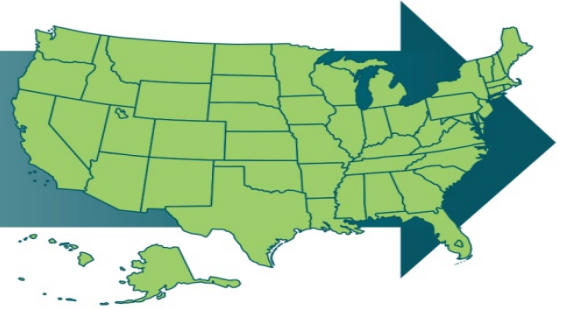

SEE Action

STATE ENERGY EFFICIENCY ACTION NETWORK

Behavior Based Energy Efficiency Webinar Series

Michael Li
U.S. Department of Energy

ACEEE

American Council for an Energy-Efficient Economy

About SEE Action

- Network of 200+ leaders and professionals, led by state and local policymakers, bringing energy efficiency to scale
- Support on energy efficiency policy and program decision making for:
  - Utility regulators, utilities and consumer advocates
  - Legislators, governors, mayors, county officials
  - Air and energy office directors, and others
- Facilitated by DOE and EPA
- Sign up for the newsletter on the website

The SEE Action Network is active in the largest areas of challenge and opportunity to advance energy efficiency

What SEE Action Does

Provides ***solution pathways through market and policy barriers*** to achieve greater investment in cost-effective energy efficiency at the state and local government levels.

Offers ***investment-grade information*** for state and local decision makers.

- Guidance Documents
- Trainings
- Peer-to-peer dialogues
- Technical Assistance

Goal: All cost-effective energy efficiency by 2020

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A Field Guide to Utility-Run Behavior Programs: Making Sense of Variety

ACEEE/SEE Action Webinar Series on Behavior

Susan Mazur-Stommen, Ph.D.
Director, Behavior and Human Dimensions
American Council for an Energy-Efficient Economy

Paper Lives at…

http://aceee.org/research-report/b132

Related blogs:

http://aceee.org/blog/2013/12/using-aceee-field-guide-utility-run-b

AND

http://aceee.org/blog/2013/06/developing-field-guide-energy-efficie

Authors

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Kate Farley conducts research for the Behavior and Human Dimensions program. She is also the point person for ACEEE's work in agricultural energy efficiency, and she is in charge of research for the Combined Heat and Power (CHP) chapter of *ACEEE's State Scorecard*. Prior to joining ACEEE in 2011, Kate interned in the House Committee on Science, Space, and Technology and in the Office of Energy and Climate Change at the White House. She earned a bachelor of arts in environmental science and public policy from Harvard University.

The American Council for an Energy-Efficient Economy (ACEEE)

- ACEEE is a 501(c)(3) nonprofit that acts as a catalyst to advance energy efficiency policies, programs, technologies, investments, & behaviors
- 50 staff; headquarters in Washington, D.C.
- Focus on end-use efficiency in industry, buildings, & transportation
- Other research in economic analysis; behavior; energy efficiency programs; & national, state, & local policy
- Funding:
  - Foundation Grants (52%)
  - Contract Work & Gov't. Grants (20%)
  - Conferences & Publications (20%)
  - Contributions & Other (8%)

www.aceee.org/@ACEEEdc

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The ACEEE Field Guide to Utility-run Behavior Programs

- First comparative analysis of utility-run behavior programs
  - Practitioners, evaluators, and regulators will be able to use the guide as they design and assess strategies and develop policies for utility-run behavior programs.
- Our study counted 281 such programs, offered by 104 energy providers and third parties between 2008 and 2013.

Background and history of project

- Original title was ‘Utility Behavior Landscape’ or ‘UBL’
  - Intended to be a broad survey of Behavior-based programs in the utility space with analysis of performance
- The idea of the taxonomy came from many conversations/presentations
  - Taxonomy is different from typology, though terms are often mis-used as interchangeable
- Goal was to define the space and clarify terms

Barriers to EE Behavior Programs

- **Throughput incentive** – energy-saving programs can be against the financial interest of utilities
- **Cost effectiveness** – do program results justify the cost to ratepayers?
- **Unfamiliarity** – high degree of uncertainty and confounding factors in dealing with human behavior

Regulatory solutions

- State energy efficiency resource standards (EERS)
- Renewable portfolio standards (RPS)
- Many states are finding it increasingly difficult to achieve the savings targets they need
- Behavior programs theoretically more cost effective

What are the takeaways for regulators and state energy officials from this research?

