

2012 Commercial Buildings Energy Consumption Survey (CBECS)

Mall Building Questionnaire – Form EIA-871I

HOW TO USE THIS QUESTIONNAIRE

The 2012 Commercial Buildings Energy Consumption Survey (CBECS) will be conducted using a *computer-assisted interview* programmed using a software called Blaise. A professional interviewer will administer the questionnaire to the building respondent using a laptop computer. The purpose of this paper representation of the questionnaire is to document the question text, fills, and skip patterns within the 2012 CBECS questionnaire.

PLEASE NOTE: All the question fills and skip patterns will be handled automatically by the software and will be transparent to the interviewer, so this document appears much more complex than the actual CBECS instrument.

Each question is formatted as follows:

A1	Question name	SASVAR
ASK		
FILL		
	Question text	
RANGE		
NEXT		

The **black box** (A1 here) contains a question number, followed by the **Question name** and the SAS *variable* (if applicable) in the same row. If the SAS variable area says “*see below*,” the variables are found within the Question text box.

The **ASK** line describes what needs to be true for a question to be asked.

The **FILL** line describes any question fills and the conditions under which each appears. If the fill appears as something such as “A6 [Square footage]” this means that the figure given in question A1 will be filled in.

The **Question text** box shows the question text, and any other elements for each question, such as Show Card indicators or instructions, and the answer choices for each question.

The **RANGE** line is only applicable to numeric questions. It shows the range of answers that will be accepted by Blaise.

The **NEXT** line details the routing for the next question. Follow these instructions in order. Once a true statement is reached, go to the question indicated by the arrow (\Rightarrow).

WORKSHEET AND RESPONDENT QUESTIONS

R1	Consent
ASK	All Mall Buildings
	<p style="text-align: right;">[F1]-Help</p> <p>Some parts of this interview will be recorded for quality control purposes. I'd like to continue now unless you have any questions.</p> <p>◆ For FAQs, press [F1] - Help</p> <ol style="list-style-type: none">1 Gives consent to record interview2 Does <u>not</u> give consent to record interview
NEXT	IF First time case started → R2 [Worksheet 1] IF Restart → R4 [Respondent function]

R2	Worksheet 1	<i>R1WS1 – RXWS1</i>
ASK	All Mall Buildings	
	<p>Do you have Worksheet 1 with you and completed?</p> <ol style="list-style-type: none">1 Yes2 No	
NEXT	IF First time case started → R3 [Respondent function] IF Restart → R4 [Respondent function]	

R3	Respondent function	R1JOB
ASK	All cases on first start	
<p data-bbox="151 212 358 247">□ SHOW CARD 1</p> <p data-bbox="164 285 964 407">◆ Take out the Show Card booklet or make sure the respondent has access to them. It is <u>very important</u> to use these cards, as some of them contain more information than can be found on your CAPI screens.</p> <p data-bbox="151 438 1411 497">Before we get started, we need to make sure that we have Show Cards available for some of the questions. Please turn to Show Card 1.</p> <p data-bbox="151 529 1102 560">Looking at this list, please tell me which of these best describes your job function.</p> <ol data-bbox="207 592 756 1014" style="list-style-type: none"> 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 		
NEXT	IF Other → R5 [Other job function] Anything but Other → R6 [Building boundaries]	

R4	Respondent function	<i>R2JOB – RXJOB</i>
ASK	All restarted cases	
<p>◆ ASK if interview is with a new respondent</p> <p>◆ If interview is with same respondent as previous interview, ENTER "0"</p> <p>☐☐ SHOW CARD 1</p> <p>Before we get started, we need to make sure that we have Show Cards available for some of the questions. Please turn to Show Card 1.</p> <p>Looking at this list, please tell me which of these best describes your job function.</p> <ul style="list-style-type: none"> 0 Same respondent as previous interview 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 		
NEXT	IF Other → R5 [Other job function] Anything but Other → R6 [Building boundaries]	

R5	Other job function	<i>R1JOBX – RXJOBX</i>
ASK	IF R3 [Respondent function] = Other OR R4 [Respondent function] = Other	
What is your job function?		
NEXT	→ R6 [Building boundaries]	

R6	Building boundaries
ASK	All Buildings
<p>The building that we're going to be talking about today is...</p> <ul style="list-style-type: none"> ◆ EXP: [Describe the boundaries of the building as described in the header. The amount of detail necessary will vary by the situation.] ◆ ENTER "1" to continue 	
NEXT	→ A1 [Strip mall name]

DRAFT (9/5/12)

SECTION A: BUILDING SIZE AND AGE

A1	Strip mall name	<i>BLDGNAM</i>
ASK	All Mall Buildings	
What is the name of this shopping center?		
NEXT	→ A2 [Street address]	

A2	Street address	<i>ADDRESS</i>
ASK	All Mall Buildings	
Please tell me the address of the building, beginning with the street address.		
NEXT	→ A3 [City]	

A3	City	<i>CITY</i>
ASK	All Mall Buildings	
What is the city?		
NEXT	→ A4 [State]	

A4	State	<i>STATE</i>
ASK	All Mall Buildings	
What is the state?		<i>[F1]-HELP</i>
◆ ENTER the two letter abbreviation		
NEXT	→ A5 [ZIP code]	

A5	ZIP code	<i>ZIP</i>
ASK	All Mall Buildings	
And what is the ZIP code?		
NEXT	→ A6 [Square footage]	

A6	Square footage	<i>SQFT</i>
ASK	All Mall Buildings	
FILL	{Worksheet1Intro} IF R has Worksheet 1 = "Please refer to Worksheet 1 for some of these next questions on general characteristics." OTHERWISE = BLANK	
		[F1]-HELP
{Worksheet1Intro} 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? ◆ DEF: [Total square footage = Length of building multiplied by width of building multiplied by the number of floors.] ◆ VERIFY number <u>digit by digit</u>		
RANGE	1 to 999,999,999	
NEXT	IF DK/RF → A8 [Square footage category] IF 1,000 square feet or less → A7 [End of interview] OTHERWISE → A9 [Wall construction material]	

A7	End of interview	
ASK	IF A6 [Square footage] ≤ 1000	
FILL	{CollectWorksheet} IF R has Worksheet 1 = "However, I would like to collect Worksheet 1 and any other worksheets that you may have completed."	
Thank you, that's all the questions that I have at this time, since we are only interviewing buildings that are larger than one thousand square feet. {CollectWorksheet} Thank you for your time and help. ◆ [F10]-Exit		
NEXT	TERMINATE	

A8	Square footage category	<i>SQFTC</i>
ASK	IF A6 [Square footage] = DK/RF	
<p>[] SHOW CARD A1</p> <p>I understand that it may be difficult to give an exact figure for square footage. However, the size of your building is very important in helping understand its use of energy.</p> <p>Please look at Show Card A1 and tell me which category best describes the total gross square footage in this building. There are examples provided to help you estimate.</p> <p>◆ If respondent gives the category code, VERIFY the response by reading the full answer</p> <ol style="list-style-type: none"> 1 1,000 square feet or less 2 1,001 to 5,000 square feet 3 5,001 to 10,000 square feet 4 10,001 to 25,000 square feet 5 25,001 to 50,000 square feet 6 50,001 to 100,000 square feet 7 100,001 to 200,000 square feet 8 200,001 to 500,000 square feet 9 500,001 to 1 million square feet 10 Over 1 million square feet 		[F1]-HELP
NEXT	→ A9 [Wall construction material]	

A9	Wall construction material	<i>WLCNS</i>
ASK	All Mall Buildings	
<p>[] SHOW CARD A2</p> <p>Please look at Show Card A2 for a list of different types of construction materials. Which of these best describes the major type of exterior wall construction material used on this building?</p> <ol style="list-style-type: none"> 1 Brick, stone, or stucco 2 Pre-cast concrete panels 3 Concrete block or poured concrete (above grade) 4 Aluminum, asbestos, plastic, or wood siding, shingles, tiles, or shakes 5 Sheet metal panels 6 Window or vision glass (glass that can be seen through) 7 Decorative or construction glass 8 IF VOLUNTEERED: No one major type 9 IF VOLUNTEERED: Other 		[F1]-HELP
NEXT	→ A10 [Roof construction material]	

A10	Roof construction material	<i>RFCNS</i>
ASK	All Mall Buildings	
<p>[SHOW CARD A3]</p> <p>Please look at Show Card A3 for a list of different types of roofing materials. Which of these best describes the building's predominant exterior roof surface?</p> <ol style="list-style-type: none"> 1 Built-up (tar, felts, or fiberglass and a ballast, such as stone) 2 Slate or tile shingles 3 Wood shingles, shakes, or other wooden materials 4 Asphalt, fiberglass, or other shingles 5 Metal surfacing 6 Plastic, rubber, or synthetic sheeting (single or multiple ply) 7 Concrete 8 IF VOLUNTEERED: No one major type 9 IF VOLUNTEERED: Other 		[F1]-HELP
NEXT	→ A11 [Cool roof materials]	

A11	Cool roof materials	<i>RFCOOL</i>
ASK	All Mall Buildings	
<p>Is the roof of this building designed to reduce solar heat gain, also known as a "cool roof"?</p> <p>◆ EXP: [Roofs with a highly reflective surface, a ballasted roof system, a vegetated roof system, or any combination of these technologies should be considered a "cool roof".]</p> <ol style="list-style-type: none"> 1 Yes 2 No 		
NEXT	→ A12 [Roof tilt]	

A12	Roof tilt	<i>RFTILT</i>
ASK	All Mall Buildings	
<p>[SHOW CARD A4]</p> <p>Looking at Show Card A4, please tell me which best describes the tilt or pitch of the roof of this building.</p> <ol style="list-style-type: none"> 1 Flat 2 Shallow pitch 3 Steeper pitch 		
NEXT	→ A13 [Building shape]	

A13	Building shape	<i>BLDSHP</i>
ASK	All Mall Buildings	
<p>☐ SHOW CARD A5</p> <p>Looking at Show Card A5, which of these shapes most resembles the floorplan of this building at ground level? This is sometimes called the "footprint" of the building.</p> <ol style="list-style-type: none"> 1 Square 2 Wide rectangle 3 Narrow rectangle 4 Rectangle or square with an interior courtyard 5 "H" shaped 6 "U" shaped 7 "E" shaped 8 "T" shaped 9 "L" shaped 10 "+" or cross shaped 11 Other shape 		
NEXT	→ A14 [Percent exterior glass]	

A14	Percent exterior glass	<i>GLSSPC</i>
ASK	All Mall Buildings	
<p>☐ SHOW CARD A6</p> <p>Which of the ranges on Show Card A6 best describes the percent of the exterior wall surface of this building that is covered with window glass or glass doors?</p> <ol style="list-style-type: none"> 1 1 percent or less 2 2 to 10 percent 3 11 to 25 percent 4 26 to 50 percent 5 51 to 75 percent 6 76 to 100 percent 		
NEXT	→ A15 [Equal glass on all sides]	

A15	Equal glass on all sides	<i>EQGLSS</i>
ASK	All Mall Buildings	
<p>Is the amount of glass about the same for all sides of the building?</p> <ol style="list-style-type: none"> 1 Yes 2 No 		
NEXT	IF Yes → A17 [Number of floors] IF No OR DK/RF → A16 [Glass sides most sunlight]	

A16	Glass sides most sunlight	<i>SUNGLS</i>
ASK	IF A15 [Equal glass on all sides] = No OR DK/RF	
<p>Do the sides receiving direct sunlight have more or less glass area than the sides that do not receive direct sunlight?</p> <ol style="list-style-type: none"> 1 More glass area 2 Less glass area 3 IF VOLUNTEERED: About the same amount 		
NEXT	→ A17 [Number of floors]	

A17	Number of floors	<i>NFLOOR</i>
ASK	All Mall Buildings	
<p style="text-align: right;">[F1]-HELP</p> <p>How many floors are in the tallest section of the building, including basements, parking levels, or any other floors below ground level, but excluding half-floors, mezzanines, balconies, and lofts?</p> <p>◆ PROBE for estimate if DK</p>		
RANGE	1 to 999	
NEXT	→ A18 [Floor-to-ceiling height]	

A18	Floor-to-ceiling height	<i>FLCEILHT</i>
ASK	All Mall Buildings	
<p>What is the typical floor-to-ceiling height in this building?</p> <p>◆ DEF: [Floor-to-ceiling height is the distance, in feet, from the floor to the ceiling surface.]</p> <p>◆ EXP: [If it varies by establishment, ask for the height of the majority of the establishments.]</p>		
RANGE	5 to 500	
NEXT	IF A17 [Number of floors] = 1 → A23 [Year of construction] IF More than one floor OR DK/RF → A19 [Elevators]	

A19	Elevators	<i>ELEVTR</i>
ASK	IF A17 [Number of floors] >1 OR DK/RF	
<p>Are there any elevators in this building?</p> <p>1 Yes 2 No</p>		
NEXT	IF Yes → A11 [Number of elevators] IF No OR DK/RF → A21 [Escalators]	

A20	Number of elevators	<i>NELVTR</i>
ASK	IF A19 [Elevators] = Yes	
<p>How many elevators are there?</p> <p>◆ PROBE for estimate if DK</p>		
RANGE	1 to 999	
NEXT	→ A21 [Escalators]	

A21	Escalators	<i>ESCLTR</i>
ASK	IF A17 [Number of floors] >1 OR DK/RF	
<p>Are there any escalators in this building?</p> <p>◆ EXP: ["Moving sidewalks" should be included as escalators.]</p> <p>1 Yes 2 No</p>		
NEXT	IF Yes → A22 [Number of escalators] IF No OR DK/RF → A23 [Year of construction]	

A22	Number of escalators	<i>NESLTR</i>
ASK	IF A21 [Escalators] = Yes	
<p>How many escalators are there? Count <u>each</u> one, for example, a pair of up and down escalators should be counted as two.</p> <ul style="list-style-type: none"> ◆ EXP: ["Moving sidewalks" should be counted as escalators.] ◆ PROBE for estimate if DK 		
RANGE	1 to 99	
NEXT	→ A23 [Year of construction]	

A23	Year of construction	<i>YRCON</i>
ASK	All Mall Buildings	
<p style="text-align: right;">[F1]-HELP</p> <p>What year was this building constructed? If there have been major additions, give the year the <u>largest portion</u> of the building was completed.</p>		
RANGE	1600 to 2013	
NEXT	IF DK/RF → A24 [Year of construction category] IF 2012 → A26 [Month ready for occupancy] IF 2013 → A25 [End of interview] IF 1999 or earlier → A27 [Renovations] IF 2000 or later → B1 [On a multibuilding complex]	

A24	Year of construction category	YRCONC
ASK	IF A23 [Year of construction] = DK/RF	
<p>[F1]-HELP</p> <p>[] SHOW CARD A7</p> <p>Please look at Show Card A7 and tell me which range best describes when this building was constructed.</p> <ol style="list-style-type: none"> 1 Before 1920 2 1920 to 1945 3 1946 to 1959 4 1960 to 1969 5 1970 to 1979 6 1980 to 1989 7 1990 to 1999 8 2000 to 2003 9 2004 to 2007 10 2008 to 2012 11 IF VOLUNTEERED: 2013 		
NEXT	IF 2013 → A25 [End of interview] IF Before 1999 → A27 [Renovations] IF 2000 to 2012 → B1 [On a multibuilding complex]	

A25	End of interview
ASK	IF A23 [Year of construction] = 2013 OR A24 [Year of construction category] = 2013
FILL	{CollectWorksheet} IF R has Worksheet 1 = "However, I would like to collect Worksheet 1 and any other worksheets that you may have completed."
<p>Thank you, that's all the questions that I have at this time, since we are only interviewing structures that were ready for occupancy before January 1, 2008. {CollectWorksheet}</p> <p>Thank you for your time and help.</p> <p>◆ [F10] - Exit</p>	
NEXT	TERMINATE

A26	Month ready for occupancy	<i>MONCON</i>
ASK	IF A23 [Year of construction] = 2012	
<p>In what month of 2012 was this building first ready for occupancy?</p> <ol style="list-style-type: none"> 1 January 2 February 3 March 4 April 5 May 6 June 7 July 8 August 9 September 10 October 11 November 12 December 		[F1]-HELP
NEXT	→ B1 [On a multibuilding complex]	

DRAFT (9/5/12)

A27	Renovations	<i>RENOV</i>
ASK	IF A23 [Year of construction] = 2007 or earlier OR A24 [Year of construction category] = Any category (OR DK/RF) except 2008 to 2012	
FILL	{Since1990orConstructed} IF A23 [Year of construction] = 1990 or later OR A24 [Year of construction category] = 1990 to 1999, 2000 to 2003, OR 2004 to 2007 = "since it was constructed" OTHERWISE = "since 1990"	
<p>Has any portion of this building undergone renovations {Since1990orConstructed}?</p> <p>1 Yes 2 No</p>		
NEXT	IF Yes → A28 [What renovations] IF No OR DK/RF → B1 [On a multibuilding complex]	

A28	What renovations	<i>see below</i>																														
ASK	IF A27 [Renovations] = Yes																															
FILL	{Since1990orConstructed} IF A23 [Year of construction] = 1990 or later OR A24 [Year of construction category] = 1990 to 1999, 2000 to 2003, OR 2004 to 2007 = "since it was constructed" OTHERWISE = "since 1990"																															
<p><input type="checkbox"/> SHOW CARD A8</p> <p>Please look at Show Card A8 and tell me which types of renovations have been done {Since1990orConstructed}.</p> <p>◆ PROBE for any others</p> <p>◆ ENTER all that apply</p> <table style="width: 100%; border: none;"> <tr> <td style="width: 50%;">1 Addition or annex</td> <td style="width: 50%; text-align: right;"><i>RENADD</i></td> </tr> <tr> <td>2 Reduction of enclosed floorspace</td> <td style="text-align: right;"><i>RENRDC</i></td> </tr> <tr> <td>3 Interior or exterior cosmetic improvements</td> <td style="text-align: right;"><i>RENCOS</i></td> </tr> <tr> <td>4 Interior wall re-configuration</td> <td style="text-align: right;"><i>RENINT</i></td> </tr> <tr> <td>5 Roof replacement</td> <td style="text-align: right;"><i>RENRF</i></td> </tr> <tr> <td>6 Exterior wall replacement</td> <td style="text-align: right;"><i>RENWLL</i></td> </tr> <tr> <td>7 Window replacement</td> <td style="text-align: right;"><i>RENWIN</i></td> </tr> <tr> <td>8 HVAC equipment upgrade</td> <td style="text-align: right;"><i>RENHVC</i></td> </tr> <tr> <td>9 Lighting upgrade</td> <td style="text-align: right;"><i>RENLGT</i></td> </tr> <tr> <td>10 Plumbing system upgrade</td> <td style="text-align: right;"><i>RENPLB</i></td> </tr> <tr> <td>11 Electrical upgrade</td> <td style="text-align: right;"><i>RENELC</i></td> </tr> <tr> <td>12 Insulation upgrade</td> <td style="text-align: right;"><i>RENINS</i></td> </tr> <tr> <td>13 Fire, safety, or security upgrade</td> <td style="text-align: right;"><i>RENSAF</i></td> </tr> <tr> <td>14 Structural upgrade</td> <td style="text-align: right;"><i>RENSTR</i></td> </tr> <tr> <td>15 Other</td> <td style="text-align: right;"><i>RENOTH</i></td> </tr> </table>			1 Addition or annex	<i>RENADD</i>	2 Reduction of enclosed floorspace	<i>RENRDC</i>	3 Interior or exterior cosmetic improvements	<i>RENCOS</i>	4 Interior wall re-configuration	<i>RENINT</i>	5 Roof replacement	<i>RENRF</i>	6 Exterior wall replacement	<i>RENWLL</i>	7 Window replacement	<i>RENWIN</i>	8 HVAC equipment upgrade	<i>RENHVC</i>	9 Lighting upgrade	<i>RENLGT</i>	10 Plumbing system upgrade	<i>RENPLB</i>	11 Electrical upgrade	<i>RENELC</i>	12 Insulation upgrade	<i>RENINS</i>	13 Fire, safety, or security upgrade	<i>RENSAF</i>	14 Structural upgrade	<i>RENSTR</i>	15 Other	<i>RENOTH</i>
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15 Other	<i>RENOTH</i>																															
NEXT	IF Other ⇒ A29 [Other renovation] OTHERWISE → B1 [On a multibuilding complex]																															

A29	Other renovation
ASK	IF A28 [What renovations] = Other
Please describe the other type of renovation. ◆ RECORD in open box	
NEXT	→ B1 [On a multibuilding complex]

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SECTION B: BUILDING ACTIVITY

B1	On a multibuilding complex	<i>FACIL</i>
ASK	All Mall Buildings	
	<p>Is this building part of a multibuilding campus or complex?</p> <p>◆ DEF: [A campus or complex is a group of two or more buildings on the same site that are owned or operated by a single organization or individual. It may also be referred to as a multibuilding facility.]</p> <p>1 Yes 2 No</p>	[F1]-HELP
NEXT	IF Yes → B2 [Federal complex] IF No OR DK/RF → C1 [Government owned]	

B2	Federal complex	<i>FEDFAC</i>
ASK	IF B1 [On a multibuilding complex] = Yes	
	<p>Is this <u>campus or complex</u> owned by the Federal government?</p> <p>1 Yes 2 No</p>	[F1]-HELP
NEXT	→ B3 [Type of complex]	

