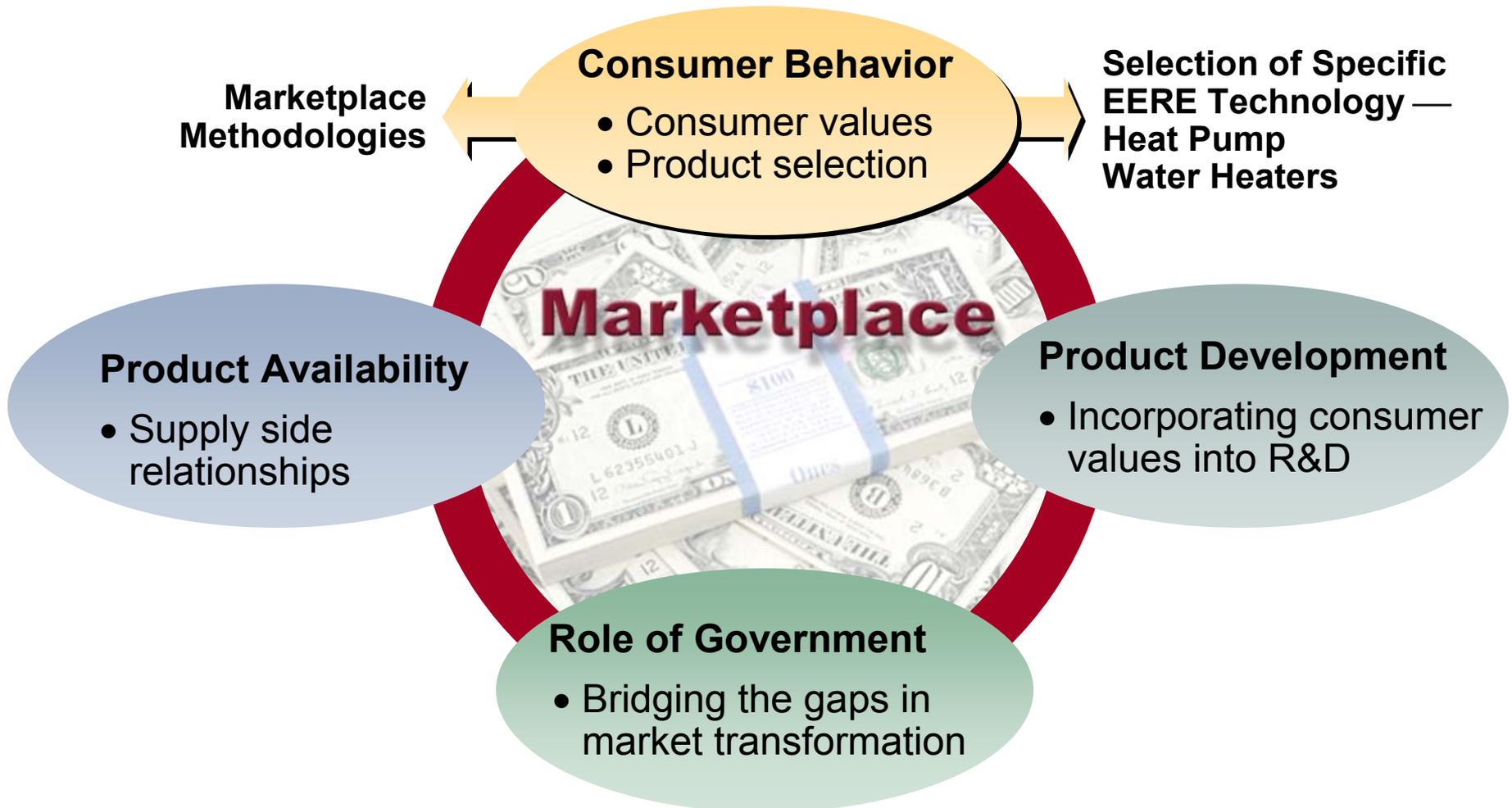


EERE's market transformation effectiveness requires understanding the marketplace



Overview of technology to market



Assessing Marketplace Methodologies for Understanding Consumer Values Influencing Product Selection in Building and Other EERE Technologies

Presented to

DOE's Office of Energy Efficiency and Renewable Energy

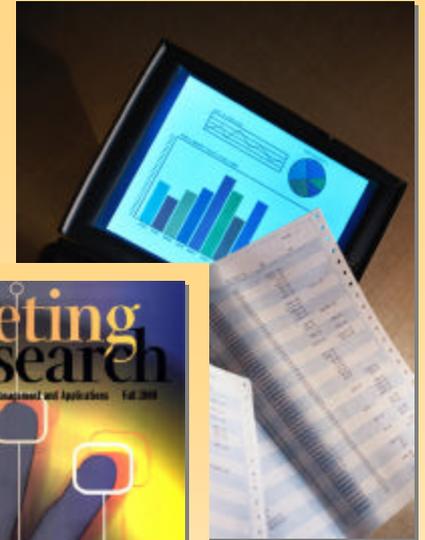
by

**Barbara G. Ashdown, David J. Bjornstad,
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EERE seeks to increase market acceptance of energy-efficient technologies

- What consumer values and product attributes drive product selection in the marketplace?
- What is the impact of market segmentation on product selection?
- What survey methodologies are used to assess consumer values/product attributes? What is the cost/benefit of these methods?
- What is the role of EERE for further market transformation given the marketplace study results?



