

# 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:

<b>A1</b>	<b>Question name</b>	<b>SASVAR</b>
<b>ASK</b>		
<b>FILL</b>		
	Question text	
<b>RANGE</b>		
<b>NEXT</b>		

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

<b>R1</b>	<b>Consent</b>
<b>ASK</b>	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"><li>1 Gives consent to record interview</li><li>2 Does <u>not</u> give consent to record interview</li></ol>
<b>NEXT</b>	IF First time case started → R2 [Worksheet 1] IF Restart → R4 [Respondent function]

<b>R2</b>	<b>Worksheet 1</b>	<i>R1WS1 – RXWS1</i>
<b>ASK</b>	All Mall Buildings	
	<p>Do you have Worksheet 1 with you and completed?</p> <ol style="list-style-type: none"><li>1 Yes</li><li>2 No</li></ol>	
<b>NEXT</b>	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"> <li>1 Operations, maintenance, or engineering</li> <li>2 Property management</li> <li>3 Store management</li> <li>4 Mall management</li> <li>5 Administration or company management</li> <li>6 Energy or environmental management</li> <li>7 Building owner</li> <li>8 Business owner</li> <li>9 Accounting, finances, or payroll</li> <li>10 Executive official</li> <li>11 School official</li> <li>12 Religious official</li> <li>13 Support staff</li> <li>14 Other</li> </ol>		
NEXT	IF Other → R5 [Other job function] Anything but Other → R6 [Building boundaries]	

<b>R4</b>	<b>Respondent function</b>	<i>R2JOB – RXJOB</i>
<b>ASK</b>	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"> <li>0 Same respondent as previous interview</li> <li>1 Operations, maintenance, or engineering</li> <li>2 Property management</li> <li>3 Store management</li> <li>4 Mall management</li> <li>5 Administration or company management</li> <li>6 Energy or environmental management</li> <li>7 Building owner</li> <li>8 Business owner</li> <li>9 Accounting, finances, or payroll</li> <li>10 Executive official</li> <li>11 School official</li> <li>12 Religious official</li> <li>13 Support staff</li> <li>14 Other</li> </ul>	
<b>NEXT</b>	IF Other → R5 [Other job function] Anything but Other → R6 [Building boundaries]	

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

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

DRAFT (9/5/12)

**SECTION A: BUILDING SIZE AND AGE**

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

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

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

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

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

<b>A6</b>	<b>Square footage</b>	<i>SQFT</i>
<b>ASK</b>	All Mall Buildings	
<b>FILL</b>	<b>{Worksheet1Intro}</b> 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>		
<b>RANGE</b>	1 to 999,999,999	
<b>NEXT</b>	IF DK/RF → A8 [Square footage category] IF 1,000 square feet or less → A7 [End of interview] OTHERWISE → A9 [Wall construction material]	

<b>A7</b>	<b>End of interview</b>	
<b>ASK</b>	IF A6 [Square footage] ≤ 1000	
<b>FILL</b>	<b>{CollectWorksheet}</b> 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		
<b>NEXT</b>	TERMINATE	

<b>A8</b>	<b>Square footage category</b>	<i>SQFTC</i>
<b>ASK</b>	IF A6 [Square footage] = DK/RF	
<p><input type="checkbox"/> 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"> <li>1 1,000 square feet or less</li> <li>2 1,001 to 5,000 square feet</li> <li>3 5,001 to 10,000 square feet</li> <li>4 10,001 to 25,000 square feet</li> <li>5 25,001 to 50,000 square feet</li> <li>6 50,001 to 100,000 square feet</li> <li>7 100,001 to 200,000 square feet</li> <li>8 200,001 to 500,000 square feet</li> <li>9 500,001 to 1 million square feet</li> <li>10 Over 1 million square feet</li> </ol>		[F1]-HELP
<b>NEXT</b>	→ A9 [Wall construction material]	

<b>A9</b>	<b>Wall construction material</b>	<i>WLCNS</i>
<b>ASK</b>	All Mall Buildings	
<p><input type="checkbox"/> 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"> <li>1 Brick, stone, or stucco</li> <li>2 Pre-cast concrete panels</li> <li>3 Concrete block or poured concrete (above grade)</li> <li>4 Aluminum, asbestos, plastic, or wood siding, shingles, tiles, or shakes</li> <li>5 Sheet metal panels</li> <li>6 Window or vision glass (glass that can be seen through)</li> <li>7 Decorative or construction glass</li> <li>8 IF VOLUNTEERED: No one major type</li> <li>9 IF VOLUNTEERED: Other</li> </ol>		[F1]-HELP
<b>NEXT</b>	→ A10 [Roof construction material]	



<b>A10</b>	<b>Roof construction material</b>	<i>RFCNS</i>
<b>ASK</b>	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"> <li>1 Built-up (tar, felts, or fiberglass and a ballast, such as stone)</li> <li>2 Slate or tile shingles</li> <li>3 Wood shingles, shakes, or other wooden materials</li> <li>4 Asphalt, fiberglass, or other shingles</li> <li>5 Metal surfacing</li> <li>6 Plastic, rubber, or synthetic sheeting (single or multiple ply)</li> <li>7 Concrete</li> <li>8 IF VOLUNTEERED: No one major type</li> <li>9 IF VOLUNTEERED: Other</li> </ol>		[F1]-HELP
<b>NEXT</b>	→ A11 [Cool roof materials]	

<b>A11</b>	<b>Cool roof materials</b>	<i>RFCOOL</i>
<b>ASK</b>	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"> <li>1 Yes</li> <li>2 No</li> </ol>		
<b>NEXT</b>	→ A12 [Roof tilt]	

<b>A12</b>	<b>Roof tilt</b>	<i>RFTILT</i>
<b>ASK</b>	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"> <li>1 Flat</li> <li>2 Shallow pitch</li> <li>3 Steeper pitch</li> </ol>		
<b>NEXT</b>	→ A13 [Building shape]	

<b>A13</b>	<b>Building shape</b>	<i>BLDSHP</i>
<b>ASK</b>	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"> <li>1 Square</li> <li>2 Wide rectangle</li> <li>3 Narrow rectangle</li> <li>4 Rectangle or square with an interior courtyard</li> <li>5 "H" shaped</li> <li>6 "U" shaped</li> <li>7 "E" shaped</li> <li>8 "T" shaped</li> <li>9 "L" shaped</li> <li>10 "+" or cross shaped</li> <li>11 Other shape</li> </ol>		
<b>NEXT</b>	→ A14 [Percent exterior glass]	

<b>A14</b>	<b>Percent exterior glass</b>	<i>GLSSPC</i>
<b>ASK</b>	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"> <li>1 1 percent or less</li> <li>2 2 to 10 percent</li> <li>3 11 to 25 percent</li> <li>4 26 to 50 percent</li> <li>5 51 to 75 percent</li> <li>6 76 to 100 percent</li> </ol>		
<b>NEXT</b>	→ A15 [Equal glass on all sides]	

<b>A15</b>	<b>Equal glass on all sides</b>	<i>EQGLSS</i>
<b>ASK</b>	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"> <li>1 Yes</li> <li>2 No</li> </ol>		
<b>NEXT</b>	IF Yes → A17 [Number of floors] IF No OR DK/RF → A16 [Glass sides most sunlight]	

<b>A16</b>	<b>Glass sides most sunlight</b>	<i>SUNGLS</i>
<b>ASK</b>	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"> <li>1 More glass area</li> <li>2 Less glass area</li> <li>3 IF VOLUNTEERED: About the same amount</li> </ol>		
<b>NEXT</b>	→ A17 [Number of floors]	

<b>A17</b>	<b>Number of floors</b>	<i>NFLOOR</i>
<b>ASK</b>	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>		
<b>RANGE</b>	1 to 999	
<b>NEXT</b>	→ A18 [Floor-to-ceiling height]	

<b>A18</b>	<b>Floor-to-ceiling height</b>	<i>FLCEILHT</i>
<b>ASK</b>	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>		
<b>RANGE</b>	5 to 500	
<b>NEXT</b>	IF A17 [Number of floors] = 1 → A23 [Year of construction] IF More than one floor OR DK/RF → A19 [Elevators]	