Behavior programs can be just as cost-effective as other EE programs

Behavior programs are diverse in type and effect

Different behavior programs can suit the needs of IOUs, Munis, and Coops

Behavior programs can be cost effective

- More details by program type in the report but highlights include:

  - Opower's Home Energy Reports have documentable savings and an average cost of 3-5 cents per kwh
  - Community-based social marketing programs by OneChange Foundation delivered a CSE of around a **penny and a half**.
  - Alliance to Save Energy K-12 *PowerSave* programs do more than save energy and still have a CSE of six cents

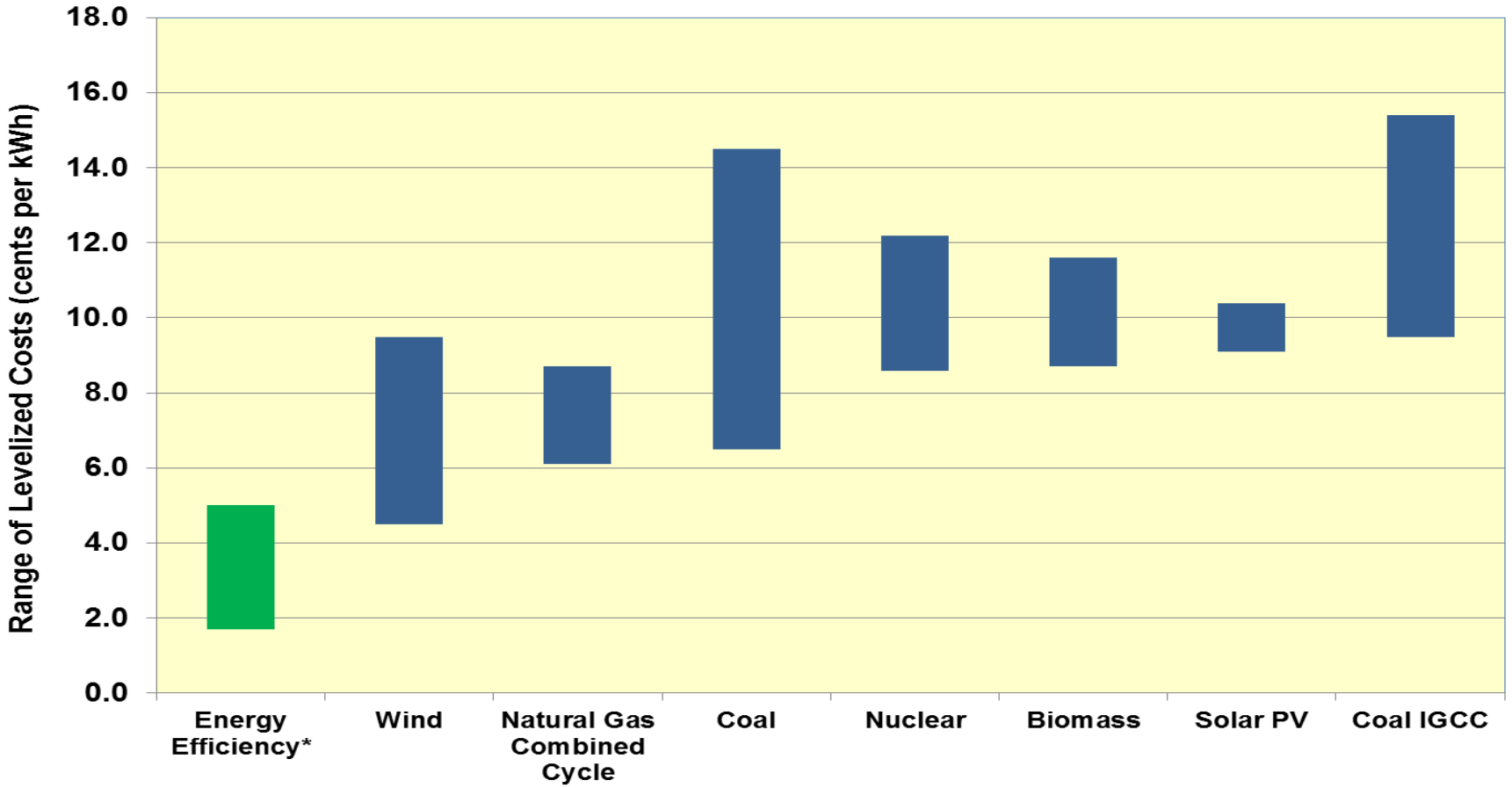
EE Behavior Program Cost Effectiveness

- Do program results justify the cost to ratepayers?
  - Probably. With a limited # of program types providing cost and savings data, we found that the Cost of Saved Energy was less than two cents per kilowatt hour *on average*.
  - Behavior Programs are within range of most energy efficiency programs.