Survey scope included open literature, market research practices

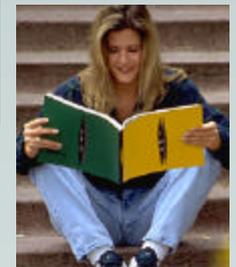
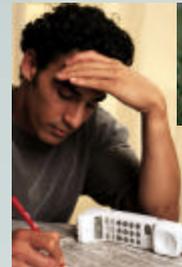
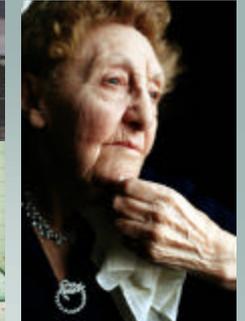
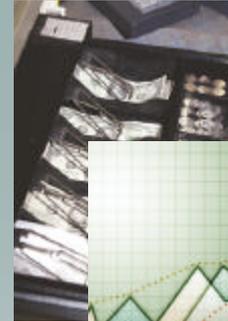


- Residential product focus
- EERE-developed products in building and weatherization, energy-intensive home appliances, lighting, and distributed and renewable energy



Consumer values drive product selection

- **Affordability**
- **Financial security and risk**
- **Conservation and ecological ethic**
- **Social concern and social responsibility ethic**
- **Comfort**
- **Convenience**
- **Reliability**
- **Independence and self-reliance**
- **Sensory quality of experience**
- **Status, image, and aesthetics**
- **Timing of entry into the market – life and technology cycles**



Market segmentation identifies receptive populations for product selection

Timing to enter market and willingness to adopt new technologies are factors



Consumer life-cycle issues influence choices for homeowners/renters



Technology life-cycle adoption is influenced by economic status and “do-it-yourself” capability



Most publicly available studies on segmentation and energy conservation are over 10 years old



Market survey research key to understanding consumer behavior

Summary of research methodologies: expenditure by research method

Worldwide split	60% ad hoc	40% continuous
Worldwide split within ad hoc	80% quantitative	20% qualitative
Worldwide split within quantitative	Telephone: North America Scandinavia Australasia	Face-to-face: Central and South America Most of Europe Asia
Worldwide split within qualitative	75% groups	25% one-on-one

Source: Samuels, J. 2001. "ESOMAR Annual Study of the Market Research Industry 2000."

Quantitative and qualitative methods used together to assess consumer values

Quantitative

- Provide numeric data and dominate survey process
- By mail, telephone, face-to-face interviews, omnibus, and online

Qualitative

- Provide understanding about the how or why of issue provided through an observer. Process is open-ended
- Used to formulate qualitative questions and follow up on unclear data
- By observation, focus group, unstructured interview, and online

Trade-offs between balancing timeliness and consumer bias

Cost/benefit methodologies matrix outlines major approaches

Methodologies Matrix ^{3/4} Quantitative						
Methodology	Survey Format	Cost	Benefit	Limitation	Price Range (\$)	Best When Project Has
Mail and self-administered questionnaire	Print	Moderately inexpensive	Removes interviewer bias	Long time frame needed to collect data	10K+	Longer time frame
Telephone survey	Print and computer-assisted telephone interviews (CATI)	Moderately inexpensive	Speed	Interviewer bias	15K+	Short time frame
Face-to-face interview	Print and computer-assisted personal interviews (CAPI)	Moderately expensive	Personal	Interviewer bias	35—40 per interview	General audience
Omnibus surveying	Print and computer-assisted telephone interviews (CATI)	Moderately inexpensive	Speed	Small amount of data received	750 per question for phone	Small budget

Cost/benefit methodologies matrix outlines major approaches

Methodologies Matrix ^{3/4} Quantitative (continued)

Methodology	Survey Format	Cost	Benefit	Limitation	Price Range (\$)	Best When Project Has
Email survey	Electronic	Moderately inexpensive	Speed	Penetration: 54% of U.S. using internet	15K+	General audience
Bulletin boards	Electronic	Moderately inexpensive	Speed	Penetration	15K+	Shorter time frame
Web survey	Electronic	Moderately inexpensive	Speed	Penetration	15K+	Shorter time frame
Downloadable surveys	Electronic	Moderately inexpensive	Depth	Penetration	20K+	General audience