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

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

<b>A21</b>	<b>Escalators</b>	<i>ESCLTR</i>
<b>ASK</b>	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>		
<b>NEXT</b>	IF Yes → A22 [Number of escalators] IF No OR DK/RF → A23 [Year of construction]	

<b>A22</b>	<b>Number of escalators</b>	<i>NESLTR</i>
<b>ASK</b>	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"> <li>◆ EXP: ["Moving sidewalks" should be counted as escalators.]</li> <li>◆ PROBE for estimate if DK</li> </ul>		
<b>RANGE</b>	1 to 99	
<b>NEXT</b>	→ A23 [Year of construction]	

<b>A23</b>	<b>Year of construction</b>	<i>YRCON</i>
<b>ASK</b>	All Mall Buildings	
[F1]-HELP		
<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>		
<b>RANGE</b>	1600 to 2013	
<b>NEXT</b>	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]	

<b>A24</b>	<b>Year of construction category</b>	YRCONC
<b>ASK</b>	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"> <li>1 Before 1920</li> <li>2 1920 to 1945</li> <li>3 1946 to 1959</li> <li>4 1960 to 1969</li> <li>5 1970 to 1979</li> <li>6 1980 to 1989</li> <li>7 1990 to 1999</li> <li>8 2000 to 2003</li> <li>9 2004 to 2007</li> <li>10 2008 to 2012</li> <li>11 IF VOLUNTEERED: 2013</li> </ol>		
<b>NEXT</b>	IF 2013 → A25 [End of interview] IF Before 1999 → A27 [Renovations] IF 2000 to 2012 → B1 [On a multibuilding complex]	

<b>A25</b>	<b>End of interview</b>
<b>ASK</b>	IF A23 [Year of construction] = 2013 OR A24 [Year of construction category] = 2013
<b>FILL</b>	<b>{CollectWorksheet}</b> 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>	
<b>NEXT</b>	TERMINATE

<b>A26</b>	<b>Month ready for occupancy</b>	<i>MONCON</i>
<b>ASK</b>	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"> <li>1 January</li> <li>2 February</li> <li>3 March</li> <li>4 April</li> <li>5 May</li> <li>6 June</li> <li>7 July</li> <li>8 August</li> <li>9 September</li> <li>10 October</li> <li>11 November</li> <li>12 December</li> </ol>		[F1]-HELP
<b>NEXT</b>	→ B1 [On a multibuilding complex]	

DRAFT (9/5/12)

<b>A27</b>	<b>Renovations</b>	<i>RENOV</i>
<b>ASK</b>	IF A23 [Year of construction] = 2007 or earlier OR A24 [Year of construction category] = Any category (OR DK/RF) except 2008 to 2012	
<b>FILL</b>	<b>{Since1990orConstructed}</b> 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>		
<b>NEXT</b>	IF Yes → A28 [What renovations] IF No OR DK/RF → B1 [On a multibuilding complex]	

<b>A28</b>	<b>What renovations</b>	<i>see below</i>																														
<b>ASK</b>	IF A27 [Renovations] = Yes																															
<b>FILL</b>	<b>{Since1990orConstructed}</b> 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: 60%;">1 Addition or annex</td> <td style="width: 40%; 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>																															
<b>NEXT</b>	IF Other ⇒ A29 [Other renovation] OTHERWISE → B1 [On a multibuilding complex]																															



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

DRAFT (9/5/12)

**SECTION B: BUILDING ACTIVITY**

<b>B1</b>	<b>On a multibuilding complex</b>	<i>FACIL</i>
<b>ASK</b>	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
<b>NEXT</b>	IF Yes → B2 [Federal complex] IF No OR DK/RF → C1 [Government owned]	

<b>B2</b>	<b>Federal complex</b>	<i>FEDFAC</i>
<b>ASK</b>	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
<b>NEXT</b>	→ B3 [Type of complex]	

<b>B3</b>	<b>Type of complex</b>	<i>FACACT</i>
<b>ASK</b>	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"> <li>1 College, university, or junior college</li> <li>2 Primary or secondary school [GRADES K-12]</li> <li>3 Other type of school</li> <li>4 Office complex</li> <li>5 Retail complex</li> <li>6 Storage complex</li> <li>7 Religious campus or complex</li> <li>8 Hospital or other health care complex</li> <li>9 Lodging or resort complex</li> <li>10 Post office complex</li> <li>11 Prison or correctional facility</li> <li>12 Other type of government complex</li> <li>13 Industrial complex</li> <li>14 Transportation complex such as a terminal, depot, or airport</li> <li>15 Other type of campus or complex</li> </ol>		[F1]-HELP
<b>NEXT</b>	IF Industrial complex → B4 [Manufacturing industrial] IF Any other type → C1 [Government owned]	

<b>B4</b>	<b>Manufacturing industrial</b>	<i>MANIND</i>
<b>ASK</b>	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"> <li>1 Yes</li> <li>2 No</li> </ol>		[F1]-HELP
<b>NEXT</b>	IF Yes → B5 [Same owner as manufacturing] IF No OR DK/RF → C1 [Government owned]	

<b>B5</b>	<b>Same owner as manufacturing</b>	MANFAC
<b>ASK</b>	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	
<b>NEXT</b>	IF Yes → B6 [End of interview] IF No OR DK/RF → C1 [Government owned]	

<b>B6</b>	<b>End of interview</b>	
<b>ASK</b>	IF B5 [Same owner as manufacturing] = Yes	
<b>FILL</b>	<b>{CollectWorksheet}</b> 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	
<b>NEXT</b>	TERMINATE	

**SECTION C. OCCUPANCY AND OPERATING HOURS**

<b>C1</b>	<b>Government owned</b>	<i>GOVOWN</i>
<b>ASK</b>	All Mall Buildings	
<b>FILL</b>	<b>{BldgIntro}</b> 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
<b>NEXT</b>	IF Yes → C2 [Type of government] IF No OR DK/RF → C3 [Owner]	

<b>C2</b>	<b>Type of government</b>	<i>GOVTYP</i>
<b>ASK</b>	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
<b>NEXT</b>	→ C5 [Number of businesses]	

<b>C3</b>	<b>Owner</b>	<b>OWNER</b>
<b>ASK</b>	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"> <li>1 Real estate investment trust (REIT)</li> <li>2 Other public or private corporation, partnership, LLC, or LLP</li> <li>3 Individual owner(s)</li> <li>4 Religious organization</li> <li>5 Non-profit organization (other than religious or government)</li> <li>6 Private academic institution</li> <li>7 Other</li> </ol>		
<b>NEXT</b>	IF Anything except Other → C5 [Number of businesses] IF Other → C4 [Other owner]	

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

<b>C5</b>	<b>Number of businesses</b>	<b>NOCC</b>
<b>ASK</b>	All Mall Buildings	
How many tenant spaces are there in this building, including vacant spaces?		[F1]-HELP
<b>RANGE</b>	1 to 9,999	
<b>NEXT</b>	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]	

<b>C6</b>	<b>Number of businesses category</b>	<i>NOCCAT</i>
<b>ASK</b>	IF C5 [Number of businesses] = DK/RF	
<input type="checkbox"/> SHOW CARD C2  Please look at Show Card C2 and tell me which category best describes the number of tenant spaces in this building?  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		[F1]-HELP
<b>NEXT</b>	IF C1 [Government owned] = DK/RF & C3 [Owner] = DK/RF → C15 [Months in use] OTHERWISE → C7 [Owner occupies]	

<b>C7</b>	<b>Owner occupies</b>	<i>OWNOCC</i>
<b>ASK</b>	IF NOT (C1 [Government owned] = DK/RF & C3 [Owner] = DK/RF)	
Is the space in this building occupied by the owner, leased to tenants, or a combination of both?  1 Owner occupies 2 Leased to tenants 3 Combination of occupied and leased		
<b>NEXT</b>	→ C8 [Owner operates]	

