

NEBs AND BENEFIT COST TEST ISSUES / VALUING NEBS

NEBs, EULs, and Other Benefit-Cost Issues

ACEEE / Little Rock, September 2015

Lisa A. Skumatz, Ph.D.,
Skumatz Economic Research Associates, Inc. (SERA)
303/494-1178; skumatz@serainc.com

©SERA 2015

NON-ENERGY BENEFITS

- Program **value** beyond direct goal (savings)
- **20 years** of progress/ where we are
- **Motivation**
 - 0 is the wrong number
 - “Bundled features” / rational / tunnel
- **B/C incomplete** – Biased investments / decisions because all costs, not all benefits
- High value from quantitative studies
 - Evaluation’s purpose – to inform decision-making



20 YEARS OF NEBS PROGRESS...

**1: Perspectives, Basic
Measurement**

1994-1998

2. Estimation & B/C & LIPPT

1996-2001+

**3: Measurement, Use, &
Expansion**

2001-present

4: Refocus B/C Applics

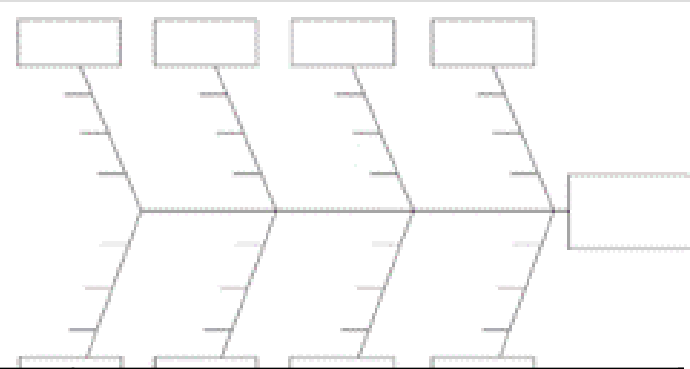
2008-present

But there still isn't agreement on name! - NEB, OPI, NNEB, MB, co-benefits...

Source: SERA, all rights reserved

SERA

NEB DRIVERS, 3 BENEFICIARIES

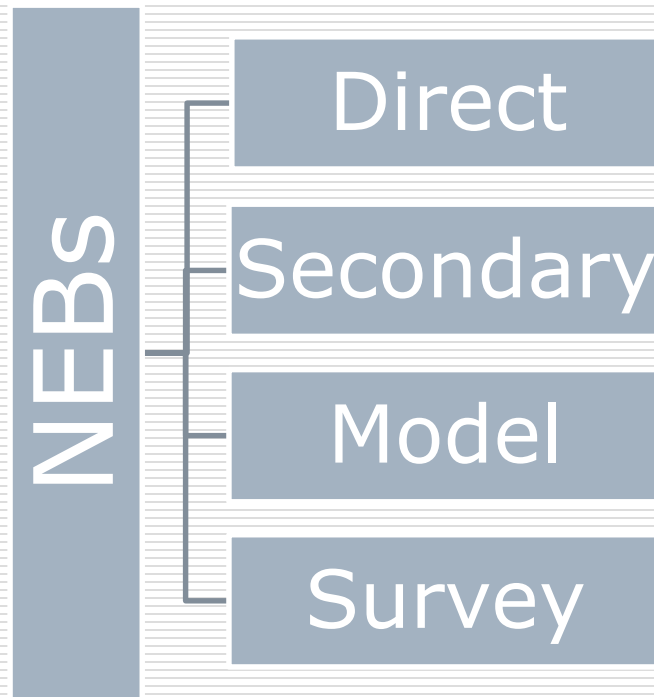


Utility/Ratepayer	Societal	Participant
<ul style="list-style-type: none"> o Payments/financial o Debt collection efforts / calls o Emergencies / insurance o T&D, power quality, reliability o Subsidy (LI) o Other 	<ul style="list-style-type: none"> o Economic development / job / multipliers o Tax impacts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

More than 60 categories derive from these drivers

Include subsets as appropriate to application.

