



Behavioral Assumptions Underlying California Residential Energy Efficiency Programs

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Goals of the White Paper

- Identify assumptions about consumers
- Examine in the light of theory and research
- Consider alternatives & improvements
- Identify unknowns that merit attention
 - Research, evaluation and/or experiments

Methods

- Analyze program information
 - PIPs, filings, evaluations
 - Consumer websites
- Key informant interviews
- Assess literatures
 - Existing critical reviews
 - Database search

Contents of the White Paper

1. Assumptions and the “policy frame”
2. The programs - what they are, what they do
3. Criticisms in light of theory & research
4. Assessing alternatives
 - Behavior econ., HH anthro, sociology of lifestyles, segmentation, EU innovations
5. Conclusions & recommendations

A Spartan policy frame

(from official policy and program manuals)

- Physical-technical-economic model: “PTEM”
- Avoided cost
- Device-centered
- KWh/therm impacts and \$\$\$ savings
- Installed *measures*
- Freezing energy *service levels*
- *Cost-effectiveness* tests

Applied to people (“Customers”)

- Mostly *absent*, but assumed to be ...
- calculating, rational, economically-oriented (costs, benefits, investments, returns, pay-backs, discount rates)
- knowledgeable and/or information-seeking
- individuals; decision-makers
- average/typical consumers