<b>C8</b>	<b>Owner operates</b>	<i>OWNOPR</i>
<b>ASK</b>	IF NOT (C1 [Government owned] = DK/RF & C3 [Owner] = DK/RF)	
Is the building owner responsible for the operation and maintenance of the energy systems?  1 Yes 2 No		
<b>NEXT</b>	IF Yes → C9 [Owner has purchasing power] IF No → C11 [Nonowner operator] IF DK/RF → C15 [Months in use]	

<b>C9</b>	<b>Owner has purchasing power</b>	<i>OWNPPR</i>
<b>ASK</b>	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>		
<b>NEXT</b>	IF Yes OR DK/RF → C15 [Months in use] IF No → C10 [Nonowner has purchasing power]	

<b>C10</b>	<b>Nonowner has purchasing power</b>	<i>NWNPPR</i>
<b>ASK</b>	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>		
<b>NEXT</b>	IF Other → C14 [Other with purchasing power] OTHERWISE → C15 [Months in use]	

<b>C11</b>	<b>Nonowner operator</b>	<i>NWNOPR</i>
<b>ASK</b>	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>		
<b>NEXT</b>	IF Other → C12 [Other operator] OTHERWISE → C13 [Who has purchasing power]	

<b>C12</b>	<b>Other operator</b>	
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<b>ASK</b>	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>	
<b>NEXT</b>	→ C13 [Who has purchasing power]

<b>C13</b>	<b>Who has purchasing power</b>	<i>WHOPPR</i>
<b>ASK</b>	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"> <li>1 Building owner</li> <li>2 Party responsible for building operations</li> <li>3 IF VOLUNTEERED: Both (either they have equal input, or are the same person)</li> <li>4 IF VOLUNTEERED: Other</li> </ol>		
<b>NEXT</b>	IF Other → C14 [Other with purchasing power] OTHERWISE → C15 [Months in use]	

<b>C14</b>	<b>Other with purchasing power</b>
<b>ASK</b>	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>	
<b>NEXT</b>	→ C15 [Months in use]

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

<b>C16</b>	<b>Percent occupancy</b>	<i>OCCUPYP</i>
<b>ASK</b>	IF C15 [Months in use] ≠ Zero	
<b>FILL</b>	<b>{MonthsInUse}</b> 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."		
<b>RANGE</b>	0 to 100	
<b>NEXT</b>	→ D1 [Heating]	

DRAFT (9/5/12)

## SECTION D. ENERGY USE AND EQUIPMENT

<b>D1</b>	<b>Heating</b>	<i>HT1</i>
<b>ASK</b>	All Buildings	
<b>FILL</b>	<b>{Worksheet1Intro}</b> 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	
<b>NEXT</b>	→ D2 [Cooling]	

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

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

<b>NEXT</b>	→ D4 [Cooking]	
<b>D4</b>	<b>Cooking</b>	<i>COOK</i>
<b>ASK</b>	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>	
<b>NEXT</b>	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]	

<b>D5</b>	<b>Missing end uses</b>	
<b>SHOW</b>	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.  <b>This information is important for understanding how energy is used in this building.</b>          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>	
<b>NEXT</b>	→ D6 [Manufacturing]	

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

<b>D7</b>	<b>Any energy used</b>	<i>ANYEGY</i>
<b>ASK</b>	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>		
<b>NEXT</b>	IF Yes, some energy was used OR DK/RF ⇒ D8 [Electricity generation capability] IF No, no energy was used ⇒ INTERVIEW COMPLETE	

<b>D8</b>	<b>Electricity generation capability</b>	<i>CAPGEN</i>
<b>ASK</b>	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>		
<b>NEXT</b>	⇒ D9 [Energy sources used]	

<b>D9</b>	<b>Energy sources used</b>	<i>see below</i>																											
<b>ASK</b>	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"> <li>◆ EXP: [Include fuel oil, diesel, or kerosene if it was purchased or delivered in 2012, even if it was not used during that time.]</li> <li>◆ EXP: [Do not include any fuels used in vehicles outside the building.]</li> <li>◆ PROBE for any others</li> <li>◆ ENTER all that apply</li> </ul> <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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<b>NEXT</b>	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 <b>OTHERWISE:</b> 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] <b>OTHERWISE</b> ⇒ D87 [Any other sources]																												

<b>D10</b>	<b>Fuel oil, diesel, or kerosene</b>	<i>FKTYPE</i>
<b>ASK</b>	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> <ul style="list-style-type: none"> <li>1 Fuel oil</li> <li>2 Diesel</li> <li>3 Kerosene</li> </ul>	
<b>NEXT</b>	<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 &amp; B1 [On a multibuilding complex] = Yes ⇒ D15 [From central plant]</p> <p>IF District steam, District hot water, OR District chilled water &amp; 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>	

<b>D11</b>	<b>Wood, coal, or solar</b>	<i>see below</i>									
<b>ASK</b>	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 style="width: 100%; border: none;"> <tr> <td style="width: 5%; text-align: center;">1</td> <td style="width: 70%;">Wood</td> <td style="width: 25%; text-align: right;"><i>WOUSED</i></td> </tr> <tr> <td style="text-align: center;">2</td> <td>Coal</td> <td style="text-align: right;"><i>COUSED</i></td> </tr> <tr> <td style="text-align: center;">3</td> <td>Solar</td> <td style="text-align: right;"><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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2	Coal	<i>COUSED</i>									
3	Solar	<i>SOUSED</i>									
<b>NEXT</b>	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]										

<b>D12</b>	<b>Other energy source 1</b>	<i>OTUSDX1</i>
<b>ASK</b>	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>		
<b>NEXT</b>	⇒ D13 [Other energy source 2]	



<b>D13</b>	<b>Other energy source 2</b>	<i>OTUSDX2</i>
<b>ASK</b>	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"> <li>◆ ENTER the next energy source</li> <li>◆ [ENTER] if no others</li> </ul>		
<b>NEXT</b>	<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  &amp; B1 [On a multibuilding complex] = Yes ⇒ D15 [From central plant]  IF District steam, District hot water, OR District chilled water  &amp; 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>	

<b>D14</b>	<b>Other energy source 3</b>	<i>OTUSDX3</i>
<b>ASK</b>	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"> <li>◆ ENTER the next energy source</li> <li>◆ [ENTER] if no others</li> </ul>		
<b>NEXT</b>	<p>IF District steam, District hot water, OR District chilled water  &amp; B1 [On a multibuilding complex] = Yes ⇒ D15 [From central plant]  IF District steam, District hot water, OR District chilled water  &amp; 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>	

<b>D15</b>	<b>From central plant</b>	<i>DHFRPL</i>
<b>ASK</b>	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	
<b>NEXT</b>	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]	

<b>D16</b>	<b>Plant produces district steam</b>	<i>FACDST</i>
<b>ASK</b>	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	
<b>NEXT</b>	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]	

<b>D17</b>	<b>Plant produces district hot water</b>	<i>FACDHW</i>
<b>ASK</b>	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	
<b>NEXT</b>	IF District chilled water IN D9 [Energy sources used] ⇒ D19 [Plant produces electricity] OTHERWISE ⇒ D18 [Plant produces district chilled water]	

<b>D18</b>	<b>Plant produces district chilled water</b>	<i>FACDCW</i>
<b>ASK</b>	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	
<b>NEXT</b>	→ D19 [Plant produces electricity]	

<b>D19</b>	<b>Plant produces electricity</b>	<i>FACELC</i>
<b>ASK</b>	IF D15 [From central plant] = Yes	
		[F1]-HELP
	(Does the central physical plant produce...)	
	Electricity?	
	1 Yes 2 No	
<b>NEXT</b>	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]	

<b>D20</b>	<b>Purchase from offsite</b>	<i>DHOFF</i>
<b>ASK</b>	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	
<b>NEXT</b>	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]	

<b>D21</b>	<b>Source for main heating</b>	<i>see below</i>
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<b>ASK</b>	IF D1 [Heating] = Yes																																							
<b>FILL</b>	<p><b>{Ht1SourcesList}</b> = List of all energy sources used  <b>{Electricity}</b> – <b>{Other3}</b> = If a source is used, it appears in this list; if not, the line is blank  <b>{FuelOilType}</b> = Type or types specified in D10 [Fuel oil, diesel, or kerosene]  <b>{Other1}</b> – <b>{Other3}</b> = 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"> <li>◆ 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.]</li> <li>◆ EXP: [Do not include electricity if it is used only to run fan motors.]</li> <li>◆ Only sources already selected are shown here</li> </ul> <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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<b>NEXT</b>	<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>																																							

