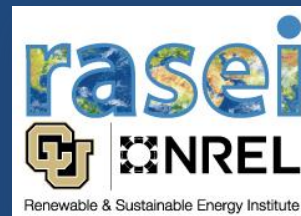


May 2012

Sustainable Energy Resources for Consumers (SERC)  
Weatherization Innovation Pilot Program (WIPP)

# Low-Income WEATHERIZATION

## The Human Dimension



# Overview

## the human dimension

- Introduction
- Framework
  - Know – Understand your audience
  - Engage – Facilitate and communicate
  - Enable – Use motivational techniques
- Conclusion





# Introduction

## behavior matters

### Two households in Austin, TX

- 1 adult, 3 children of similar ages
- 850 square foot apartment, same building

**\$42.80 or**  
**469 Kilowatt -hours**

**\$83.68 or**  
**835 Kilowatt-hours**



**Buildings don't use energy, people do!**

#### Introduction

- Behavior
- Weatherize
- Framework

Changing energy-use behaviors can  
reduce household energy consumption  
by 25%!

Potential impact is large, yet behavior is  
often overlooked







# Introduction

## weatherization

Weatherization programs aim to reduce energy costs for low-income families

### Introduction

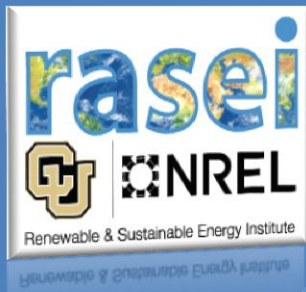
- Behavior
- **Weatherize**
- Framework

To maximize savings use a comprehensive approach

- Building/Technology
- Behavior



WEATHERIZATION



# Introduction

## weatherization

### Unique opportunity to influence behavior

- Already work one-on-one with households
- Low-income households are ideal for discussing behavior change

#### Introduction

- Behavior
- Weatherize
- Framework

### Client Education $\neq$ Behavior Change

Training for measures installed, discuss energy bills, provide tip sheets

Understand and engage households to facilitate a change in behavior

WEATHERIZATION

## Designing the behavior-change component of weatherization programs

### Introduction

- Behavior
- Weatherize
- Framework

**KNOW**

Understand your audience

**ENGAGE**

Facilitate and communicate

**ENABLE**

Use motivational techniques

WEATHERIZATION



# KNOW

Understand your audience



WEATHERIZATION



**every household is different**

**To influence behavior, understand the audience and tailor the program**

**One-size fits-all approaches are ineffective...**

## Know

- Households are different
- Physical characteristics
- Split incentives
- Community & Household

## Engage

## Enable

**How is energy being used?**

Habits, electronic devices, medical

**What are the barriers?**

Knowledge, access, culture, cooperation

**What are the motivations?**

Financial, religious, "waste less" philosophy

## Southern California Edison study of low-income households that are high energy users

### Know

- Households are different
- Physical characteristics
- Split incentives
- Community & Household

### Engage

### Enable

### 1 Hostage to Domicile

- Older homes and appliances
- No means to improve condition

### 2 Declining Health or Wealth

- Retired or disabled
- Aware, but there is a need

### 3 Merry Users

- Well-off and educated
- Lack of interest in energy use

### 4 Concerned but Uninformed

- Younger and less educated
- Unaware of energy use

### 5 Divided Household

- Larger households, more appliances and electronics
- Cooperation is a barrier
- Tailor educational materials and encourage cooperation
- Discuss devices with parental control

Tailor program to  
specific household-type



every household is different

To the extent possible, programs should consider the following characteristics

## Know

- Households are different
- Physical characteristics
- Split incentives
- Community & Household