B3	Type of complex	<i>FACACT</i>
ASK	IF B1 [On a multibuilding complex] = Yes	
<p>[] SHOW CARD B16</p> <p>Looking at the list on Show Card B16, what is the primary business or function of this group of buildings as a whole?</p> <ol style="list-style-type: none"> 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 		[F1]-HELP
NEXT	IF Industrial complex → B4 [Manufacturing industrial] IF Any other type → C1 [Government owned]	

B4	Manufacturing industrial	<i>MANIND</i>
ASK	IF B3 [Type of complex] = Industrial complex	
<p>Is it a <u>manufacturing industrial</u> complex?</p> <p>◆ DEF: [Manufacturing industrial complexes involve the production or processing of goods, merchandise, raw materials, or food.]</p> <ol style="list-style-type: none"> 1 Yes 2 No 		[F1]-HELP
NEXT	IF Yes → B5 [Same owner as manufacturing] IF No OR DK/RF → C1 [Government owned]	

B5	Same owner as manufacturing	MANFAC
ASK	IF B4 [Manufacturing industrial] = Yes	
	[F1]-HELP	
	Does this building have the same owner and operator as the manufacturing campus or complex?	
	1 Yes 2 No	
NEXT	IF Yes → B6 [End of interview] IF No OR DK/RF → C1 [Government owned]	

B6	End of interview	
ASK	IF B5 [Same owner as manufacturing] = Yes	
FILL	{CollectWorksheet} IF R has Worksheet 1 = "However, I would like to collect Worksheet 1 and any other worksheets that you may have completed."	
	Thank you, that's all the questions that I have at this time, since this study does not include buildings on manufacturing facilities. {CollectWorksheet}	
	Thank you for your time and help.	
	◆ [F10]-Exit	
NEXT	TERMINATE	

SECTION C. OCCUPANCY AND OPERATING HOURS

C1	Government owned	<i>GOVOWN</i>
ASK	All Mall Buildings	
FILL	{BldgIntro} IF B1 [On a multibuilding complex] = Yes = "For the rest of this survey, I will be asking you only about the building, not the entire campus or complex." OTHERWISE = BLANK	
	{BldgIntro} Is this building owned by a government agency? 1 Yes 2 No	[F1]-HELP
NEXT	IF Yes → C2 [Type of government] IF No OR DK/RF → C3 [Owner]	

C2	Type of government	<i>GOVTYP</i>
ASK	IF C1 [Government owned] = Yes	
	Is it owned by the Federal government, a State government, or a local government? 1 Federal 2 State 3 Local	[F1]-HELP
NEXT	→ C5 [Number of businesses]	

C3	Owner	OWNER
ASK	IF C1 [Government owned] ≠ Yes	
<input type="checkbox"/> SHOW CARD C1 Looking at Show Card C1, please tell me which category best describes the owner of this building. <ol style="list-style-type: none"> 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 		
NEXT	IF Anything except Other → C5 [Number of businesses] IF Other → C4 [Other owner]	

C4	Other owner
ASK	IF C3 [Owner] = Other
Please describe this other owner.	
◆ RECORD in open box	
NEXT	→ C5 [Number of businesses]

C5	Number of businesses	NOCC
ASK	All Mall Buildings	
		[F1]-HELP
How many tenant spaces are there in this building, including vacant spaces?		
RANGE	1 to 9,999	
NEXT	IF DK/RF → C6 [Number of businesses category] IF C1 [Government owned] = DK/RF & C3 [Owner] = DK/RF → C15 [Months in use] OTHERWISE → C7 [Owner occupies]	

C6	Number of businesses category	<i>NOCCAT</i>
ASK	IF C5 [Number of businesses] = DK/RF	
<input type="checkbox"/> SHOW CARD C2		[F1]-HELP
<p>Please look at Show Card C2 and tell me which category best describes the number of tenant spaces in this building?</p> <ol style="list-style-type: none"> 1 One 2 2 to 5 3 6 to 10 4 11 to 20 5 21 to 50 6 51 to 100 7 More than 100 		
NEXT	IF C1 [Government owned] = DK/RF & C3 [Owner] = DK/RF → C15 [Months in use] OTHERWISE → C7 [Owner occupies]	

C7	Owner occupies	<i>OWNOCC</i>
ASK	IF NOT (C1 [Government owned] = DK/RF & C3 [Owner] = DK/RF)	
<p>Is the space in this building occupied by the owner, leased to tenants, or a combination of both?</p> <ol style="list-style-type: none"> 1 Owner occupies 2 Leased to tenants 3 Combination of occupied and leased 		
NEXT	→ C8 [Owner operates]	

C8	Owner operates	<i>OWNOPR</i>
ASK	IF NOT (C1 [Government owned] = DK/RF & C3 [Owner] = DK/RF)	
<p>Is the building owner responsible for the operation and maintenance of the energy systems?</p> <ol style="list-style-type: none"> 1 Yes 2 No 		
NEXT	IF Yes → C9 [Owner has purchasing power] IF No → C11 [Nonowner operator] IF DK/RF → C15 [Months in use]	

C9	Owner has purchasing power	<i>OWNPPR</i>
ASK	IF C8 [Owner operates] = Yes	
<p>Does the building owner also have direct input on decisions regarding purchases of energy-related equipment?</p> <p>1 Yes 2 No</p>		
NEXT	IF Yes OR DK/RF → C15 [Months in use] IF No → C10 [Nonowner has purchasing power]	

C10	Nonowner has purchasing power	<i>NWNPPR</i>
ASK	IF C9 [Owner has purchasing power] = No	
<p>☐ SHOW CARD C3</p> <p>Looking at Show Card C3, please tell me who <u>does</u> have direct input (on decisions regarding purchases of energy-related equipment).</p> <p>1 Property management company or leasing agent 2 Business owner or tenant 3 Facilities personnel employed directly by the building owner 4 Facilities or energy management consultant 5 Volunteer member of the organization 6 Manager with general supervisory duties 7 Other</p>		
NEXT	IF Other → C14 [Other with purchasing power] OTHERWISE → C15 [Months in use]	

C11	Nonowner operator	<i>NWNOPR</i>
ASK	IF C8 [Owner operates] = No	
<p>☐ SHOW CARD C3</p> <p>Looking at Show Card C3, please tell me who <u>is</u> responsible for the operation and maintenance of the energy systems.</p> <p>1 Property management company or leasing agent 2 Business owner or tenant 3 Facilities personnel employed directly by the building owner 4 Facilities or energy management consultant 5 Volunteer member of the organization 6 Manager with general supervisory duties 7 Other</p>		
NEXT	IF Other → C12 [Other operator] OTHERWISE → C13 [Who has purchasing power]	

C12	Other operator	
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ASK	IF C11 [Nonowner operator] = Other
<p>Please describe who is responsible for the operation and maintenance of the energy systems.</p> <p>◆ RECORD in open box</p>	
NEXT	→ C13 [Who has purchasing power]

C13	Who has purchasing power	<i>WHOPPR</i>
ASK	IF C8 [Owner operates] = No	
<p>Who has the most direct input on decisions regarding purchases of energy-related equipment - the building owner or the party who is responsible for the energy systems?</p> <ol style="list-style-type: none"> 1 Building owner 2 Party responsible for building operations 3 IF VOLUNTEERED: Both (either they have equal input, or are the same person) 4 IF VOLUNTEERED: Other 		
NEXT	IF Other → C14 [Other with purchasing power] OTHERWISE → C15 [Months in use]	

C14	Other with purchasing power
ASK	IF C13 [Who has purchasing power] = Other
<p>Please describe who has the most direct input on decisions regarding purchases of energy-related equipment.</p> <p>◆ RECORD in open box</p>	
NEXT	→ C15 [Months in use]

C15	Months in use	<i>MONUSE</i>
ASK	All Mall Buildings	
<p>Thinking of calendar year 2012, for how many months was this building in use?</p>		[F1]-HELP
RANGE	0 to 12	
NEXT	IF Zero → D1 [Heating] IF 1-12 months OR DK/RF → C16 [Percent occupancy]	

C16	Percent occupancy	<i>OCCUPYP</i>
ASK	IF C15 [Months in use] ≠ Zero	
FILL	{MonthsInUse} IF C18 [Months in use] < 12 = "Thinking about the months that this building was in use in 2012, about " OTHERWISE = 'In 2012, about '	
{MonthsInUse} what percent of the total floorspace of this building was <u>occupied</u> ? If occupancy varied, please provide an average percent occupancy."		
RANGE	0 to 100	
NEXT	→ D1 [Heating]	

DRAFT (9/5/12)

SECTION D. ENERGY USE AND EQUIPMENT

D1	Heating	<i>HT1</i>
ASK	All Buildings	
FILL	{Worksheet1Intro} IF R has Worksheet 1 = "Please continue to refer to Worksheet 1 for some of these next questions on energy sources, uses, and equipment." OTHERWISE = BLANK	
		[F1]-HELP
{Worksheet1Intro} For the next five questions, please tell me if energy was used in this building for any of these purposes during calendar year 2012. Was any energy used for heating the building? 1 Yes 2 No		
NEXT	→ D2 [Cooling]	

D2	Cooling	<i>COOL</i>
ASK	All Buildings	
		[F1]-HELP
(Was any energy used...) For air conditioning? 1 Yes 2 No		
NEXT	→ D3 [Water heating]	

D3	Water heating	<i>WATR</i>
ASK	All Buildings	
		[F1]-HELP
(Was any energy used...) For heating water for purposes such as washing hands, dishes, or clothes? 1 Yes 2 No		

NEXT	→ D4 [Cooking]
D4	Cooking <i>COOK</i>
ASK	All Buildings
	[F1]-HELP
	<p>(Was any energy used...)</p> <p>For cooking?</p> <p>◆ EXP: [If there is only minimal cooking, such as microwaves, hot plates, or toaster ovens, answer "No."]</p> <p>1 Yes 2 No</p>
NEXT	IF D1 [Heating] = DK/RF & D2 [Cooling] = DK/RF & D3 [Water heating] = DK/RF & D4 [Cooking] = DK/RF → D5 [Missing end uses] OTHERWISE → D6 [Manufacturing]

D5	Missing end uses
SHOW	IF D1 [Heating] = DK/RF & D2 [Cooling] = DK/RF & D3 [Water heating] = DK/RF & D4 [Cooking] = DK/RF
	<p>◆ INTERVIEWER: You have entered DK or RF for the four major end use questions. This information is important for understanding how energy is used in this building. You may need to find a new respondent at this point. Explain to the current respondent that the remainder of the questionnaire contains technical information about energy use and equipment and ask whether the respondent would want us to consult someone else in the building for these questions.</p> <p>◆ ENTER "1" when you are ready to continue</p>
NEXT	→ D6 [Manufacturing]

D6	Manufacturing <i>MANU</i>
ASK	All Buildings
	[F1]-HELP
	<p>(Was any energy used...)</p> <p>For manufacturing?</p> <p>1 Yes 2 No</p>
NEXT	IF No & D1 [Heating] = No & D2 [Cooling] = No & D3 [Water heating] = No & D4 [Cooking] = No → D7 [Any energy used] OTHERWISE → D8 [Electricity generation capability]

D7	Any energy used	<i>ANYEGY</i>
ASK	IF D1 [Heating] = No & D2 [Cooling] = No & D3 [Water heating] = No & D4 [Cooking] = No & D6 [Manufacturing] = No	
<p>I did not record any uses of energy for this building. Did this building use <u>any</u> energy in 2012 for other purposes, such as lighting or appliances?</p> <p>1 Yes, some energy was used in 2012 2 No, no energy was used</p>		
NEXT	IF Yes, some energy was used OR DK/RF ⇒ D8 [Electricity generation capability] IF No, no energy was used ⇒ INTERVIEW COMPLETE	

D8	Electricity generation capability	<i>CAPGEN</i>
ASK	IF D1 [Heating] = Yes OR D2 [Cooling] = Yes OR D3 [Water heating] = Yes OR D4 [Cooking] = Yes OR D6 [Manufacturing] = Yes OR D7 [Any energy used] = Yes, some energy was used OR DK/RF	
<p style="text-align: right;">[F1]-HELP</p> <p>Does this building have the ability to generate electricity, including for emergency backup?</p> <p>1 Yes 2 No</p>		
NEXT	⇒ D9 [Energy sources used]	

D9	Energy sources used	<i>see below</i>																											
ASK	IF D1 [Heating] = Yes OR D2 [Cooling] = Yes OR D3 [Water heating] = Yes OR D4 [Cooking] = Yes OR D6 [Manufacturing] = Yes OR D7 [Any energy used] = Yes, some energy was used OR DK/RF																												
<p style="text-align: right;">[F1]-HELP</p> <p>☐ SHOW CARD D1</p> <p>Looking at this list of energy sources on Show Card D1, please tell me which ones were used <u>in this building</u> for any purpose in 2012.</p> <ul style="list-style-type: none"> ◆ EXP: [Include fuel oil, diesel, or kerosene if it was purchased or delivered in 2012, even if it was not used during that time.] ◆ EXP: [Do not include any fuels used in vehicles outside the building.] ◆ PROBE for any others ◆ ENTER all that apply <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 10%; vertical-align: top;">11</td> <td style="width: 70%;">Electricity</td> <td style="width: 20%; text-align: right;"><i>ELUSED</i></td> </tr> <tr> <td>12</td> <td>Natural gas</td> <td style="text-align: right;"><i>NGUSED</i></td> </tr> <tr> <td>13</td> <td>Fuel oil, diesel, or kerosene</td> <td style="text-align: right;"><i>FKUSED</i></td> </tr> <tr> <td>14</td> <td>Bottled gas, also known as LPG or propane</td> <td style="text-align: right;"><i>PRUSED</i></td> </tr> <tr> <td>15</td> <td>District steam piped in from a separate building or utility</td> <td style="text-align: right;"><i>STUSED</i></td> </tr> <tr> <td>16</td> <td>District hot water piped in from a separate building or utility</td> <td style="text-align: right;"><i>HWUSED</i></td> </tr> <tr> <td>17</td> <td>District chilled water piped in from a separate building or utility</td> <td style="text-align: right;"><i>CWUSED</i></td> </tr> <tr> <td>18</td> <td>Wood, coal, or solar</td> <td></td> </tr> <tr> <td>24</td> <td>Other source or sources</td> <td style="text-align: right;"><i>OTUSED</i></td> </tr> </table>			11	Electricity	<i>ELUSED</i>	12	Natural gas	<i>NGUSED</i>	13	Fuel oil, diesel, or kerosene	<i>FKUSED</i>	14	Bottled gas, also known as LPG or propane	<i>PRUSED</i>	15	District steam piped in from a separate building or utility	<i>STUSED</i>	16	District hot water piped in from a separate building or utility	<i>HWUSED</i>	17	District chilled water piped in from a separate building or utility	<i>CWUSED</i>	18	Wood, coal, or solar		24	Other source or sources	<i>OTUSED</i>
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NEXT	IF Fuel, oil, diesel, or kerosene ⇒ D10 [Fuel oil, diesel, or kerosene] IF Wood, coal, or solar ⇒ D11 [Wood, coal, or solar] IF Other source or sources ⇒ D12 [Other energy source 1] IF District steam, District hot water, OR District chilled water & B1 [On a multibuilding complex] = Yes ⇒ D15 [From central plant] IF District steam, District hot water, OR District chilled water & B1 [On a multibuilding complex] ≠ Yes ⇒ D20 [Purchase from offsite] IF DK/RF: IF D8 [Electricity generation capability] = Yes ⇒ D81 [Energy for generation] IF D8 [Electricity generation capability] ≠ Yes → INTERVIEW COMPLETE OTHERWISE: IF D1 [Heating] = Yes ⇒ D21 [Source for main heating] IF D2 [Cooling] = Yes ⇒ D52 [Sources for cooling] IF D3 [Water heating] = Yes ⇒ D74 [Sources for water heating] IF D4 [Cooking] = Yes ⇒ D77 [Sources for cooking] IF D6 [Manufacturing] = Yes ⇒ D79 [Sources for manufacturing] IF D8 [Electricity generation capability] = Yes ⇒ D81 [Energy for generation] OTHERWISE ⇒ D87 [Any other sources]																												

D10	Fuel oil, diesel, or kerosene	<i>FKTYPE</i>
ASK	IF Fuel oil, diesel, or kerosene IN D9 [Energy sources used]	
		[F1]-HELP
	<p>◆ VERIFY if volunteered in previous question</p> <p>You mentioned fuel oil, diesel, or kerosene. Which of these were used (in this building in 2012)?</p> <p>◆ ENTER all that apply</p> <ol style="list-style-type: none"> 1 Fuel oil 2 Diesel 3 Kerosene 	
NEXT	<p>IF Wood, coal, or solar IN D9 [Energy sources used] ⇒ D11 [Wood, coal, or solar]</p> <p>IF Other source or sources IN D9 [Energy sources used] ⇒ D12 [Other energy source 1]</p> <p>IF District steam, District hot water, OR District chilled water & B1 [On a multibuilding complex] = Yes ⇒ D15 [From central plant]</p> <p>IF District steam, District hot water, OR District chilled water & B1 [On a multibuilding complex] ≠ Yes ⇒ D20 [Purchase from offsite]</p> <p>OTHERWISE:</p> <p>IF D1 [Heating] = Yes ⇒ D21 [Source for main heating]</p> <p>IF D2 [Cooling] = Yes ⇒ D52 [Sources for cooling]</p> <p>IF D3 [Water heating] = Yes ⇒ D74 [Sources for water heating]</p> <p>IF D4 [Cooking] = Yes ⇒ D77 [Sources for cooking]</p> <p>IF D6 [Manufacturing] = Yes ⇒ D79 [Sources for manufacturing]</p> <p>IF D8 [Electricity generation capability] = Yes ⇒ D81 [Energy for generation]</p> <p>OTHERWISE ⇒ D87 [Any other sources]</p>	

D11	Wood, coal, or solar	<i>see below</i>									
ASK	IF Wood, coal, or solar IN D9 [Energy sources used]										
	<p>◆ VERIFY if volunteered in previous question</p> <p>You mentioned wood, coal, or solar. Which of these were used (in this building in 2012)?</p> <p>◆ ENTER all that apply</p> <table> <tr> <td>1</td> <td>Wood</td> <td><i>WOUSED</i></td> </tr> <tr> <td>2</td> <td>Coal</td> <td><i>COUSED</i></td> </tr> <tr> <td>3</td> <td>Solar</td> <td><i>SOUSED</i></td> </tr> </table>		1	Wood	<i>WOUSED</i>	2	Coal	<i>COUSED</i>	3	Solar	<i>SOUSED</i>
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3	Solar	<i>SOUSED</i>									
NEXT	IF Other source or sources IN D9 [Energy sources used] ⇒ D12 [Other energy source 1] IF District steam, District hot water, OR District chilled water & B1 [On a multibuilding complex] = Yes ⇒ D15 [From central plant] IF District steam, District hot water, OR District chilled water & B1 [On a multibuilding complex] ≠ Yes ⇒ D20 [Purchase from offsite] OTHERWISE: IF D1 [Heating] = Yes ⇒ D21 [Source for main heating] IF D2 [Cooling] = Yes ⇒ D52 [Sources for cooling] IF D3 [Water heating] = Yes ⇒ D74 [Sources for water heating] IF D4 [Cooking] = Yes ⇒ D77 [Sources for cooking] IF D6 [Manufacturing] = Yes ⇒ D79 [Sources for manufacturing] IF D8 [Electricity generation capability] = Yes ⇒ D81 [Energy for generation] OTHERWISE ⇒ D87 [Any other sources]										

D12	Other energy source 1	<i>OTUSDX1</i>
ASK	IF Other source or sources IN D9 [Energy sources used]	
	<p>What was the first other energy source used (in this building in 2012)?</p> <p>◆ ENTER the first energy source used</p>	
NEXT	⇒ D13 [Other energy source 2]	

D13	Other energy source 2	<i>OTUSDx2</i>
ASK	IF Other source or sources IN D9 [Energy sources used]	
<p>Were there any other energy sources used (in this building in 2012)?</p> <ul style="list-style-type: none"> ◆ ENTER the next energy source ◆ [ENTER] if no others 		
NEXT	<p>IF Source entered here ⇒ D14 [Other energy source 3] IF No source entered here: IF District steam, District hot water, OR District chilled water & B1 [On a multibuilding complex] = Yes ⇒ D15 [From central plant] IF District steam, District hot water, OR District chilled water & B1 [On a multibuilding complex] ≠ Yes ⇒ D20 [Purchase from offsite] OTHERWISE: IF D1 [Heating] = Yes ⇒ D21 [Source for main heating] IF D2 [Cooling] = Yes ⇒ D52 [Sources for cooling] IF D3 [Water heating] = Yes ⇒ D74 [Sources for water heating] IF D4 [Cooking] = Yes ⇒ D77 [Sources for cooking] IF D6 [Manufacturing] = Yes ⇒ D79 [Sources for manufacturing] IF D8 [Electricity generation capability] = Yes ⇒ D81 [Energy for generation] OTHERWISE ⇒ D87 [Any other sources]</p>	