<b>D22</b>	<b>Other source for main heating</b>	<i>see below</i>																														
<b>ASK</b>	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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<b>NEXT</b>	⇒ D23 [Which other sources for heating]																															

<b>D23</b>	<b>Which other sources for heating</b>	<i>HT2 &amp; see below</i>
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<b>ASK</b>	IF D1 [Heating] = Yes & More than one energy source used																																											
<b>FILL</b>	<p><b>{Ht2SourcesList}</b> = List of all energy sources used, minus the one used for main heating  <b>{Electricity} – {Other3}</b> = If a source is used (other than for main space heating), it appears in this list; if not, the line is blank  <b>{FuelOilType}</b> = Type or types specified in D10 [Fuel oil, diesel, or kerosene]  <b>{Other1} – {Other3}</b> = 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"> <li>◆ EXP: [Do not include electricity if it is used only to run fan motors.]</li> <li>◆ Only sources already selected are shown here</li> <li>◆ PROBE for any others</li> <li>◆ ENTER all that apply</li> </ul> <table style="width: 100%; border: none;"> <tr> <td style="width: 10%;">11</td> <td style="width: 70%;">{Electricity}</td> <td style="width: 20%;">ELHT2</td> </tr> <tr> <td>12</td> <td>{Natural gas}</td> <td>NGHT2</td> </tr> <tr> <td>13</td> <td>{FuelOilType}</td> <td>FKHT2</td> </tr> <tr> <td>14</td> <td>{Bottled gas}</td> <td>PRHT2</td> </tr> <tr> <td>15</td> <td>{District steam}</td> <td>STHT2</td> </tr> <tr> <td>16</td> <td>{District hot water}</td> <td>HWHT2</td> </tr> <tr> <td>18</td> <td>{Wood}</td> <td>WOHT2</td> </tr> <tr> <td>19</td> <td>{Coal}</td> <td>COHT2</td> </tr> <tr> <td>20</td> <td>{Solar}</td> <td>SOHT2</td> </tr> <tr> <td>21</td> <td>{Other1}</td> <td>OTHT2</td> </tr> <tr> <td>22</td> <td>{Other2}</td> <td>OTHT2</td> </tr> <tr> <td>23</td> <td>{Other3}</td> <td>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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<b>NEXT</b>	IF Some other energy source ⇒ D25 [Other source for heating] IF Anything but Some other energy source OR DK/RF ⇒ D26 [Percent heated]																																											

<b>D24</b>	<b>Any other sources for heating</b>	<i>HT2</i>				
<b>ASK</b>	IF D1 [Heating] = Yes & Only one energy source used					
<p>Were there any other energy sources used for heating?</p> <table style="width: 100%; border: none;"> <tr> <td style="width: 10%;">1</td> <td style="width: 90%;">Yes</td> </tr> <tr> <td>2</td> <td>No</td> </tr> </table>			1	Yes	2	No
1	Yes					
2	No					
<b>NEXT</b>	IF Yes ⇒ D25 [Other source for heating] IF No OR DK/RF ⇒ D26 [Percent heated]					

<b>D25</b>	<b>Other source for heating</b>																														
<b>ASK</b>	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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<b>NEXT</b>	⇒ 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.

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

<b>D27</b>	<b>Heated to less than 50 degrees</b>	<i>HTLS50</i>
<b>ASK</b>	IF D26 [Percent heated] = Zero	
<p>Was any of this building heated to less than 50 degrees Fahrenheit?</p> <ul style="list-style-type: none"> <li>◆ EXP: [Areas may be heated to less than 50 degrees to prevent pipes from freezing.]</li> </ul> <ol style="list-style-type: none"> <li>1 Yes</li> <li>2 No</li> </ol>		
<b>NEXT</b>	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]	

<b>D28</b>	<b>Heating equipment types</b>	<i>see below</i>													
<b>ASK</b>	IF D26 [Percent heated] > 0 OR D27 [Heated to less than 50 degrees] = Yes OR DK/RF														
<p>[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"> <li>◆ PROBE for any others</li> <li>◆ ENTER all that apply</li> </ul> <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 70%;">1 Furnaces that heat air directly, without using steam or hot water</td> <td style="width: 30%; text-align: right;"><i>FURNAC</i></td> </tr> <tr> <td>2 Packaged central unit (roof mounted)</td> <td style="text-align: right;"><i>PKGHT</i></td> </tr> <tr> <td>3 Boilers inside (or adjacent to) the building that produce steam or hot water</td> <td style="text-align: right;"><i>BOILER</i></td> </tr> <tr> <td>4 District steam or hot water piped in from outside the building</td> <td style="text-align: right;"><i>STHW</i></td> </tr> <tr> <td>5 Heat pumps (other than components of a packaged unit)</td> <td style="text-align: right;"><i>HTPMPH</i></td> </tr> <tr> <td>6 Individual space heaters, other than heat pumps</td> <td style="text-align: right;"><i>SLFCON</i></td> </tr> <tr> <td>7 Other heating equipment</td> <td style="text-align: right;"><i>OTHTEQ</i></td> </tr> </table>		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>
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<b>NEXT</b>	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]														



<b>D29</b>	<b>Type of furnace</b>
<b>ASK</b>	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"> <li>1 Packaged central unit (roof mounted)</li> <li>2 Split system (residential-type furnace with DX cooling unit)</li> <li>3 Duct furnace (installed in air distribution duct)</li> <li>4 Individual room furnace (freestanding or floor-mounted)</li> </ol>	
<b>NEXT</b>	<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>

<b>D30</b>	<b>Classify furnace as packaged</b>
<b>ASK</b>	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>	
<b>NEXT</b>	<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>

<b>D31</b>	<b>Classify furnace as space heater</b>
<b>ASK</b>	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>	
<b>NEXT</b>	<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]  <b>OTHERWISE:</b>  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 &amp; (A23 [Year of construction] &lt; 1990 OR  A24 [Year of construction category] ≠ 2000 to 2003 OR 2004 to 2007 OR 2008 to 2012)  ⇒ D51 [Main heating replaced]  <b>OTHERWISE:</b>  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]  <b>OTHERWISE</b> ⇒ D87 [Any other sources]</p>

<b>D32</b>	<b>Type of boiler system</b>														
<b>ASK</b>	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><i>BLRRAD</i></td> </tr> <tr> <td>2 Fan coil units in rooms (or areas)</td> <td><i>BLRFNCL</i></td> </tr> <tr> <td>3 Induction units</td> <td><i>BLRINDC</i></td> </tr> <tr> <td>4 Water loop heat pump</td> <td><i>BLRWATR</i></td> </tr> <tr> <td>5 Central air handler (hydronic/steam coils)</td> <td><i>BLRAIR</i></td> </tr> <tr> <td>6 Packaged unit (hydronic/steam coils)</td> <td><i>BLRPKG</i></td> </tr> <tr> <td>7 Duct reheat (hydronic/steam coils)</td> <td><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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7 Duct reheat (hydronic/steam coils)	<i>BLRDUCT</i>														
<b>NEXT</b>	<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 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 &amp; (A23 [Year of construction] &lt; 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>														

<b>D33</b>	<b>Type of district heat system</b>		
<b>ASK</b>	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"> <li>1 Radiators</li> <li>2 Fan coil units in rooms (or areas)</li> <li>3 Induction units</li> <li>4 Water loop heat pump</li> <li>5 Central air handler (hydronic/steam coils)</li> <li>6 Packaged unit (hydronic/steam coils)</li> <li>7 Duct reheat (hydronic/steam coils)</li> </ol> </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"> <li>1 Radiators</li> <li>2 Fan coil units in rooms (or areas)</li> <li>3 Induction units</li> <li>4 Water loop heat pump</li> <li>5 Central air handler (hydronic/steam coils)</li> <li>6 Packaged unit (hydronic/steam coils)</li> <li>7 Duct reheat (hydronic/steam coils)</li> </ol>	<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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<b>NEXT</b>	<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</p> <p>IF Main heating equipment ≠ District steam or hot water &amp; (A23 [Year of construction] &lt; 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>		

