Behavior, Energy, and Climate Change

Carrie Armel, Ph.D.
BECC Co-Chair
Technological & Economic Tools

Tools for Accelerating Climate & Energy Solutions

Behavioral Tools

- Public Policy
- Sociology
- Economics
- Education
- Medicine
- Marketing
- Social Cognitive & Perceptual Psychology
- Communication
- Public Health
- City Planning
- Anthropology & Sociology
- Technology Design
- Diffusion Theory
- Behavioral Economics
- Persuasion Theories
- Behavioral Epidemiology
- Social Marketing
- Community Based SM
- Consumer Behavior
- Communication Theories
- Persuasion Theories
- Behavioral Design
- Technology & Sociology
Behavioral Interventions

- Policy
- Physical Env.
- Media/Marketing
- Community-Based
- Individual

- Complementary interventions
- Many tools at each level

Based on the socio-ecological model of health behavior
Policy

1. Increase program participation
   - E.g., green electricity or carbon credits

2. Address higher up front costs
   - Amortize costs, etc.
   - E.g., solar panels
Built Environment

**Model City: Muenster, Germany**
- 35% of all vehicle trips made by bike
- Popul.: 300,000

**Infrastructure**

**Safety**

**Promotion**

**Figure 5-4**: Proportion of trips in urban areas made by walking and bicycling in North America and Europe, 1995

Technology

BEHAVIOR IMPACTS
• Purchasing
• Installation
• Proper & persistent use

PROGRAMMABLE THERMOSTATS
• 70% of homeowners find them too difficult to operate and lose out on energy savings benefits (Honeywell, 2004)
• Designed from engineer’s perspective of what’s easiest to implement
• Should be designed from user’s perspective of what’s easiest to use

ELEMENTS OF DESIGN
• Learnability
• Usability
• Motivation, incl. identity signaling
• Aesthetics (Decision Analyst, 2007)

**Technology**

**ELECTRICITY FEEDBACK**
- 5-15% reductions in ~40 studies
- Greater reductions w/ specific feedback

**SMART METERS**
- Throughout U.S. & Europe
- CA - All buildings by 2012; HAN plans unclear

**FEEDBACK & CONTROL TECHNOLOGIES**
- Web displays of smart meters data
- Wireless HANs or disambiguation provide appliance specific data
- Chips embedded in appliances allow for control
Media/Marketing

Entertainment Education
Serial dramas are extremely effective for positive societal change

How do they work?
1. 2/3 Entertainment
2. Modeling
   - Instruct
   - Create norms
   - Build self-efficacy (confidence)
   - Demonstrate expected outcomes
     - Pos., Neg., & transitional chars.
Community-Based

SUCCESSFUL PROGRAMS
- Hood River Project
- EnergyMark
- Gore’s 1000 soldiers
- Interfaith Power and Light

ADVANTAGES
- Messages feel personal, not anonymous
- Caters information for people like me
- Enhanced learning - Direct experience
- Additional tools
  - Goals, Feedback, Barriers, Practice
  - Group feedback & competitions
  - Commitment
Beyond Residential

• Government
• Business
• Evaluation & Modeling
Can we expedite the development of successful interventions?
Design

Project Timeline

# of Opportunities

Understand
Observe
POV
Visualize
Prototype
Test
Diffusion of Innovation

Characteristics of People

Characteristics of Networks

Characteristics of Innovations

- Simplicity - Is it easy to understand and use?
- Observability - Are the results of using it visible?
- Trialability - Can it be experimented with?
- Compatibility - Is it consistent with existing values/needs?
- Relative Advantage - Is it better than the prior thing?
### DAY 1  
**SUNDAY, NOV. 15**