D14	Other energy source 3	<i>OTUSDx3</i>
ASK	IF Source was entered in D13 [Other energy source 2]	
<p>Were there any other energy sources used (in this building in 2012)?</p> <ul style="list-style-type: none"> ◆ ENTER the next energy source ◆ [ENTER] if no others 		
NEXT	<p>IF District steam, District hot water, OR District chilled water & B1 [On a multibuilding complex] = Yes ⇒ D15 [From central plant] IF District steam, District hot water, OR District chilled water & B1 [On a multibuilding complex] ≠ Yes ⇒ D20 [Purchase from offsite] OTHERWISE: IF D1 [Heating] = Yes ⇒ D21 [Source for main heating] IF D2 [Cooling] = Yes ⇒ D52 [Sources for cooling] IF D3 [Water heating] = Yes ⇒ D74 [Sources for water heating] IF D4 [Cooking] = Yes ⇒ D77 [Sources for cooking] IF D6 [Manufacturing] = Yes ⇒ D79 [Sources for manufacturing] IF D8 [Electricity generation capability] = Yes ⇒ D81 [Energy for generation] OTHERWISE ⇒ D87 [Any other sources]</p>	

D15	From central plant	<i>DHFRPL</i>
ASK	IF District steam, District hot water, OR District chilled water IN D9 [Energy sources used] & B1 [On a multibuilding facility] =Yes	
		[F1]-HELP
	Is the district steam, district hot water, or district chilled water piped in from a central plant that is part of the same campus or complex as your building?	
	1 Yes 2 No	
NEXT	IF No OR DK/RF ⇒ D20 [Purchase from offsite] IF Yes: IF NOT District steam IN D9 [Energy sources used] → D16 [Plant produces district steam] IF District steam IN D9 [Energy sources used]: IF NOT District hot water IN D9 [Energy sources used] ⇒ D17 [Plant produces district hot water] IF NOT District chilled water IN D9 [Energy sources used] ⇒ D18 [Plant produces district chilled water] OTHERWISE → D19 [Plant produces electricity]	

D16	Plant produces district steam	<i>FACDST</i>
ASK	IF D15 [From central plant] = Yes & NOT District steam IN D9 [Energy sources used]	
		[F1]-HELP
	Does the central physical plant produce... District steam?	
	1 Yes 2 No	
NEXT	IF NOT District hot water IN D9 [Energy sources used] ⇒ D17 [Plant produces district hot water] IF NOT District chilled water IN D9 [Energy sources used] ⇒ D18 [Plant produces district chilled water] OTHERWISE → D19 [Plant produces electricity]	

D17	Plant produces district hot water	<i>FACDHW</i>
ASK	IF D15 [From central plant] = Yes & NOT District hot water IN D9 [Energy sources used]	
		[F1]-HELP
	(Does the central physical plant produce...) District hot water?	
	1 Yes 2 No	
NEXT	IF District chilled water IN D9 [Energy sources used] ⇒ D19 [Plant produces electricity] OTHERWISE ⇒ D18 [Plant produces district chilled water]	

D18	Plant produces district chilled water	<i>FACDCW</i>
ASK	IF D15 [From central plant] = Yes & NOT District chilled water IN D9 [Energy sources used]	
		[F1]-HELP
	(Does the central physical plant produce...)	
	District chilled water?	
	1 Yes 2 No	
NEXT	→ D19 [Plant produces electricity]	

D19	Plant produces electricity	<i>FACELC</i>
ASK	IF D15 [From central plant] = Yes	
		[F1]-HELP
	(Does the central physical plant produce...)	
	Electricity?	
	1 Yes 2 No	
NEXT	IF D1 [Heating] = Yes ⇒ D21 [Source for main heating] IF D2 [Cooling] = Yes ⇒ D52 [Sources for cooling] IF D3 [Water heating] = Yes ⇒ D74 [Sources for water heating] IF D4 [Cooking] = Yes ⇒ D77 [Sources for cooking] IF D5 [Manufacturing] = Yes ⇒ D79 [Sources for manufacturing] IF D7 [Electricity generation capability] = Yes ⇒ D81 [Energy for generation] OTHERWISE ⇒ D87 [Any other sources]	

D20	Purchase from offsite	<i>DHOFF</i>
ASK	IF (District steam, District hot water, or District chilled water IN D9 [Energy sources used] & B1 [On a multibuilding facility] ≠ Yes) OR D15 [From central plant] = No OR DK/RF	
	Is the district steam, hot water, or chilled water purchased from somewhere off-site, such as a commercial or municipal plant?	
	1 Yes 2 No	
NEXT	IF D1 [Heating] = Yes ⇒ D21 [Source for main heating] IF D2 [Cooling] = Yes ⇒ D52 [Sources for cooling] IF D3 [Water heating] = Yes ⇒ D74 [Sources for water heating] IF D4 [Cooking] = Yes ⇒ D77 [Sources for cooking] IF D5 [Manufacturing] = Yes ⇒ D79 [Sources for manufacturing] IF D7 [Electricity generation capability] = Yes ⇒ D81 [Energy for generation] OTHERWISE ⇒ D87 [Any other sources]	

D21	Source for main heating	<i>see below</i>
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ASK	IF D1 [Heating] = Yes																																							
FILL	<p>{Ht1SourcesList} = List of all energy sources used {Electricity} – {Other3} = If a source is used, it appears in this list; if not, the line is blank {FuelOilType} = Type or types specified in D10 [Fuel oil, diesel, or kerosene] {Other1} – {Other3} = Sources specified in D12 [Other energy source 1] – D14 [Other energy source 3]</p>																																							
<p>What was the <u>main</u> energy source for heating? (Was it {Ht1SourcesList}?)</p> <ul style="list-style-type: none"> ◆ DEF: [The main energy source for heating is the energy source used to heat most of the square footage in this building most of the time.] ◆ EXP: [Do not include electricity if it is used only to run fan motors.] ◆ Only sources already selected are shown here <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 5%;">11</td> <td style="width: 70%;">{Electricity}</td> <td style="width: 25%; text-align: right;">ELHT1</td> </tr> <tr> <td>12</td> <td>{Natural gas}</td> <td style="text-align: right;">NGHT1</td> </tr> <tr> <td>13</td> <td>{FuelOilType}</td> <td style="text-align: right;">FKHT1</td> </tr> <tr> <td>14</td> <td>{Bottled gas}</td> <td style="text-align: right;">PRHT1</td> </tr> <tr> <td>15</td> <td>{District steam}</td> <td style="text-align: right;">STHT1</td> </tr> <tr> <td>16</td> <td>{District hot water}</td> <td style="text-align: right;">HWHT1</td> </tr> <tr> <td>18</td> <td>{Wood}</td> <td style="text-align: right;">WOHT1</td> </tr> <tr> <td>19</td> <td>{Coal}</td> <td style="text-align: right;">COHT1</td> </tr> <tr> <td>20</td> <td>{Solar}</td> <td style="text-align: right;">SOHT1</td> </tr> <tr> <td>21</td> <td>{Other1}</td> <td style="text-align: right;">OTHT1</td> </tr> <tr> <td>22</td> <td>{Other2}</td> <td style="text-align: right;">OTHT1</td> </tr> <tr> <td>23</td> <td>{Other3}</td> <td style="text-align: right;">OTHT1</td> </tr> <tr> <td>24</td> <td>Some other energy source</td> <td></td> </tr> </table>		11	{Electricity}	ELHT1	12	{Natural gas}	NGHT1	13	{FuelOilType}	FKHT1	14	{Bottled gas}	PRHT1	15	{District steam}	STHT1	16	{District hot water}	HWHT1	18	{Wood}	WOHT1	19	{Coal}	COHT1	20	{Solar}	SOHT1	21	{Other1}	OTHT1	22	{Other2}	OTHT1	23	{Other3}	OTHT1	24	Some other energy source	
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23	{Other3}	OTHT1																																						
24	Some other energy source																																							
NEXT	<p>IF Some other energy source ⇒ D22 [Other source for main heating] IF Anything but Some other energy source OR DK/RF: IF More than one energy source used ⇒ D23 [Which other sources for heating] IF Only one energy source used ⇒ D24 [Any other sources for heating]</p>																																							

D22	Other source for main heating	<i>see below</i>																														
ASK	IF D21 [Source for main heating] = Some other energy source																															
<p>What was the other energy source used for <u>main</u> space heating?</p> <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 5%;">11</td> <td style="width: 70%;">Electricity</td> <td style="width: 25%; text-align: right;">ELHT1</td> </tr> <tr> <td>12</td> <td>Natural gas</td> <td style="text-align: right;">NGHT1</td> </tr> <tr> <td>13</td> <td>Fuel oil/Diesel/Kerosene</td> <td style="text-align: right;">FKHT1</td> </tr> <tr> <td>14</td> <td>Bottled gas</td> <td style="text-align: right;">PRHT1</td> </tr> <tr> <td>15</td> <td>District steam</td> <td style="text-align: right;">STHT1</td> </tr> <tr> <td>16</td> <td>District hot water</td> <td style="text-align: right;">HWHT1</td> </tr> <tr> <td>18</td> <td>Wood</td> <td style="text-align: right;">WOHT1</td> </tr> <tr> <td>19</td> <td>Coal</td> <td style="text-align: right;">COHT1</td> </tr> <tr> <td>20</td> <td>Solar</td> <td style="text-align: right;">SOHT1</td> </tr> <tr> <td>24</td> <td>Some other energy source</td> <td style="text-align: right;">OTHT1</td> </tr> </table>			11	Electricity	ELHT1	12	Natural gas	NGHT1	13	Fuel oil/Diesel/Kerosene	FKHT1	14	Bottled gas	PRHT1	15	District steam	STHT1	16	District hot water	HWHT1	18	Wood	WOHT1	19	Coal	COHT1	20	Solar	SOHT1	24	Some other energy source	OTHT1
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24	Some other energy source	OTHT1																														
NEXT	⇒ D23 [Which other sources for heating]																															

D23	Which other sources for heating	<i>HT2 & see below</i>
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ASK	IF D1 [Heating] = Yes & More than one energy source used																																											
FILL	<p>{Ht2SourcesList} = List of all energy sources used, minus the one used for main heating</p> <p>{Electricity} – {Other3} = If a source is used (other than for main space heating), it appears in this list; if not, the line is blank</p> <p>{FuelOilType} = Type or types specified in D10 [Fuel oil, diesel, or kerosene]</p> <p>{Other1} – {Other3} = Sources specified in D12 [Other energy source 1] – D14 [Other energy source 3]</p>																																											
<p>Which other energy sources, if any, were used for heating? ({Ht2SourcesList})</p> <ul style="list-style-type: none"> ◆ EXP: [Do not include electricity if it is used only to run fan motors.] ◆ Only sources already selected are shown here ◆ PROBE for any others ◆ ENTER all that apply <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 5%;">11</td> <td style="width: 70%;">{Electricity}</td> <td style="width: 25%; text-align: right;">ELHT2</td> </tr> <tr> <td>12</td> <td>{Natural gas}</td> <td style="text-align: right;">NGHT2</td> </tr> <tr> <td>13</td> <td>{FuelOilType}</td> <td style="text-align: right;">FKHT2</td> </tr> <tr> <td>14</td> <td>{Bottled gas}</td> <td style="text-align: right;">PRHT2</td> </tr> <tr> <td>15</td> <td>{District steam}</td> <td style="text-align: right;">STHT2</td> </tr> <tr> <td>16</td> <td>{District hot water}</td> <td style="text-align: right;">HWHT2</td> </tr> <tr> <td>18</td> <td>{Wood}</td> <td style="text-align: right;">WOHT2</td> </tr> <tr> <td>19</td> <td>{Coal}</td> <td style="text-align: right;">COHT2</td> </tr> <tr> <td>20</td> <td>{Solar}</td> <td style="text-align: right;">SOHT2</td> </tr> <tr> <td>21</td> <td>{Other1}</td> <td style="text-align: right;">OTHT2</td> </tr> <tr> <td>22</td> <td>{Other2}</td> <td style="text-align: right;">OTHT2</td> </tr> <tr> <td>23</td> <td>{Other3}</td> <td style="text-align: right;">OTHT2</td> </tr> <tr> <td>24</td> <td>Some other energy source</td> <td></td> </tr> <tr> <td>99</td> <td>No other sources for heating</td> <td></td> </tr> </table>			11	{Electricity}	ELHT2	12	{Natural gas}	NGHT2	13	{FuelOilType}	FKHT2	14	{Bottled gas}	PRHT2	15	{District steam}	STHT2	16	{District hot water}	HWHT2	18	{Wood}	WOHT2	19	{Coal}	COHT2	20	{Solar}	SOHT2	21	{Other1}	OTHT2	22	{Other2}	OTHT2	23	{Other3}	OTHT2	24	Some other energy source		99	No other sources for heating	
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NEXT	IF Some other energy source ⇒ D25 [Other source for heating] IF Anything but Some other energy source OR DK/RF ⇒ D26 [Percent heated]																																											

D24	Any other sources for heating	<i>HT2</i>
ASK	IF D1 [Heating] = Yes & Only one energy source used	
<p>Were there any other energy sources used for heating?</p> <p>1 Yes</p> <p>2 No</p>		
NEXT	IF Yes ⇒ D25 [Other source for heating] IF No OR DK/RF ⇒ D26 [Percent heated]	

D25	Other source for heating																														
ASK	IF D24 [Any other sources for heating] = Some other energy source OR D24 [Any other sources for heating] = Yes																														
<p>What was the other energy source used for secondary space heating?</p> <table> <tr> <td>11</td> <td>Electricity</td> <td><i>ELHT2</i></td> </tr> <tr> <td>12</td> <td>Natural gas</td> <td><i>NGHT2</i></td> </tr> <tr> <td>13</td> <td>Fuel oil/Diesel/Kerosene</td> <td><i>FKHT2</i></td> </tr> <tr> <td>14</td> <td>Bottled gas</td> <td><i>PRHT2</i></td> </tr> <tr> <td>15</td> <td>District steam</td> <td><i>STHT2</i></td> </tr> <tr> <td>16</td> <td>District hot water</td> <td><i>HWHT2</i></td> </tr> <tr> <td>18</td> <td>Wood</td> <td><i>WOHT2</i></td> </tr> <tr> <td>19</td> <td>Coal</td> <td><i>COHT2</i></td> </tr> <tr> <td>20</td> <td>Solar</td> <td><i>SOHT2</i></td> </tr> <tr> <td>24</td> <td>Some other energy source</td> <td><i>OTHT2</i></td> </tr> </table>		11	Electricity	<i>ELHT2</i>	12	Natural gas	<i>NGHT2</i>	13	Fuel oil/Diesel/Kerosene	<i>FKHT2</i>	14	Bottled gas	<i>PRHT2</i>	15	District steam	<i>STHT2</i>	16	District hot water	<i>HWHT2</i>	18	Wood	<i>WOHT2</i>	19	Coal	<i>COHT2</i>	20	Solar	<i>SOHT2</i>	24	Some other energy source	<i>OTHT2</i>
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NEXT	⇒ D26 [Percent heated]																														

NOTE ON ENERGY SOURCES:

Throughout the rest of this questionnaire, there will be references such as “Electricity used” or “Natural gas used.” In addition to the energy sources that were given in D9 [Energy sources used], if sources are added along the way, such as in D22 [Other source for main heating] OR D25 [Other source for heating], those sources are then also considered to be used.

D26	Percent heated	<i>HEATP</i>
ASK	IF D1 [Heating] = Yes	
FILL	{SqFt} IF A6 [Square footage] known = "A6 [Square footage]" IF A6 [Square footage] = DK/RF = "floorspace"	
		[F1]-HELP
What percent of the {SqFt} in this building was heated to at least 50 degrees Fahrenheit during 2012, including basements and indoor parking levels if they were heated to at least 50 degrees?		
<ul style="list-style-type: none"> ◆ If heated square footage is known, but not the percent, RECORD square footage in comments, then code DK ◆ PROBE for estimate if DK 		
RANGE	0 to 100	
NEXT	IF Zero ⇒ D27 [Heated to less than 50 degrees] IF Anything else ⇒ D28 [Heating equipment types]	

D27	Heated to less than 50 degrees	<i>HTLS50</i>
ASK	IF D26 [Percent heated] = Zero	
Was any of this building heated to less than 50 degrees Fahrenheit?		
<ul style="list-style-type: none"> ◆ EXP: [Areas may be heated to less than 50 degrees to prevent pipes from freezing.] <ol style="list-style-type: none"> 1 Yes 2 No 		
NEXT	IF Yes OR DK/RF ⇒ D28 [Heating equipment types] IF No: IF D2 [Cooling] = Yes ⇒ D52 [Sources for cooling] IF D3 [Water heating] = Yes ⇒ D74 [Sources for water heating] IF D4 [Cooking] = Yes ⇒ D77 [Sources for cooking] IF D6 [Manufacturing] = Yes ⇒ D79 [Sources for manufacturing] IF D8 [Electricity generation capability] = Yes ⇒ D81 [Energy for generation] OTHERWISE ⇒ D87 [Any other sources]	

D28	Heating equipment types	<i>see below</i>
ASK	IF D26 [Percent heated] > 0 OR D27 [Heated to less than 50 degrees] = Yes OR DK/RF	
<p style="text-align: right;">[F1]-HELP</p> <p>☐ SHOW CARD D2</p> <p>Looking at the list of heating equipment types on Show Card D2, please tell me which types are used in this building.</p> <ul style="list-style-type: none"> ◆ PROBE for any others ◆ ENTER all that apply <ul style="list-style-type: none"> 1 Furnaces that heat air directly, without using steam or hot water <i>FURNAC</i> 2 Packaged central unit (roof mounted) <i>PKGHT</i> 3 Boilers inside (or adjacent to) the building that produce steam or hot water <i>BOILER</i> 4 District steam or hot water piped in from outside the building <i>STHW</i> 5 Heat pumps (other than components of a packaged unit) <i>HTPMPH</i> 6 Individual space heaters, other than heat pumps <i>SLFCON</i> 7 Other heating equipment <i>OTHTEQ</i> 		
NEXT	IF Furnaces ⇒ D29 [Type of furnace] IF Boilers ⇒ D32 [Type of boiler system] IF District steam or hot water ⇒ D33 [Type of district heat system] IF Other heating equipment ⇒ D34 [Other heating components] IF Packaged central unit ⇒ D40 [Type of packaged heating] IF Heat pumps ⇒ D42 [Heat pump heating system] IF Individual space heaters ⇒ D45 [Type of individual heater] IF DK/RF: IF D2 [Cooling] = Yes ⇒ D52 [Sources for cooling] IF D3 [Water heating] = Yes ⇒ D74 [Sources for water heating] IF D4 [Cooking] = Yes ⇒ D77 [Sources for cooking] IF D6 [Manufacturing] = Yes ⇒ D79 [Sources for manufacturing] IF D8 [Electricity generation capability] = Yes ⇒ D81 [Energy for generation] OTHERWISE ⇒ D87 [Any other sources]	

D29	Type of furnace
ASK	IF Furnaces IN D28 [Heating equipment types]
[F1]-HELP	
<p>□ SHOW CARD D3</p> <p>Looking at Show Card D3, please tell me the type or types of furnace systems used in the building.</p> <p>◆ ENTER all that apply</p> <ol style="list-style-type: none"> 1 Packaged central unit (roof mounted) 2 Split system (residential-type furnace with DX cooling unit) 3 Duct furnace (installed in air distribution duct) 4 Individual room furnace (freestanding or floor-mounted) 	
NEXT	<p>IF Packaged central unit OR Duct furnace ⇒ D30 [Classify furnace as packaged]</p> <p>IF Individual room furnace ⇒ D31 [Classify furnace as space heater]</p> <p>OTHERWISE:</p> <p>IF Boilers IN D28 [Heating equipment types] ⇒ D32 [Type of boiler system]</p> <p>IF District steam or hot water IN D28 [Heating equipment types] ⇒ D33 [Type of district heat system]</p> <p>IF Other heating equipment IN D28 [Heating equipment types] ⇒ D34 [Other heating components]</p> <p>IF Packaged central unit IN D28 [Heating equipment types] ⇒ D40 [Type of packaged heating]</p> <p>IF Heat pumps IN D28 [Heating equipment types] ⇒ D42 [Heat pump heating system]</p> <p>IF Individual space heaters ⇒ D45 [Type of individual heater]</p> <p>OTHERWISE:</p> <p>IF More than one energy source used for heating ⇒ D46 [Explain sources for heating]</p> <p>OTHERWISE ⇒ D47 [Heating ventilation types]</p>

D30	Classify furnace as packaged
ASK	IF Packaged central unit OR Duct furnace IN D29 [Type of furnace]
<p>For the purposes of this study, I am going to refer to the packaged central furnace as a "packaged unit."</p> <p>◆ ENTER "1" to continue</p>	
NEXT	<p>IF Individual room furnace IN D29 [Type of furnace] ⇒ D31 [Classify furnace as space heater]</p> <p>OTHERWISE:</p> <p>IF Boilers IN D28 [Heating equipment types] ⇒ D32 [Type of boiler system]</p> <p>IF District steam or hot water IN D28 [Heating equipment types] ⇒ D33 [Type of district heat system]</p> <p>IF Other heating equipment IN D28 [Heating equipment types] ⇒ D34 [Other heating components]</p> <p>OTHERWISE ⇒ D40 [Type of packaged heating]</p>

