

EIA-457A: Residential Energy Consumption Survey Cognitive Interview and Pretesting Protocol

This protocol is a guide – the questions presented here will be tailored to the pretesting method and respondent. Both cognitive interviewing and online pretesting are planned, but not all questions will be asked in each method or for all respondents.

Research Goals

Cognitive interviews and pretesting for the 2015 Residential Energy Consumption Survey (RECS) will focus on: how to collect information about new technologies, potential revisions to questions that are outdated or known to be problematic, and comparing alternate response options that may improve respondent understanding and data quality.

Specific areas for pretesting include how respondents understand, construct, and report answers to questions about:

- Structural characteristics of their home
- Housing unit size, including square footage
- Equipment and fuels used for heating, cooling, and water heating
- Behavior related to heating and cooling the home, include thermostat usage
- Appliance usage, including dishwashers and cooking appliances
- Electronics, including the penetration and usage of new and evolving devices
- Lighting
- Fuels used and payment of energy bills
- ENERGY STAR products
- Participation in energy efficiency programs

Introduction

- Thank you for agreeing to participate today. We are currently interviewing people to help us improve the Residential Energy Consumption Survey, which collects information about how energy is used in homes. This interview should take about 1 hour. I will ask you some questions, and I'm interested in hearing your answers as well as your thought process. There are no right or wrong answers. I may also have some follow-up questions about how you arrived at your answers. We will use the information we get from these interviews to improve the design of our survey questions.
- Your answers will be kept confidential, and we will not use your name in the report summarizing these interviews. Before we begin, do you have any questions?
- It would be helpful to me if I recorded our interview. Is this okay with you?

Background Information

I'm going to start with some questions about your home.

Q: About how long have you lived in your home?

Record answer – actual year, a time interval, an estimate based on other life events, etc.

How did you come up with this answer?

[If less than one year] Do you know if your home was occupied before you moved in? Of the past 12 months, how many months was your home occupied?

Q: Is this your primary residence? Your primary residence is the place you live the largest part of the year.

[If no] How much time do you spend here?

Q: Is this residence owned or being bought by someone in your household, rented, or occupied without payment of rent?

Structural Information and Housing Unit Size

Q: What is your housing unit type? (Show current RECS response options.)

How did you determine your answer?

Are there other words or terms you use to describe your home that aren't listed here?

Q: In what year was this structure built?

[If give an exact year] Can you tell me how you answered this question? How do you know?

[If give a range or decade] Would you be able to provide an estimate of the exact year the home was built? Do you think others in your household would know this information?

Q: Since you have occupied this home, has any portion undergone renovations?

[If yes] Can you tell me about the type of renovations that were done? (For example, was there an addition or reduction of floorspace, window or wall replacement, equipment replacement, etc.)

[If not the original occupant of the home] Do you have any information about whether your home was renovated before you occupied it? What do you know about that?

Q: Could you describe the areas and spaces in your home for me?

Record the words and terms used by the respondent.

Q: Thinking about the outside walls, which of these examples best describes the shape of the first or main floor of your home. (Show examples of square/rectangle, T-shaped, L-shaped, and some other shape.) Please include the attached garage if it is on the main floor.

How did you determine your answer?

How easy or difficult is it for you to answer this question?

Q: Not including basements or attics, how many stories does your home have?

[If unsure or "split level"] Can you describe the levels of your home?

Q: I want to talk about the size of your home. About how many square feet of living space do you have in your home? Your best estimate will do.

Record answer and observations (ex: quick response, hesitant, rounded, etc.)

How did you come up with your answer?

How confident are you in your answer?

Q: Do you know whether your estimate of <enter number here> square feet includes all of the areas and spaces mentioned earlier?

[If have a basement, attic, and/or attached garage] Do you know whether your estimate includes the <basement, attic, and/or attached garage>?

Which areas are excluded? Why?

Could you estimate the size of the <excluded area>?

Q: Now I'd like you to think about the ceilings in your home. How high would you say the ceilings are?

How did you come up with your answer?

Are any of the ceilings in your home unusually high or low? Would it be possible to estimate these ceiling heights? Please describe the areas with high or low ceilings.

Heating

It's important for us to understand the different ways that people heat and cool their homes. Let's start with some questions about heating equipment.

Q: Which type of heating equipment provides most of the heat for your home? (Show card with response options.)

Q: What is the main fuel used for heating your home?

[If responses provided for both questions] Can you tell me how you came up with your answers? How certain are you that the equipment is XX and the fuel is YY? [If equipment is Heat Pump] How confident are you that you have a heat pump to heat your home? Tell me about any back-up or emergency heating source you use when it's too cold for your heat pump to work.

[If not provided] Do you have more than one [main heating equipment]?

