

Appendix H 2018 CBECS Interview Protocol

2018 CBECS Pretesting interview protocol
11/17/2017

INTERVIEWER INTRODUCTION

Hello, my name is _____ and I work for Westat, a survey research company based in Rockville, Maryland. {I'd also like to introduce _____ from the U.S. Energy Information Administration (EIA)), who is with me today to observe our discussion.

Thank you for taking the time to participate in this research study. Westat is working with the (U.S. Energy Information Administration) EIA to help develop some questions about energy use in nonresidential buildings that will be used on the national Commercial Buildings Energy Consumption Survey (CBECS). The survey has been conducted periodically for over 3 decades. Some of the ways that results from the survey are used, include to develop building codes, forecast energy consumption, and as input to the [Energy Star models](#). Today, we would like to go over these questions with you and get your opinions about them – what you think the questions are asking for, whether the questions are relevant for your company and how easy or difficult it is for you to answer them and why.

If you agree to take part in this study, I will ask the survey questions we are testing and talk with you about how you answered them. There are no right or wrong answers. Our purpose is not to compile information on you or your company. Instead, your interview along with those of others will show us how we might improve the survey questions.

Before we get started, there are a few things I should mention. This is a research project, and your participation is voluntary. If you prefer not to answer a question just say so and we'll go on to the next one. It's also okay if you change your mind after starting and would rather not participate. All your answers, everything you say, will be kept confidential. We will not use your name, the name of your company or other identifying information in any reports, although we may include quotes for illustrative purposes.

This discussion will take no more than an hour. With your permission, we would also like to audio record our conversation. This helps me so I can listen to what you are saying and won't have to take a lot of detailed notes while you are talking; it will also help when we write up a summary of this interview. Only project staff will have access to the recording and other project materials. These materials will be destroyed once we have completed the project.

TURN ON RECORDER. The date and time is _____. Please confirm that you are willing to take part in this study. Do I also have your permission to record the interview? [**Obtain audible “yes”**

from R.]

GENERAL INTERVIEWER INSTRUCTIONS

Introductory questions Q1-Q7

DO NOT PROBE INTRODUCTORY QUESTIONS Q1 – Q7

IF R DOES NOT UNDERSTAND ONE OF THE INTRODUCTORY QUESTIONS YOU CAN REPEAT IT AS WORDED. OTHERWISE, TELL RESPONDENT TO ANSWER AS BEST THEY CAN AND NOTE ANY HESITATION OR CONFUSION.

RECORD ANY DK OR REF RESPONSES

HVAC and Data Center questions

FOLLOW-UP AT RELEVANT QUESTION:

- NOTE ANY SIGNS OF CONFUSION OR HESITATION AT ANY QUESTION IF APPROPRIATE REFLECT BACK THE NATURE OF OBSERVED BEHAVIOR.
- RECORD AND PROBE ALL DK OR REF RESPONSES TO ESTABLISH REASON.
- FOR “OTHER SPECIFY” ANSWERS REFER R BACK TO LIST PROVIDED AND ASK IF ANY OF THE ITEMS COULD BE RELEVANT OR WHY THEY ARE NOT.

ESTABLISHING “THIS BUILDING”

INTERVIEWER: REFER TO SCREENING GRID COMPLETED PRIOR TO INTERVIEW

Before I ask the questions that we are testing, it is important that I confirm with you the building that I will be asking you about. You mentioned to our recruiter that you are responsible for a building {on this campus} that was used for the purposes of {building type from screener Q3} [IF OFFICE, LODGING OR WAREHOUSE] AND was {over 10,000sq feet / 10,000 sq feet or less} in total square footage. Is that correct?

ESTABLISH WITH RESPONDENT BUILDING THAT WILL BE REFERRED TO AS “THIS BUILDING” DURING THE INTERVIEW.

So, to clarify, during this interview when I say “this building” I am referring to [Building].

INTRODUCTORY QUESTIONS

Okay, I'll start by asking some of the background questions that are included in the survey.