D31	Classify furnace as space heater
ASK	IF D29 [Type of furnace] = Individual room furnace
<p>For the purposes of this study, I am going to refer to the individual room furnace as an "individual space heater."</p> <p>◆ ENTER "1" to continue</p>	
NEXT	<p>IF Boilers IN D28 [Heating equipment types] ⇒ D32 [Type of boiler system] IF District steam or hot water IN D28 [Heating equipment types] ⇒ D33 [Type of district heat system] IF Other heating equipment IN D28 [Heating equipment types] ⇒ D34 [Other heating components] IF Packaged central unit IN D28 [Heating equipment types] ⇒ D40 [Type of packaged heating] IF Heat pumps IN D28 [Heating equipment types] ⇒ D42 [Heat pump heating system] IF Individual space heaters ⇒ D45 [Type of individual heater] OTHERWISE: IF More than one heating equipment ⇒ D49 [Percent heated by each type] IF Only one equipment, assign it as Main heating equipment, THEN IF Main heating equipment ≠ District steam or hot water & (A23 [Year of construction] < 1990 OR A24 [Year of construction category] ≠ 2000 to 2003 OR 2004 to 2007 OR 2008 to 2012) ⇒ D51 [Main heating replaced] OTHERWISE: IF D2 [Cooling] = Yes ⇒ D52 [Sources for cooling] IF D3 [Water heating] = Yes ⇒ D74 [Sources for water heating] IF D4 [Cooking] = Yes ⇒ D77 [Sources for cooking] IF D6 [Manufacturing] = Yes ⇒ D79 [Sources for manufacturing] IF D8 [Electricity generation capability] = Yes ⇒ D81 [Energy for generation] OTHERWISE ⇒ D87 [Any other sources]</p>

D32	Type of boiler system														
ASK	IF Boilers IN D28 [Heating equipment types]														
[F1]-HELP															
<p>□ SHOW CARD D4</p> <p>Looking at Show Card D4, please tell me the type or types of distribution systems used with the boiler.</p> <p>◆ ENTER all that apply</p> <table style="width: 100%; border: none;"> <tr> <td style="width: 70%;">1 Radiators</td> <td style="width: 30%; text-align: right;"><i>BLRRAD</i></td> </tr> <tr> <td>2 Fan coil units in rooms (or areas)</td> <td style="text-align: right;"><i>BLRFNCL</i></td> </tr> <tr> <td>3 Induction units</td> <td style="text-align: right;"><i>BLRINDC</i></td> </tr> <tr> <td>4 Water loop heat pump</td> <td style="text-align: right;"><i>BLRWATR</i></td> </tr> <tr> <td>5 Central air handler (hydronic/steam coils)</td> <td style="text-align: right;"><i>BLRAIR</i></td> </tr> <tr> <td>6 Packaged unit (hydronic/steam coils)</td> <td style="text-align: right;"><i>BLRPKG</i></td> </tr> <tr> <td>7 Duct reheat (hydronic/steam coils)</td> <td style="text-align: right;"><i>BLRDUCT</i></td> </tr> </table>		1 Radiators	<i>BLRRAD</i>	2 Fan coil units in rooms (or areas)	<i>BLRFNCL</i>	3 Induction units	<i>BLRINDC</i>	4 Water loop heat pump	<i>BLRWATR</i>	5 Central air handler (hydronic/steam coils)	<i>BLRAIR</i>	6 Packaged unit (hydronic/steam coils)	<i>BLRPKG</i>	7 Duct reheat (hydronic/steam coils)	<i>BLRDUCT</i>
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NEXT	<p>IF District steam or hot water IN D28 [Heating equipment types] ⇒ D33 [Type of district heat system] IF Other heating equipment IN D28 [Heating equipment types] ⇒ D34 [Other heating components] IF Packaged central unit IN D28 [Heating equipment types] ⇒ D40 [Type of packaged heating] IF Heat pumps IN D28 [Heating equipment types] ⇒ D42 [Heat pump heating system] IF Individual space heaters ⇒ D45 [Type of individual heater] OTHERWISE: IF Water loop, Central air handler, Packaged unit, OR Duct reheat given here OR Any type except Individual room furnace IN D29 [Type of furnace] OR Packaged central unit IN D28 [Heating equipment types] ⇒ D47 [Heating ventilation types] IF More than one heating equipment ⇒ D49 [Percent heated by each type] IF Only one equipment, assign it as Main heating equipment, THEN IF Main heating equipment ≠ District steam or hot water & (A23 [Year of construction] < 1990 OR A24 [Year of construction category] ≠ 2000 to 2003 OR 2004 to 2007 OR 2008 to 2012) ⇒ D51 [Main heating replaced] OTHERWISE: IF D2 [Cooling] = Yes ⇒ D52 [Sources for cooling] IF D3 [Water heating] = Yes ⇒ D74 [Sources for water heating] IF D4 [Cooking] = Yes ⇒ D77 [Sources for cooking] IF D6 [Manufacturing] = Yes ⇒ D79 [Sources for manufacturing] IF D8 [Electricity generation capability] = Yes ⇒ D81 [Energy for generation] OTHERWISE ⇒ D87 [Any other sources]</p>														

D33	Type of district heat system		
ASK	IF District steam or hot water IN D28 [Heating equipment types]		
[F1]-HELP			
<p>□ SHOW CARD D4</p> <p>Looking at Show Card D4, please tell me the type or types of distribution systems used with the district steam or hot water.</p> <p>◆ ENTER all that apply</p> <table style="width: 100%; border: none;"> <tr> <td style="width: 60%; vertical-align: top;"> <ol style="list-style-type: none"> 1 Radiators 2 Fan coil units in rooms (or areas) 3 Induction units 4 Water loop heat pump 5 Central air handler (hydronic/steam coils) 6 Packaged unit (hydronic/steam coils) 7 Duct reheat (hydronic/steam coils) </td> <td style="width: 40%; vertical-align: top; text-align: right;"> <p><i>DHRAD</i></p> <p><i>DHFNCL</i></p> <p><i>DHINDC</i></p> <p><i>DHWATR</i></p> <p><i>DHAIR</i></p> <p><i>DHPKG</i></p> <p><i>DHDUCT</i></p> </td> </tr> </table>		<ol style="list-style-type: none"> 1 Radiators 2 Fan coil units in rooms (or areas) 3 Induction units 4 Water loop heat pump 5 Central air handler (hydronic/steam coils) 6 Packaged unit (hydronic/steam coils) 7 Duct reheat (hydronic/steam coils) 	<p><i>DHRAD</i></p> <p><i>DHFNCL</i></p> <p><i>DHINDC</i></p> <p><i>DHWATR</i></p> <p><i>DHAIR</i></p> <p><i>DHPKG</i></p> <p><i>DHDUCT</i></p>
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NEXT	<p>IF Other heating equipment IN D28 [Heating equipment types] ⇒ D34 [Other heating components]</p> <p>IF Packaged central unit IN D28 [Heating equipment types] ⇒ D40 [Type of packaged heating]</p> <p>IF Heat pumps IN D28 [Heating equipment types] ⇒ D42 [Heat pump heating system]</p> <p>IF Individual space heaters ⇒ D45 [Type of individual heater]</p> <p>OTHERWISE:</p> <p>IF Water loop, Central air handler, Packaged unit, OR Duct reheat given here OR Any type except Individual room furnace IN D29 [Type of furnace] OR Packaged central unit IN D28 [Heating equipment types] ⇒ D47 [Heating ventilation types]</p> <p>IF More than one heating equipment ⇒ D49 [Percent heated by each type]</p> <p>IF Only one equipment, assign it as Main heating equipment, THEN IF Main heating equipment ≠ District steam or hot water & (A23 [Year of construction] < 1990 OR A24 [Year of construction category] ≠ 2000 to 2003 OR 2004 to 2007 OR 2008 to 2012) ⇒ D51 [Main heating replaced]</p> <p>OTHERWISE:</p> <p>IF D2 [Cooling] = Yes ⇒ D52 [Sources for cooling]</p> <p>IF D3 [Water heating] = Yes ⇒ D74 [Sources for water heating]</p> <p>IF D4 [Cooking] = Yes ⇒ D77 [Sources for cooking]</p> <p>IF D6 [Manufacturing] = Yes ⇒ D79 [Sources for manufacturing]</p> <p>IF D8 [Electricity generation capability] = Yes ⇒ D81 [Energy for generation]</p> <p>OTHERWISE ⇒ D87 [Any other sources]</p>		

D34	Other heating components												
ASK	IF Other heating equipment IN D28 [Heating equipment types]												
<p>□ SHOW CARD D5</p> <p>Looking at Show Card D5, please tell me if the other heating equipment includes any of these components.</p> <p>◆ ENTER all that apply</p> <table> <tr> <td>1</td> <td>Heating coil or electric heat strip</td> <td><i>OTSTRP</i></td> </tr> <tr> <td>2</td> <td>Duct reheat or electric reheat</td> <td><i>OTDUCT</i></td> </tr> <tr> <td>3</td> <td>Powered induction units (PIU)</td> <td><i>OTPIU</i></td> </tr> <tr> <td>4</td> <td>None of these components</td> <td></td> </tr> </table>		1	Heating coil or electric heat strip	<i>OTSTRP</i>	2	Duct reheat or electric reheat	<i>OTDUCT</i>	3	Powered induction units (PIU)	<i>OTPIU</i>	4	None of these components	
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4	None of these components												
NEXT	<p>IF Any components: IF Packaged central unit IN D28 [Heating equipment types] OR Packaged central unit OR Duct furnace IN D29 [Type of furnace] ⇒ D35 [Classify other as part of packaged] IF Boiler IN D28 [Heating equipment types] ⇒ D36 [Classify other as part of boiler] IF District steam or hot water IN D28 [Heating equipment types] ⇒ D37 [Classify other as part of district] OTHERWISE ⇒ D38 [Classify other as packaged] IF None of these components OR DK/RF ⇒ D39 [Other heat specify]</p>												

D35	Classify other as part of packaged
ASK	IF Any components given in D34 [Other heating components] & Packaged central unit IN D28 [Heating equipment types] OR Packaged central unit OR Duct furnace IN D29 [Type of furnace]
<p>For the purposes of this study, I am going to consider the other heating equipment to be part of the packaged unit.</p> <p>◆ ENTER "1" to continue</p>	
NEXT	⇒ D40 [Type of packaged heating]

D36	Classify other as part of boiler
ASK	IF Any components given in D34 [Other heating components] & Boiler IN D28 [Heating equipment types]
<p>For the purposes of this study, I am going to consider the other heating equipment to be part of the boiler system.</p> <p>◆ ENTER "1" to continue</p>	
NEXT	<p>IF Packaged central unit IN D28 [Heating equipment types] ⇒ D40 [Type of packaged heating] IF Heat pumps IN D28 [Heating equipment types] ⇒ D42 [Heat pump heating system] IF Individual space heaters ⇒ D45 [Type of individual heater] OTHERWISE: IF Any type except Individual room furnace IN D29 [Type of furnace] OR Water loop, Central air handler, Packaged unit, OR Duct reheat IN D32 [Type of boiler system] OR Water loop, Central air handler, Packaged unit, OR Duct reheat IN D33 [Type of district heat system] OR Any components given in D34 [Other heating components] OR Packaged central unit IN D28 [Heating equipment types] ⇒ D47 [Heating ventilation types] IF More than one heating equipment ⇒ D49 [Percent heated by each type] IF Only one equipment, assign it as Main heating equipment, THEN IF Main heating equipment ≠ District steam or hot water & (A23 [Year of construction] < 1990 OR A24 [Year of construction category] ≠ 2000 to 2003 OR 2004 to 2007 OR 2008 to 2012) ⇒ D51 [Main heating replaced] OTHERWISE: IF D2 [Cooling] = Yes ⇒ D52 [Sources for cooling] IF D3 [Water heating] = Yes ⇒ D74 [Sources for water heating] IF D4 [Cooking] = Yes ⇒ D77 [Sources for cooking] IF D6 [Manufacturing] = Yes ⇒ D79 [Sources for manufacturing] IF D8 [Electricity generation capability] = Yes ⇒ D81 [Energy for generation] OTHERWISE ⇒ D87 [Any other sources]</p>

D37	Classify other as part of district
ASK	IF Any components given in D34 [Other heating components] & District steam or hot water IN D28 [Heating equipment types]
<p>For the purposes of this study, I am going to consider the other heating equipment to be part of the district heating system.</p> <p>◆ ENTER "1" to continue</p>	
NEXT	<p>IF Packaged central unit IN D28 [Heating equipment types] ⇒ D40 [Type of packaged heating]</p> <p>IF Heat pumps IN D28 [Heating equipment types] ⇒ D42 [Heat pump heating system]</p> <p>IF Individual space heaters ⇒ D45 [Type of individual heater]</p> <p>OTHERWISE:</p> <p>IF Any type except Individual room furnace IN D29 [Type of furnace]</p> <p>OR Water loop, Central air handler, Packaged unit, OR Duct reheat IN D32 [Type of boiler system]</p> <p>OR Water loop, Central air handler, Packaged unit, OR Duct reheat IN D33 [Type of district heat system]</p> <p>OR Any components given in D34 [Other heating components]</p> <p>OR Packaged central unit IN D28 [Heating equipment types] ⇒ D47 [Heating ventilation types]</p> <p>IF More than one heating equipment ⇒ D49 [Percent heated by each type]</p> <p>IF Only one equipment, assign it as Main heating equipment, THEN</p> <p>IF Main heating equipment ≠ District steam or hot water & (A23 [Year of construction] < 1990 OR A24 [Year of construction category] ≠ 2000 to 2003 OR 2004 to 2007 OR 2008 to 2012) ⇒ D51 [Main heating replaced]</p> <p>OTHERWISE:</p> <p>IF D2 [Cooling] = Yes ⇒ D52 [Sources for cooling]</p> <p>IF D3 [Water heating] = Yes ⇒ D74 [Sources for water heating]</p> <p>IF D4 [Cooking] = Yes ⇒ D77 [Sources for cooking]</p> <p>IF D6 [Manufacturing] = Yes ⇒ D79 [Sources for manufacturing]</p> <p>IF D8 [Electricity generation capability] = Yes ⇒ D81 [Energy for generation]</p> <p>OTHERWISE ⇒ D87 [Any other sources]</p>

D38	Classify other as packaged
ASK	IF Any components given in D34 [Other heating components] & NOT (Packaged central unit IN D28 [Heating equipment types] OR Packaged central unit OR Duct furnace IN D29 [Type of furnace] OR Boiler IN D28 [Heating equipment types] OR District steam or hot water IN D28 [Heating equipment types])
<p>For the purposes of this study, I am going to refer to the other heating equipment as a “packaged unit.” In the next couple questions I just need to verify some of the components of the packaged system.</p> <p>◆ ENTER "1" to continue</p>	
NEXT	⇒ D40 [Type of packaged heating]

D39	Other heat specify
ASK	IF Other heating equipment IN D28 [Heating equipment types] & D34 [Other heating components] = None of these components
Please describe the other type of heating equipment.	
◆ RECORD in open box	
NEXT	<p>IF Packaged central unit IN D28 [Heating equipment types] ⇒ D40 [Type of packaged heating]</p> <p>IF Heat pumps IN D28 [Heating equipment types] ⇒ D42 [Heat pump heating system]</p> <p>IF Individual space heaters ⇒ D45 [Type of individual heater]</p> <p>OTHERWISE:</p> <p>IF Any type except Individual room furnace IN D29 [Type of furnace] OR Water loop, Central air handler, Packaged unit, OR Duct reheat IN D32 [Type of boiler system] OR Water loop, Central air handler, Packaged unit, OR Duct reheat IN D33 [Type of district heat system] OR Any components given in D34 [Other heating components] OR Packaged central unit IN D28 [Heating equipment types] ⇒ D47 [Heating ventilation types]</p> <p>IF More than one heating equipment ⇒ D49 [Percent heated by each type]</p> <p>IF Only one equipment, assign it as Main heating equipment, THEN</p> <p>IF Main heating equipment ≠ District steam or hot water & (A23 [Year of construction] < 1990 OR A24 [Year of construction category] ≠ 2000 to 2003 OR 2004 to 2007 OR 2008 to 2012) ⇒ D51 [Main heating replaced]</p> <p>OTHERWISE:</p> <p>IF D2 [Cooling] = Yes ⇒ D52 [Sources for cooling]</p> <p>IF D3 [Water heating] = Yes ⇒ D74 [Sources for water heating]</p> <p>IF D4 [Cooking] = Yes ⇒ D77 [Sources for cooking]</p> <p>IF D6 [Manufacturing] = Yes ⇒ D79 [Sources for manufacturing]</p> <p>IF D8 [Electricity generation capability] = Yes ⇒ D81 [Energy for generation]</p> <p>OTHERWISE ⇒ D87 [Any other sources]</p>

D40	Type of packaged heating	<i>PKGHTTYP</i>
ASK	IF Packaged central unit IN D28 [Heating equipment types] OR Packaged central unit OR Duct furnace IN D29 [Type of furnace] OR Any components given in D34 [Other heating components] & NOT (Packaged central unit IN D28 [Heating equipment types] OR Packaged central unit OR Duct furnace IN D29 [Type of furnace] OR Boiler IN D28 [Heating equipment types] OR District steam or hot water IN D28 [Heating equipment types])	
		[F1]-HELP
<input type="checkbox"/> SHOW CARD D6 Please look at Show Card D6 and tell me if the packaged unit is a factory-assembled unitary packaged unit or a custom built-up unit? 1 Factory-assembled unitary packaged unit 2 Custom built-up packaged unit 3 IF VOLUNTEERED: Both factory-assembled and custom built-up packaged units		
NEXT	IF Any type given ⇒ D41 [Packaged heating components] IF DK/RF: IF Heat pumps IN D28 [Heating equipment types] ⇒ D42 [Heat pump heating system] IF Individual space heaters ⇒ D45 [Type of individual heater] OTHERWISE ⇒ D47 [Heating ventilation types]	

D41	Packaged heating components											
ASK	IF Any type given in D40 [Type of packaged heating]											
		[F1]-HELP										
<input type="checkbox"/> SHOW CARD D6 Looking at the second list on Show Card D6, please tell me which heating components are part of this packaged system. ◆ ENTER all that apply <table style="width: 100%; border: none;"> <tr> <td style="width: 60%;">1 Furnace</td> <td style="width: 40%; text-align: right;"><i>PKG FURN</i></td> </tr> <tr> <td>2 Heat pump</td> <td style="text-align: right;"><i>PKG HTP</i></td> </tr> <tr> <td>3 Heating coil</td> <td style="text-align: right;"><i>PKG COIL</i></td> </tr> <tr> <td>4 Powered induction unit (PIU)</td> <td style="text-align: right;"><i>PKG PIU</i></td> </tr> <tr> <td>5 Duct reheat</td> <td style="text-align: right;"><i>PKG DUCT</i></td> </tr> </table>			1 Furnace	<i>PKG FURN</i>	2 Heat pump	<i>PKG HTP</i>	3 Heating coil	<i>PKG COIL</i>	4 Powered induction unit (PIU)	<i>PKG PIU</i>	5 Duct reheat	<i>PKG DUCT</i>
1 Furnace	<i>PKG FURN</i>											
2 Heat pump	<i>PKG HTP</i>											
3 Heating coil	<i>PKG COIL</i>											
4 Powered induction unit (PIU)	<i>PKG PIU</i>											
5 Duct reheat	<i>PKG DUCT</i>											
NEXT	IF Heat pumps IN D28 [Heating equipment types] ⇒ D42 [Heat pump heating system] IF Individual space heaters ⇒ D45 [Type of individual heater] OTHERWISE ⇒ D47 [Heating ventilation types]											

D42	Heat pump heating system	<i>see below</i>															
ASK	IF Heat pumps IN D28 [Heating equipment types]																
<p>[] SHOW CARD D7</p> <p>Please look at the first list on Show Card D7 and tell me which heat pump systems are used for heating in this building.</p> <p>◆ ENTER all that apply</p> <table border="0"> <tr> <td>1</td> <td>Packaged unit</td> <td><i>HHPKPG</i></td> </tr> <tr> <td>2</td> <td>Split system (residential-type)</td> <td><i>HHSPLT</i></td> </tr> <tr> <td>3</td> <td>Individual room heat pump (packaged terminal heat pump or PTHP)</td> <td><i>HHRROOM</i></td> </tr> <tr> <td>4</td> <td>Ductless mini-split system</td> <td><i>HHPMINI</i></td> </tr> <tr> <td>5</td> <td>Variable refrigerant flow (VRF) system</td> <td><i>HHPVRF</i></td> </tr> </table>		1	Packaged unit	<i>HHPKPG</i>	2	Split system (residential-type)	<i>HHSPLT</i>	3	Individual room heat pump (packaged terminal heat pump or PTHP)	<i>HHRROOM</i>	4	Ductless mini-split system	<i>HHPMINI</i>	5	Variable refrigerant flow (VRF) system	<i>HHPVRF</i>	[F1]-HELP
1	Packaged unit	<i>HHPKPG</i>															
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4	Ductless mini-split system	<i>HHPMINI</i>															
5	Variable refrigerant flow (VRF) system	<i>HHPVRF</i>															
NEXT	⇒ D43 [Heat pump heating type]																

DRAFT (9/5/14)