Cost/benefit methodologies matrix outlines major approaches

Methodologies Matrix ³ / ₄ Qualitative						
Methodology	Survey Format	Cost	Benefit	Limitation	Price Range (\$)	Best When Project Has
Observation	Print and electronic (handhelds)	Moderately expensive	Hands-on data	Interviewer bias	35—40 per observation	Longer time frame
Focus group interviews	Print and electronic	Moderately expensive	Personal	Interviewer bias	15K+	Strong need for personal feedback
In-depth unstructured interview	Print and electronic	Moderately expensive	Personal	Interviewer bias	35—40 per interview	Strong need for personal feedback
Web-moderated interview	Electronic	Moderately inexpensive	Depth	Penetration	20K+	General audience

Sample case studies reflect complexity of survey process

- Residential energy-efficient lighting study
Regional Economic Research, Inc.
- Goal: determine energy savings from
fluorescent lighting

Regional
Alliance



**Attributes of standard fluorescent bulbs (halogen)
vs energy-efficient lamps (ENERGY STAR)**



	Standard	Energy Efficient
Bulb temperature (°F)	750 to 860	100 to 150
Bulb life	5 to 17 months	3 to 8 years
Bulb cost	\$4 to \$6	\$20 to \$30
Power consumption (watts)	265 to 335	55 to 80
Torchiere light output (lumens)	3200 to 5500	3000 to 4100
Torchiere efficiency (lumens per watt)	10 to 12	60 to 65
Operating cost per year	\$35 to \$75	\$7 to \$15

Source: Regional Economic Research, Inc. 2000. "Residential Energy-Efficient Lighting Consumer Research," March, p. 2-30.

Lighting research produced important results

- Required telephone interview survey, focus groups, and an online questionnaire
- Past negative perceptions of product dominated response (expensive, unreliable, too large)
- Consumers interested in long bulb life, interesting shapes, smaller sizes, low heat, and quality of light
- Consumer awareness was largest barrier to CFL



Lighting research produced important results *(continued)*

- **Interactive retail displays considered important**
- **Link with kitchen remodeling was apparent**
- **Consumers indicated interest in a product that was small, had a medium life and was less costly**



No product was on the market to meet consumer values

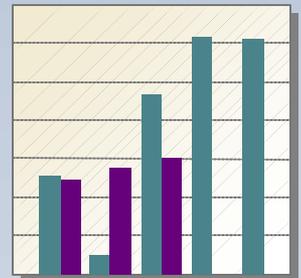
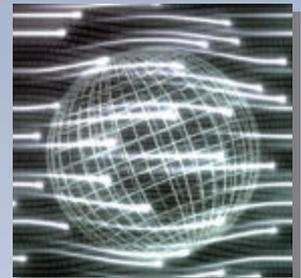
Consumer value assessment is complex and proprietary

- **Issues that affect consumer selection of technologies include:**
 - Consumers have limited ability to retain complex technical/performance information about products
 - Information needs to be relevant to what consumers value
 - Store retail people are important sources of information in decisions
 - Energy efficient products need to be available and advertised in terms of what consumers value
- **Most case study information is still proprietary, unavailable, and targeted to specific marketplace interests**



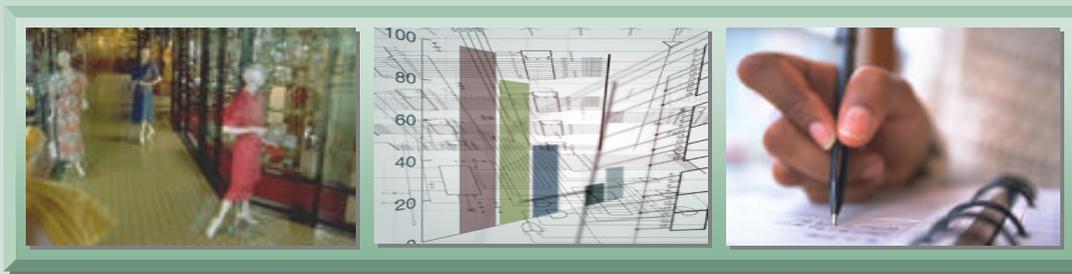
EERE can increase market transformation through value assessment

- Continue to conduct/sponsor market research in areas where gaps remain
- Offer ways to provide greater public access to important trends in consumer value research (website?)
- Review regularly the results from market research on consumer values
- Support update of studies in population segmentation and analysis
- Employ consumer panels to assess trends in overcoming market adoption gaps



Summary

- **Effective market transformation requires understanding of how consumers' values affect product selection**
- **EERE can continue to sponsor, conduct, study, and publicize market research on consumer behavior**
- **Cost effectiveness in survey design requires careful planning using multiple methodologies**



Summary *(continued)*

- **EERE can collaborate to support products that consumers value and will adopt**
- **Further study of the actual marketplace will support EERE's role in market transformation**



Key topics for further market transformation study

Consumer Behavior

- Understanding consumer values in selecting and using specific EERE technologies $\frac{3}{4}$ heat pump water heaters

Product Availability

- Assessing the supply side relationships in market transformation

Product Development

- Incorporating consumer values into the R&D process

Role of Government

- Assessing appropriate market intervention for government

Virtual team will be assembled to support studies



Questions and
ideas are welcome