- **5:00 – 9:10 PM**  
  Conference Registration & Speaker Check-In

- **7:00 – 9:00**  
  Dinner

### DAY 2  
**MONDAY, NOV. 17**

- **7:00 AM – 8:00**  
  Conference Registration & Speaker Check-In

#### Session 1  
**8:30 – 10:30**  
**Regency Ballroom**

**Setting the Stage: Behavior, Energy & Climate Change**

- **1A – Regency A**  
  CA Climate Policy

- **1B – Regency B**  
  Entertainment & Hollywood

- **1C – Regency C**  
  Leveraging Social Norms

- **1D – Regency D**  
  Market Environment

- **1E – Big Sur**  
  Energy Modeling

#### Roundtable Discussions  
**12:45 – 2:00**

- **Small Group Discussions**

#### Lunch  
**12:45 – 2:00**

### DAY 3  
**TUESDAY, NOV. 18**

#### Session 2  
**8:30 – 10:30**  
**Regency Ballroom**

**Plenary Panel: Points of Leverage on Climate Change**

- **2A – Regency A**  
  Green Jobs and Workplaces

- **2B – Regency B**  
  Branding

- **2C – Regency C**  
  Applying Design Thinking

- **2D – Regency D**  
  Assumptions Underlying Programs

- **2E – Big Sur**  
  Social Networks

#### Lunch  
**12:45 – 2:00**

**Keynote Speaker**

#### Session 3  
**2:45 – 4:15**

- **3A – Regency A**  
  Business & Future Legislation

- **3B – Regency B**  
  Technologies

- **3C – Regency C**  
  Business

- **3D – Regency D**  
  Feedback

- **3E – Big Sur**  
  Behavioral Economics

#### Poster Session & Reception  
**5:00 – 7:00**

### DAY 4  
**WEDNESDAY, NOV. 19**

#### Session 4  
**7:30 – 9:30**

- **4A – Regency A**  
  Communication & Organizational Perspectives

- **4B – Regency B**  
  Markets & Messages

- **4C – Regency C**  
  Culture, Values & Identity

- **4D – Regency D**  
  Behavior Programs

- **4E – Big Sur**  
  Demand Response & Energy Management
It’s a failure to apply behavioral tools, not a people failure.
It’s a design failure, not a people failure.

-Craig Lawrence, IDEO
# BEHAVIOR, ENERGY & CLIMATE CHANGE CONFERENCE

## DAY 1
**SUNDAY, NOV. 16**

- 7:00 – 9:00: Breakfast & Coffee Break
- 9:00 – 10:30: Kick-Off Program & Dessert Reception

## DAY 2
**MONDAY, NOV. 17**

- 7:30 – 9:00: Continental Breakfast
- 8:30 – 10:30: Opening Plenary

### Session 1

| Time  | Session | Topic
|-------|---------|-------|
| 11:00 | 1A Regency A | CA Climate Policy
| 1B Regency B | Entertainment & Hollywood
| 1C Regency C | Leveraging Social Norms
| 1D Camelot | Built Environment
| 1E Big Sur | Energy Modeling

### Lunch

### Session 2

| Time  | Session | Topic
|-------|---------|-------|
| 2:00  | 2A Regency A | Behavior as an Energy Resource
| 2B Regency B | New Media Strategies
| 2C Regency C | Lessons from Public Health
| 2D Camelot | Diffusion of Innovation
| 2E Big Sur | Carbon Footprints & Regulations

### Break

### Roundtable Discussions

| Time  | Topic
|-------|-------|
| 4:00  | Small Group Discussions in Regency Ballroom

### Panel Discussions & Panels

| Time  | Topic
|-------|-------|
| 4:30  | Panel: Regency A, Energy Efficiency, Eco-system
| 4:30  | Panel: Regency B, SIsters of the Plan
| 4:30  | Panel: Regency C, Bridging Gap Between Research & Investment
| 4:30  | Panel: Camelot, Local Government Partnership

### Free Time

- 5:30 – on: See Bulletin Board for Locations and Informal Meetings
- 8:00 – 9:00: Films & Informal Meetings

## DAY 3
**TUESDAY, NOV. 18**

- 7:30 – 9:00: Continental Breakfast
- 8:30 – 10:30: Plenary Panel: Points of Leverage on Climate Change

### Session 3

| Time  | Session | Topic
|-------|---------|-------|
| 11:00 | 3A Regency A | Green Jobs and Workplaces
| 3B Regency B | Branding
| 3C Regency C | Applying Design Thinking
| 3D Camelot | Assumptions Underlying Programs
| 3E Big Sur | Social Networks

### Lunch

### Keynote Speaker

| Time  | Topic
|-------|-------|
| 1:30  | 4A Regency A, Behavior & Future Legislation
| 4B Regency D | Segmentation
| 4C Regency C | Business
| 4D Camelot | Feedback Technologies
| 4E Big Sur | Behavioral Economics

### Networking and Free Time: Poster Session Set Up

- 4:00 – 5:00: Poster Session & Reception
- 5:00 – 7:00: Poster Session & Reception

## DAY 4
**WEDNESDAY, NOV. 19**

- 7:30 – 9:30: Continental Breakfast
- 9:30 – 10:30: Plenary Panel: Points of Leverage on Climate Change

### Session 4

| Time  | Session | Topic
|-------|---------|-------|
| 10:30 | 4A Regency A | Washington Perspectives
| 4B Regency B | Marketing & Messages
| 4C Regency C | Culture, Values & Identity
| 4D Regency D | Organizational Behavior
| 4E Regency E | Feedback Programs
| 4F Regency F | Demand Response & Energy Managmt

### Coffee Break

### Session 5

| Time  | Session | Topic
|-------|---------|-------|
| 10:30 | 5A Regency A | Cities
| 5B Regency B | Framing & Context
| 5C Regency C | Consumption & Lifestyle
| 5D Regency D | Business Decision Chains
| 5E Regency E | Transportation
| 5F Regency F | Colleges & Competitions

This schedule is subject to change.