NEBs MEASUREMENT – 4 MAIN MEASUREMENT APPROACHES



→ Monetized NEBs

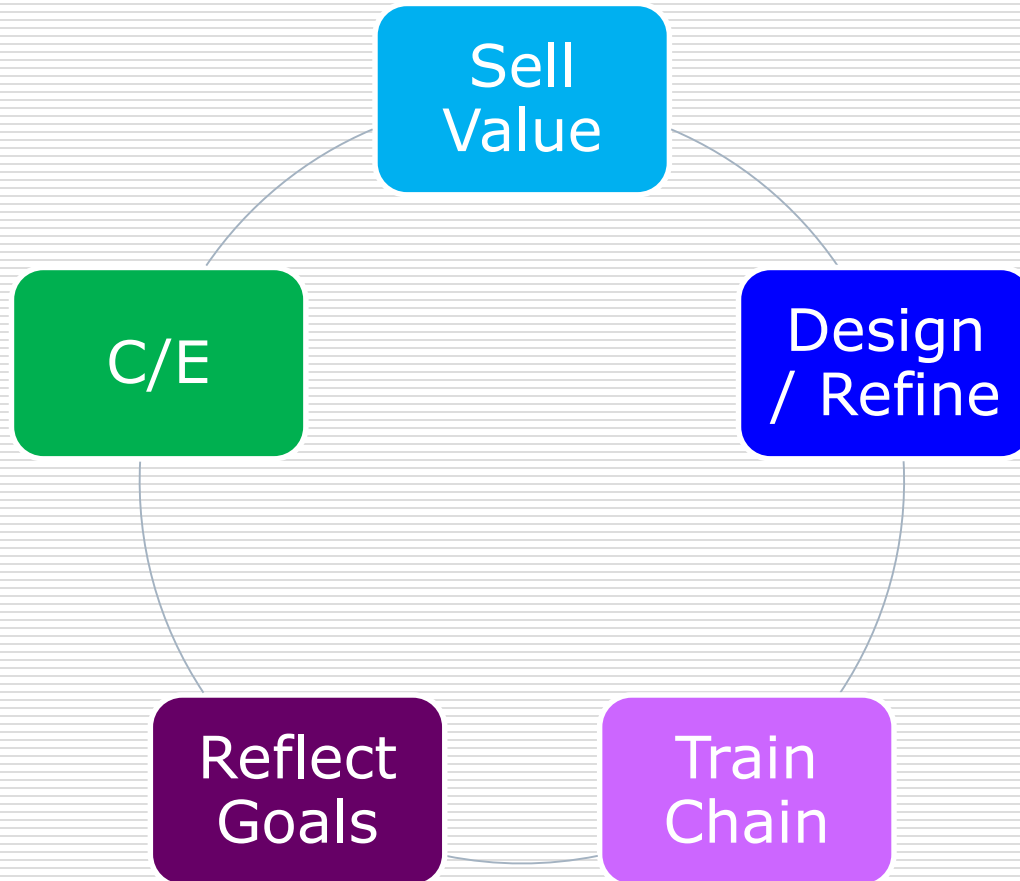
Story of a ferry... then it's academic

*Strengths & weaknesses; bracket
Surveys most appropriate for some
Balancing precision & practical
Avoid bias, achieve many responses
Multiple survey approaches
How accurate is needed?*

MEASUREMENT ISSUES & BEST PRACTICES

- Best measurement practices
 - “Net” positive & negative, meaningful, outcomes, non-overlapping...
 - Large sample, discount rates, host of other best practices / research
- Measurement accuracy (coming)
- Transferability considerations
 - Can’t transfer directly (measures, climate, target, *lists*)
 - Some relatively constant or easily measured