Table 5. CSE for Eight Electricity Behavioral Programs

	Program cost	Average cost per customer	Savings goal (MWh)	Savings achieved (MWh)	CSE
Total	$29,149,389		224,592	1,311,125	
Average	$3,643,674	$6.59	74,864	163,891	1.6 cents

Levelized costs of new electricity resource options in 2012 (EE preliminary)



*Notes: Energy efficiency program portfolio data from Molina 2013 (ACEEE forthcoming); All other data from Lazard 2013. High-end range of coal includes 90% carbon capture and compression.

Why should regulators and state energy officials support behavior in their state?

Research shows that behavior programs can deliver consistent savings at scale (Opower)

Research shows that behavior programs can reach new audiences for traditional offerings (OneChange)

Research shows that behavior programs integrate well with physical/component/widget programs (PowerSave)

Behavior programs need not be capital intensive to start*

What would qualify as “behavior programs”?

All demand-side and energy efficiency programs involve human activity and decision making.

BUT

Programs can achieve greater impact and deeper savings by incorporating insights from social and behavioral sciences.

Every program needs a key insight…

Table 1. Typologies		
CEE	NYSERDA	Energy Trust
	Feedback	Energy benchmarking
		Feedback devices
		Information and training programs
Framing	Framing	
Follow-through	Follow-through	
Decision-making	Commitment	
	Social norms	
Person to person	In person	
Rewarding	Reward	
	Sunk cost	
	Multipronged strategies	

What should regulators and state energy officials ask for in a behavior program?

1. Which energy usage behaviors will be changed?
2. How are interventions grounded in social and behavioral science?
3. What specific behavioral strategy will be used?
4. How is it based on the drivers above?
5. How will it have the ability to be evaluated?
6. Is it designed using a logic model?

Challenges and barriers for implementation

- Unfamiliarity with social science
- Confusing labels and vague definitions
- Human decision making and technology often intertwined
- Difficult to assign causality with respect to energy savings
- Need to track and justify behavioral strategies.

Focus and clarity in the Field Guide

- Each program occupies a single category
- The report provides common metrics for disparate program types
- Categories are concrete and practical.
- Based on behavioral and cognitive sciences

Common language

- Regulators, administrators, designers, and evaluators need to speak a common language around behavior programs.
- Common language eliminates confusion
- The taxonomy offers that common language and clarity.

How should regulators and state energy officials use the taxonomy in the field guide?

The Field Guide is a reference to the variety of programs

Compare what is being offered to what has occurred

Gain familiarity with some of the social science insights

Set expectations for performance from behavior programs

Think about crafting a state-wide strategy for behavior

Taxonomy vs. Typology

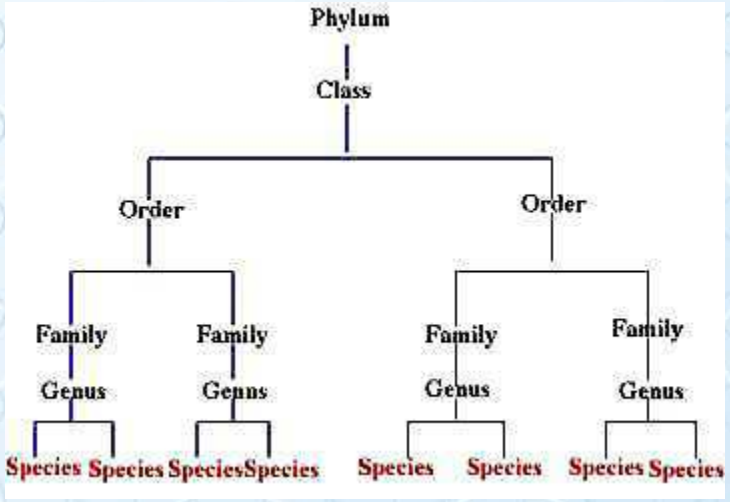
- UBL is a *taxonomy* of Behavior Program types; not a *typology*
- Typologies are analytic constructs, based upon ideal concepts
  - CEE Behavior Insights and Tools
- Taxonomies is generally based upon empirically observable and measurable characteristics
  - Traits and features in contrasting sets