## Engage

## Enable

### Physical

- Dwelling type
- Climate region

### Split Incentives

- Owner vs. renter
- Pays energy bill

### Community & Household

- Socio-economic
- Demographics

# Behavior-change recommendations should vary with physical characteristics

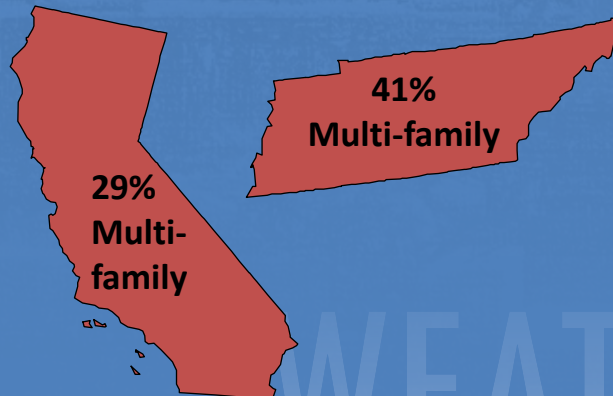
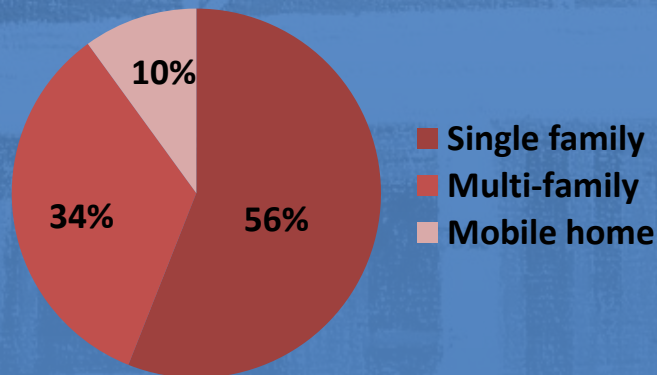
## Know

- Households are different
- **Physical characteristics**
- Split incentives
- Community & Household

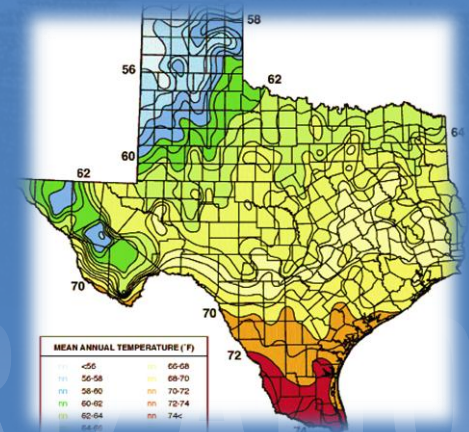
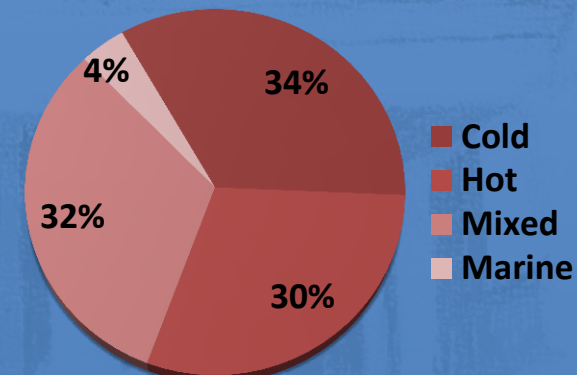
## Engage

## Enable

## Variation in dwelling type



## Variation in climate





# Motivations and barriers differ between homeowners and renters, and by who pays the bill

### Know

- Households are different
- Physical characteristics
- **Split incentives**
- Community & Household