[If respondent seems uncertain or doesn't know one or both] Tell me why you aren't sure/don't know the equipment/fuel used to heat your home. How would you go about finding the correct answer to this/these question(s)?

[If respondent still uncertain offer to read list of equipment/fuels]

Q: Are there any other ways that you heat your home?

Record response(s). Probe for electric space heaters and fireplaces.

Q: Describe how and when you and others in your household use this equipment to keep warm in the winter?

[If not offered] Do you have a thermostat? How do you use the thermostat during the winter months? Tell me about the temperature in your home when it's cold outside.

[If secondary equipment used] How/when do you use the [secondary equipment]?

Cooling

Q: Tell me how you and others in your household keep your home cool when it gets warm outside?

[If necessary probe for equipment types, ceiling fans, evaporative coolers, opening windows, shade trees.

[If not provided] Is your air conditioning unit a heat pump? How confident are you that you have a heat pump to cool your home?

[If not provided] Do you have more than one central air-conditioning unit?

Q: [If not provided] Describe how and when you and others in your household use this equipment to keep cool in the summer?

[If not offered] Do you have a thermostat? How do you use the thermostat during the summer months? Tell me about the temperature in your home when it's warm outside.

Water Heating

Let's move on to heating water in your home.

Q: How many storage water heaters are used in your home?

[If uncertain] Do you have a water heating *tank* in your home?

Are there any other terms beside "storage water heater" that you might prefer?

Q: How many tankless water heaters are used in your home?

Can you describe your tankless water heater for me?

Are there any other terms beside "tankless water heater" that you might prefer?

Q: What fuel does your water heating equipment use?

Tell me how you came up with your answers? How certain are you that the equipment is XX and the fuel is YY?

Q: [If respondent lives in apartment] Is the water heating equipment located inside your apartment unit, or is it located somewhere else in the building?

[If equipment not an apartment or uncertain] Where is the water heating equipment located?

[If respondent was not certain about this or the fuel] How would you go about finding the fuel used to heat water in your home?

Appliances

Q: Which category best describes how often your dishwasher is used?

At least once each day
4 to 6 times a week
2 or 3 times a week
Once each week
Less than once each week

Ask current question with no response categories.

Show subject the response categories. Do these response options make sense? Should "never" be included as a response option?

Q: Do you ever use your dishwasher more than once a day? In a typical day, how many times is your dishwasher used? In a typical week, how many times is your dishwasher used?

Q: Which best describes the refrigerator used the most?

Full-size with one door
Full-size with two doors, freezer next to the refrigerator
Full-size with two doors, freezer above the refrigerator
Full-size with two doors, freezer below the refrigerator
Full-size with three or more doors
Half-size or compact
Some other kind

Ask the respondent to describe the configuration of their primary refrigerator with no response categories.

Show subject the response categories and ask if they make sense. Do these response options make sense?

Are any refrigerator configurations not included in the response options?

Is the three door option necessary or could those be included in the full-size categories if they did not include the number of doors?

Q: How would you describe your main cooking equipment?

Probe whether it is a range or oven and if both of these terms make sense or how they are different.

Q: What fuel does your main cooking equipment use?

Q: How often do you use your main cooking equipment?

Is an estimate per week the best time interval?

Do these response options make sense to you?

Never
Three or more times a day
Two times a day

- Once a day
- A few times each week
- About once a week
- Less than once a week

Q: Besides your main cooking equipment, how else are hot meals prepared in your home?

What other devices are used to cook hot meals?

Q: Currently RECS asks about stoves (also known as ranges), separate cooktops, separate wall ovens, microwave ovens, both indoor and outdoor grills, toaster ovens, and coffee makers. What other cooking appliances are used in your home?

How often are these other cooking appliances used?

Are they left on for extended periods of time (e.g., rice cookers, crockpots, etc.)?

Electronics

Q: How many televisions are used in your home?

Q: Thinking about how the most-used television is used on weekdays, how many hours is this television turned on each day? Include the time it is on even if no one is actually watching it.

[If uncertain] Do these response options help in answering the question?

- Less than 1 hour
- 1 to 3 hours
- 3 to 6 hours
- 6 to 10 hours
- More than 10 hours

Q: Does your television usage differ on weekdays and weekends?

Q: Would estimating weekly hours of use be easier than estimating daily hours of use?

Q: How many other television sets do you have that are used in your home?

[If yes] Are any of those sets watched more than 1 hour per day?

Q: Could you list all devices plugged in to your most watched television?

[If unsure] For example: cable boxes, DVRs, DVD players, home theater system, internet streaming box, video game consoles, computers, etc.

Q: If you were going to watch a television show, movie, or video, which device would you be most likely to use?

Are any other devices involved in the process? (For example, please think about whether a DVR, cable box, internet streaming box, DVD player, etc. would also be used.)