Figure 1. Taxonomy of Utility-Run Behavior Programs

- **COGNITION**
  - **Communication efforts**
    - General
      - Cable or broadcast TV
      - Radio
      - Billboards
      - Other traditional media outlets
    - Targeted
      - Enhanced billing
      - Direct mail
      - Bill inserts
      - User-friendly bill designs
  - **Social media**
    - Facebook
    - Twitter
    - Tumblr
    - Blogs
  - **Education and training**
    - In schools
      - K-12
      - Higher education
    - In companies or institutions
      - Commercial
      - Industrial
- **CALCULUS**
  - **Feedback**
    - Real-time
    - Asynchronous
  - **Games**
    - Competitions
    - Challenges
    - Lotteries
  - **Incentives**
    - Cash
    - Rebates
    - Subsidies
  - **Home energy audits**
    - Audit only
    - Audit+
  - **Installation**
    - Direct install
    - DIY
- **SOCIAL INTERACTION**
  - **Human scale**
    - Community-based social marketing
    - Person-to-person
    - Peer champions
    - Eco teams
  - **Online forums**
  - **Gifts**

Family, genus, species

- A taxonomic approach makes categories from specific combinations of features
- Taxa are units of similar phenomena
  - Taxa can hold sub-units
  - Simultaneously taxa are members of larger groups



Three families of behavior programs

- *Cognition*:
  - Programs where intrinsic psychological processes are foremost
- *Calculus*:
  - Programs where the deliberation of extrinsic aspects play a primary motivating role
- *Social interaction*:
  - Programs whose key drivers are sociability and belonging

Cognition: Motivated by intrinsic factors

Communication efforts

- General
  - Cable or broadcast TV
  - Radio
  - Billboards
  - Other traditional media outlets
- Targeted
  - Enhanced billing
  - Direct mail
  - Bill inserts
  - User-friendly bill designs

Social media

- Facebook
- Twitter
- Tumblr
- Blogs

Education and training

- In schools
  - K-12
  - Higher education
- In companies or institutions
  - Commercial
  - Industrial

Calculus: Motivated by extrinsic factors

Feedback
- Real-time
- Asynchronous

Games
- Competitions
- Challenges
- Lotteries

Incentives
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Home energy audits
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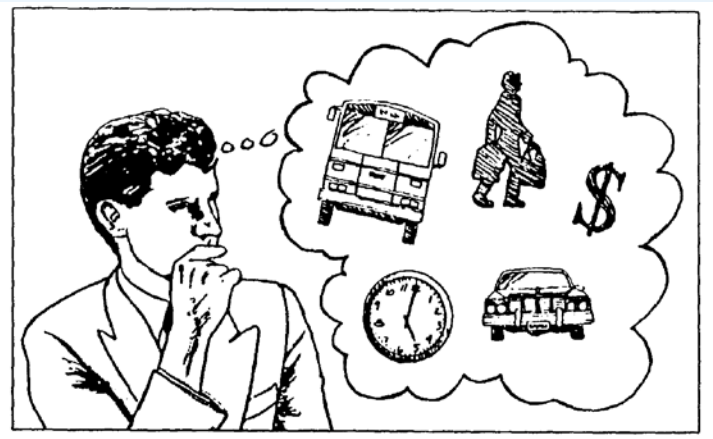


Genus: Games

- Members include competitions, challenges, and lotteries
- Game-based programs include: Efficiency Vermont's *Vermontivate* and the City of Palo Alto's *LED Contest*
  - 9 Game-based programs since 2003
  - Most since 2009
  - Cost range 3-75K
- Only Puget Sound tracked energy savings; reported 118,390 MWh saved in 3 'Rock the Bulb' campaigns; no cost data reported

SOCIAL INTERACTION: sociability and belonging

Human scale

- Community-based social marketing
- Person-to-person
- Peer champions
- Eco teams

Online forums

Gifts

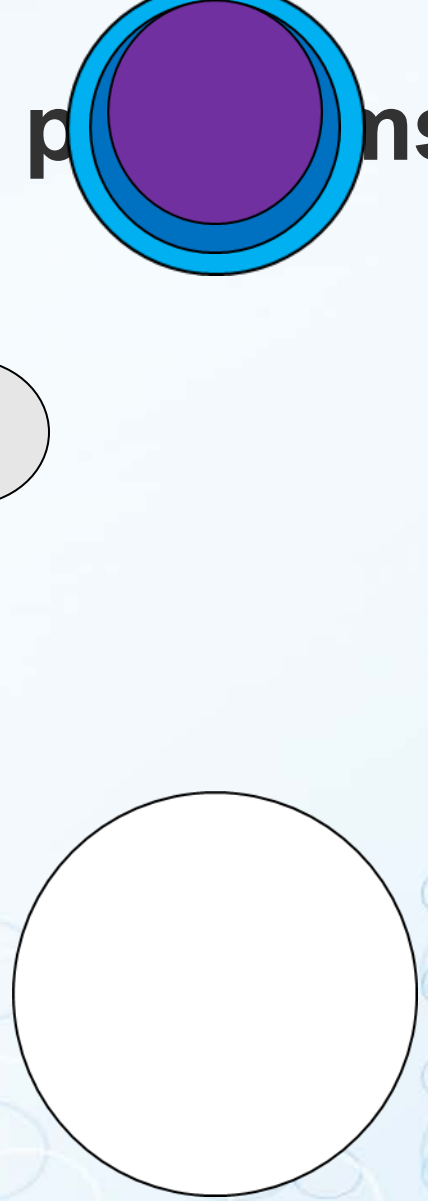
Genus: Community-based Social Marketing (CBSM)