### Own

### Rent

**Pay bill**

No split incentive

High effort to reduce energy use

**Do not pay bill**

Low effort to reduce energy use

Low effort to reduce energy use

If do not pay bill, motivation to save is unrelated to money

Renters may have fewer options for behavior change

Engage

Enable

# Learn as much as possible about the community and household

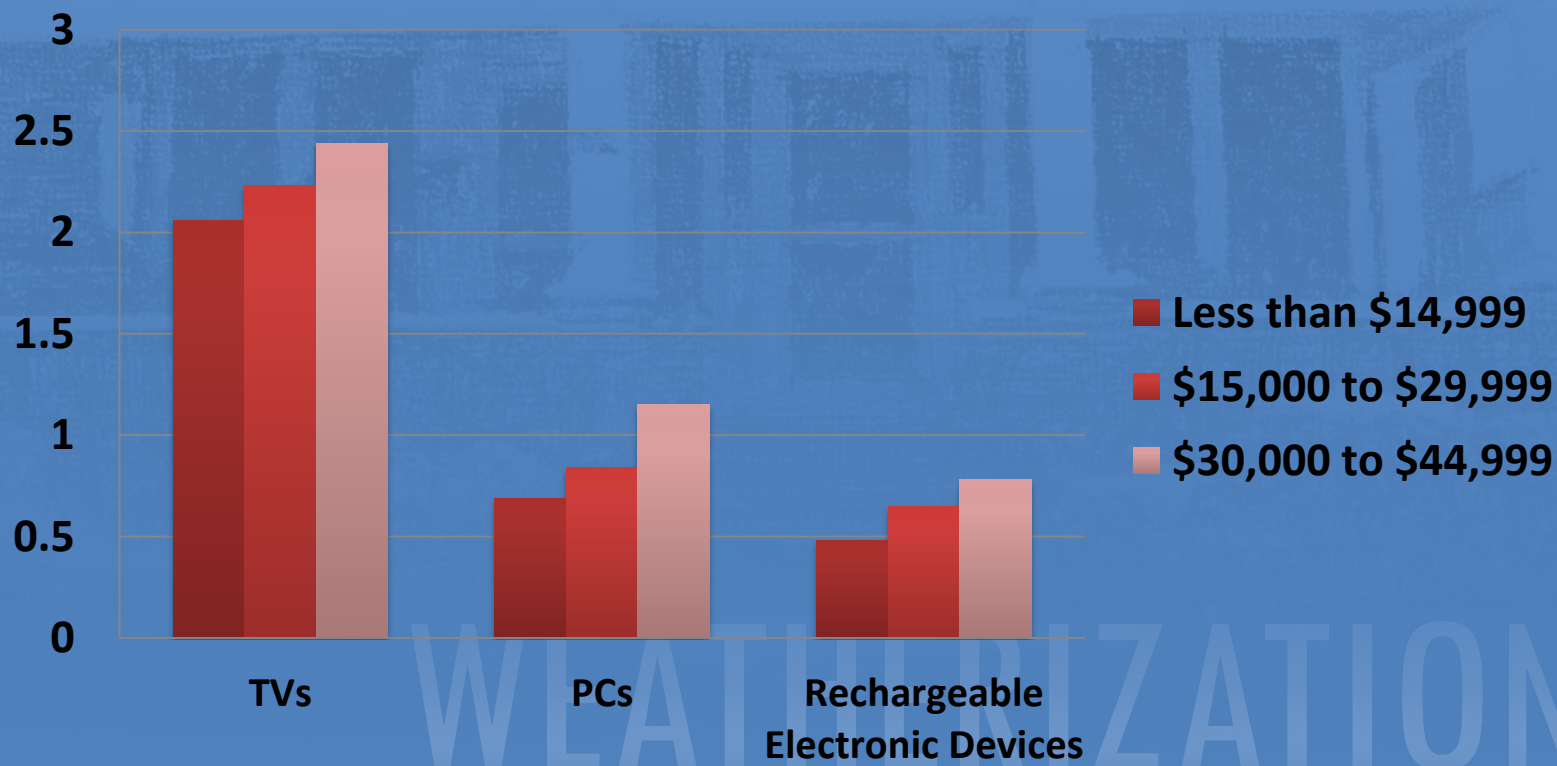
## Know

- Households are different
- Physical characteristics
- Split incentives
- **Community & Household**

## Engage

## Enable

**Average Number of Electronic Devices per Household**





Is the community mostly retirees or families? Large immigrant population?

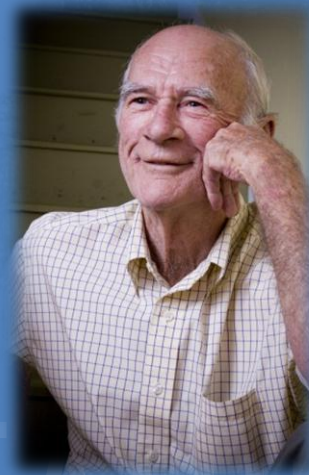
How many household members are there (ages, relationships)?