D43	Heat pump heating type	<i>see below</i>												
ASK	IF Heat pumps IN D28 [Heating equipment types]													
		[F1]-HELP												
	<p>□ SHOW CARD D7</p> <p>Looking at the second list on Show Card D7, which types of heat pumps are these?</p> <p>◆ ENTER all that apply</p> <table> <tr> <td>1</td> <td>Air source heat pump</td> <td><i>HPHAIR</i></td> </tr> <tr> <td>2</td> <td>Ground source or ground water heat pump (geothermal)</td> <td><i>HPHGRD</i></td> </tr> <tr> <td>3</td> <td>Dual source heat pump (combination air source and geothermal)</td> <td><i>HPHDUAL</i></td> </tr> <tr> <td>4</td> <td>Water loop heat pump</td> <td><i>HPHWTR</i></td> </tr> </table>	1	Air source heat pump	<i>HPHAIR</i>	2	Ground source or ground water heat pump (geothermal)	<i>HPHGRD</i>	3	Dual source heat pump (combination air source and geothermal)	<i>HPHDUAL</i>	4	Water loop heat pump	<i>HPHWTR</i>	
1	Air source heat pump	<i>HPHAIR</i>												
2	Ground source or ground water heat pump (geothermal)	<i>HPHGRD</i>												
3	Dual source heat pump (combination air source and geothermal)	<i>HPHDUAL</i>												
4	Water loop heat pump	<i>HPHWTR</i>												
NEXT	<p>IF Air source heat pump & Natural gas OR Bottled gas used for heating ⇒ D44 [Heat pump backup]</p> <p>IF Individual space heaters ⇒ D45 [Type of individual heater]</p> <p>OTHERWISE:</p> <p>IF Any type except Individual room furnace IN D29 [Type of furnace]</p> <p>OR Water loop, Central air handler, Packaged unit, OR Duct reheat IN D32 [Type of boiler system]</p> <p>OR Water loop, Central air handler, Packaged unit, OR Duct reheat IN D33 [Type of district heat system]</p> <p>OR Any components given in D34 [Other heating components]</p> <p>OR Packaged central unit IN D28 [Heating equipment types]</p> <p>OR Packaged unit OR Split system IN D42 [Heat pump heating system]</p> <p>⇒ D47 [Heating ventilation types]</p> <p>IF More than one heating equipment ⇒ D49 [Percent heated by each type]</p> <p>IF Only one equipment, assign it as Main heating equipment, THEN</p> <p>IF Main heating equipment ≠ District steam or hot water & (A23 [Year of construction] < 1990 OR A24 [Year of construction category] ≠ 2000 to 2003 OR 2004 to 2007 OR 2008 to 2012)</p> <p>⇒ D51 [Main heating replaced]</p> <p>OTHERWISE:</p> <p>IF D2 [Cooling] = Yes ⇒ D52 [Sources for cooling]</p> <p>IF D3 [Water heating] = Yes ⇒ D74 [Sources for water heating]</p> <p>IF D4 [Cooking] = Yes ⇒ D77 [Sources for cooking]</p> <p>IF D6 [Manufacturing] = Yes ⇒ D79 [Sources for manufacturing]</p> <p>IF D8 [Electricity generation capability] = Yes ⇒ D81 [Energy for generation]</p> <p>OTHERWISE ⇒ D87 [Any other sources]</p>													

D44	Heat pump backup	<i>HPHBKUP</i>
ASK	IF D43 [Heat pump heating type] = Air source heat pump & Natural gas OR Bottled gas used for heating	
FILL	<p>{NatGasBotGas} IF Natural gas but not bottled gas for heating = "natural gas" IF Bottled gas but not natural gas for heating = "bottled gas" IF Both natural gas and bottled gas for heating = "natural gas or bottled gas" { NatGasBotGasList} IF Natural gas but not bottled gas for heating = "Natural gas" IF Bottled gas but not natural gas for heating = "Bottled gas" IF Both natural gas and bottled gas for heating = "Natural gas or bottled gas"</p>	
<p>Does the air source heat pump have electric resistance backup, is it a dual fuel heat pump with {NatGasBotGas} backup, or is there no backup source for the heat pump?</p> <ul style="list-style-type: none"> ◆ DEF: [Air source heat pumps do not operate efficiently when outside temperatures are sub-freezing for extended periods of time. An air source heat pump may use electric resistance coils to provide supplemental heat. Other air source heat pumps may use a natural gas or bottled gas furnace that operates at colder temperatures (these are also known as dual fuel heat pumps)] <ol style="list-style-type: none"> 1 Electric resistance backup 2 {NatGasBotGasList} backup (dual fuel) 3 No backup source 		
NEXT	IF Individual space heaters ⇒ D45 [Type of individual heater] OTHERWISE: IF Any type except Individual room furnace IN D29 [Type of furnace] OR Water loop, Central air handler, Packaged unit, OR Duct reheat IN D32 [Type of boiler system] OR Water loop, Central air handler, Packaged unit, OR Duct reheat IN D33 [Type of district heat system] OR Any components given in D34 [Other heating components] OR Packaged central unit IN D28 [Heating equipment types] OR Packaged unit OR Split system IN D42 [Heat pump heating system] ⇒ D47 [Heating ventilation types] IF More than one heating equipment ⇒ D49 [Percent heated by each type] IF Only one equipment, assign it as Main heating equipment, THEN IF Main heating equipment ≠ District steam or hot water & (A23 [Year of construction] < 1990 OR A24 [Year of construction category] ≠ 2000 to 2003 OR 2004 to 2007 OR 2008 to 2012) ⇒ D51 [Main heating replaced] OTHERWISE: IF D2 [Cooling] = Yes ⇒ D52 [Sources for cooling] IF D3 [Water heating] = Yes ⇒ D74 [Sources for water heating] IF D4 [Cooking] = Yes ⇒ D77 [Sources for cooking] IF D6 [Manufacturing] = Yes ⇒ D79 [Sources for manufacturing] IF D8 [Electricity generation capability] = Yes ⇒ D81 [Energy for generation] OTHERWISE ⇒ D87 [Any other sources]	

D45	Type of individual heater														
ASK	IF Individual space heaters IN D28 [Heating equipment types]														
	[F1]-HELP														
	<p>□ SHOW CARD D8</p> <p>Looking at Show Card D8, please tell me the type or types of individual heaters used in the building.</p> <p>◆ ENTER all that apply</p> <table style="width: 100%; border: none;"> <tr> <td style="width: 70%;">1 Infrared radiant heater (permanent)</td> <td style="width: 30%; text-align: right;"><i>SHRDNT</i></td> </tr> <tr> <td>2 Baseboard heater (permanent)</td> <td style="text-align: right;"><i>SHBBRD</i></td> </tr> <tr> <td>3 Portable space heater</td> <td style="text-align: right;"><i>SHPORT</i></td> </tr> <tr> <td>4 Wall heater</td> <td style="text-align: right;"><i>SHWALL</i></td> </tr> <tr> <td>5 Individual furnace</td> <td style="text-align: right;"><i>SHFURN</i></td> </tr> <tr> <td>6 Unit heater</td> <td style="text-align: right;"><i>SHUNIT</i></td> </tr> <tr> <td>7 Heating element in package terminal air conditioner (PTAC)</td> <td style="text-align: right;"><i>SHPTAC</i></td> </tr> </table>	1 Infrared radiant heater (permanent)	<i>SHRDNT</i>	2 Baseboard heater (permanent)	<i>SHBBRD</i>	3 Portable space heater	<i>SHPORT</i>	4 Wall heater	<i>SHWALL</i>	5 Individual furnace	<i>SHFURN</i>	6 Unit heater	<i>SHUNIT</i>	7 Heating element in package terminal air conditioner (PTAC)	<i>SHPTAC</i>
1 Infrared radiant heater (permanent)	<i>SHRDNT</i>														
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5 Individual furnace	<i>SHFURN</i>														
6 Unit heater	<i>SHUNIT</i>														
7 Heating element in package terminal air conditioner (PTAC)	<i>SHPTAC</i>														
NEXT	<p>IF Any type except Individual room furnace IN D29 [Type of furnace] OR Water loop, Central air handler, Packaged unit, OR Duct reheat IN D32 [Type of boiler system] OR Water loop, Central air handler, Packaged unit, OR Duct reheat IN D33 [Type of district heat system] OR Any components given in D34 [Other heating components] OR Packaged central unit IN D28 [Heating equipment types] OR Packaged unit OR Split system IN D42 [Heat pump heating system] ⇒ D47 [Heating ventilation types]</p> <p>IF More than one heating equipment ⇒ D49 [Percent heated by each type]</p> <p>IF Only one equipment, assign it as Main heating equipment, THEN IF Main heating equipment ≠ District steam or hot water & (A23 [Year of construction] < 1990 OR A24 [Year of construction category] ≠ 2000 to 2003 OR 2004 to 2007 OR 2008 to 2012) ⇒ D51 [Main heating replaced]</p> <p>OTHERWISE: IF D2 [Cooling] = Yes ⇒ D52 [Sources for cooling] IF D3 [Water heating] = Yes ⇒ D74 [Sources for water heating] IF D4 [Cooking] = Yes ⇒ D77 [Sources for cooking] IF D6 [Manufacturing] = Yes ⇒ D79 [Sources for manufacturing] IF D8 [Electricity generation capability] = Yes ⇒ D81 [Energy for generation] OTHERWISE ⇒ D87 [Any other sources]</p>														

D46	Explain sources for heating
ASK	IF ONLY Boiler, Furnace, OR District heat as heating equipment but more than one energy source used for heating
FILL	<p>{HeatEquip} IF Boilers = "boiler" IF Furnace = "furnace" IF District heat = "district heating system" {HeatSources} = list of the energy sources given for heating</p>
<p>I've recorded just one type of heating equipment - a {HeatEquip} - but more than one energy source – {HeatSources} - for heating. For clarification, will you please briefly explain how these sources are used for operating the {HeatEquip}.</p> <p>◆ RECORD in open box</p>	
NEXT	<p>IF Any type except Individual room furnace IN D29 [Type of furnace] OR Water loop, Central air handler, Packaged unit, OR Duct reheat IN D32 [Type of boiler system] OR Water loop, Central air handler, Packaged unit, OR Duct reheat IN D33 [Type of district heat system] OR Any components given in D34 [Other heating components] OR Packaged central unit IN D28 [Heating equipment types] OR Packaged unit OR Split system IN D42 [Heat pump heating system] ⇒ D47 [Heating ventilation types] OTHERWISE: IF More than one heating equipment ⇒ D49 [Percent heated by each type] IF Only one equipment, assign it as Main heating equipment, THEN IF Main heating equipment ≠ District steam or hot water & (A23 [Year of construction] < 1990 OR A24 [Year of construction category] ≠ 2000 to 2003 OR 2004 to 2007 OR 2008 to 2012) ⇒ D51 [Main heating replaced] OTHERWISE: IF D2 [Cooling] = Yes ⇒ D52 [Sources for cooling] IF D3 [Water heating] = Yes ⇒ D74 [Sources for water heating] IF D4 [Cooking] = Yes ⇒ D77 [Sources for cooking] IF D6 [Manufacturing] = Yes ⇒ D79 [Sources for manufacturing] IF D8 [Electricity generation capability] = Yes ⇒ D81 [Energy for generation] OTHERWISE ⇒ D87 [Any other sources]</p>

D47	Heating ventilation types												
ASK	<p>IF Any type except Individual room furnace IN D29 [Type of furnace] OR Water loop, Central air handler, Packaged unit, OR Duct reheat IN D32 [Type of boiler system] OR Water loop, Central air handler, Packaged unit, OR Duct reheat IN D33 [Type of district heat system] OR Any components given in D34 [Other heating components] OR Packaged central unit IN D28 [Heating equipment types] OR Packaged unit OR Split system IN D42 [Heat pump heating system]</p>												
<p style="text-align: right;">[F1]-HELP</p> <p>□ SHOW CARD D9</p> <p>Show Card D9 provides a list of mechanical ventilation equipment types. Please tell me which types are used with the heating system.</p> <ul style="list-style-type: none"> ◆ PROBE for any others ◆ ENTER all that apply <table border="0" style="width: 100%;"> <tr> <td style="width: 70%;">1 Central air handling unit(s) with constant air volume (CAV) control</td> <td style="width: 30%; text-align: right;">HTVCAV</td> </tr> <tr> <td>2 Central air handling unit(s) with variable air volume (VAV) control</td> <td style="text-align: right;">HTVVAV</td> </tr> <tr> <td>3 Underfloor air distribution</td> <td style="text-align: right;">HTVFLR</td> </tr> <tr> <td>4 Dedicated outside air system (DOAS)</td> <td style="text-align: right;">HTVOAS</td> </tr> <tr> <td>5 Demand controlled ventilation</td> <td style="text-align: right;">HTVDEM</td> </tr> <tr> <td>6 None of these types</td> <td style="text-align: right;">HTVNON</td> </tr> </table>		1 Central air handling unit(s) with constant air volume (CAV) control	HTVCAV	2 Central air handling unit(s) with variable air volume (VAV) control	HTVVAV	3 Underfloor air distribution	HTVFLR	4 Dedicated outside air system (DOAS)	HTVOAS	5 Demand controlled ventilation	HTVDEM	6 None of these types	HTVNON
1 Central air handling unit(s) with constant air volume (CAV) control	HTVCAV												
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4 Dedicated outside air system (DOAS)	HTVOAS												
5 Demand controlled ventilation	HTVDEM												
6 None of these types	HTVNON												
NEXT	<p>IF None of these types ⇒ D48 [Heating ventilation specify] OTHERWISE: IF More than one heating equipment ⇒ D49 [Percent heated by each type] IF Only one equipment, assign it as Main heating equipment, THEN IF Main heating equipment ≠ District steam or hot water & (A23 [Year of construction] < 1990 OR A24 [Year of construction category] ≠ 2000 to 2003 OR 2004 to 2007 OR 2008 to 2012) ⇒ D51 [Main heating replaced] OTHERWISE: IF D2 [Cooling] = Yes ⇒ D52 [Sources for cooling] IF D3 [Water heating] = Yes ⇒ D74 [Sources for water heating] IF D4 [Cooking] = Yes ⇒ D77 [Sources for cooking] IF D6 [Manufacturing] = Yes ⇒ D79 [Sources for manufacturing] IF D8 [Electricity generation capability] = Yes ⇒ D81 [Energy for generation] OTHERWISE ⇒ D87 [Any other sources]</p>												

D48	Heating ventilation specify
ASK	IF D47 [Heating ventilation types] = None of these types
<p>Please describe the ventilation system that is used with the heating system.</p> <p>◆ RECORD in open box</p>	
NEXT	<p>IF More than one heating equipment ⇒ D49 [Percent heated by each type] IF Only one equipment, assign it as Main heating equipment, THEN IF Main heating equipment ≠ District steam or hot water & (A23 [Year of construction] < 1990 OR A24 [Year of construction category] ≠ 2000 to 2003 OR 2004 to 2007 OR 2008 to 2012) ⇒ D51 [Main heating replaced] OTHERWISE: IF D2 [Cooling] = Yes ⇒ D52 [Sources for cooling] IF D3 [Water heating] = Yes ⇒ D74 [Sources for water heating] IF D4 [Cooking] = Yes ⇒ D77 [Sources for cooking] IF D6 [Manufacturing] = Yes ⇒ D79 [Sources for manufacturing] IF D8 [Electricity generation capability] = Yes ⇒ D81 [Energy for generation] OTHERWISE ⇒ D87 [Any other sources]</p>

DRAFT (9/5/12)

D49	Percent heated by each type <p style="text-align: right;"><i>FURNP, PKGHP, BOILP, STHWP, HTPHP, SLFCNP, OTHTP</i></p>
ASK	For each equipment type given in D28 [Heating equipment types]
FILL	<p>{Introduction} IF First equipment = “The next questions are about the percent of floorspace heated by the equipment you just mentioned. Please keep in mind.” OTHERWISE = BLANK</p> <p>{Explanation} IF First equipment and D26 [Percent heated] ≠ 100 = “We are talking only about the <u>heated portion</u> of the floorspace, so these percents must add up to at least 100, but since more than one type of equipment can heat the same area, it is also possible for them to add up to <u>more</u> than 100.” IF First equipment and D26 [Percent heated] = 100 = “These percents must add up to at least 100, but since more than one type of equipment can heat the same area, it is also possible for them to add up to <u>more</u> than 100.” OTHERWISE = BLANK</p> <p>{Equipment} IF Furnaces that heat air directly IN D28 [Heating equipment types] = “furnace” IF Packaged heating units IN D28 [Heating equipment types] = “packaged heating” IF Boilers inside the building IN D28 [Heating equipment types] = “boiler” IF District steam or hot water IN D28 [Heating equipment types] = “district steam or hot water” IF Heat pumps IN D28 [Heating equipment types] = “heat pump” IF Individual space heaters IN D28 [Heating equipment types] = “space heater” IF Other heating equipment IN D28 [Heating equipment types] = “other heating equipment”</p>
	<p><input type="checkbox"/> SHOW CARD D10</p> <p>{Introduction}</p> <p>{Explanation}</p> <p>What percent of the heated area in this building is served by the {Equipment}?</p> <p>◆ PROBE for estimate if DK</p>
RANGE	0 to 100
NEXT	IF There are equal maximum percents OR DK/RF ⇒ D50 [Main heating equipment] IF There is an equipment with a maximum percent, assign that equipment as the Main heating equipment [MAINHT]. THEN: IF Main heating equipment ≠ District steam or hot water & (A23 [Year of construction] < 1990 OR A24 [Year of construction category] ≠ 2000 to 2003 OR 2004 to 2007 OR 2008 to 2012) ⇒ D51 [Main heating replaced] OTHERWISE: IF D2 [Cooling] = Yes ⇒ D52 [Sources for cooling] IF D3 [Water heating] = Yes ⇒ D74 [Sources for water heating] IF D4 [Cooking] = Yes ⇒ D77 [Sources for cooking] IF D6 [Manufacturing] = Yes ⇒ D79 [Sources for manufacturing] IF D8 [Electricity generation capability] = Yes ⇒ D81 [Energy for generation] OTHERWISE ⇒ D87 [Any other sources]

D50	Main heating equipment	<i>MNHTEQ</i>
ASK	IF D49 [Percent heated by each type] has equal maximum percents OR DK/RF	
FILL	<p>{EquipmentList} = List of the equipments with equal maximum percents {Furnace} – {Other heating equipment} = Each equipment with an equal maximum percent appears on this list; otherwise the line is blank</p>	
<p>Which do you consider to be your main heating equipment – {EquipmentList} ?</p> <p>◆ Only equipment types with equal percentages are shown here</p> <ol style="list-style-type: none"> 1 {Furnace} 2 {Packaged heating} 3 {Boiler} 4 {District steam or hot water} 5 {Heat pump} 6 {Space heater} 7 {Other heating equipment} 		
NEXT	<p>IF Main equipment NOT (District steam or hot water OR DK/RF) & (A23 [Year of construction] < 1990 OR A24 [Year of construction category] ≠ 2000 to 2003 OR 2004 to 2007 OR 2008 to 2012) ⇒ D51 [Main heating replaced]</p> <p>OTHERWISE: IF D2 [Cooling] = Yes ⇒ D52 [Sources for cooling] IF D3 [Water heating] = Yes ⇒ D74 [Sources for water heating] IF D4 [Cooking] = Yes ⇒ D77 [Sources for cooking] IF D6 [Manufacturing] = Yes ⇒ D79 [Sources for manufacturing] IF D8 [Electricity generation capability] = Yes ⇒ D81 [Energy for generation] OTHERWISE ⇒ D87 [Any other sources]</p>	

D51	Main heating replaced	<i>NWMNHT</i>
ASK	IF Main heating equipment known & NOT District steam or hot water & (A23 [Year of construction] < 1990 OR A24 [Year of construction category] ≠ 2000 to 2003 OR 2004 to 2007 OR 2008 to 2012)	
FILL	{MainHeatEquip} IF Main heating equipment = Furnace = “Has the furnace” IF Main heating equipment = Boiler = “Has the boiler” IF Main heating equipment = Packaged heating = “Has the packaged heating unit” IF Main heating equipment = Individual space heater = “Have any of the individual space heaters” IF Main heating equipment = Heat pump = “Has the heat pump” IF Main heating equipment = Other = “Has the other type of heating equipment”	
{MainHeatEquip} been replaced since 1990? ◆ EXP: [If there is more than one of this equipment type and at least one has been replaced, answer "Yes."] 1 Yes 2 No		
NEXT	IF D2 [Cooling] = Yes ⇒ D52 [Sources for cooling] IF D3 [Water heating] = Yes ⇒ D74 [Sources for water heating] IF D4 [Cooking] = Yes ⇒ D77 [Sources for cooking] IF D6 [Manufacturing] = Yes ⇒ D79 [Sources for manufacturing] IF D8 [Electricity generation capability] = Yes ⇒ D81 [Energy for generation] OTHERWISE ⇒ D87 [Any other sources]	