Ask all

1. Looking at this list, please tell me which of these best describes your job function.

SHOWCARD A

- 1 Operations, maintenance, or engineering
- 2 Property management
- 3 Store management
- 4 Mall management
- 5 Administration or company management
- 6 Energy or environmental management
- 7 Building owner
- 8 Business owner
- 9 Accounting, finances, or payroll
- 10 Executive official
- 11 School official
- 12 Religious official
- 13 Support staff
- 14 Other

IF OTHER ASK: How would you describe your job function?

Ask all

2. What year was this building constructed? If there have been major additions, give the year the largest portion of the building was completed.

If R is unable to provide exact year of construction:

Please look at this list and tell me which range best describes when this building was constructed.

SHOWCARD B

- 01 Before 1920
- 02 1920 to 1945
- 03 1946 to 1959
- 04 1960 to 1969
- 05 1970 to 1979
- 06 1980 to 1989
- 07 1990 to 1999
- 08 2000 to 2003
- 09 2004 to 2007
- 10 2008 to 2012
- 11 2013 to 2017

3. Building activity subcategory (Use appropriate question based on screening building activity)

For hospitals: no follow-up necessary **GO TO 4**

3a For offices:

Looking at this list, what type of office is this?

SHOWCARD C

- 1 Administrative or professional office building
- 2 Government office
- 3 Mixed-use office
- 4 Bank or other financial institution
- 5 Doctor's or dentist's office
- 6 Sales or leasing office
- 7 Contractor's office
- 8 Non-profit or social services office
- 9 Research and development office
- 10 City hall or city center
- 11 Religious office
- 12 Call center
- 13 Other type of office

IF OTHER ASK: **What other type of office is this?**

3b For lodging buildings

Looking at this list, what type of lodging is this?

SHOWCARD D

- 1 Motel or inn
- 2 Hotel
- 3 Dormitory, fraternity, or sorority
- 4 Retirement home
- 5 Other type of lodging

IF OTHER ASK: **What other type of lodging is this?**

3c For education buildings:

Looking at this list, what type of education is this?

SHOWCARD E

- 1 Elementary or middle school
- 2 High school
- 3 College or university
- 4 Preschool or daycare
- 5 Adult education
- 6 Career or vocational training
- 7 Religious education
- 8 Other type of classroom education

IF OTHER ASK: **What other type of classroom education is this?**

3d For food service buildings:

Looking at this list, what type of food service building is this?

SHOWCARD F

- 1 Restaurant or cafeteria
- 2 Fast food
- 3 Bar, pub, or lounge
- 4 Coffee, doughnut, or bagel shop
- 5 Ice cream or frozen yogurt shop
- 6 Bakery
- 7 Other type of food sales or service

IF OTHER ASK: **What other type of food sales or service building is this?**

3e For warehouses:

Looking at this list, what type of warehouse is this?

SHOWCARD G

- 1 Non-refrigerated warehouse or storage building
- 2 Refrigerated warehouse
- 3 Distribution or shipping center
- 4 Public rental storage units
- 5 Other type of warehouse

IF OTHER ASK: **What other type of warehouse is this?**

4. INTERVIEWER ASK OR RECORD

Is this building part of a campus or complex?

- 1 Yes
- 2 No

If building is located on a campus ask 4a ELSE GO TO 5

Ask if part of a campus or complex

4a Looking at the list on Show Card H, what is the primary business or function of this group of buildings as a whole?

SHOWCARD H

- 1 College, university, or junior college
- 2 Primary or secondary school [GRADES K-12]
- 3 Other type of school
- 4 Office complex
- 5 Retail complex
- 6 Storage complex
- 7 Religious campus or complex
- 8 Hospital or other health care complex
- 9 Lodging or resort complex
- 10 Post office complex
- 11 Prison or correctional facility
- 12 Other type of government complex
- 13 Industrial complex
- 14 Transportation complex such as a terminal, depot, or airport
- 15 Other type of campus or complex