### Know

- Households are different
- Physical characteristics
- Split incentives
- Community & Household

### Engage

### Enable



## Air drying clothes outside saves energy



Household uses a dryer



Effective

Humid or wet climate

Stiffness and fading

Theft is a concern



Ineffective

**“Knowing” yields more  
effective recommendations**

Know

• Scenario



Engage



Enable



## Sustainable Living Project (Pilot)

### Wellstone apartment in Minneapolis, MN

- “Green” building but high bills
- Residents are mostly low-income, East-African immigrants



Know

• Case study



Engage



Enable

Know

• Case study



Engage



Enable


## Conducted household interviews to learn about target audience

- Religion teaches to only use the resources they need
- Wine bottle imagery was offensive
- Resident involvement, translated materials

Magacaaga \_\_\_\_\_ Lambarkaaga zip ka \_\_\_\_\_

Cinwaankaaga internetka \_\_\_\_\_

Cinwaankaaga guriga (haddii aad rabto) \_\_\_\_\_



	Adigu gurigaaga qorshe u sameyso si aad u dhaqaaleysato lacagta iyo korontada	CO2 Waxaad iska yareyso/sannadkii	Lacagtaad dhaqaaleysay
<input type="checkbox"/>	Is-baddel samee—iska baddel nalaalkii hore oo soo libso nalaalka casriga iyo qaalka ah ee (CFL)	107 Culeyska	\$5/Sannadkii
<input type="checkbox"/>	La-qabso oo raac bamaamij—heerkuilka gurigaaga ka dhigo 8 digni 8-dii saac	497 Culeyska	\$91/Sannadkii
<input type="checkbox"/>	Biyo qabow isticmaal—dharka ku meyro biyo qabow	930 Culeyska	\$86/Sannadkii
<input type="checkbox"/>	Iska dhig baabuurka—raac basaska, tareenka; usbuuciiba maalin lugee ama baaskii kaxeysa	811 Culeyska	\$154/Sannadkii
<input type="checkbox"/>	Isu gee faa'iidooyinkaaga	_____ Culeyska	\$ _____

Questions? Contact Neely Crane-Smith, Challenge coordinator at 612-335-5852 or ncranesmith@mncee.org



- **United States Census Bureau:**  
<http://quickfacts.census.gov/qfd/index.html>
- **Community development agencies or other local organizations**
  - **State Associations of Community Development Corporations**
  - **Action Without Borders:** <http://www.idealists.org/>
  - **Habitat for Humanity:** [www.habitat.org/](http://www.habitat.org/)
- **Community or opinion leaders**
- **Household focus groups, surveys, interviews**

Know

• Methods



Engage



Enable

WEATHERIZATION

# ENGAGE

Facilitate and communicate



WEATHERIZATION





# Engage

tailoring is not enough

“Knowing” allows information to be tailored, but information alone is ineffective at changing behavior

Know

Engage

- Tailoring is not enough
- Facilitate
- Method
- Principles

Enable

To engage households in the process

- Be a facilitator, not a trainer
- Use effective methods of communication
- Keep in mind basic communication principles

WEATHERIZATION

## Be a *facilitator*, not a trainer!

- Provide support and assistance, engage in a **two-way conversation**, give guidance
- **Actively involve households** in identifying solutions rather than telling them what to do



Know

Engage

- Tailoring is not enough
- **Facilitate**
- Method
- Principles

Enable



For example, programmable thermostats

Be aware of barriers and work with households to identify solutions

Know

Engage

- Tailoring is not enough
- Facilitate
- Method
- Principles

Enable

- Determine appropriate temperatures and time settings
- Show how to program it, then have them do it



Engage households multiple times...  
Before, during, and after weatherization

Know

Engage

- Tailoring is not enough
- Facilitate
- Method
- Principles

Enable

- Opportunity to “know” the household
- Builds trust
- Most behaviors are habitual





Use multiple forms of communication...  
Households will only be exposed to  
some methods