<b>D34</b>	<b>Other heating components</b>												
<b>ASK</b>	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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2	Duct reheat or electric reheat	<i>OTDUCT</i>											
3	Powered induction units (PIU)	<i>OTPIU</i>											
4	None of these components												
<b>NEXT</b>	<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>												

<b>D35</b>	<b>Classify other as part of packaged</b>
<b>ASK</b>	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>	
<b>NEXT</b>	⇒ D40 [Type of packaged heating]

<b>D36</b>	<b>Classify other as part of boiler</b>
<b>ASK</b>	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>	
<b>NEXT</b>	<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 &amp; (A23 [Year of construction] &lt; 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>

<b>D37</b>	<b>Classify other as part of district</b>
<b>ASK</b>	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>	
<b>NEXT</b>	<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 &amp; (A23 [Year of construction] &lt; 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>

<b>D38</b>	<b>Classify other as packaged</b>
<b>ASK</b>	IF Any components given in D34 [Other heating components] & <b>NOT</b> (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>	
<b>NEXT</b>	⇒ D40 [Type of packaged heating]

<b>D39</b>	<b>Other heat specify</b>
<b>ASK</b>	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	
<b>NEXT</b>	<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 &amp; (A23 [Year of construction] &lt; 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>



<b>D40</b>	<b>Type of packaged heating</b>	<i>PKGHTTYP</i>
<b>ASK</b>	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] & <b>NOT</b> (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		
<b>NEXT</b>	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]	

<b>D41</b>	<b>Packaged heating components</b>											
<b>ASK</b>	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: 50%;">1 Furnace</td> <td style="width: 50%; 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>
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4 Powered induction unit (PIU)	<i>PKG PIU</i>											
5 Duct reheat	<i>PKG DUCT</i>											
<b>NEXT</b>	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]											

<b>D42</b>	<b>Heat pump heating system</b>	<i>see below</i>															
<b>ASK</b>	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> <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
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<b>NEXT</b>	⇒ D43 [Heat pump heating type]																

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<b>D43</b>	<b>Heat pump heating type</b>	<i>see below</i>												
<b>ASK</b>	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>	
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4	Water loop heat pump	<i>HPHWTR</i>												
<b>NEXT</b>	<p>IF Air source heat pump &amp; 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 &amp; (A23 [Year of construction] &lt; 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>													

<b>D44</b>	<b>Heat pump backup</b>	<i>HPHBKUP</i>
<b>ASK</b>	IF D43 [Heat pump heating type] = Air source heat pump & Natural gas OR Bottled gas used for heating	
<b>FILL</b>	<p><b>{NatGasBotGas}</b>  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"  <b>{ NatGasBotGasList}</b>  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"> <li>◆ 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)]</li> </ul> <ol style="list-style-type: none"> <li>1 Electric resistance backup</li> <li>2 {NatGasBotGasList} backup (dual fuel)</li> <li>3 No backup source</li> </ol>		
<b>NEXT</b>	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]	

<b>D45</b>	<b>Type of individual heater</b>														
<b>ASK</b>	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>
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<b>NEXT</b>	<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 &amp; (A23 [Year of construction] &lt; 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>														

<b>D46</b>	<b>Explain sources for heating</b>
<b>ASK</b>	IF ONLY Boiler, Furnace, OR District heat as heating equipment but more than one energy source used for heating
<b>FILL</b>	<p><b>{HeatEquip}</b>  IF Boilers = "boiler"  IF Furnace = "furnace"  IF District heat = "district heating system"  <b>{HeatSources}</b> = 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>	
<b>NEXT</b>	<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 &amp; (A23 [Year of construction] &lt; 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>

<b>D47</b>	<b>Heating ventilation types</b>												
<b>ASK</b>	<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"> <li>◆ PROBE for any others</li> <li>◆ ENTER all that apply</li> </ul> <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
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<b>NEXT</b>	<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 &amp; (A23 [Year of construction] &lt; 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>												

<b>D48</b>	<b>Heating ventilation specify</b>
<b>ASK</b>	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>	
<b>NEXT</b>	<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 &amp; (A23 [Year of construction] &lt; 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>

DRAFT (9/5/12)



<b>D49</b>	<b>Percent heated by each type</b> <p style="text-align: right;"><i>FURNP, PKGHP, BOILP, STHWP, HTPHP, SLFCNP, OTHTP</i></p>
<b>ASK</b>	For each equipment type given in D28 [Heating equipment types]
<b>FILL</b>	<p><b>{Introduction}</b>  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><b>{Explanation}</b>  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><b>{Equipment}</b>  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>
<b>RANGE</b>	0 to 100
<b>NEXT</b>	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]

<b>D50</b>	<b>Main heating equipment</b>	<i>MNHTEQ</i>
<b>ASK</b>	IF D49 [Percent heated by each type] has equal maximum percents OR DK/RF	
<b>FILL</b>	<p><b>{EquipmentList}</b> = List of the equipments with equal maximum percents  <b>{Furnace} – {Other heating equipment}</b> = 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"> <li>1 {Furnace}</li> <li>2 {Packaged heating}</li> <li>3 {Boiler}</li> <li>4 {District steam or hot water}</li> <li>5 {Heat pump}</li> <li>6 {Space heater}</li> <li>7 {Other heating equipment}</li> </ol>		
<b>NEXT</b>	<p>IF Main equipment NOT (District steam or hot water OR DK/RF) &amp; (A23 [Year of construction] &lt; 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>	

<b>D51</b>	<b>Main heating replaced</b>	<i>NWMNHT</i>
<b>ASK</b>	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)	
<b>FILL</b>	<b>{MainHeatEquip}</b> 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		
<b>NEXT</b>	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]	

<b>D52</b>	<b>Sources for cooling</b>	<i>see below</i>																																	
<b>ASK</b>	IF D2 [Cooling] = Yes																																		
<b>FILL</b>	<p><b>{CoolSourcesList}</b> = List of all possible air conditioning energy sources used  <b>{Electricity}</b> – <b>{Other3}</b> = If a source is used, it appears in this list; if not, the line is blank  <b>{FuelOilType}</b> = Type or types specified in D10 [Fuel oil, diesel, or kerosene]  <b>{Other1}</b> – <b>{Other3}</b> = 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"> <li>◆ Only sources already selected are shown here</li> <li>◆ PROBE for any others</li> <li>◆ ENTER all that apply</li> </ul> <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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<b>NEXT</b>	IF Some other energy source selected ⇒ D53 [Other source for cooling] OTHERWISE ⇒ D54 [Percent cooled]																																		

<b>D53</b>	<b>Other source for cooling</b>	<i>see below</i>																								
<b>ASK</b>	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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<b>NEXT</b>	⇒ D54 [Percent cooled]																									

<b>D54</b>	<b>Percent cooled</b>	<i>COOLP</i>
<b>ASK</b>	IF D1 [Cooling] = Yes	
<b>FILL</b>	{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"> <li>◆ If cooled square footage is known, but not the percent, RECORD square footage in comments, then code DK</li> <li>◆ PROBE for estimate if DK</li> </ul>	
<b>RANGE</b>	0 to 100	
<b>NEXT</b>	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]	

<b>D55</b>	<b>Cooling equipment types</b>	<i>see below</i>
<b>ASK</b>	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"> <li>◆ PROBE for any others</li> <li>◆ ENTER all that apply</li> </ul> <ol style="list-style-type: none"> <li>1 Residential-type central air conditioners, other than heat pumps, that cool air directly and circulate it without using chilled water</li> <li>2 Packaged air conditioning units, other than heat pumps</li> <li>3 Central chillers inside (or adjacent to) the building that chill water for air conditioning</li> <li>4 District chilled water piped in from outside the building</li> <li>5 Heat pumps for cooling</li> <li>6 Individual room air conditioners, other than heat pumps</li> <li>7 "Swamp" coolers or evaporative coolers</li> <li>8 Other cooling equipment</li> </ol>		<p>[F1]-HELP</p> <p>RCAC PKGCL  CHILLR CHWT HTPMPC ACWNWL EVAPCL OTCLEQ</p>
<b>NEXT</b>	<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 &amp; D1 [Heating] = Yes &amp; D47 [Heating ventilation types] ≠DK/RF ⇒ D65 [Cooling ventilation same as heating]  IF Residential-type central air &amp; (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] &lt; 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>	