IF OTHER ASK: **Please describe the other type of campus or complex.**

Ask all

5. Looking at this list, which category best describes the owner of this building?

SHOWCARD I

- 1 Real estate investment trust (REIT)
- 2 Other public or private corporation, partnership, LLC, or LLP
- 3 Individual owner(s)
- 4 Religious organization
- 5 Non-profit organization (other than religious or government)
- 6 Private academic institution
- 7 Other non-government
- 8 Federal government
- 9 State government
- 10 Local government

Ask all

6. How many different businesses or organizations use space full-time in this building?

Enter Number [_____]

Ask all

7. Is the space in this building occupied by the owner, leased to tenants, or a combination of both?

- 1 Owner occupied
- 2 Leased to tenants
- 3 Combination of occupied and leased

MAIN STUDY QUESTIONS FOR COGNITIVE TESTING

Total square footage

- 1) What is the gross or total square footage of all the space in this building, both finished and unfinished, including basements, hallways, lobbies, stairways, elevator shafts, and indoor parking levels?

Record square footage: _____

Note if R was (circle): confident hesitant confused performing calculation
other (specify): _____

If R is unable to provide exact square footage:

- 2) [Display SHOWCARD J]
Please look at this list and tell me which category best describes the total gross square footage in this building. There are examples provided to help you estimate.
- a. 1,000 square feet or less
 - b. 1,001 to 5,000 square feet
 - c. 5,001 to 10,000 square feet
 - d. 10,001 to 25,000 square feet
 - e. 25,001 to 50,000 square feet
 - f. 50,001 to 100,000 square feet
 - g. 100,001 to 200,000 square feet
 - h. 200,001 to 500,000 square feet
 - i. 500,001 to 1 million square feet
 - j. Over 1 million square feet

PROBE:

- How did you determine the building square footage? What is the source of your knowledge? Did you do any calculations?
- How precise would you say your answer is? (If needed: Did you make an estimate?)
- If NOT precise and records NOT mentioned as source, ask: Do you know of any records you could consult to find the building square footage? What are they?
- To you, what does “gross or total square footage” mean?
- What building spaces did you include in your calculation of total square footage? What spaces did you exclude? (If necessary prompt: basements (finished/unfinished), hallways, lobbies, stairways, elevator shafts and indoor parking levels.)
- If estimate or Showcard used, ask: Looking at Showcard J, how helpful were/are the examples on this card in helping you reach an estimate, or did you think they were/are not helpful?

HVAC

1. Is this building heated, cooled, or both?
 - a. Heated
 - b. Cooled
 - c. Both

PROBE:

- If not heated or cooled, ask: why is that?

2. [Display SHOWCARD K]
Looking at this list of energy sources, please tell me which ones were used in this building for any purpose in 2017.
 - a. Electricity
 - b. Natural gas
 - c. Fuel oil, diesel, or kerosene
 - d. Bottled gas, also known as LPG or propane
 - e. District steam piped in from a separate building or utility
 - f. District hot water piped in from a separate building or utility
 - g. District chilled water piped in from a separate building or utility
 - h. Other energy source or sources

If Q2 = h (Other) ask: What was/were the other(s) energy source(s) used?

PROBE:

- If R says electricity only, ask: Was electricity the only energy source for everything in this building, such as heating/cooling, water heating, and cooking?
- Are you familiar with the terms district steam, district hot water, and district chilled water? If yes, ask: What, to you, is district hot water? How about the others?
- If R says they have district steam/hot water/chilled water, ask: Where do these energy sources come from? A plant on campus? A utility? Somewhere else?

IF NO HEATING OR COOLING, GO TO DATA CENTER QUESTIONS

IF NO HEATING, GO TO COOLING QUESTIONS

ELSE GO TO HEATING QUESTIONS

HEATING QUESTIONS

1. What percent of the floorspace in the building was heated to at least 50 degrees Fahrenheit during 2017, including basements and indoor parking levels if they were heated to at least 50 degrees?