## Methods of Communication



Increasing effectiveness →

WEATHERIZATION

Know

Engage

- Tailoring is not enough
- Facilitate
- **Method**
- Principles

Enable

The most common form of face-to-face communication is by program staff

Know

Engage

- Tailoring is not enough
- Facilitate
- **Method**
- Principles

Enable



An even more effective approach uses trusted messengers from the community

WEATHERIZATION



Create opportunities for people to share experiences and learn from one another, further encouraging energy savings

Know

Engage

- Tailoring is not enough
- Facilitate
- **Method**
- Principles

Enable



WEATHERIZATION

For all methods of communication, keep in mind two basic principles

- Do not overload the household with information or choices
- Keep information simple and non-technical

Know

Engage

- Tailoring is not enough
- Facilitate
- Method
- Principles

Enable





## Less effective

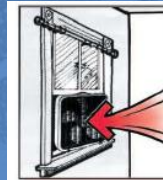
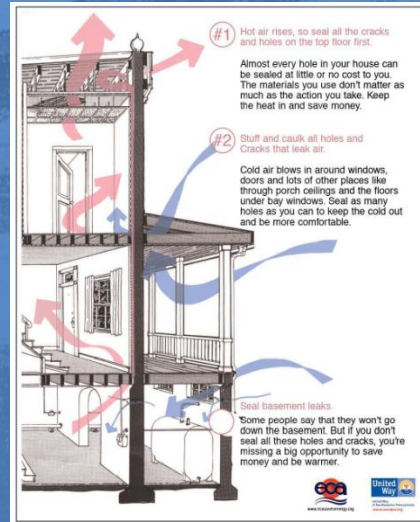
## More effective

### Know

### Engage

- Tailoring is not enough
- Facilitate
- Method
- Principles

### Enable



**Switch from Air Conditioning to fans to stay cool. Exhaust hot air when it's cooler outside.**

SAVE **\$49** or 350 Kilowatt-Hours—Per Family of 3—Per Year



**Electric usage adds up so turn off unused TVs, lights and appliances.**

SAVE **\$37** or 267 Kilowatt-Hours—Per Family of 3—Per Year

### Lighting Energy Saving Tips

Electric lights account for about 10 to 15 percent of your electric bill. You can save money on lighting with little or no effort or cost. The best way is to turn off lights when they're not needed and to not overlight areas. Take a walk through your house and see where you can make these energy savings changes:

- Use "task lighting" wherever possible. In other words, use a small lamp for reading or working—light the subject instead of the entire room.
- Don't use "long-life" incandescent bulbs. They're less energy efficient than ordinary bulbs, giving off less light per watt.
- For areas that need a great deal of light, use one large wattage bulb instead of several small ones (one 100-watt bulb actually provides more light than two 60-watt bulbs).
- Use fluorescent lights where possible, they're much more efficient. Compact fluorescent lamps will fit into normal light sockets and will save you about \$40 over the life of the bulb.
- When buying bulbs, check the package for information. Light is measured in lumens—you want the most lumens per watt.
- Dimmer controls and three-way switches on lamps can reduce energy use by allowing you to select the lighting levels sufficient for your needs.

be resistance when you pull on the bill. Do this in several spots around the door. If you find a loose area, you might only have to clean the gasket. If it is loose or torn, you may be able to fix it with glue. If it can't be fixed, contact a dealer that handles your model and get a new gasket.

- Keep the coils on the back or at the bottom of the refrigerator clean and cool to keep it working at peak efficiency. Periodically remove dirt and vacuum the coils. Place the refrigerator as far away as possible from heat sources such as stoves and radiators in order to keep the coils cool. Also leave a few inches of space between the coils and the wall to allow cooling air to circulate.
- Let hot food cool before storing it and the refrigerator will use less energy.
- Both the freezer and the refrigerator work more efficiently when relatively full. Items in the refrigerator should be spaced a little to allow air to circulate around them.
- Cover liquids. Uncovered liquids add humidity, making the refrigerator work longer.
- Invest in a refrigerator thermometer and keep the refrigerator at the proper temperature. The refrigerator compartment should be at 38° to 40° and the freezer at about 5°. For long-term storage in a separate freezer unit, the temperature should be 0°.



**Energy Saving Tip:** If you reduce your thermostat setting by five degrees or more when you are asleep or away, you could save up to 5% of your heating costs.