<b>D56</b>	<b>Type of packaged cooling</b>	<i>PKGCLTYP</i>
<b>ASK</b>	<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] &amp;  <b>NOT</b>(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"> <li>1 Factory-assembled unitary packaged unit</li> <li>2 Custom built-up packaged unit</li> <li>3 IF VOLUNTEERED: Both factory-assembled and custom built-up packaged units</li> </ol>		
<b>NEXT</b>	<p>IF Central chillers ⇒ D57 [Type of chiller]  IF District chilled water ⇒ D60 [Type of district chilled water system]  IF Heat pumps for cooling &amp; NOT Heat pumps for heating ⇒ D61 [Heat pump cooling system]  IF Other cooling equipment ⇒ D63 [Other cool specify]  <b>OTHERWISE:</b>  IF Any source(s) other than electricity or chilled water reported in D52 [Sources for cooling] OR  D53 [Other source for cooling] &amp; Central chillers NOT IN D55 [Cooling equipment types]  ⇒ D64 [Cool source explanation]  <b>OTHERWISE:</b>  IF D1 [Heating] = Yes &amp; 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>	

<b>D57</b>	<b>Type of chiller</b>	<i>see below</i>									
<b>ASK</b>	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>									
<b>NEXT</b>	IF Absorption ⇒ D58 [Heater chiller] OTHERWISE ⇒ D59 [Type of chiller system]										

<b>D58</b>	<b>Heater chiller</b>	<i>HTRCHLR</i>				
<b>ASK</b>	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					
<b>NEXT</b>	⇒ D59 [Type of chiller system]					



<b>D59</b>	<b>Type of chiller system</b>	<i>see below</i>														
<b>ASK</b>	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
1 Central air handler (hydronic coils)	CHLAIR															
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6 Packaged unit (hydronic coils)	CHLPKG															
7 Duct reheat	CHLDUCT															
<b>NEXT</b>	<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 &amp; D47 [Heating ventilation types] ≠ DK/RF &amp;  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 &amp;  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) &amp; (Main cooling equipment  NOT Packaged cooling if the Main heating equipment was Packaged heating)  &amp; (Main cooling equipment NOT Heat pump if the main heating equipment was Heat pump)  &amp; (A23 [Year of construction] &lt; 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>															

<b>D60</b>	<b>Type of district chilled water system</b>	<i>see below</i>														
<b>ASK</b>	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
1 Central air handler (hydronic coils)	DCWAIR															
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6 Packaged unit (hydronic coils)	DCWPKG															
7 Duct reheat	DCWDUCT															
<b>NEXT</b>	<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] &amp; Central chillers NOT IN D55 [Cooling equipment types] ⇒ D64 [Cool source explanation]  IF D1 [Heating] = Yes &amp; D47 [Heating ventilation types] ≠ DK/RF &amp; 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 &amp; 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) &amp; (Main cooling equipment NOT Packaged cooling if the Main heating equipment was Packaged heating) &amp; (Main cooling equipment NOT Heat pump if the main heating equipment was Heat pump) &amp; (A23 [Year of construction] &lt; 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>															

<b>D61</b>	<b>Heat pump cooling system</b>	<i>see below</i>															
<b>ASK</b>	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>
1	Packaged unit	<i>HPCPKG</i>															
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4	Ductless mini-split system	<i>HPCMINI</i>															
5	Variable refrigerant flow (VRF) system	<i>HPCVRF</i>															
<b>NEXT</b>	⇒ D62 [Heat pump cooling type]																

DRAFT (9/5/12)

<b>D62</b>	<b>Heat pump cooling type</b>	<i>see below</i>												
<b>ASK</b>	IF Heat pumps IN D55 [Cooling equipment types] & Heat pumps NOT IN D28 [Heating equipment types]													
<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 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	Water loop heat pump	<i>HPCWTR</i>												
<b>NEXT</b>	<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] &amp; Central chillers NOT IN D55 [Cooling equipment types] ⇒ D64 [Cool source explanation]</p> <p>IF D1 [Heating] = Yes &amp; D47 [Heating ventilation types] ≠ DK/RF &amp; 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 &amp; 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) &amp; (Main cooling equipment NOT Packaged cooling if the Main heating equipment was Packaged heating) &amp; (Main cooling equipment NOT Heat pump if the main heating equipment was Heat pump) &amp; (A23 [Year of construction] &lt; 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>													

<b>D63</b>	<b>Other cool specify</b>
<b>ASK</b>	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>	
<b>NEXT</b>	<p>IF Any source(s) other than electricity or chilled water reported in D52 [Sources for cooling] OR D53 [Other source for cooling] &amp; Central chillers NOT IN D55 [Cooling equipment types]  ⇒ D64 [Cool source explanation]</p> <p>IF D1 [Heating] = Yes &amp; D47 [Heating ventilation types] ≠ DK/RF &amp;  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 &amp;  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) &amp; (Main cooling equipment NOT Packaged cooling if the Main heating equipment was Packaged heating)  &amp; (Main cooling equipment NOT Heat pump if the main heating equipment was Heat pump)  &amp; (A23 [Year of construction] &lt; 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>

<b>D64</b>	<b>Cool source explanation</b>
<b>ASK</b>	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]
<b>FILL</b>	<p><b>{CoolSources}</b> = List of the energy sources given for cooling, other than electricity or chilled water  <b>{IsAre}</b> =  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>
<b>NEXT</b>	<p>IF D1 [Heating] = Yes &amp; D47 [Heating ventilation types] ≠ DK/RF &amp; 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 &amp; 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) &amp; (Main cooling equipment NOT Packaged cooling if the Main heating equipment was Packaged heating)  &amp; (Main cooling equipment NOT Heat pump if the main heating equipment was Heat pump)  &amp; (A23 [Year of construction] &lt; 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>

<b>D65</b>	<b>Cooling ventilation same as heating</b>
<b>ASK</b>	<p>IF D1 [Heating] = Yes &amp; D47 [Heating ventilation types] ≠ (No ventilation or DK/RF) &amp; 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>	
<b>NEXT</b>	<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) &amp; (Main cooling equipment NOT Packaged cooling if the Main heating equipment was Packaged heating)  &amp; (Main cooling equipment NOT Heat pump if the main heating equipment was Heat pump)  &amp; (A23 [Year of construction] &lt; 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>

<b>D66</b>	<b>Cooling ventilation types</b>												
<b>ASK</b>	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"> <li>◆ PROBE for any others</li> <li>◆ ENTER all that apply</li> </ul> <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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<b>NEXT</b>	<p>IF None of these types ⇒ D66a [Cooling ventilation specify]</p> <p>OTHERWISE:</p> <p>IF More than one cooling equipment ⇒ D67 [Percent cooled by each type]</p> <p>IF Only one equipment, assign as Main cooling equipment. THEN:</p> <p>IF (Main equipment NOT District chilled water OR DK/RF) &amp; (Main cooling equipment NOT Packaged cooling if the Main heating equipment was Packaged heating) &amp; (Main cooling equipment NOT Heat pump if the main heating equipment was Heat pump) &amp; (A23 [Year of construction] &lt; 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 More than just Individual room air conditioners IN D55 [Cooling equipment types] → D70 [Economizer cycle]</p> <p>OTHERWISE:</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>												