Record %: _____

Note if R was (circle): confident hesitant confused performing calculation
other (specify): _____

- If R is hesitating or seems unsure PROBE: Can you provide an estimate?
- PROBE ALL: How did you determine your answer to this question?
- IF NEEDED: How accurate would you say your answer was? Did you make an estimate?
- If less than 100%, PROBE: How did you come up with this percentage? What areas did you include? What areas did you exclude? Why is that?
- If R unsure or provided estimate PROBE: Are there records you could use to find out the exact amount? Is there someone else in your building who could answer this question? How likely are you to ask someone else for help in answering questions like this?

2. [Display SHOWCARD L]

What was the main energy source for heating?

- a. Electricity
- b. Natural gas
- c. Fuel oil/Diesel/Kerosene
- d. Bottled gas
- e. District steam piped in from a separate building or utility
- f. District hot water piped in from a separate building or utility
- g. Some other energy source

If Q2= g (other) ask: What was the other energy source used?

3. [Display SHOWCARD L]

Were there any other sources used for heating?

- a. Yes
- b. No

3a. If Q3= Yes, which other energy sources were used? You can select more than one source.

- c. Electricity
- d. Natural gas
- e. Fuel oil/Diesel/Kerosene
- f. Bottled gas
- g. District steam piped in from a separate building or utility
- h. District hot water piped in from a separate building or utility
- i. Some other energy source

If Q3a= i (other) ask: What was the other energy source used?

If more than one heating source, PROBE:

- How did you decide what is your main heating source?

4. [Display SHOWCARD M]

Now look at this list of heating equipment types. Please tell me where you see your equipment on this list. You can select more than one type.

- a. Furnaces that heat air directly, without using steam or hot water
- b. Packaged central unit (roof mounted)
- c. Boilers that produce steam or hot water
- d. Heat pumps (other than components of a packaged unit)
- e. Individual space heaters (other than heat pumps)
- f. Duct reheat coils
- g. Fan coil units
- h. Central air handlers
- i. Radiators
- j. Other heating equipment

If Q4 = j (Other) ask: Please describe the other type of heating equipment.

PROBE:

- If R selected "Furnace", "Packaged central unit", "Boilers", "Heat pumps", or "Individual space heaters", PROBE: Tell me more about why you made that/those section(s). IF NEEDED: Is there a specific word or term in the description that led you to choose that equipment?
- PROBE ALL: Are there any equipment types or terms on this list that you're unfamiliar with?
- Looking at Showcard M, how helpful were the examples on this card or did you think they were not helpful?

IF "C. BOILER", GO TO QUESTION 5

IF "D. HEAT PUMP", GO TO QUESTION 6

ELSE GO TO FINAL HEATING PROBE

5. If R selects boiler: Where is the boiler located? (open ended)

PROBE:

- IF VAGUE RESPONSE ENCOURAGE R TO PROVIDE DESCRIPTION OF BOILER LOCATION. IF NEEDED: Describe to me exactly where the boiler is located?

**IF QUESTION 4= "D. HEAT PUMP", GO TO QUESTION 6
ELSE GO TO FINAL HEATING PROBE**

6. If R selects heat pump: What type of heat pump is this? (open ended)

7. [Display SHOWCARD N]

You just described the heat pumps(s) in your building. Looking at the list, which types of heat pumps are these? You can select more than one type.

- a. Air source heat pump
- b. Ground source or ground water heat pump (geothermal)
- c. Dual source heat pump (combination air source and geothermal)
- d. Water loop heat pump

PROBE:

- Are there any types of heat pumps listed or terms on this list that you're unfamiliar with?
- How helpful were the examples on this card?

FINAL HEATING PROBES:

- If more than one energy source for heating, but only one equipment type, ask: You told me you use [list multiple energy sources], and only [heating equipment type], can you describe how that works?
- If more than one energy source and more than one type of equipment for heating, ask: You told me you use [list multiple energy sources] and [multiple heating equipment types]. Can you tell me which energy source powers which heating equipment?
(FILL OUT GRAPHIC MATCHING SOURCES and EQUIPMENT)
- Thinking about the questions I have just asked about heating this building. Is there anything else about these questions that was confusing or unclear to you that we have not discussed?