## PowerSavvy (pilot) - Queensland, Australia

Know

Engage

• Case study

Enable

- Advisors make in-home visits
- Advisors are from the community
- Broad strategy increased word-of-mouth

### Early results

- 61% participation rate (875 consultations)
- Residents reported savings of 16%

WEATHERIZATION



# ENABLE

Use motivational techniques



WEATHERIZATION

Increase effectiveness by incorporating well-established motivational techniques

For example:

- Commitments
- Goal setting
- Prompts
- Feedback
- Social norming





Saying that you will act a certain way  
makes it much more likely that you will

Ask households to make a voluntary  
commitment or pledge

Know

Engage

Enable

- Motivational techniques
- **Commitment**
- Goal Setting
- Prompts
- Feedback
- Social Norming
- Combine techniques

No  
commitment

Verbal

Written

Written and  
publicized

Increasing effectiveness →

WEATHERIZATION

## Set specific goals for the household

## Goals should be challenging, but achievable



## More effective if you provide

- Tools to help households reach their goal
- Feedback on performance in relation to the goal

Know

Engage

Enable

- Motivational techniques
- Commitment
- **Goal Setting**
- Prompts
- Feedback
- Social Norming
- Combine techniques



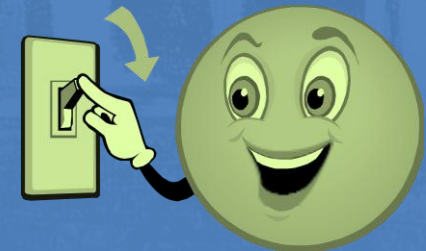
Household has already decided to act,  
remembering is the barrier

Position prompts where the  
action occurs



Examples include:

- Light switch stickers
- Stickers for a calendar
- Blinking light



Know

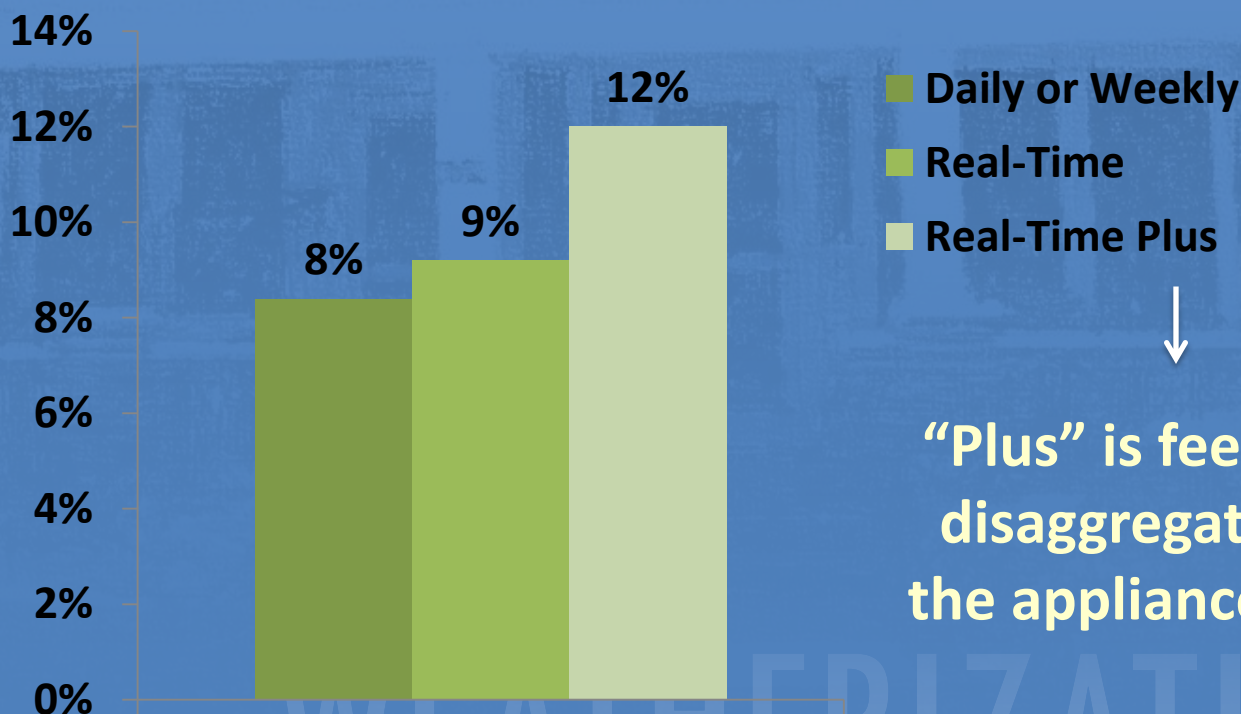
Engage

Enable

- Motivational techniques
- Commitment
- Goal Setting
- **Prompts**
- Feedback
- Social Norming
- Combine techniques

## Provide households with information about their energy use

### Average Household Electricity Savings



“Plus” is feedback disaggregated to the appliance-level

Know

Engage

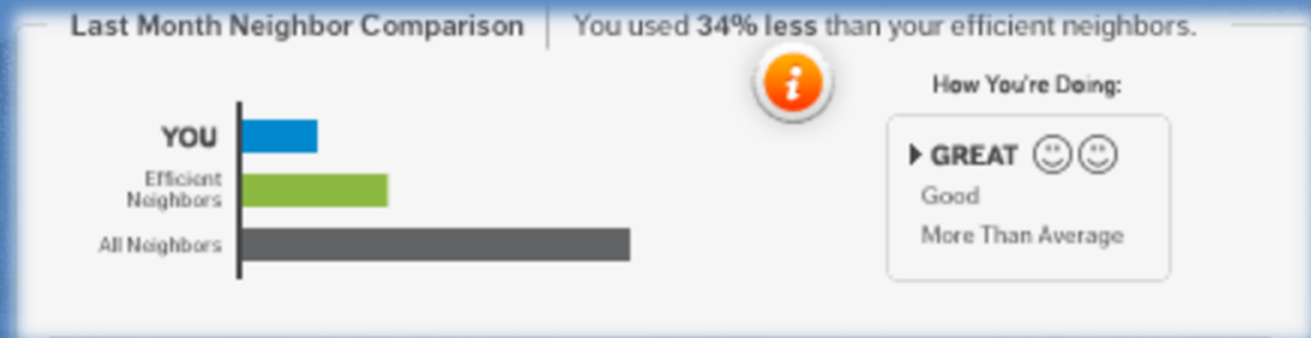
Enable

- Motivational techniques
- Commitment
- Goal Setting
- Prompts
- **Feedback**
- Social Norming
- Combine techniques



## Increasingly households are getting feedback in a social context

- Neighbor energy-use comparison



- Newspapers or yard signs
- Neighborhood groups



## Combine motivational techniques

Know

Engage

Enable

- Motivational techniques
- Commitment
- Goal Setting
- Prompts
- Feedback
- Social Norming
- **Combine techniques**



WEATHERIZATION



**Behavior matters, but is largely ignored**

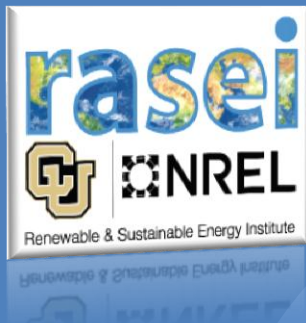
**Weatherization programs have a unique opportunity to influence behavior and maximize energy savings**

**Framework for designing an effective behavior-change program:**

**KNOW**

**ENGAGE**

**ENABLE**



# Thank you!

**Deborah Baker Brannan, Ph.D.**  
**[deborah.brannan@colorado.edu](mailto:deborah.brannan@colorado.edu)**

**Wayne A. Tomac, A.I.C.P.**  
**[wayne.tomac@colorado.edu](mailto:wayne.tomac@colorado.edu)**

**Barbara C. Farhar, Ph.D., Principal Investigator**  
**[barbara.farhar@colorado.edu](mailto:barbara.farhar@colorado.edu)**

**Amy Hollander, Senior Project Manager (NREL)**  
**[amy.hollander@nrel.gov](mailto:amy.hollander@nrel.gov)**

WEATHERIZATION