D52	Sources for cooling	<i>see below</i>																																	
ASK	IF D2 [Cooling] = Yes																																		
FILL	<p>{CoolSourcesList} = List of all possible air conditioning energy sources used {Electricity} – {Other3} = If a source is used, it appears in this list; if not, the line is blank {FuelOilType} = Type or types specified in D10 [Fuel oil, diesel, or kerosene] {Other1} – {Other3} = Sources specified in D12 [Other energy source 1] – D14 [Other energy source 3]</p>																																		
<p>Which energy sources were used for air conditioning? ({CoolSourcesList})</p> <ul style="list-style-type: none"> ◆ Only sources already selected are shown here ◆ PROBE for any others ◆ ENTER all that apply <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 5%;">11</td> <td style="width: 70%;">{Electricity}</td> <td style="width: 25%; text-align: right;">ELCOOL</td> </tr> <tr> <td>12</td> <td>{Natural gas}</td> <td style="text-align: right;">NGCOOL</td> </tr> <tr> <td>13</td> <td>{FuelOilType}</td> <td style="text-align: right;">FKCOOL</td> </tr> <tr> <td>14</td> <td>{Bottled gas}</td> <td style="text-align: right;">PRCOOL</td> </tr> <tr> <td>15</td> <td>{District steam}</td> <td style="text-align: right;">STCOOL</td> </tr> <tr> <td>16</td> <td>{District hot water}</td> <td style="text-align: right;">HWCOOL</td> </tr> <tr> <td>17</td> <td>{District chilled water}</td> <td style="text-align: right;">CWCOOL</td> </tr> <tr> <td>21</td> <td>{Other1}</td> <td style="text-align: right;">OTCOOL</td> </tr> <tr> <td>22</td> <td>{Other2}</td> <td style="text-align: right;">OTCOOL</td> </tr> <tr> <td>23</td> <td>{Other3}</td> <td style="text-align: right;">OTCOOL</td> </tr> <tr> <td>24</td> <td>Some other energy source</td> <td></td> </tr> </table>			11	{Electricity}	ELCOOL	12	{Natural gas}	NGCOOL	13	{FuelOilType}	FKCOOL	14	{Bottled gas}	PRCOOL	15	{District steam}	STCOOL	16	{District hot water}	HWCOOL	17	{District chilled water}	CWCOOL	21	{Other1}	OTCOOL	22	{Other2}	OTCOOL	23	{Other3}	OTCOOL	24	Some other energy source	
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23	{Other3}	OTCOOL																																	
24	Some other energy source																																		
NEXT	IF Some other energy source selected ⇒ D53 [Other source for cooling] OTHERWISE ⇒ D54 [Percent cooled]																																		

D53	Other source for cooling	<i>see below</i>																								
ASK	IF Some other energy source IN D52 [Sources for cooling]																									
<p>What was the other energy source used for air conditioning?</p> <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 5%;">11</td> <td style="width: 70%;">Electricity</td> <td style="width: 25%; text-align: right;">ELCOOL</td> </tr> <tr> <td>12</td> <td>Natural gas</td> <td style="text-align: right;">NGCOOL</td> </tr> <tr> <td>13</td> <td>Fuel oil/Diesel/Kerosene</td> <td style="text-align: right;">FKCOOL</td> </tr> <tr> <td>14</td> <td>Bottled gas</td> <td style="text-align: right;">PRCOOL</td> </tr> <tr> <td>15</td> <td>District steam</td> <td style="text-align: right;">STCOOL</td> </tr> <tr> <td>16</td> <td>District hot water</td> <td style="text-align: right;">HWCOOL</td> </tr> <tr> <td>17</td> <td>District chilled water</td> <td style="text-align: right;">CWCOOL</td> </tr> <tr> <td>24</td> <td>Some other energy source</td> <td style="text-align: right;">OTCOOL</td> </tr> </table>			11	Electricity	ELCOOL	12	Natural gas	NGCOOL	13	Fuel oil/Diesel/Kerosene	FKCOOL	14	Bottled gas	PRCOOL	15	District steam	STCOOL	16	District hot water	HWCOOL	17	District chilled water	CWCOOL	24	Some other energy source	OTCOOL
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17	District chilled water	CWCOOL																								
24	Some other energy source	OTCOOL																								
NEXT	⇒ D54 [Percent cooled]																									

D54	Percent cooled	<i>COOLP</i>
ASK	IF D1 [Cooling] = Yes	
FILL	{SqFtIn} IF A6 [Square footage] known = A6 [Square footage] IF A6 [Square footage] = DK/RF = "floorspace"	
		[F1]-HELP
	<p>What percent of the {SqFt} in this building was cooled by air conditioning equipment during 2012?</p> <ul style="list-style-type: none"> ◆ If cooled square footage is known, but not the percent, RECORD square footage in comments, then code DK ◆ PROBE for estimate if DK 	
RANGE	0 to 100	
NEXT	IF 1-100, DK/RF ⇒ D55 [Cooling equipment types] IF Zero: IF More than just Individual space heaters IN D28 [Heating equipment types] → D73 [Regular HVAC maintenance] IF D3 [Water heating] = Yes ⇒ D74 [Sources for water heating] IF D4 [Cooking] = Yes ⇒ D77 [Sources for cooking] IF D6 [Manufacturing] = Yes ⇒ D79 [Sources for manufacturing] IF D8 [Electricity generation capability] = Yes ⇒ D81 [Energy for generation] OTHERWISE ⇒ D87 [Any other sources]	

D55	Cooling equipment types	<i>see below</i>
ASK	IF D54 [Percent cooled] = 1 to 100 OR DK/RF	
<p>[] SHOW CARD D11</p> <p>Looking at the list of cooling equipment types on Show Card D11, please tell me which types are used in this building.</p> <ul style="list-style-type: none"> ◆ PROBE for any others ◆ ENTER all that apply <ol style="list-style-type: none"> 1 Residential-type central air conditioners, other than heat pumps, that cool air directly and circulate it without using chilled water 2 Packaged air conditioning units, other than heat pumps 3 Central chillers inside (or adjacent to) the building that chill water for air conditioning 4 District chilled water piped in from outside the building 5 Heat pumps for cooling 6 Individual room air conditioners, other than heat pumps 7 "Swamp" coolers or evaporative coolers 8 Other cooling equipment 		<p>[F1]-HELP</p> <p>RCAC PKGCL CHILLR CHWT HTPMPC ACWNWL EVAPCL OTCLEQ</p>
NEXT	<p>IF Packaged air conditioning units ⇒ D56 [Type of packaged cooling] IF Central chillers ⇒ D57 [Type of chiller] IF District chilled water ⇒ D60 [Type of district chilled water system] IF Heat pumps for cooling AND NOT Heat pumps for heating ⇒ D61 [Heat pump cooling system] IF Other cooling equipment ⇒ D63 [Other cool specify] IF DK/RF: IF D3 [Water heating] = Yes ⇒ D74 [Sources for water heating] IF D4 [Cooking] = Yes ⇒ D77 [Sources for cooking] IF D6 [Manufacturing] = Yes ⇒ D79 [Sources for manufacturing] IF D8 [Electricity generation capability] = Yes ⇒ D81 [Energy for generation] OTHERWISE ⇒ D87 [Any other sources] OTHERWISE: IF Any source(s) other than electricity or chilled water reported in D52 [Sources for cooling] OR D53 [Other source for cooling] ⇒ D64 [Cool source explanation] IF Residential-type central air & D1 [Heating] = Yes & D47 [Heating ventilation types] ≠DK/RF ⇒ D65 [Cooling ventilation same as heating] IF Residential-type central air & (D1 [Heating] ≠ Yes OR D47 [Heating ventilation types] =DK/RF) ⇒ D66 [Cooling ventilation types] OTHERWISE: IF More than one selected ⇒ D67 [Percent cooled by each type] IF Only one selected, assign as Main cooling equipment. THEN: IF (A23 [Year of construction] < 1990 OR A24 [Year of construction category] ≠ 2000 to 2003 OR 2004 to 2007 OR 2008 to 2012) ⇒ D69 [Main cooling replaced] OTHERWISE: IF More than just Individual room air conditioners IN D55 [Cooling equipment types] → D70 [Economizer cycle] OTHERWISE: IF D3 [Water heating] = Yes ⇒ D74 [Sources for water heating] IF D4 [Cooking] = Yes ⇒ D77 [Sources for cooking] IF D6 [Manufacturing] = Yes ⇒ D79 [Sources for manufacturing] IF D8 [Electricity generation capability] = Yes ⇒ D81 [Energy for generation] OTHERWISE ⇒ D87 [Any other sources]</p>	

D56	Type of packaged cooling	<i>PKGCLTYP</i>
ASK	<p>IF Packaged central unit IN D28 [Heating equipment types] OR Packaged central unit OR Duct furnace IN D29 [Type of furnace] OR Any components given in D34 [Other heating components] & NOT(Packaged central unit IN D28 [Heating equipment types] OR Packaged central unit OR Duct furnace IN D29 [Type of furnace] OR Boiler IN D28 [Heating equipment types] OR District steam or hot water IN D28 [Heating equipment types])</p>	
<p style="text-align: right;">[F1]-HELP</p> <p>□ SHOW CARD D6</p> <p>Please look at Show Card D6 and tell me if the packaged unit for cooling is a factory-assembled unitary packaged unit or a custom built-up unit?</p> <ol style="list-style-type: none"> 1 Factory-assembled unitary packaged unit 2 Custom built-up packaged unit 3 IF VOLUNTEERED: Both factory-assembled and custom built-up packaged units 		
NEXT	<p>IF Central chillers ⇒ D57 [Type of chiller] IF District chilled water ⇒ D60 [Type of district chilled water system] IF Heat pumps for cooling & NOT Heat pumps for heating ⇒ D61 [Heat pump cooling system] IF Other cooling equipment ⇒ D63 [Other cool specify] OTHERWISE: IF Any source(s) other than electricity or chilled water reported in D52 [Sources for cooling] OR D53 [Other source for cooling] & Central chillers NOT IN D55 [Cooling equipment types] ⇒ D64 [Cool source explanation] OTHERWISE: IF D1 [Heating] = Yes & D47 [Heating ventilation types] ≠DK/RF ⇒ D65 [Cooling ventilation same as heating] IF D1 [Heating] ≠ Yes OR D47 [Heating ventilation types] =DK/RF ⇒ D66 [Cooling ventilation types]</p>	

D57	Type of chiller	<i>see below</i>									
ASK	IF Central chillers IN D55 [Cooling equipment types]										
		[F1]-HELP									
<p>☐ SHOW CARD D12</p> <p>Please look at Show Card D12 and tell me whether the chiller is air-cooled, water cooled, or an absorption chiller?</p> <p>◆ ENTER all that apply</p> <table> <tr> <td>1</td> <td>Air-cooled</td> <td><i>CHLAIRCL</i></td> </tr> <tr> <td>2</td> <td>Water cooled</td> <td><i>CHLWTRCL</i></td> </tr> <tr> <td>3</td> <td>Absorption</td> <td><i>CHLABSRP</i></td> </tr> </table>			1	Air-cooled	<i>CHLAIRCL</i>	2	Water cooled	<i>CHLWTRCL</i>	3	Absorption	<i>CHLABSRP</i>
1	Air-cooled	<i>CHLAIRCL</i>									
2	Water cooled	<i>CHLWTRCL</i>									
3	Absorption	<i>CHLABSRP</i>									
NEXT	IF Absorption ⇒ D58 [Heater chiller] OTHERWISE ⇒ D59 [Type of chiller system]										

D58	Heater chiller	<i>HTRCHLR</i>				
ASK	IF Absorption IN D57 [Type of chiller]					
<p>A “heater chiller” is a type of absorption chiller that can produce both chilled and hot water and can provide both cooling and heating. Does this absorption chiller have this capability?</p> <table> <tr> <td>1</td> <td>Yes</td> </tr> <tr> <td>2</td> <td>No</td> </tr> </table>			1	Yes	2	No
1	Yes					
2	No					
NEXT	⇒ D59 [Type of chiller system]					

D59	Type of chiller system	<i>see below</i>														
ASK	IF Central chillers IN D55 [Cooling equipment types]															
<p style="text-align: right;">[F1]-HELP</p> <p>□ SHOW CARD D13</p> <p>Please look at Show Card D13 and tell me which system or systems are used for distributing the water from the chiller.</p> <p>◆ ENTER all that apply</p> <table border="0" style="width: 100%;"> <tr> <td style="width: 60%;">1 Central air handler (hydronic coils)</td> <td>CHLAIR</td> </tr> <tr> <td>2 Fan coil units in rooms (or areas)</td> <td>CHLFNCL</td> </tr> <tr> <td>3 Induction units</td> <td>CHLINDC</td> </tr> <tr> <td>4 Water loop heat pump</td> <td>CHLWATR</td> </tr> <tr> <td>5 Chilled beam</td> <td>CHLBEAM</td> </tr> <tr> <td>6 Packaged unit (hydronic coils)</td> <td>CHLPKG</td> </tr> <tr> <td>7 Duct reheat</td> <td>CHLDUCT</td> </tr> </table>			1 Central air handler (hydronic coils)	CHLAIR	2 Fan coil units in rooms (or areas)	CHLFNCL	3 Induction units	CHLINDC	4 Water loop heat pump	CHLWATR	5 Chilled beam	CHLBEAM	6 Packaged unit (hydronic coils)	CHLPKG	7 Duct reheat	CHLDUCT
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5 Chilled beam	CHLBEAM															
6 Packaged unit (hydronic coils)	CHLPKG															
7 Duct reheat	CHLDUCT															
NEXT	<p>IF District chilled water ⇒ D60 [Type of district chilled water system] IF Heat pumps for cooling AND NOT Heat pumps for heating ⇒ D61 [Heat pump cooling system] IF Other cooling equipment ⇒ D63 [Other cool specify] OTHERWISE: IF D1 [Heating] = Yes & D47 [Heating ventilation types] ≠ DK/RF & Residential-type central air IN D55 [Cooling equipment types] OR Packaged unit IN D55 [Cooling equipment types] OR Water loop, Central air handler, Packaged unit, OR Duct reheat IN D59 [Type of chiller system] OR Water loop, Central air handler, Packaged unit, OR Duct reheat IN D60 [Type of district chilled water system] OR Packaged unit OR Split system IN D61 [Heat pump cooling system] ⇒ D65 [Cooling ventilation same as heating] IF D1 [Heating] ≠ Yes OR D47 [Heating ventilation types] = DK/RF & Residential-type central air IN D55 [Cooling equipment types] OR Packaged unit IN D55 [Cooling equipment types] OR Water loop, Central air handler, Packaged unit, OR Duct reheat IN D59 [Type of chiller system] OR Water loop, Central air handler, Packaged unit, OR Duct reheat IN D60 [Type of district chilled water system] ⇒ D66 [Cooling ventilation types] OTHERWISE: IF More than one selected ⇒ D67 [Percent cooled by each type] IF Only one selected, assign as Main cooling equipment. THEN: IF (Main equipment NOT District chilled water OR DK/RF) & (Main cooling equipment NOT Packaged cooling if the Main heating equipment was Packaged heating) & (Main cooling equipment NOT Heat pump if the main heating equipment was Heat pump) & (A23 [Year of construction] < 1990 OR A24 [Year of construction category] ≠ 2000 to 2003 OR 2004 to 2007 OR 2008 to 2012) ⇒ D69 [Main cooling replaced] OTHERWISE: IF D3 [Water heating] = Yes ⇒ D74 [Sources for water heating] IF D4 [Cooking] = Yes ⇒ D77 [Sources for cooking] IF D6 [Manufacturing] = Yes ⇒ D79 [Sources for manufacturing] IF D8 [Electricity generation capability] = Yes ⇒ D81 [Energy for generation] OTHERWISE ⇒ D87 [Any other sources]</p>															

D60	Type of district chilled water system	<i>see below</i>														
ASK	IF District chilled water IN D55 [Cooling equipment types]															
<p style="text-align: right;">[F1]-HELP</p> <p>□ SHOW CARD D13</p> <p>Please look at Show Card D13 and tell me which system or systems are used for distributing the district chilled water.</p> <p>◆ ENTER all that apply</p> <table border="0" style="width: 100%;"> <tr> <td style="width: 60%;">1 Central air handler (hydronic coils)</td> <td>DCWAIR</td> </tr> <tr> <td>2 Fan coil units in rooms (or areas)</td> <td>DCWFNCL</td> </tr> <tr> <td>3 Induction units</td> <td>DCWINDC</td> </tr> <tr> <td>4 Water loop heat pump</td> <td>DCWWATR</td> </tr> <tr> <td>5 Chilled beam</td> <td>DCWBEAM</td> </tr> <tr> <td>6 Packaged unit (hydronic coils)</td> <td>DCWPKG</td> </tr> <tr> <td>7 Duct reheat</td> <td>DCWDUCT</td> </tr> </table>			1 Central air handler (hydronic coils)	DCWAIR	2 Fan coil units in rooms (or areas)	DCWFNCL	3 Induction units	DCWINDC	4 Water loop heat pump	DCWWATR	5 Chilled beam	DCWBEAM	6 Packaged unit (hydronic coils)	DCWPKG	7 Duct reheat	DCWDUCT
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7 Duct reheat	DCWDUCT															
NEXT	<p>IF Heat pumps for cooling AND NOT Heat pumps for heating ⇒ D61 [Heat pump cooling system] IF Other cooling equipment ⇒ D63 [Other cool specify] OTHERWISE: IF Any source(s) other than electricity or chilled water reported in D52 [Sources for cooling] OR D53 [Other source for cooling] & Central chillers NOT IN D55 [Cooling equipment types] ⇒ D64 [Cool source explanation] IF D1 [Heating] = Yes & D47 [Heating ventilation types] ≠ DK/RF & Residential-type central air IN D55 [Cooling equipment types] OR Packaged unit IN D55 [Cooling equipment types] OR Water loop, Central air handler, Packaged unit, OR Duct reheat IN D59 [Type of chiller system] OR Water loop, Central air handler, Packaged unit, OR Duct reheat IN D60 [Type of district chilled water system] ⇒ D65 [Cooling ventilation same as heating] IF D1 [Heating] ≠ Yes OR D47 [Heating ventilation types] = DK/RF & Residential-type central air IN D55 [Cooling equipment types] OR Packaged unit IN D55 [Cooling equipment types] OR Water loop, Central air handler, Packaged unit, OR Duct reheat IN D59 [Type of chiller system] OR Water loop, Central air handler, Packaged unit, OR Duct reheat IN D60 [Type of district chilled water system] ⇒ D66 [Cooling ventilation types] OTHERWISE: IF More than one selected ⇒ D67 [Percent cooled by each type] IF Only one selected, assign as Main cooling equipment. THEN: IF (Main equipment NOT District chilled water OR DK/RF) & (Main cooling equipment NOT Packaged cooling if the Main heating equipment was Packaged heating) & (Main cooling equipment NOT Heat pump if the main heating equipment was Heat pump) & (A23 [Year of construction] < 1990 OR A24 [Year of construction category] ≠ 2000 to 2003 OR 2004 to 2007 OR 2008 to 2012) ⇒ D69 [Main cooling replaced] OTHERWISE: IF D3 [Water heating] = Yes ⇒ D74 [Sources for water heating] IF D4 [Cooking] = Yes ⇒ D77 [Sources for cooking] IF D6 [Manufacturing] = Yes ⇒ D79 [Sources for manufacturing] IF D8 [Electricity generation capability] = Yes ⇒ D81 [Energy for generation] OTHERWISE ⇒ D87 [Any other sources]</p>															

D61	Heat pump cooling system	<i>see below</i>															
ASK	IF Heat pumps IN D55 [Cooling equipment types] & Heat pumps NOT IN D28 [Heating equipment types]																
<input type="checkbox"/> SHOW CARD D7		[F1]-HELP															
<p>Please look at the first list on Show Card D7 and tell me which heat pump systems are used for cooling in this building.</p> <p>◆ ENTER all that apply</p> <table> <tr> <td>1</td> <td>Packaged unit</td> <td><i>HPCPKG</i></td> </tr> <tr> <td>2</td> <td>Split system (residential-type)</td> <td><i>HPCSPLT</i></td> </tr> <tr> <td>3</td> <td>Individual room heat pump (packaged terminal heat pump or PTHP)</td> <td><i>HPCROOM</i></td> </tr> <tr> <td>4</td> <td>Ductless mini-split system</td> <td><i>HPCMINI</i></td> </tr> <tr> <td>5</td> <td>Variable refrigerant flow (VRF) system</td> <td><i>HPCVRF</i></td> </tr> </table>			1	Packaged unit	<i>HPCPKG</i>	2	Split system (residential-type)	<i>HPCSPLT</i>	3	Individual room heat pump (packaged terminal heat pump or PTHP)	<i>HPCROOM</i>	4	Ductless mini-split system	<i>HPCMINI</i>	5	Variable refrigerant flow (VRF) system	<i>HPCVRF</i>
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4	Ductless mini-split system	<i>HPCMINI</i>															
5	Variable refrigerant flow (VRF) system	<i>HPCVRF</i>															
NEXT	⇒ D62 [Heat pump cooling type]																

DRAFT (9/5/12)