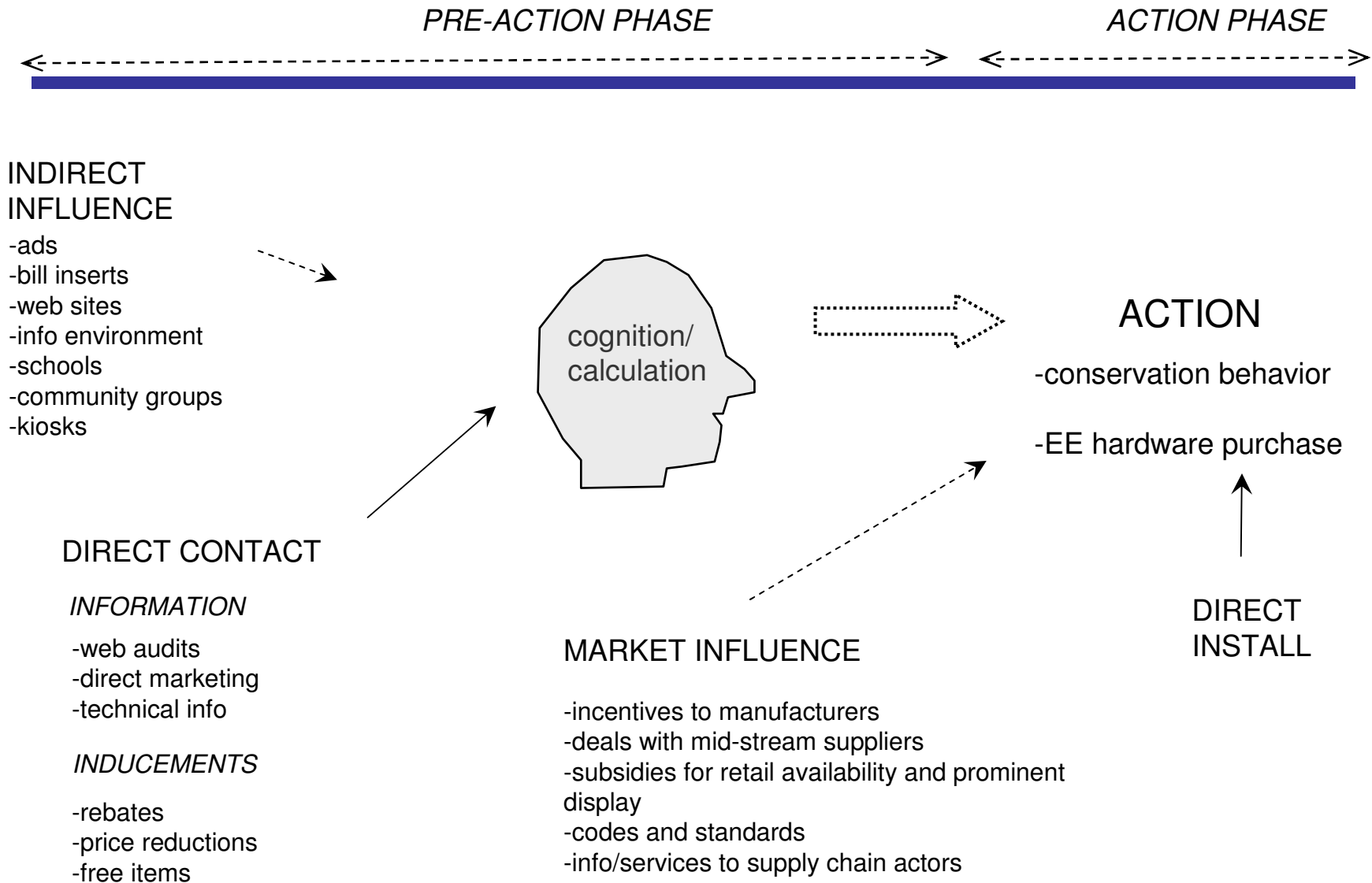
But long-recognized problems

- “efficiency gap” and “market failures”
- widespread irrational failure to adopt EE
- extreme “discount rates”
- barriers to adoption (e.g., “information deficit”)
- free riders
- market effects
- rebound effects (“take-back”)

What are the 75 programs doing?

- Address “information deficit”
 - Mass info, tailored info, educ. projects
 - Financial inducements (\$\$\$)
 - Rebates, price reductions
 - Gifts / direct installation
 - Information/inducement environments (up/mid/down-stream)
 - Proof, trust, \$\$\$, joint venture
- = direct + indirect + market-based influences*

Program Logics and Strategies



Overall conclusions about programs

- Widget-focused . . . *BUT*
- Stretching the policy frame
 - Added *information* elements
 - Added *market* intervention elements

Messages: “*save energy, save money, good for the environment*”

Primary widgets = CFLs & some HVAC

Real-world utility and program implementer experience

- PIPs and formal documents \neq knowledge
- More complex understandings
- Experience and iterative learning
- Weak connections to theory and research
- “Craft knowledge” is crucial, but also *fragile*

What does the social science research show ?

- Choices infrequent and not carefully considered
- Anything but cost and benefits are important
- Little information seeking; not sure what to do with info
- Groups not individuals use energy
- Consumption and conservation is highly varied (no average or typical consumers)
- System is characterized by *complexity*

and . . .

- Hierarchies of factors/variables in consumption and conservation
 - habits, psychological, social, contexts, constraints
- Different combinations for different behaviors or widgets
- Mass info not very effective
- Psychological variables (e.g., attitudes, values) trumped by context and constraint
- No clear agreement among models, theories, perspectives; little progress toward an integration

Alternative understandings/models

- Behavioral econ no magic bullet
- Understanding cultures and meanings important
- Lifestyles and social structure promising
- Segmentation not ready for prime time
- Promising European perspectives
 - Sustainable Lifestyles
 - Norms, routines, practices
 - It's not just “upstream” it's the entire chain

Climate change changes everything

- AB32 and California EE Strategic Plan
- Big Bold Ideas – zero energy, transform tech.
- *KEY QUESTIONS*
 - Is the EE policy frame up to the task?
 - Do we know enough to proceed with confidence?

Research needs: NRC, ARB, WP4

1. Dynamics of consumption & demand
2. Information + policy instruments
3. Consumer choice & constraint
4. Upstream effects
5. Breaking the consumption → well-being link
6. Linking consumers and government
7. Device & behavior-specific research and experimentation

Experiments: What can we try ?

- Will vary by energy use and behaviors involved
- Extremely difficult to design
 - Very specific interventions
 - Controlled conditions
 - Randomized and/or carefully measured external factors
- Need to be relatively large scale to detect small effects
- Equity and legal issues

Experiments - criteria for selection

- Where we have the most experience
 - CFLs
- Where the demand savings may be largest
 - summer air conditioning behavior in hot places
- Where the total energy savings may be greatest
 - vampires
- Where we can most readily generalize to other cases
 - appliance A, B or C

Experiments - what to vary ?

- Information, education, knowledge, experience
 - form, content, delivery system, frequency, duration
- Incentives, inducements, costs, prices, subsidies
 - amounts, timing, recipient, delivery system
- Point-of-sale
 - signage, advertising, packaged with other items/services
- Mid-stream and upstream
 - education, inducement, service provision, competition
- *Multi-actor multi-level change*
- *Household dynamics*
- *Community effects*
- *Culture change*

Experiments - in order to detect

- Short-term changes ?
 - behaviors, routines, usage patterns, consciousness, expertise, commitment, concern, competence
- Longer-term effects ?
 - behaviors, routines, usage patterns, consciousness, expertise, commitment, concern, competence
- Changes in behavior ? In technology choices ?
- Attributable to the intervention ?
- How and when and why ?

IDEAS ?

Contact information

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