**IF NO COOLING, GO TO FINAL HVAC PROBES
ELSE, GO TO COOLING QUESTIONS**

COOLING QUESTIONS

% FLOORSPACE

1. What percent of the floorspace in the building was cooled by air conditioning equipment in 2017?

Record %: _____

Note if R was (circle): confident hesitant confused performing calculation
other (specify): _____

PROBE:

- If R is hesitating or seems unsure PROBE: Can you provide an estimate?
- PROBE ALL: How did you determine your answer to this question? IF NEEDED: How accurate would you say your answer was? Did you make an estimate?
- If less than 100%, PROBE: How did you come up with this percentage? What areas did you include? What areas did you exclude? Why is that?
- If 100%: What areas did you include? Are there any areas that are not cooled by air conditioning?
- If R unsure or provided estimate PROBE: Are there records you could use to find out the exact amount? Is there someone else in your building who could answer this question? How likely are you to ask someone else for help in answering questions like this?

ELECTRICITY FOR COOLING

1. Was electricity the only energy source used for air conditioning in this building in 2017?
 - a. Yes, electricity was the only energy source for air conditioning **GO TO QUESTION 3**
 - b. No, some other energy source was used in addition to or instead of electricity for air conditioning **GO TO QUESTION 2**
2. [Display SHOWCARD O]
Which energy sources were used for air conditioning? You may select more than one source.
 - a. Electricity
 - b. Natural gas
 - c. Fuel oil
 - d. Bottled gas
 - e. District Steam
 - f. District Chilled Water
 - g. Some other energy source

If Q2 = g ask: What was the other energy source used?

3. Tell me about the equipment that cools this building. (open ended)
4. [Display SHOWCARD P]
Now look at this list of cooling equipment types. Please tell me where you see your equipment on this list. You can select more than one type.
 - a. Residential-type central air conditioners (other than heat pumps) that cool air directly and circulate it without using chilled water
 - b. Packaged air conditioning units (other than heat pumps)
 - c. Central chillers inside (or adjacent to) the building that chill water for air conditioning
 - d. Heat pumps for cooling
 - e. Individual room air conditioners (other than heat pumps)
 - f. "Swamp" coolers or evaporative coolers
 - g. Fan coil units
 - h. Central air handlers
 - i. Chilled beam
 - j. Other cooling equipment

If 4=j (Other): Please describe the "other" type of cooling equipment.

PROBE: If R selected "Residential type central AC", "Packaged AC units", "Central Chillers", "Heat pumps", or "Individual room AC", PROBE:

- Tell me more about why you made that/those section(s). IF NEEDED: Is there a specific word or term in the description that led you to choose that equipment?

PROBE ALL:

- Are there any equipment types or terms on this list that you're unfamiliar with? Which ones?

If R selected "Residential Type Central Air Conditioning" PROBE:

- "What else on this list might describe your equipment?"
- If R selects different response option ask "Which best describes the type of cooling equipment? Why?"

**IF "C. Central chillers" GO TO QUESTION 5
ELSE GO TO FINAL COOLING PROBES**

5. Where is the chiller located? (open ended)

PROBE:

IF VAGUE RESPONSE ENCOURAGE R TO PROVIDE DESCRIPTION OF CHILLER LOCATION. IF NEEDED: Describe to me exact

FINAL COOLING PROBES:

If more than one energy source for cooling, and only one equipment type, ask: You told me you use [list multiple energy

If more than one energy source and more than one type of equipment for cooling, ask: You told me you use [list multiple

(FILL OUT GRAPHIC MATCHING SOURCES and EQUIPMENT)

Thinking about the questions I have just asked about cooling this building. Is there anything else about these questions

FINAL HVAC PROBE:

- What else can you tell me about your heating or cooling equipment that we haven't already talked about?
- So may I just check, would you say you were the most knowledgeable person to ask about heating and cooling systems used in this building or are there other people who would be equally or more knowledgeable. ESTABLISH ROLE OF ANY OTHER PEOPLE.

GO TO DATA CENTER QUESTIONS

DATA CENTER QUESTIONS

Now we're going to talk about computing spaces in this building.

SERVERS

1. Are there any dedicated computer servers used in this building?

- a. Yes
- b. No

PROBE:

- In this question, what does "dedicated computer server" mean to you?