KEY APPLICATIONS OF NEBS



NEBS IN COST- EFFECTIVENESS APPLICATIONS

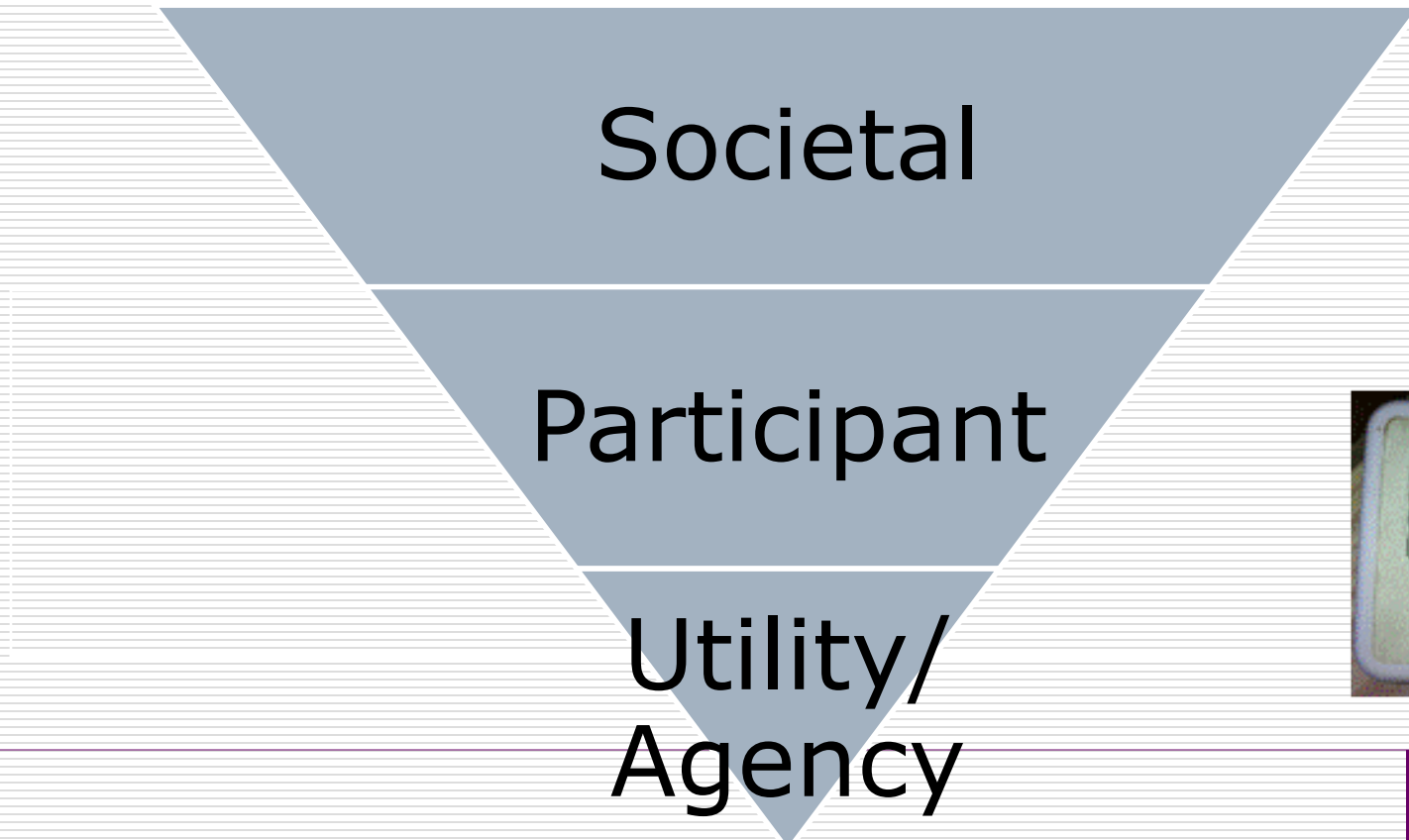
NEBS IN C/E – COMPARE & OPTIMIZE INVESTMENT

- TRC / Societal, Participant, UCT, RIM... NEBs
 - *Bias from 0 value for part of net benefits. For true representation of B & C, NEBs elements estimate the missing factors.*
 - *Addresses bias, better guide measure, pgm, and portfolio investment*
 - **Address by:**
 - 1) include monetized NEBs appropriate to test (e.g. TRC, SCT), or
 - 2) exclude all costs associated with achieving NEBs or
 - 3) use UCT
 - B/C early, then “conservative” awaiting evidence

WHICH NEBS ARE HIGHEST VALUE?

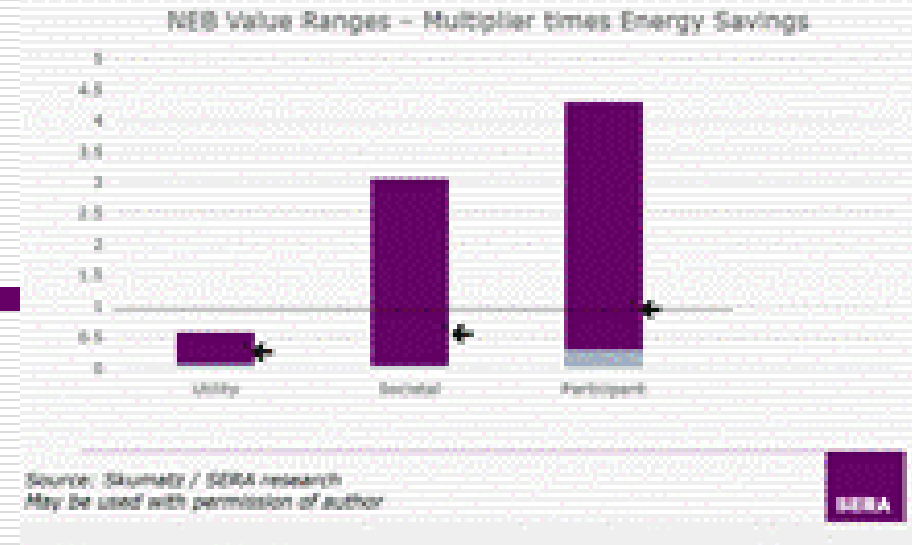


- Some variation in patterns depending on program, inclusions...



ARE NEBS HIGH VALUE?