- Belongs to the Family *Social*
  - Includes Person to person, eco teams, and peer champions
- 10 major campaigns since 2007
  - 4 Project Porchlight; cost avg 4.4M and saved avg of 300,000 MWh per campaign
- Tucson Power reported 45% participation

Use the taxonomy for clarity

- Using the taxonomy makes results more easily comparable across different program efforts.
- This helps build the data-set for Behavior-based programs generally
- Using the taxonomy with the ‘three family’ structure aids in designing programs that ‘stack’

Stack programs for optimal results



- Three aspects to human behavior that should be treated in every program
  - Rational/**Calculus**
  - Emotional/**Cognitive**
  - **Social**/Interactive
  - Physical/Habitual*

"The FortisBC *Energy Efficient Laundry* campaign may qualify as a stacked program as it draws elements from all three families. The program **gives away** clotheslines, offers **rebates** for ENERGY STAR washers, and includes an **educational** component on the energy savings benefits of washing clothes in cold water. In addition, a June 2012 press release reads:

> To further encourage people to hang their laundry out, FortisBC PowerSense **Ambassadors** will be visiting neighborhoods and leaving prize packs for homes they observe to be actively using a clothesline. People can sign up to "get caught hanging out" either online or when they pick up their laundry line."

Track every program

- All Behavior-based programs are measurable
- Behavior *can* work as a resource
- Track the success of programs
- Randomized control trials are a gold standard method
  - But not the ONLY method
- Metrics need not always be kWh or $$
  - Measure impressions/touches/attitude changes/awareness
  - At a minimum correlate with energy savings

Share information

- The collection and reporting of data from behavior programs currently varies wildly by state.
- ACEEE would like to see these results distributed via a central platform.
  - A centralized location and more uniform presentation would make it easier for researchers to draw robust and replicable results from the larger ensuing datasets.
- The Energy Information Administration would make an excellent location for such an effort.

Coordinate efforts regionally

- We recommend that utilities coordinate their behavior program efforts with others in their region.
  - Energy Trust of Oregon, for example, has had success in coordinating with Puget Sound Energy in Seattle, in part due to similar customer bases and climate.
- Smaller organizations may want to piggy-back on the efforts of larger regional suppliers.
  - Scale may affect the performance and cost effectiveness of specific program types (e.g. home energy audits and reports)

Coordinate across fuel types and sectors

We also suggest that electric utilities coordinate their efforts with other local utilities such as gas and water.

Smaller electric coops want to be strategic and consider a game-based program or a community-based social marketing program to round out other messaging.

Taxonomy not limited to utility programs

- Behavior programs can use this taxonomy in other areas that intersect with energy:
  - Water
  - Food
  - Waste
  - Transportation
  - Air quality

Stack, track, share, and coordinate

- Using these principles, it is our hope that utilities could develop program strategies that are:
- Successful in connecting with customers
- Cost-effective in their deployment
- Achieve targets set by state regulators
- Meet their own business needs

AND

- Deliver substantial energy savings

Want *more* Behavior?

- Go to www.aceee.org, register, then click keyword 'Behavior' to get updates and invites from our program.
- The Behavior, Energy, and Climate Change conference (BECC) also has numerous resources, available at:
  - Website: http://beccconference.org/
  - LinkedIn: http://www.linkedin.com/groups/Behavior-Energy-Climate-Change-BECC-3794406
  - Facebook: https://www.facebook.com/BECCconference
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Who Should Attend:

- Policymakers
- Energy efficiency program implementers
- Local, state, and federal agency personnel
- Utility staff
- NGOs
- Energy efficiency professionals
- Consultants
- Behavioral scientists

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"Behavior, Energy, and Climate Change"

Who Should Attend:

- Social and Behavioral science researchers
- Regulators and policymakers
- Utility staff responsible for programs
- Local, state, and federal agency personnel
- Consultants
- NGOs and Foundations
- Energy efficiency professionals