1a. Please read the definitions shown on this card and then I'd like to get your feedback.

Showcard Q

DEFINITION 1: A server is usually just the CPU, or "case," portion of a computer that manages network resources such as computer files, printers, databases, or network traffic; servers do not require much human operation, so most do not have keyboards or monitors.

DEFINITION 2: Dedicated means that the server performs no other tasks besides server tasks.

PROBE:

- Do you think these definitions are helpful or not? (Why/Why not?) IF NEEDED: Would it have helped to see these definitions while you were answering the question? Why/Why not?)
- Would you have provided the same answer if you had seen these definitions?
- Are there any specific words or phrases that are unclear to you or that you were uncertain about? (What words or phrases, if any, are unclear to you?) Why?

IF Q1 = YES, GO TO QUESTION 2

IF Q1a = NO, GO TO SEPARATE COMPUTER AREAS

2. About how many dedicated servers are used in this building?

Record number of servers: _____

Note if R was (circle): confident hesitant confused performing calculation

other (specify): _____

IF DK OR RANGE IS OFFERED, GO TO SERVERS CATEGORY

PROBE:

- How did you arrive at this number of servers?
- Please tell me about the spaces where the servers are located. If not offered, ask: Is there a name for these areas? How do you refer to these areas?

IF ABLE TO PROVIDE NUMBER, GO TO SEPARATE COMPUTER AREAS

SERVERS CATEGORY

1. [Display SHOWCARD R]

Looking at this list, which category best describes the number of servers used in this building?

- Zero
- 1 to 4
- 5 to 9
- 10 to 19
- 20 to 49
- 50 to 99
- 100 to 249
- 250 to 499
- 500 or more

PROBE:

- Please tell us about the spaces where the servers are located. (If not offered, ask: Is there a name for these areas? How do you refer to these areas?)

SEPARATE COMPUTER AREAS

2. [Display SHOWCARD S]

Please look at this list and tell me if any of these types of separate computer areas are found in this building. You can select more than one type of space.

- Data center or server farm
- Computer-based training room
- Student or public computer center
- Trading floor
- None of these types of areas

PROBE:

- Do you think the definitions included on the card are helpful or not? (Why/Why not?) Are you familiar with all of these terms? Are there any terms or phrases that you are unsure of or are unclear to you?
- Are you familiar with the term “server closet”? Does it mean the same thing as “data center or server farm to you”? How are those two terms the same or different?
- If R selects data center or server farm, ask: Does the data center have uninterruptible power? Cooling and humidity control? A raised floor?

**IF “Data center or server farm”, GO TO DATA CENTER SQUARE FOOTAGE
ELSE FINISHED**

DATA CENTER SQUARE FOOTAGE

PROBE:

- What is the size of the data center? (Interviewer should probe on terms R uses).
- Could you measure this by racks? Square footage? Computing power? Some other way?
- Would you have to ask someone else the answer to this question?

1. What is the square footage of the data center or server farm you just mentioned?

Record square footage: _____

Note if R was (circle): confident hesitant confused performing calculation
other (specify): _____

PROBE:

- How did you determine your answer to this question? How accurate would you say your answer is? Why?
- I noticed you (hesitated, seemed confused, etc.), why is that?

FINAL DATA CENTER PROBE:

- So again would you say you were the most knowledgeable person to ask about computing areas in this building or are there other people who would be equally or more knowledgeable. ESTABLISH ROLE OF ANY OTHER PEOPLE.

Closing

- In general, how did you find answering the survey questions?
- Were any of the questions harder to answer than others? In what way were they harder to answer?
- Were there any questions you were expecting to be asked but weren't?
- Were there any questions you were surprised to be asked?

IF OBSERVERS ARE PRESENT, CHECK TO SEE IF THEY HAVE FURTHER QUESTIONS.

Those are all the questions I have for you. Is there anything we haven't discussed that you would like to mention?

DISCUSS ANY RESPONDENT COMMENTS.

Thank you for your time.

STOP RECORDER.