[If household has more than one person] Are others in your household likely to do the same thing to watch a television show, movie, or video? How might it differ?

Q: How many internet-connected devices are typically used in your home?

Probe to see whether they might be missing any desktop computers, laptop computers, tablets, smart phones, etc.

Which device are you most likely to use for... checking email, browsing the internet, watching videos, social media, reading e-books, other activities?

Which of these devices is used most-frequently by your household? Would it be possible to estimate how many hours or minutes it is used each day or week?

Lighting

Q: How many indoor lights do you have in your house?

How did you arrive at that answer?

Did you include lights that are rarely used such as lights in closets?

Did you count individual bulbs or did you count fixtures with multiple bulbs as one light?

Which term is clearest to you and would be easiest to count: light bulbs, lights, or light fixtures?

Q: How many lights are used at least one hour per day in your house? Was that easier or more difficult to determine than the total light count?

Q: How many lights are used at least four hours a day in your house? Was that easier or more difficult to determine than lights used at least one hour per day?

Q: Would you describe your house as well-lit, lit an average amount, or less lit?

How did you come up with this answer?

Do you know people that light their homes in very different ways from you? How?

Q: Do you have any compact fluorescent or CFL bulbs installed in your house?

[If yes] What portion of your lights are CFLs? All, most, about half, some, very few.

[If yes] Are your most commonly used lights where the CFLs are installed?

Q: Do you have any LED bulbs installed in your house?

[If yes] How many?

Q: People vary in how they use lights. I would like to get a little more information about how lights are used in your home. Do you typically turn lights off when you leave the room?

Q: Are there any lights that are left on at all times?

Windows

Q: How many windows do you have in your house?

How did you determine the number of windows? (estimation, room by room count, etc.)

Would these response categories help with your count?

1 or 2

3 to 5

6 to 9

10 to 15

16 to 19

20 to 29

30 or more

Did you count windows that are fixed (in other words, do not open)?

Did you count large windows such as picture windows or bay windows as just one window?

Did you count individual panes in larger windows such as sliders or double-hung windows as one or multiple windows?

Q: What material are most of your window frames? Wood, vinyl, aluminum, fiberglass, or composite?

How confident are you in that answer?

How do you know your frame material? Probe if they did not purchase the windows themselves.

Fuels Used

Let's talk a little bit about energy bills.

Q: Who is responsible for paying your household's energy bills?

[If all paid by household] How many energy suppliers bill your household? How do you receive the bills? (For example, by mail, electronically, etc.)

[If in rent, condo fee, someone else, etc.] Are all of your energy bills paid by someone else, or are any paid by your household directly?

[If both] Do you know which energy uses or equipment are paid by your household, vs. those paid some other way?

Q: Do you know whether your electricity meter is a "smart meter"?

[If yes] Do you have access to interval electricity data, such as daily or hourly usage? Have you ever looked at it?

Q: Does your household use wood as an energy source?

[If yes] What kind of wood does your household burn – wood logs, wood scraps, wood pellets, or some other kind of wood?

Does your household purchase wood, or receive it some other way?

In the past 12 months, how much wood did your household use? (Record the amount, including units.) How did you come up with an answer?

Q: Do you have any on-site system that generates electricity, such as solar panels or a small wind turbine?

[If yes] Can you tell me more about the system? What type is it? (Make sure they are not including backup generators.)

Is it connected to the grid?

When was it installed?

Do you know the capacity or actual amount of electricity generated?

ENERGY STAR

(For reference, here is the current question: Some appliances contain this ENERGY STAR label to indicate that they are more efficient than similar products. Is this refrigerator an Energy Star appliance?)

Q: Are you aware of the ENERGY STAR program for appliances?

(Show ENERGY STAR logo) Are you familiar with this label?

Q: Could you describe what it means if an appliance has the ENERGY STAR label?

Q: Do you have any products that are ENERGY STAR qualified?

[If yes] Which ones?

[If yes] How do you know that they are ENERGY STAR qualified?

Energy Efficiency

Q: Since you have occupied this home, have you received a home energy audit?

[If yes] Can you tell me more about that? When did it happen? What were the findings? Did you take any follow-up actions recommended by the auditor?

Q: Have you ever received any appliance or equipment rebates from a manufacturer, retailer, or energy supplier?

[If yes] When did this happen? What was it for?

Q: Have you ever received any energy-related tax credits or subsidized loans?

[If yes] When did this happen? What was it for?

Q: Have you ever received any weatherization assistance?

[If yes] When did this happen? What was it for?

Concluding Remarks

Okay, we're almost done.

Considering the range of questions I asked you today, do you think you are the best person in your household to provide this information? If not, who might be a better respondent? Why?

Is there anything else you would like to share with me?

Thank you so much for participating!