D62	Heat pump cooling type	<i>see below</i>												
ASK	IF Heat pumps IN D55 [Cooling equipment types] & Heat pumps NOT IN D28 [Heating equipment types]													
<p><input type="checkbox"/> SHOW CARD D7</p> <p>Looking at the second list on Show Card D7, which types of heat pumps are these?</p> <p>◆ ENTER all that apply</p> <table border="0"> <tr> <td>1</td> <td>Air source heat pump</td> <td><i>HPCAIR</i></td> </tr> <tr> <td>2</td> <td>Ground source or ground water heat pump (geothermal)</td> <td><i>HPCGRD</i></td> </tr> <tr> <td>3</td> <td>Dual source heat pump (combination air source and geothermal)</td> <td><i>HPCDUAL</i></td> </tr> <tr> <td>3</td> <td>Water loop heat pump</td> <td><i>HPCWTR</i></td> </tr> </table>		1	Air source heat pump	<i>HPCAIR</i>	2	Ground source or ground water heat pump (geothermal)	<i>HPCGRD</i>	3	Dual source heat pump (combination air source and geothermal)	<i>HPCDUAL</i>	3	Water loop heat pump	<i>HPCWTR</i>	[F1]-HELP
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3	Dual source heat pump (combination air source and geothermal)	<i>HPCDUAL</i>												
3	Water loop heat pump	<i>HPCWTR</i>												
NEXT	<p>IF Other cooling equipment ⇒ D63 [Other cool specify] OTHERWISE:</p> <p>IF Any source(s) other than electricity or chilled water reported in D52 [Sources for cooling] OR D53 [Other source for cooling] & Central chillers NOT IN D55 [Cooling equipment types] ⇒ D64 [Cool source explanation]</p> <p>IF D1 [Heating] = Yes & D47 [Heating ventilation types] ≠ DK/RF & Residential-type central air IN D55 [Cooling equipment types] OR Packaged unit IN D55 [Cooling equipment types] OR Water loop, Central air handler, Packaged unit, OR Duct reheat IN D59 [Type of chiller system] OR Water loop, Central air handler, Packaged unit, OR Duct reheat IN D60 [Type of district chilled water system] OR Packaged unit OR Split system IN D61 [Heat pump cooling system] ⇒ D65 [Cooling ventilation same as heating]</p> <p>IF D1 [Heating] ≠ Yes OR D47 [Heating ventilation types] = DK/RF & Residential-type central air IN D55 [Cooling equipment types] OR Packaged unit IN D55 [Cooling equipment types] OR Water loop, Central air handler, Packaged unit, OR Duct reheat IN D59 [Type of chiller system] OR Water loop, Central air handler, Packaged unit, OR Duct reheat IN D60 [Type of district chilled water system] OR Packaged unit OR Split system IN D61 [Heat pump cooling system] ⇒ D66 [Cooling ventilation types]</p> <p>OTHERWISE:</p> <p>IF More than one selected ⇒ D67 [Percent cooled by each type] IF Only one selected, assign as Main cooling equipment. THEN:</p> <p>IF (Main equipment NOT District chilled water OR DK/RF) & (Main cooling equipment NOT Packaged cooling if the Main heating equipment was Packaged heating) & (Main cooling equipment NOT Heat pump if the main heating equipment was Heat pump) & (A23 [Year of construction] < 1990 OR A24 [Year of construction category] ≠ 2000 to 2003 OR 2004 to 2007 OR 2008 to 2012) ⇒ D69 [Main cooling replaced]</p> <p>OTHERWISE:</p> <p>IF D3 [Water heating] = Yes ⇒ D74 [Sources for water heating] IF D4 [Cooking] = Yes ⇒ D77 [Sources for cooking] IF D6 [Manufacturing] = Yes ⇒ D79 [Sources for manufacturing] IF D8 [Electricity generation capability] = Yes ⇒ D81 [Energy for generation] OTHERWISE ⇒ D87 [Any other sources]</p>													

D63	Other cool specify
ASK	IF Other cooling equipment in D55 [Cooling equipment types]
<p>Please describe the other type of cooling equipment.</p> <p>◆ RECORD in open box</p>	
NEXT	<p>IF Any source(s) other than electricity or chilled water reported in D52 [Sources for cooling] OR D53 [Other source for cooling] & Central chillers NOT IN D55 [Cooling equipment types] ⇒ D64 [Cool source explanation]</p> <p>IF D1 [Heating] = Yes & D47 [Heating ventilation types] ≠ DK/RF & Residential-type central air IN D55 [Cooling equipment types] OR Packaged unit IN D55 [Cooling equipment types] OR Water loop, Central air handler, Packaged unit, OR Duct reheat IN D59 [Type of chiller system] OR Water loop, Central air handler, Packaged unit, OR Duct reheat IN D60 [Type of district chilled water system] OR Packaged unit OR Split system IN D61 [Heat pump cooling system] ⇒ D65 [Cooling ventilation same as heating]</p> <p>IF D1 [Heating] ≠ Yes OR D47 [Heating ventilation types] = DK/RF & Residential-type central air IN D55 [Cooling equipment types] OR Packaged unit IN D55 [Cooling equipment types] OR Water loop, Central air handler, Packaged unit, OR Duct reheat IN D59 [Type of chiller system] OR Water loop, Central air handler, Packaged unit, OR Duct reheat IN D60 [Type of district chilled water system] OR Packaged unit OR Split system IN D61 [Heat pump cooling system] ⇒ D66 [Cooling ventilation types]</p> <p>OTHERWISE: IF More than one selected ⇒ D67 [Percent cooled by each type] IF Only one selected, assign as Main cooling equipment. THEN: IF (Main equipment NOT District chilled water OR DK/RF) & (Main cooling equipment NOT Packaged cooling if the Main heating equipment was Packaged heating) & (Main cooling equipment NOT Heat pump if the main heating equipment was Heat pump) & (A23 [Year of construction] < 1990 OR A24 [Year of construction category] ≠ 2000 to 2003 OR 2004 to 2007 OR 2008 to 2012) ⇒ D69 [Main cooling replaced]</p> <p>OTHERWISE: IF D3 [Water heating] = Yes ⇒ D74 [Sources for water heating] IF D4 [Cooking] = Yes ⇒ D77 [Sources for cooking] IF D6 [Manufacturing] = Yes ⇒ D79 [Sources for manufacturing] IF D8 [Electricity generation capability] = Yes ⇒ D81 [Energy for generation] OTHERWISE ⇒ D87 [Any other sources]</p>

D64	Cool source explanation
ASK	IF Any source(s) other than electricity or chilled water reported in D52 [Sources for cooling] OR D53 [Other source for cooling] & Central chillers NOT IN D55 [Cooling equipment types]
FILL	<p>{CoolSources} = List of the energy sources given for cooling, other than electricity or chilled water {IsAre} = IF Only one cooling source in list = "is" IF More than one cooling source in list = "are"</p> <p>Among the sources for cooling, I have recorded that {CoolSources} {IsAre} used. Because it is somewhat unusual to use sources other than electricity or chilled water for cooling, will you please briefly describe how the {CoolSources} {IsAre} used with the cooling equipment.</p> <p>◆ RECORD in open box</p>
NEXT	<p>IF D1 [Heating] = Yes & D47 [Heating ventilation types] ≠ DK/RF & Residential-type central air IN D55 [Cooling equipment types] OR Packaged unit IN D55 [Cooling equipment types] OR Water loop, Central air handler, Packaged unit, OR Duct reheat IN D59 [Type of chiller system] OR Water loop, Central air handler, Packaged unit, OR Duct reheat IN D60 [Type of district chilled water system] OR Packaged unit OR Split system IN D61 [Heat pump cooling system] ⇒ D65 [Cooling ventilation same as heating]</p> <p>IF D1 [Heating] ≠ Yes OR D47 [Heating ventilation types] = DK/RF & Residential-type central air IN D55 [Cooling equipment types] OR Packaged unit IN D55 [Cooling equipment types] OR Water loop, Central air handler, Packaged unit, OR Duct reheat IN D59 [Type of chiller system] OR Water loop, Central air handler, Packaged unit, OR Duct reheat IN D60 [Type of district chilled water system] OR Packaged unit OR Split system IN D61 [Heat pump cooling system] ⇒ D66 [Cooling ventilation types]</p> <p>OTHERWISE: IF More than one cooling equipment ⇒ D67 [Percent cooled by each type] IF Only one equipment, assign as Main cooling equipment. THEN: IF (Main equipment NOT District chilled water OR DK/RF) & (Main cooling equipment NOT Packaged cooling if the Main heating equipment was Packaged heating) & (Main cooling equipment NOT Heat pump if the main heating equipment was Heat pump) & (A23 [Year of construction] < 1990 OR A24 [Year of construction category] ≠ 2000 to 2003 OR 2004 to 2007 OR 2008 to 2012) ⇒ D69 [Main cooling replaced]</p> <p>OTHERWISE: IF D3 [Water heating] = Yes ⇒ D74 [Sources for water heating] IF D4 [Cooking] = Yes ⇒ D77 [Sources for cooking] IF D6 [Manufacturing] = Yes ⇒ D79 [Sources for manufacturing] IF D8 [Electricity generation capability] = Yes ⇒ D81 [Energy for generation] OTHERWISE ⇒ D87 [Any other sources]</p>

D65	Cooling ventilation same as heating
ASK	<p>IF D1 [Heating] = Yes & D47 [Heating ventilation types] ≠ (No ventilation or DK/RF) & Residential-type central air IN D55 [Cooling equipment types] OR Packaged unit IN D55 [Cooling equipment types] OR Water loop, Central air handler, Packaged unit, OR Duct reheat IN D59 [Type of chiller system] OR Water loop, Central air handler, Packaged unit, OR Duct reheat IN D60 [Type of district chilled water system] OR Packaged unit OR Split system IN D61 [Heat pump cooling system]</p>
<p>Is the ventilation system for cooling the same as the one for heating?</p> <p>1 Yes 2 No</p>	
NEXT	<p>IF No ⇒ D66 [Cooling ventilation types] OTHERWISE: IF More than one cooling equipment ⇒ D67 [Percent cooled by each type] IF Only one equipment, assign as Main cooling equipment. THEN: IF (Main equipment NOT District chilled water OR DK/RF) & (Main cooling equipment NOT Packaged cooling if the Main heating equipment was Packaged heating) & (Main cooling equipment NOT Heat pump if the main heating equipment was Heat pump) & (A23 [Year of construction] < 1990 OR A24 [Year of construction category] ≠ 2000 to 2003 OR 2004 to 2007 OR 2008 to 2012) ⇒ D69 [Main cooling replaced] OTHERWISE: IF D3 [Water heating] = Yes ⇒ D74 [Sources for water heating] IF D4 [Cooking] = Yes ⇒ D77 [Sources for cooking] IF D6 [Manufacturing] = Yes ⇒ D79 [Sources for manufacturing] IF D8 [Electricity generation capability] = Yes ⇒ D81 [Energy for generation] OTHERWISE ⇒ D87 [Any other sources]</p>

D66	Cooling ventilation types												
ASK	IF D65 [Cooling ventilation same as heating] = No												
[F1]-HELP													
<p>☐ SHOW CARD D9</p> <p>Show Card D9 provides a list of mechanical ventilation equipment types. Please tell me which types are used with the cooling system.</p> <ul style="list-style-type: none"> ◆ PROBE for any others ◆ ENTER all that apply <table style="width: 100%; border: none;"> <tr> <td style="width: 70%;">1 Central air handling unit(s) with constant air volume (CAV) control</td> <td>CLVCAV</td> </tr> <tr> <td>2 Central air handling unit(s) with variable air volume (VAV) control</td> <td>CLVVAV</td> </tr> <tr> <td>3 Underfloor air distribution</td> <td>CLVFLR</td> </tr> <tr> <td>4 Dedicated outside air system (DOAS)</td> <td>CLVOAS</td> </tr> <tr> <td>5 Demand controlled ventilation</td> <td>CLVDEM</td> </tr> <tr> <td>6 None of these types</td> <td>CLVNON</td> </tr> </table>		1 Central air handling unit(s) with constant air volume (CAV) control	CLVCAV	2 Central air handling unit(s) with variable air volume (VAV) control	CLVVAV	3 Underfloor air distribution	CLVFLR	4 Dedicated outside air system (DOAS)	CLVOAS	5 Demand controlled ventilation	CLVDEM	6 None of these types	CLVNON
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2 Central air handling unit(s) with variable air volume (VAV) control	CLVVAV												
3 Underfloor air distribution	CLVFLR												
4 Dedicated outside air system (DOAS)	CLVOAS												
5 Demand controlled ventilation	CLVDEM												
6 None of these types	CLVNON												
NEXT	<p>IF None of these types ⇒ D66a [Cooling ventilation specify] OTHERWISE: IF More than one cooling equipment ⇒ D67 [Percent cooled by each type] IF Only one equipment, assign as Main cooling equipment. THEN: IF (Main equipment NOT District chilled water OR DK/RF) & (Main cooling equipment NOT Packaged cooling if the Main heating equipment was Packaged heating) & (Main cooling equipment NOT Heat pump if the main heating equipment was Heat pump) & (A23 [Year of construction] < 1990 OR A24 [Year of construction category] ≠ 2000 to 2003 OR 2004 to 2007 OR 2008 to 2012) ⇒ D69 [Main cooling replaced] OTHERWISE: IF More than just Individual room air conditioners IN D55 [Cooling equipment types] → D70 [Economizer cycle] OTHERWISE: IF D3 [Water heating] = Yes ⇒ D74 [Sources for water heating] IF D4 [Cooking] = Yes ⇒ D77 [Sources for cooking] IF D6 [Manufacturing] = Yes ⇒ D79 [Sources for manufacturing] IF D8 [Electricity generation capability] = Yes ⇒ D81 [Energy for generation] OTHERWISE ⇒ D87 [Any other sources]</p>												

D66a	Cooling ventilation specify
ASK	IF D66 [Cooling ventilation types] = None of these types
<p>Please describe the ventilation system that is used with the cooling system.</p> <p>◆ RECORD in open box</p>	
NEXT	<p>IF More than one cooling equipment ⇒ D67 [Percent cooled by each type] IF Only one equipment, assign as Main cooling equipment. THEN: IF (Main equipment NOT District chilled water OR DK/RF) & (Main cooling equipment NOT Packaged cooling if the Main heating equipment was Packaged heating) & (Main cooling equipment NOT Heat pump if the main heating equipment was Heat pump) & (A23 [Year of construction] < 1990 OR A24 [Year of construction category] ≠ 2000 to 2003 OR 2004 to 2007 OR 2008 to 2012) ⇒ D69 [Main cooling replaced] OTHERWISE: IF More than just Individual room air conditioners IN D55 [Cooling equipment types] → D70 [Economizer cycle] OTHERWISE: IF D3 [Water heating] = Yes ⇒ D74 [Sources for water heating] IF D4 [Cooking] = Yes ⇒ D77 [Sources for cooking] IF D6 [Manufacturing] = Yes ⇒ D79 [Sources for manufacturing] IF D8 [Electricity generation capability] = Yes ⇒ D81 [Energy for generation] OTHERWISE ⇒ D87 [Any other sources]</p>

D67	<p>Percent cooled by each type</p> <p style="text-align: right;"><i>RCACP, PKGCP, CHILP, CHWTP, HTPCP, ACWNWP, EVAPP, OTCLP</i></p>
ASK	For each equipment type given in D55 [Cooling equipment types]
FILL	<p>{Introduction} IF First equipment = "The next questions are about the percent of floorspace cooled by the equipment you just mentioned. Please keep in mind:" OTHERWISE = BLANK</p> <p>{Explanation} IF First equipment and D54 [Percent cooled] \neq 100 = "We are talking only about the <u>cooled portion</u> of the floorspace, so these percents must add up to at least 100, but since more than one type of equipment can cool the same area, it is also possible for them to add up to <u>more</u> than 100." IF First equipment and D54 [Percent cooled] = 100 = "These percents must add up to at least 100, but since more than one type of equipment can cool the same area, it is also possible for them to add up to <u>more</u> than 100." OTHERWISE = BLANK</p> <p>{Equipment} IF Residential-type central air conditioners IN D55 [Cooling equipment types] = "central air conditioner" IF Packaged air conditioning units IN D55 [Cooling equipment types] = "packaged cooling" IF Central chillers inside the building IN D55 [Cooling equipment types] = "central chiller" IF District chilled water IN D55 [Cooling equipment types] = "district chilled water" IF Heat pumps for cooling IN D55 [Cooling equipment types] = "heat pump" IF Individual room air conditioners IN D55 [Cooling equipment types] = "room air conditioner" IF "Swamp" coolers or evaporative coolers IN D55 [Cooling equipment types] = "swamp cooler" IF Other cooling equipment IN D55 [Cooling equipment types] = "other cooling equipment"</p>
<p><input type="checkbox"/> SHOW CARD D15</p> <p>{Introduction}</p> <p>{Explanation}</p> <p>Please look at Show Card D15. What percent of the cooled area in this building is served by the {Equipment}?</p> <p>◆ PROBE for estimate if DK</p>	
RANGE	0 to 100
NEXT	<p>IF there are equal maximum percents OR DK/RF \Rightarrow D68 [Main cooling equipment] IF there is an equipment with a maximum percent, assign that equipment as the Main cooling equipment [MAINCL9]. THEN: IF (Main equipment NOT District chilled water OR DK/RF) & (Main cooling equipment NOT Packaged cooling if the Main heating equipment was Packaged heating) & (Main cooling equipment NOT Heat pump if the main heating equipment was Heat pump) & (A23 [Year of construction] < 1990 OR A24 [Year of construction category] \neq 2000 to 2003 OR 2004 to 2007 OR 2008 to 2012) \Rightarrow D69 [Main cooling replaced] OTHERWISE: IF More than just Individual room air conditioners IN D55 [Cooling equipment types] → D70 [Economizer cycle] OTHERWISE: IF D3 [Water heating] = Yes \Rightarrow D74 [Sources for water heating] IF D4 [Cooking] = Yes \Rightarrow D77 [Sources for cooking] IF D6 [Manufacturing] = Yes \Rightarrow D79 [Sources for manufacturing] IF D8 [Electricity generation capability] = Yes \Rightarrow D81 [Energy for generation] OTHERWISE \Rightarrow D87 [Any other sources]</p>

D68	Main cooling equipment	<i>MNCLEQ</i>
ASK	IF D67 [Percent cooled by each type] has equal maximum percents OR DK/RF	
FILL	<p>{EquipmentList} = List of the equipments with equal maximum percents {Packaged cooling} – {Other cooling equipment} = Each equipment with an equal maximum percent appears on this list; otherwise the line is blank</p>	
<p>Which do you consider to be your main cooling equipment – {EquipmentList} ?</p> <p>◆ Only equipment types with equal percentages are shown here</p> <ol style="list-style-type: none"> 1 {Central air conditioner} 2 {Packaged cooling} 3 {Central chiller} 4 {District chilled water} 5 {Heat pump} 6 {Room air conditioner} 7 {Swamp coolers} 8 {Other cooling equipment} 		
NEXT	<p>IF (Main equipment NOT District chilled water OR DK/RF) & (Main cooling equipment NOT Packaged cooling if the Main heating equipment was Packaged heating) & (Main cooling equipment NOT Heat pump if the main heating equipment was Heat pump) & (A23 [Year of construction] < 1990 OR A24 [Year of construction category] ≠ 2000 to 2003 OR 2004 to 2007 OR 2008 to 2012) ⇒ D69 [Main cooling replaced]</p> <p>OTHERWISE: IF More than just Individual room air conditioners IN D55 [Cooling equipment types] → D70 [Economizer cycle]</p> <p>OTHERWISE: IF D3 [Water heating] = Yes ⇒ D74 [Sources for water heating] IF D4 [Cooking] = Yes ⇒ D77 [Sources for cooking] IF D6 [Manufacturing] = Yes ⇒ D79 [Sources for manufacturing] IF D8 [Electricity generation capability] = Yes ⇒ D81 [Energy for generation] OTHERWISE ⇒ D87 [Any other sources]</p>	

D69	Main cooling replaced	<i>NWMNCL</i>
ASK	IF Main cooling equipment known & NOT District chilled water & (Main cooling equipment NOT Packaged cooling if the Main heating equipment was Packaged heating) & (Main cooling equipment NOT Heat pump if the main heating equipment was Heat pump) & (A23 [Year of construction] < 1990 OR A24 [Year of construction category] ≠ 2000 to 2003 OR 2004 to 2007 OR 2008 to 2012)	
FILL	{MainCoolEquip} IF Main cooling equipment = Packaged cooling = "Has the packaged air conditioning unit" IF Main cooling equipment = Central air conditioner = "Has the central air conditioner" IF Main cooling equipment = Room air conditioner = "Have any of the room air conditioners" IF Main cooling equipment = Heat pump = "Has the heat pump" IF Main cooling equipment = Central chiller = "Has the central chiller" IF Main cooling equipment = Swamp coolers = "Has the swamp cooler" IF Main cooling equipment = Other cooling equipment = "Has the other type of cooling equipment"	
{MainCoolEquip} been replaced since 1990? ◆ EXP: [If there is more than one of this equipment type and at least one has been replaced, the answer is "Yes."]		
1 Yes 2 No		
NEXT	IF More than just Individual room air conditioners IN D55 [Cooling equipment types] → D70 [Economizer cycle] OTHERWISE: IF D3 [Water heating] = Yes ⇒ D74 [Sources for water heating] IF D4 [Cooking] = Yes ⇒ D77 [Sources for cooking] IF D6 [Manufacturing] = Yes ⇒ D79 [Sources for manufacturing] IF D8 [Electricity generation capability] = Yes ⇒ D81 [Energy for generation] OTHERWISE ⇒ D87 [Any other sources]	

D70	Economizer cycle	<i>ECN</i>
ASK	IF More than just Individual room air conditioners IN D55 [Cooling equipment types]	
[F1]-HELP		
Does this building have any equipment that uses outside air for cooling, often called an "economizer cycle"?		
1 Yes 2 No		
NEXT	IF Yes → D71 [Type of economizer cycle] OTHERWISE: IF Packaged air conditioning units OR Central chillers OR Heat pumps for cooling IN D55 [Cooling equipment types] → D72 [Cooling tower] OTHERWISE → D73 [Regular HVAC maintenance]	

