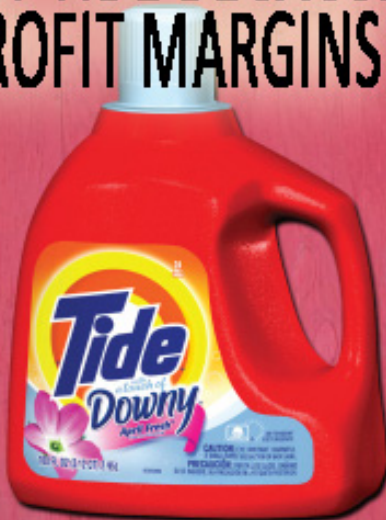
HOW TIDE DOESN'T SELL

BUY TIDE BECAUSE IT HELPS US MAKE LOTS AND LOTS OF MONEY!



Like regular Tide, Tide with a touch of Surfactant molecules have two parts. One is "water hating." The water-loving (hydrophilic) of water. The water-hating (hydrophobic) part soils, loosening and removing them from fabr is also formulated with special ingredients t throughout the wash.

BUY TIDE BECAUSE IT HAS ONE OF OUR LARGEST PROFIT MARGINS




Like regular Tide, Tide with a touch of Downy Surfactant molecules have two parts. One is "water hating." The water-loving (hydrophilic) part brea of water. The water-hating (hydrophobic) part is attrac soils, loosening and removing them from fabrics. Tide is also formulated with special ingredients that provi throughout the wash.




Procter & Gamble's amazing new TIDE gives you a real **MIRACLE WASH!**

No soap - no other "suds" - no other washing product known - will get your family wash as CLEAN as Tide!



THE WORLD'S CLEANEST, BRIGHTEST, WHITEST WASH

... only Tide gives you all this! Tide gets some whole family wash



It does sell miracles

NEBS ARE THE MARKET RESEARCH & THE "BUNDLE"

- People buy bundles of features and services
- People buy perceptions & emotions
- People make tradeoffs in decision-making (ROI)



"SELLABLE" FEATURES OF EFFICIENCY - HOUSEHOLDS



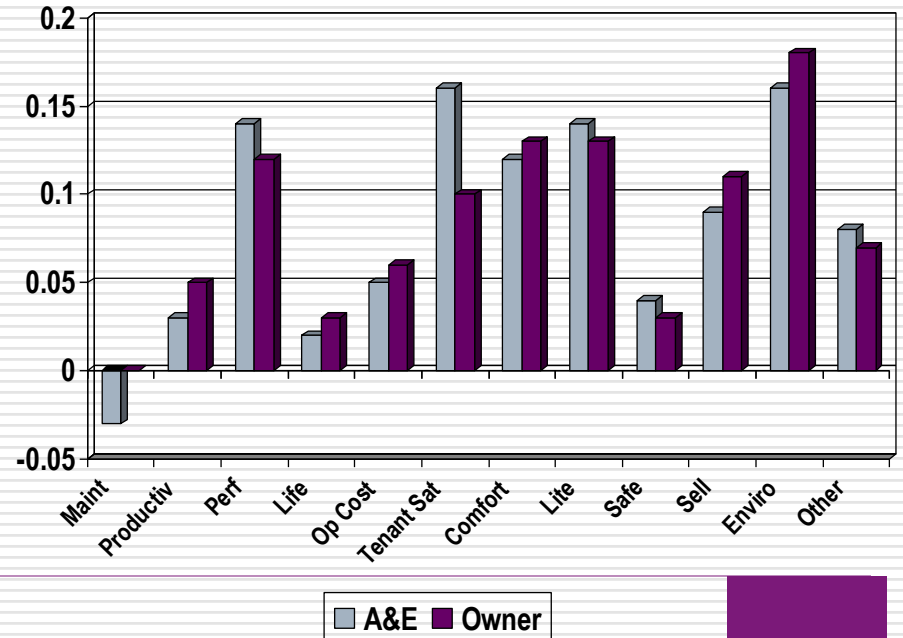
"SELLABLE" FEATURES OF EFFICIENCY - BUSINESSES



42-20045297 [RF] © www.visualphotos.com



"SELLABLE" FEATURES OF EFFICIENCY – SCHOOLS



TIDE™ SELLS WHAT CUSTOMERS THINK THEY WANT TO BUY

□ Learning from that...



Procter & Gamble's amazing new TIDE gives you a real **MIRACLE WASH!**

No soap—no other “suds”—no other washing product known—will get your family wash as **CLEAN** as Tide!

THE WORLD'S CLEANEST, BRIGHTEST, WHITEST WASH

... only Tide gives you all this! Tide gets your whole family wash cleaner than any soap or any other washing product. Tide not only leaves clothes free from dirt, but actually removes soap film, too. Yet with all its terrific cleaning power, Tide is safe... safe right for all your washable colors. In fact, Tide actually brightens soap-dull colors. What's more... in harder water, Tide gets white things whiter than any soap or any other washing product known! Yes, ma'am! For a real miracle wash—try Tide!

TIDE
GETS CLOTHES CLEANER THAN ANY OTHER WASHDAY PRODUCT YOU CAN BUY
—yet, really safe for colors

PROCTER & GAMBLE GUARANTEES EVERY PACKAGE OF TIDE!
Tide will do everything claimed for it in this advertisement. If you are not completely satisfied, return the unused portion of your package for a dollar and the purchase price will be refunded.

New miracle seeds!
More seeds in hardest water! And kind-to-kinds seeds that don't differ—just different! Wonderful in the kitchen, too! Try Tide for dishes... see how they sparkle, even without rinsing!

TIDE'S IN—DIRT'S OUT!

TIDE WORKS EXTRA MIRACLES IN HARD WATER! SCANS OF DIRT! NO MATCH (SOMETIMES) NEEDS!

She hangs the cleanest wash ^x in town
... she swears by **TIDE!**

She hangs the cleanest wash in town—From work clothes right to “undies”! It sparkles so, you simply *know*! She uses Tide on Mondays!

sallyedelsteincollage.com

AND IF THEY WANT TO BUY FOR THE "WRONG" REASON, **SO WHAT!?**... GET OVER IT.

- Don't have to be purists... We just want them to buy it!



I'm so **embarrassed**, but at least I'm ENERGY EFFICIENT!!!



LEARNING THE BASICS

Sell what people want to buy...

Or what they think they want to buy

Not what WE want to SELL!!!

*And don't
Lecture or
talk down.
Make them
happy*

TO IMPROVE UPTAKE -- SELL ON WHAT PEOPLE WANT

- To recognize ROI, bundle
 - To reach the next group
 - To cut through the media clutter
 - To move the needle forward
- ... it's not selling OUT, it's selling...

Honey, I really want to buy it...!
Jeff Gordon endorses it!



NEBS ARE MARKET RESEARCH, B/C, & BEYOND



DEAL WITH IT



THANK YOU!!

Questions?



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