<b>D66a</b>	<b>Cooling ventilation specify</b>
<b>ASK</b>	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>	
<b>NEXT</b>	<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) &amp; (Main cooling equipment NOT Packaged cooling if the Main heating equipment was Packaged heating)  &amp; (Main cooling equipment NOT Heat pump if the main heating equipment was Heat pump)  &amp; (A23 [Year of construction] &lt; 1990 OR A24 [Year of construction category] ≠ 2000 to 2003 OR 2004 to 2007 OR 2008 to 2012) ⇒ D69 [Main cooling replaced]  <b>OTHERWISE:</b>  IF More than just Individual room air conditioners IN D55 [Cooling equipment types]  → D70 [Economizer cycle]  <b>OTHERWISE:</b>  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]  <b>OTHERWISE</b> ⇒ D87 [Any other sources]</p>

<b>D67</b>	<p><b>Percent cooled by each type</b></p> <p style="text-align: right;"><i>RCACP, PKGCP, CHILP, CHWTP, HTPCP, ACWNWP, EVAPP, OTCLP</i></p>
<b>ASK</b>	For each equipment type given in D55 [Cooling equipment types]
<b>FILL</b>	<p><b>{Introduction}</b>  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><b>{Explanation}</b>  IF First equipment and D54 [Percent cooled] <math>\neq</math> 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><b>{Equipment}</b>  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>	
<b>RANGE</b>	0 to 100
<b>NEXT</b>	<p>IF there are equal maximum percents OR DK/RF <math>\Rightarrow</math> 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) &amp; (Main cooling equipment NOT Packaged cooling if the Main heating equipment was Packaged heating)  &amp; (Main cooling equipment NOT Heat pump if the main heating equipment was Heat pump)  &amp; (A23 [Year of construction] &lt; 1990 OR A24 [Year of construction category] <math>\neq</math> 2000 to 2003 OR 2004 to 2007 OR 2008 to 2012) <math>\Rightarrow</math> 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 <math>\Rightarrow</math> D74 [Sources for water heating]  IF D4 [Cooking] = Yes <math>\Rightarrow</math> D77 [Sources for cooking]  IF D6 [Manufacturing] = Yes <math>\Rightarrow</math> D79 [Sources for manufacturing]  IF D8 [Electricity generation capability] = Yes <math>\Rightarrow</math> D81 [Energy for generation]  OTHERWISE <math>\Rightarrow</math> D87 [Any other sources]</p>

<b>D68</b>	<b>Main cooling equipment</b>	<i>MNCLEQ</i>
<b>ASK</b>	IF D67 [Percent cooled by each type] has equal maximum percents OR DK/RF	
<b>FILL</b>	<p><b>{EquipmentList}</b> = List of the equipments with equal maximum percents  <b>{Packaged cooling}</b> – <b>{Other cooling equipment}</b> = 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"> <li>1 {Central air conditioner}</li> <li>2 {Packaged cooling}</li> <li>3 {Central chiller}</li> <li>4 {District chilled water}</li> <li>5 {Heat pump}</li> <li>6 {Room air conditioner}</li> <li>7 {Swamp coolers}</li> <li>8 {Other cooling equipment}</li> </ol>		
<b>NEXT</b>	<p>IF (Main equipment NOT District chilled water OR DK/RF) &amp; (Main cooling equipment NOT Packaged cooling if the Main heating equipment was Packaged heating)  &amp; (Main cooling equipment NOT Heat pump if the main heating equipment was Heat pump)  &amp; (A23 [Year of construction] &lt; 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>	

<b>D69</b>	<b>Main cooling replaced</b>	<i>NWMNCL</i>
<b>ASK</b>	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)	
<b>FILL</b>	<b>{MainCoolEquip}</b> 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		
<b>NEXT</b>	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]	

<b>D70</b>	<b>Economizer cycle</b>	<i>ECN</i>
<b>ASK</b>	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		
<b>NEXT</b>	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]	

<b>D71</b>	<b>Type of economizer cycle</b>	<i>ECNTYPE</i>
<b>ASK</b>	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"> <li>1 Air-side economizer</li> <li>2 Water-side economizer</li> </ol>		
<b>NEXT</b>	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]	

<b>D72</b>	<b>Cooling tower</b>	<i>CTOWER</i>
<b>ASK</b>	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"> <li>1 Yes</li> <li>2 No</li> </ol>		
<b>NEXT</b>	→ D73 [Regular HVAC maintenance]	

<b>D73</b>	<b>Regular HVAC maintenance</b>	<i>MAINT</i>
<b>ASK</b>	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]	
<b>FILL</b>	<b>{HeatCool}</b> IF Heating only = "heating" IF Cooling only = "cooling" IF Heating & Cooling = "heating and cooling"	
<i>[F1]-HELP</i>		
<p>Is there any regularly scheduled maintenance and repair for the {HeatCool} system?</p> <ol style="list-style-type: none"> <li>1 Yes</li> <li>2 No</li> </ol>		
<b>NEXT</b>	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]	

<b>D74</b>	<b>Sources for water heating</b>	<i>see below</i>																																							
<b>ASK</b>	IF D3 [Water heating] = Yes																																								
<b>FILL</b>	<p><b>{WatrSourcesList}</b> = List of all energy sources used  <b>{Electricity}</b> – <b>{Other3}</b> = If a source is used, it appears in this list; if not, the line is blank  <b>{FuelOilType}</b> = Type or types specified in D10 [Fuel oil, diesel, or kerosene]  <b>{Other1}</b> – <b>{Other3}</b> = 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"> <li>◆ Only sources already selected are shown here</li> <li>◆ PROBE for any others</li> <li>◆ ENTER all that apply</li> </ul> <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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<b>NEXT</b>	IF Some other energy source selected ⇒ D75 [Other water heating source] OTHERWISE ⇒ D76 [Water heating equipment]																																								

<b>D75</b>	<b>Other water heating source</b>	<i>see below</i>																														
<b>ASK</b>	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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<b>NEXT</b>	⇒ D76 [Water heating equipment]																															

<b>D76</b>	<b>Water heating equipment</b>	<i>WTHTEQ</i>
<b>ASK</b>	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)?	
	<ol style="list-style-type: none"> <li>1 One or more centralized water heaters</li> <li>2 One or more "point-of-use" water heaters</li> <li>3 Both types</li> </ol>	
<b>NEXT</b>	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]	

<b>D77</b>	<b>Sources for cooking</b>	<i>see below</i>																																							
<b>ASK</b>	IF D4 [Cooking] = Yes																																								
<b>FILL</b>	<b>{CookSourcesList}</b> = List of all energy sources used <b>{Electricity} – {Other3}</b> = If a source is used, it appears in this list; if not, the line is blank <b>{FuelOilType}</b> = Type or types specified in D10 [Fuel oil, diesel, or kerosene] <b>{Other1} – {Other3}</b> = Sources specified in D12 [Other energy source 1] – D14 [Other energy source 3]																																								
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<b>NEXT</b>	IF Some other energy source selected ⇒ D78 [Other cooking source] OTHERWISE: IF D6 [Manufacturing] = Yes ⇒ D79 [Sources for manufacturing] IF D8 [Electricity generation capability] = Yes ⇒ D81 [Energy for generation] OTHERWISE ⇒ D87 [Any other sources]																																								

<b>D78</b>	<b>Other cooking source</b>																														
<b>ASK</b>	IF Some other energy source IN D77 [Sources for cooking]																														
<p>What was the other energy source used for cooking?</p> <table> <tr><td>11</td><td>Electricity</td><td>ELCOOK</td></tr> <tr><td>12</td><td>Natural gas</td><td>NGCOOK</td></tr> <tr><td>13</td><td>Fuel oil/Diesel/Kerosene</td><td>FKCOOK</td></tr> <tr><td>14</td><td>Bottled gas</td><td>PRCOOK</td></tr> <tr><td>15</td><td>District steam</td><td>STCOOK</td></tr> <tr><td>16</td><td>District hot water</td><td>HWCOOK</td></tr> <tr><td>18</td><td>Wood</td><td>WOCOOK</td></tr> <tr><td>19</td><td>Coal</td><td>COCOOK</td></tr> <tr><td>20</td><td>Solar</td><td>SOCOOK</td></tr> <tr><td>24</td><td>Some other energy source</td><td>OTCOOK</td></tr> </table>		11	Electricity	ELCOOK	12	Natural gas	NGCOOK	13	Fuel oil/Diesel/Kerosene	FKCOOK	14	Bottled gas	PRCOOK	15	District steam	STCOOK	16	District hot water	HWCOOK	18	Wood	WOCOOK	19	Coal	COCOOK	20	Solar	SOCOOK	24	Some other energy source	OTCOOK
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<b>NEXT</b>	IF D6 [Manufacturing] = Yes ⇒ D79 [Sources for manufacturing] IF D8 [Electricity generation capability] = Yes ⇒ D81 [Energy for generation] OTHERWISE ⇒ D87 [Any other sources]																														