- Value ranges
 - Vary by climate, measures, sector.
- Utility NEBs – size, major components
- Societal NEBs – economics, emissions, other
- Participant NEBs – leaders, variations, disaggregating



NEBS IN B/C – THE ACCURACY & BIAS QUESTION

*Risk from NEB??
Under the rug...!*

- Simplified B/C Inputs- Lets compare the risks/ranges

$$[PV[NTG*(Sav+NET NEB)*Lifetime]/PV(Cost)...]$$

NTG – accuracy, measurement, incomplete
RISK/RANGE: Medium, \$ high

Savings: Impact, repeatedly & expensively measured, little variation, \$100K+
RISK/RANGE: LOW (+/- very small), \$ HIGH

EUL: Lists 20+ years old, Origins (!), technologies, dated, varies / local, values 50% - 2x+ variation
Risk/Range: HIGH (?-2+,varies; wrong), \$ medium-low

Cost: Complicated, expensive, local, changes
Risk / Range: Medium

Discount rate: Not highly complicated, purpose / use; <WACC, risk link, regulatory environment;
RISK/RANGE: medium, \$ Very Low

NEBs: Lit exists, comparability, transferability, local, inexpensive to add to existing studies, gaps
RISK/RANGE: low-med (+/-...)
\$ Very low

BIAS / RISK INVESTMENTS & IMPACTS ON B/C

Input?	Size / Risk	Impact on B/C	Relative cost	Do it?
Impact eval	Small variation	Minimal	High	No
NEB	Substantial	Direct with savings	Very low – add to process, body of lit	Yes;
Measure Life	Wide range	Nearly direct,, interacts with discount	Med/Low	Yes
NTG	Add SO	Nearly direct	Med / Low	Yes/ some
Discount Rate (numerator)	1% vs. 8-10%	Increase 40% and more depending on years	~Zero	Yes
Costs	Some; if change...	Direct	High	?

Source: Skumatz, independent research

KEY QUESTIONS FOR IMPROVING TESTS - BALANCE

- **Tradeoffs** – How much to improve tests?
Depends on costs & benefits of accuracy improvements (in NEB categories)
1. Which NEBs **most valuable**?
 2. What **value range** arises from reasonable cost measurement (eval budget)
 3. Does inclusion of this RANGE (low vs. high value) **change the B/C conclusion**?

If **NO**,
You're done
And bias addressed
sufficiently

IF **YES**,
Refine measurement
up to value or cost of
"wrong" decision

'NEB-
It"
Model

SERA

EXAMPLES OF STATE TREATMENT OF NEBS

- Adders
 - (well-suited to program / measure independent)
- Readily Measurable
- Hybrid ←
- All NEBs ←

- Domino effect
- “Sellable” name – “Prince Albert in a Can” if that’s what they need...!

IMPLICATIONS FOR JUSTIFIABLE NEBS VALUES

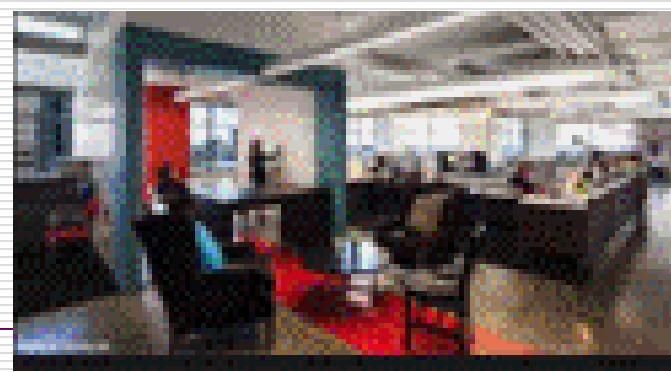
	Utility	Soc	Part	Conserv. Rec'm	Rationale
Base Percent	X%	X%		X%	Program-invariant
Low Income	X%	X%	X%	X%	Multiple sources
Weatherization		X%	X%	X%	Substantial Participant impacts
Measure / Program-specific			X%		Varies by measure, sector
Other Recom's					Local Research

SERA had developed values / multiple states & utilities

For programs and measure-based

Source:
Skumatz / SERA

SUMMARY - NEBS, C/E, BIAS



- Widely researched; >20 years, >100 programs & portfolios, many states
 - Methods, gaps, priorities, applications
 - NEB-It Model to assemble results, quickly analyze
- NEBs are high value; help reduce bias
 - They exceed the primary benefit in many cases
 - Other sources of bias to research (EUL, NTG, etc.) bring high variation
- States are incorporating NEBs / dominos
 - input in deliberations in multiple states

**'NEB-
It"
Model**

THANK YOU!!

Questions?



Lisa A. Skumatz, Ph.D.

*Skumatz Economic Research
Associates (SERA),*

Phone: 303/494-1178

skumatz@serainc.com