D71	Type of economizer cycle	<i>ECNTYPE</i>
ASK	IF D70 [Economizer cycle] = Yes	
<p>□ SHOW CARD D14</p> <p>Looking at Show Card D14, is this an air-side economizer or a water-side economizer?</p> <ol style="list-style-type: none"> 1 Air-side economizer 2 Water-side economizer 		
NEXT	IF Packaged air conditioning units OR Central chillers OR Heat pumps for cooling IN D55 [Cooling equipment types] → D72 [Cooling tower] OTHERWISE → D73 [Regular HVAC maintenance]	

D72	Cooling tower	<i>CTOWER</i>
ASK	IF Packaged air conditioning units OR Central chillers OR Heat pumps for cooling IN D55 [Cooling equipment types]	
<p>Does this building have a cooling tower for the cooling equipment?</p> <p>◆ DEF: [A cooling tower is used to dispose of unwanted heat from the cooling equipment.]</p> <ol style="list-style-type: none"> 1 Yes 2 No 		
NEXT	→ D73 [Regular HVAC maintenance]	

D73	Regular HVAC maintenance	<i>MAINT</i>
ASK	IF More than just Individual space heaters IN D28 [Heating equipment types] OR More than just Individual room air conditioners IN D55 [Cooling equipment types]	
FILL	<p>{HeatCool}</p> <p>IF Heating only = "heating"</p> <p>IF Cooling only = "cooling"</p> <p>IF Heating & Cooling = "heating and cooling"</p>	
<i>[F1]-HELP</i>		
<p>Is there any regularly scheduled maintenance and repair for the {HeatCool} system?</p> <ol style="list-style-type: none"> 1 Yes 2 No 		
NEXT	<p>IF D3 [Water heating] = Yes ⇒ D74 [Sources for water heating]</p> <p>IF D4 [Cooking] = Yes ⇒ D77 [Sources for cooking]</p> <p>IF D6 [Manufacturing] = Yes ⇒ D79 [Sources for manufacturing]</p> <p>IF D8 [Electricity generation capability] = Yes ⇒ D81 [Energy for generation]</p> <p>OTHERWISE ⇒ D87 [Any other sources]</p>	

D74	Sources for water heating	<i>see below</i>																																							
ASK	IF D3 [Water heating] = Yes																																								
FILL	<p>{WatrSourcesList} = List of all energy sources used {Electricity} – {Other3} = If a source is used, it appears in this list; if not, the line is blank {FuelOilType} = Type or types specified in D10 [Fuel oil, diesel, or kerosene] {Other1} – {Other3} = Sources specified in D12 [Other energy source 1] – D14 [Other energy source 3]</p>																																								
<p>Which energy sources were used for water heating? ({WatrSourcesList})</p> <ul style="list-style-type: none"> ◆ Only sources already selected are shown here ◆ PROBE for any others ◆ ENTER all that apply <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 5%;">11</td> <td style="width: 70%;">{Electricity}</td> <td style="width: 25%;">ELWATR</td> </tr> <tr> <td>12</td> <td>{Natural gas}</td> <td>NGWATR</td> </tr> <tr> <td>13</td> <td>{FuelOilType}</td> <td>FKWATR</td> </tr> <tr> <td>14</td> <td>{Bottled gas}</td> <td>PRWATR</td> </tr> <tr> <td>15</td> <td>{District steam}</td> <td>STWATR</td> </tr> <tr> <td>16</td> <td>{District hot water}</td> <td>HWWATR</td> </tr> <tr> <td>18</td> <td>{Wood}</td> <td>WOWATR</td> </tr> <tr> <td>19</td> <td>{Coal}</td> <td>COWATR</td> </tr> <tr> <td>20</td> <td>{Solar}</td> <td>SOWATR</td> </tr> <tr> <td>21</td> <td>{Other1}</td> <td>OTWATR</td> </tr> <tr> <td>22</td> <td>{Other2}</td> <td>OTWATR</td> </tr> <tr> <td>23</td> <td>{Other3}</td> <td>OTWATR</td> </tr> <tr> <td>24</td> <td>Some other energy source</td> <td></td> </tr> </table>			11	{Electricity}	ELWATR	12	{Natural gas}	NGWATR	13	{FuelOilType}	FKWATR	14	{Bottled gas}	PRWATR	15	{District steam}	STWATR	16	{District hot water}	HWWATR	18	{Wood}	WOWATR	19	{Coal}	COWATR	20	{Solar}	SOWATR	21	{Other1}	OTWATR	22	{Other2}	OTWATR	23	{Other3}	OTWATR	24	Some other energy source	
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23	{Other3}	OTWATR																																							
24	Some other energy source																																								
NEXT	IF Some other energy source selected ⇒ D75 [Other water heating source] OTHERWISE ⇒ D76 [Water heating equipment]																																								

D75	Other water heating source	<i>see below</i>																														
ASK	IF Some other energy source IN D74 [Sources for water heating]																															
<p>What was the other energy source used for water heating?</p> <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 5%;">11</td> <td style="width: 70%;">Electricity</td> <td style="width: 25%;">ELWATR</td> </tr> <tr> <td>12</td> <td>Natural gas</td> <td>NGWATR</td> </tr> <tr> <td>13</td> <td>Fuel oil/Diesel/Kerosene</td> <td>FKWATR</td> </tr> <tr> <td>14</td> <td>Bottled gas</td> <td>PRWATR</td> </tr> <tr> <td>15</td> <td>District steam</td> <td>STWATR</td> </tr> <tr> <td>16</td> <td>District hot water</td> <td>HWWATR</td> </tr> <tr> <td>18</td> <td>Wood</td> <td>WOWATR</td> </tr> <tr> <td>19</td> <td>Coal</td> <td>COWATR</td> </tr> <tr> <td>20</td> <td>Solar</td> <td>SOWATR</td> </tr> <tr> <td>24</td> <td>Some other energy source</td> <td>OTWATR</td> </tr> </table>			11	Electricity	ELWATR	12	Natural gas	NGWATR	13	Fuel oil/Diesel/Kerosene	FKWATR	14	Bottled gas	PRWATR	15	District steam	STWATR	16	District hot water	HWWATR	18	Wood	WOWATR	19	Coal	COWATR	20	Solar	SOWATR	24	Some other energy source	OTWATR
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24	Some other energy source	OTWATR																														
NEXT	⇒ D76 [Water heating equipment]																															

D76	Water heating equipment	<i>WTHTEQ</i>
ASK	IF D3 [Water heating] = Yes	
	[F1]-HELP	
	Does this building have one or more centralized water heaters, one or more "point-of-use" water heaters, or both of these types (of water heaters)?	
	<ul style="list-style-type: none"> 1 One or more centralized water heaters 2 One or more "point-of-use" water heaters 3 Both types 	
NEXT	IF D4 [Cooking] = Yes ⇒ D77 [Sources for cooking] IF D6 [Manufacturing] = Yes ⇒ D79 [Sources for manufacturing] IF D8 [Electricity generation capability] = Yes ⇒ D81 [Energy for generation] OTHERWISE ⇒ D87 [Any other sources]	

D77	Sources for cooking	<i>see below</i>																																							
ASK	IF D4 [Cooking] = Yes																																								
FILL	{CookSourcesList} = List of all energy sources used {Electricity} – {Other3} = If a source is used, it appears in this list; if not, the line is blank {FuelOilType} = Type or types specified in D10 [Fuel oil, diesel, or kerosene] {Other1} – {Other3} = Sources specified in D12 [Other energy source 1] – D14 [Other energy source 3]																																								
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D79	Sources for manufacturing	<i>see below</i>																																							
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NEXT	IF D8 [Electricity generation capability] = Yes ⇒ D81 [Energy for generation] IF D8 [Electricity generation capability] ≠ Yes ⇒ D87 [Any other sources]																															

D81	Energy for generation	<i>GENR</i>				
ASK	IF D8 [Electricity generation capability] = Yes					
<p>Was any energy actually <u>used</u> for generating electricity in this building during 2012, even if just a small amount was used for emergency backup or for testing generators?</p> <table> <tr> <td>1</td> <td>Yes</td> </tr> <tr> <td>2</td> <td>No</td> </tr> </table>			1	Yes	2	No
1	Yes					
2	No					
NEXT	IF Yes ⇒ D82 [Sources for electricity generation] IF No OR DK/RF: IF D9 [Energy sources used] = DK/RF ⇒ INTERVIEW COMPLETE OTHERWISE ⇒ D87 [Any other sources]					

D82	Sources for electricity generation	<i>see below</i>																														
ASK	IF D81 [Energy for generation] = Yes																															
FILL	{Other1} – {Other3} = Sources specified in D12 [Other energy source 1] – D14 [Other energy source 3]																															
<p>☐ SHOW CARD D16</p> <p>Looking at Show Card D16, please tell me which energy sources were used for electricity generation.</p> <ul style="list-style-type: none"> ◆ PROBE for any others ◆ ENTER all that apply <table style="width: 100%; border: none;"> <tr> <td style="width: 10%;">12</td> <td style="width: 70%;">Natural gas</td> <td style="width: 20%;">NGGENR</td> </tr> <tr> <td>13</td> <td>Fuel oil/Diesel/Kerosene</td> <td>FKGENR</td> </tr> <tr> <td>14</td> <td>Bottled gas/LPG/Propane</td> <td>PRGENR</td> </tr> <tr> <td>18</td> <td>Wood</td> <td>WOGENR</td> </tr> <tr> <td>19</td> <td>Coal</td> <td>COGENR</td> </tr> <tr> <td>20</td> <td>Solar</td> <td>SOGENR</td> </tr> <tr> <td>21</td> <td>{Other1}</td> <td>OTGENR</td> </tr> <tr> <td>22</td> <td>{Other2}</td> <td>OTGENR</td> </tr> <tr> <td>23</td> <td>{Other3}</td> <td>OTGENR</td> </tr> <tr> <td>24</td> <td>Some other energy source</td> <td>OTGENR</td> </tr> </table>			12	Natural gas	NGGENR	13	Fuel oil/Diesel/Kerosene	FKGENR	14	Bottled gas/LPG/Propane	PRGENR	18	Wood	WOGENR	19	Coal	COGENR	20	Solar	SOGENR	21	{Other1}	OTGENR	22	{Other2}	OTGENR	23	{Other3}	OTGENR	24	Some other energy source	OTGENR
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NEXT	⇒ D83 [Generation technologies]																															

D83	Generation technologies	<i>see below</i>																					
ASK	IF D81 [Energy for generation] = Yes																						
<p>☐ SHOW CARD D17</p> <p>Looking at Show Card D17, were any of the technologies on this list used on-site for generating electricity?</p> <ul style="list-style-type: none"> ◆ PROBE for any others ◆ ENTER all that apply <table style="width: 100%; border: none;"> <tr> <td style="width: 10%;">1</td> <td style="width: 70%;">Photovoltaic cells</td> <td style="width: 20%;">PVC</td> </tr> <tr> <td>2</td> <td>Fuel cells</td> <td>FUELCL</td> </tr> <tr> <td>5</td> <td>Large turbines</td> <td>LRGTRB</td> </tr> <tr> <td>3</td> <td>Microturbines</td> <td>MCROTB</td> </tr> <tr> <td>4</td> <td>Wind turbines</td> <td>WNDTRB</td> </tr> <tr> <td>6</td> <td>Reciprocating engines</td> <td>ENGINE</td> </tr> <tr> <td>7</td> <td colspan="2">IF VOLUNTEERED: None of these</td> </tr> </table>			1	Photovoltaic cells	PVC	2	Fuel cells	FUELCL	5	Large turbines	LRGTRB	3	Microturbines	MCROTB	4	Wind turbines	WNDTRB	6	Reciprocating engines	ENGINE	7	IF VOLUNTEERED: None of these	
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7	IF VOLUNTEERED: None of these																						
NEXT	⇒ D84 [Use of generated electricity]																						

D84	Use of generated electricity	<i>GENUSE</i>
ASK	IF D81 [Energy for generation] = Yes	
		[F1]-HELP
	During 2012, was the electricity generated in this building used: primarily for emergency back-up or testing, during periods of high electricity demand, or whenever electricity was used?	
	<ol style="list-style-type: none"> 1 Primarily for emergency back-up or testing 2 During periods of high electricity demand 3 Whenever electricity was used 	
NEXT	IF Primarily for emergency back-up or testing OR DK/RF ⇒ D87 [Any other sources] IF During periods of high electricity demand OR Whenever electricity was used ⇒ D85 [Cogeneration system]	

D85	Cogeneration system	<i>COGEN</i>
ASK	IF D84 [Use of generated electricity] = During periods of high electricity demand OR Whenever electricity was used	
		[F1]-HELP
	Is the electric power generating system also a cogeneration system? That is, in addition to producing electric power, does the same system simultaneously produce heat that <u>is used</u> in this or another building for space heating, water heating, or industrial processes?	
	<ol style="list-style-type: none"> 1 Yes 2 No 	
NEXT	⇒ D86 [Deliver electricity to grid]	

D86	Deliver electricity to grid	<i>TOGRID</i>
ASK	IF D84 [Use of generated electricity] = During periods of high electricity demand OR Whenever electricity was used	
	Is the generation system interconnected with an electric utility so that it is able to deliver or sell electricity <u>to the grid</u> ?	
	<ol style="list-style-type: none"> 1 Yes 2 No 	
NEXT	⇒ D87 [Any other sources]	

D87	Any other sources
ASK	IF D9 [Energy sources used] was answered
FILL	{SourcesList} = List of all energy sources used
<p>As a final check, were there any energy sources used in this building other than {Sources List} ?</p> <p>1 Yes 2 No</p>	
NEXT	<p>IF Yes ⇒ D88 [Other sources] IF No OR DK/RF: Check that every energy source given in D9 [Energy sources used] (other than electricity or district chilled water) was assigned an end use. THEN: IF Yes: IF Electricity used ⇒ D91 [AMI smart metering] OTHERWISE: IF Heating OR Cooling → D92 [Energy management plan] OTHERWISE → L1 [Response effort] IF No → D90 [Missed {energy source} use]</p>

D88	Other sources	<i>see below</i>																																	
ASK	IF D87 [Any other sources] =Yes																																		
FILL	{Electricity} – {Solar} = If a source has NOT been mentioned, it appears in this list; if it has, the line is blank																																		
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FILL	<p>{EnergySource} IF Electricity IN D88 [Other sources] = “electricity” IF Natural gas IN D88 [Other sources] = “natural gas” IF Fuel oil/Diesel/Kerosene IN D88 [Other sources] = “fuel oil/diesel/kerosene” IF Bottled gas IN D88 [Other sources] = “bottled gas” IF District steam IN D88 [Other sources] = “district steam” IF District hot water IN D88 [Other sources] = “district hot water” IF Wood IN D88 [Other sources] = “wood” IF Coal IN D88 [Other sources] = “coal” IF Solar IN D88 [Other sources] = “solar energy” IF Other IN D88 [Other sources] = “other fuel”</p> <p>{Cooling} Does not appear as a choice for Wood use, Coal use, OR Solar use</p> <p>{Electricity generation} Does not appear as a choice for Electricity use, District steam use, OR District hot water use</p>																								
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NEXT	<p>Check that every energy source given in D9 [Energy sources used] (other than electricity or district chilled water) was assigned an end use: IF Yes: IF Electricity used ⇒ D91 [AMI smart metering] OTHERWISE: IF Heating OR Cooling → D92 [Energy management plan] OTHERWISE → L1 [Response effort] IF No ⇒ D90 [Missed {energy source} use]</p>																								

D90	Missed {energy source} use <i>see below where {XX} is the energy source abbreviation</i>																								
ASK	For every energy source given in D9 [Energy sources used] that was not assigned an end use (other than electricity)																								
FILL	<p>{EnergySource} IF No end use for Natural gas = “natural gas” IF No end use for Fuel oil = Type or types specified in D10 [Fuel oil, diesel, or kerosene] IF No end use for Bottled gas = “bottled gas” IF No end use for District steam = “district steam” IF No end use for District hot water = “district hot water” IF No end use for District chilled water = “district chilled water” IF No end use for Wood = “wood” IF No end use for Coal = “coal” IF No end use for Solar = “solar energy” IF No end use for Other = “another energy source” (second fill = “other energy source”) {Heating}, {Water heating}, {Cooking}, {Manufacturing} Do not appear as a choice for District chilled water use {Cooling} Does not appear as a choice for Wood use, Coal use, OR Solar use {Electricity generation} Does not appear as a choice for District chilled water use, District steam use OR District hot water use</p>																								
<p>I have recorded that {EnergySource} was used in this building but not how it was used. What was the {EnergySource} used for?</p> <table> <tr> <td>1</td> <td>{Heating}</td> <td>{XX}HT1/HT2</td> </tr> <tr> <td>2</td> <td>{Cooling}</td> <td>{XX}COOL</td> </tr> <tr> <td>3</td> <td>{Water heating}</td> <td>{XX}WATR</td> </tr> <tr> <td>4</td> <td>{Cooking}</td> <td>{XX}COOK</td> </tr> <tr> <td>5</td> <td>{Manufacturing}</td> <td>{XX}MANU</td> </tr> <tr> <td>6</td> <td>{Electricity generation}</td> <td>{XX}GENR</td> </tr> <tr> <td>7</td> <td>Some other use</td> <td>{XX}OTH</td> </tr> <tr> <td>8</td> <td>Incorrectly recorded--source not used</td> <td></td> </tr> </table>		1	{Heating}	{XX}HT1/HT2	2	{Cooling}	{XX}COOL	3	{Water heating}	{XX}WATR	4	{Cooking}	{XX}COOK	5	{Manufacturing}	{XX}MANU	6	{Electricity generation}	{XX}GENR	7	Some other use	{XX}OTH	8	Incorrectly recorded--source not used	
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NEXT	IF Electricity used ⇒ D91 [AMI smart metering] OTHERWISE: IF Heating OR Cooling → D92 [Energy management plan] OTHERWISE → L1 [Response effort]																								

D91	AMI smart metering	<i>AMIMETER</i>
ASK	IF Electricity used	
<p>Does this building have advanced metering infrastructure, sometimes referred to as AMI or "smart metering"?</p> <p>◆ DEF: [An AMI or "smart meter" is a meter that records electricity consumption in intervals of one hour or less. Daily data are available to both the energy company and the consumer through a web portal, display device, or other form of communication.]</p> <p>1 Yes 2 No</p>		
NEXT	IF Heating OR Cooling → D92 [Energy management plan] OTHERWISE → L1 [Response effort]	

D92	Energy management plan	<i>ENERGYPLN</i>
ASK	IF Heating OR Cooling	
<p>Does this building have a formal energy management plan in which energy targets are set and consistently monitored?</p> <p>1 Yes 2 No</p>		
NEXT	→ L1 [Response effort]	

DRAFT (9/5/12)

SECTION L. COLLECT MATERIALS

L1	Response effort	<i>REFFORT</i>
ASK	All Mall Buildings	
Just a few last questions before we finish. Including yourself, please tell me how many people were needed to compile the information for this interview.		
RANGE	1 to 99	
NEXT	→ L2 [Green building certification]	

L2	Green building certification	<i>GRNCRT</i>
ASK	All Mall Buildings	
In the past 3 years, has this building been certified as a “green building,” such as Energy Star, LEED, or Green Globes?		
<ul style="list-style-type: none"> 1 Yes 2 No 		
NEXT	IF Yes → L3 [Type of green certification] OTHERWISE: IF R2 [Worksheet 1] = Yes → L5 [Collect Worksheet 1] IF R2 [Worksheet 1] ≠ Yes → L6 [Thank you]	

L3	Type of green certification	<i>see below</i>
ASK	IF L2 [Green building certification] = Yes	
Which type of certification did the building receive? Was it Energy Star, LEED, Green Globes, or did it receive some other green building recognition?		
◆ ENTER all that apply		
<ul style="list-style-type: none"> 1 Energy Star <i>ENGYSTR</i> 2 LEED <i>LEED</i> 3 Green Globes <i>GRNGLBS</i> 4 Other <i>OTCERT</i> 		
NEXT	IF Other selected → L4 [Other certification] OTHERWISE: IF R2 [Worksheet 1] = Yes → L5 [Collect Worksheet 1] IF R2 [Worksheet 1] ≠ Yes → L6 [Thank you]	

L4	Other certification	<i>GRNCRTX</i>
ASK	IF Other IN L3 [Type of green certification]	
<p>What was the other type of recognition received by this building?</p> <p>◆ ENTER the type of certification</p>		
NEXT	IF R2 [Worksheet 1] = Yes → L5 [Collect Worksheet 1] IF R2 [Worksheet 1] ≠ Yes → L6 [Thank you]	

L5	Collect Worksheet 1	
ASK	IF R2 [Worksheet 1] = Yes	
<p>That completes our interview. Before I leave, may I please collect Worksheet 1? [This is the “Characteristics, Energy Sources, and Equipment” worksheet that you filled out before the interview.]</p> <p>◆ ENTER “1” to continue</p>		
NEXT	INTERVIEW COMPLETE	

L6	Thank you	
ASK	If R2 [Worksheet 1] ≠ Yes	
<p>That completes our interview. Thank you so much for your time and help.</p> <p>◆ ENTER “1” to continue</p>		
NEXT	INTERVIEW COMPLETE	