<b>D79</b>	<b>Sources for manufacturing</b>	<i>see below</i>																																							
<b>ASK</b>	IF D6 [Manufacturing] = Yes																																								
<b>FILL</b>	<p><b>{ManuSourcesList}</b> = List of all energy sources used  <b>{Electricity}</b> – <b>{Other3}</b> = If a source is used, it appears in this list; if not, the line is blank  <b>{FuelOilType}</b> = Type or types specified in D10 [Fuel oil, diesel, or kerosene]  <b>{Other1}</b> – <b>{Other3}</b> = Sources specified in D12 [Other energy source 1] – D14 [Other energy source 3]</p>																																								
<p>Which energy sources were used for manufacturing? [ {ManuSourcesList} ]</p> <ul style="list-style-type: none"> <li>◆ Only sources already selected are shown here</li> <li>◆ PROBE for any others</li> <li>◆ ENTER all that apply</li> </ul> <table> <tr><td>11</td><td>{Electricity}</td><td>ELMANU</td></tr> <tr><td>12</td><td>{Natural gas}</td><td>NGMANU</td></tr> <tr><td>13</td><td>{FuelOilType}</td><td>FKMANU</td></tr> <tr><td>14</td><td>{Bottled gas}</td><td>PRMANU</td></tr> <tr><td>15</td><td>{District steam}</td><td>STMANU</td></tr> <tr><td>16</td><td>{District hot water}</td><td>HWMANU</td></tr> <tr><td>18</td><td>{Wood}</td><td>WOMANU</td></tr> <tr><td>19</td><td>{Coal}</td><td>COMANU</td></tr> <tr><td>20</td><td>{Solar}</td><td>SOMANU</td></tr> <tr><td>21</td><td>{Other1}</td><td>OTMANU</td></tr> <tr><td>22</td><td>{Other2}</td><td>OTMANU</td></tr> <tr><td>23</td><td>{Other3}</td><td>OTMANU</td></tr> <tr><td>24</td><td>Some other energy source</td><td></td></tr> </table>			11	{Electricity}	ELMANU	12	{Natural gas}	NGMANU	13	{FuelOilType}	FKMANU	14	{Bottled gas}	PRMANU	15	{District steam}	STMANU	16	{District hot water}	HWMANU	18	{Wood}	WOMANU	19	{Coal}	COMANU	20	{Solar}	SOMANU	21	{Other1}	OTMANU	22	{Other2}	OTMANU	23	{Other3}	OTMANU	24	Some other energy source	
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<b>NEXT</b>	<p>IF Some other energy source selected ⇒ D80 [Other manufacturing source]  OTHERWISE:  IF D8 [Electricity generation capability] = Yes ⇒ D81 [Energy for generation]  IF D8 [Electricity generation capability] ≠ Yes ⇒ D87 [Any other sources]</p>																																								



<b>D80</b>	<b>Other manufacturing source</b>	<i>see below</i>																														
<b>ASK</b>	IF Some other energy source IN D79 [Sources for manufacturing]																															
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<b>NEXT</b>	IF D8 [Electricity generation capability] = Yes ⇒ D81 [Energy for generation] IF D8 [Electricity generation capability] ≠ Yes ⇒ D87 [Any other sources]																															

<b>D81</b>	<b>Energy for generation</b>	<i>GENR</i>				
<b>ASK</b>	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					
<b>NEXT</b>	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]					

<b>D82</b>	<b>Sources for electricity generation</b>	<i>see below</i>																														
<b>ASK</b>	IF D81 [Energy for generation] = Yes																															
<b>FILL</b>	{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"> <li>◆ PROBE for any others</li> <li>◆ ENTER all that apply</li> </ul> <table style="width: 100%; border: none;"> <tr> <td style="width: 10%; vertical-align: top;">12</td> <td style="width: 70%;">Natural gas</td> <td style="width: 20%; text-align: right;">NGGENR</td> </tr> <tr> <td>13</td> <td>Fuel oil/Diesel/Kerosene</td> <td style="text-align: right;">FKGENR</td> </tr> <tr> <td>14</td> <td>Bottled gas/LPG/Propane</td> <td style="text-align: right;">PRGENR</td> </tr> <tr> <td>18</td> <td>Wood</td> <td style="text-align: right;">WOGENR</td> </tr> <tr> <td>19</td> <td>Coal</td> <td style="text-align: right;">COGENR</td> </tr> <tr> <td>20</td> <td>Solar</td> <td style="text-align: right;">SOGENR</td> </tr> <tr> <td>21</td> <td>{Other1}</td> <td style="text-align: right;">OTGENR</td> </tr> <tr> <td>22</td> <td>{Other2}</td> <td style="text-align: right;">OTGENR</td> </tr> <tr> <td>23</td> <td>{Other3}</td> <td style="text-align: right;">OTGENR</td> </tr> <tr> <td>24</td> <td>Some other energy source</td> <td style="text-align: right;">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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<b>NEXT</b>	⇒ D83 [Generation technologies]																															

<b>D83</b>	<b>Generation technologies</b>	<i>see below</i>																					
<b>ASK</b>	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"> <li>◆ PROBE for any others</li> <li>◆ ENTER all that apply</li> </ul> <table style="width: 100%; border: none;"> <tr> <td style="width: 10%; vertical-align: top;">1</td> <td style="width: 70%;">Photovoltaic cells</td> <td style="width: 20%; text-align: right;">PVC</td> </tr> <tr> <td>2</td> <td>Fuel cells</td> <td style="text-align: right;">FUELCL</td> </tr> <tr> <td>5</td> <td>Large turbines</td> <td style="text-align: right;">LRGTRB</td> </tr> <tr> <td>3</td> <td>Microturbines</td> <td style="text-align: right;">MCROTB</td> </tr> <tr> <td>4</td> <td>Wind turbines</td> <td style="text-align: right;">WNDTRB</td> </tr> <tr> <td>6</td> <td>Reciprocating engines</td> <td style="text-align: right;">ENGINE</td> </tr> <tr> <td>7</td> <td>IF VOLUNTEERED: None of these</td> <td></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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<b>NEXT</b>	⇒ D84 [Use of generated electricity]																						

<b>D84</b>	<b>Use of generated electricity</b>	<i>GENUSE</i>
<b>ASK</b>	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"> <li>1 Primarily for emergency back-up or testing</li> <li>2 During periods of high electricity demand</li> <li>3 Whenever electricity was used</li> </ol>	
<b>NEXT</b>	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]	

<b>D85</b>	<b>Cogeneration system</b>	<i>COGEN</i>
<b>ASK</b>	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"> <li>1 Yes</li> <li>2 No</li> </ol>	
<b>NEXT</b>	⇒ D86 [Deliver electricity to grid]	

<b>D86</b>	<b>Deliver electricity to grid</b>	<i>TOGRID</i>
<b>ASK</b>	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"> <li>1 Yes</li> <li>2 No</li> </ol>	
<b>NEXT</b>	⇒ D87 [Any other sources]	

<b>D87</b>	<b>Any other sources</b>
<b>ASK</b>	IF D9 [Energy sources used] was answered
<b>FILL</b>	{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>	
<b>NEXT</b>	<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>

<b>D88</b>	<b>Other sources</b>	<i>see below</i>																																	
<b>ASK</b>	IF D87 [Any other sources] =Yes																																		
<b>FILL</b>	{Electricity} – {Solar} = If a source has NOT been mentioned, it appears in this list; if it has, the line is blank																																		
<p>What other sources were used?</p> <ul style="list-style-type: none"> <li>◆ PROBE for any others</li> <li>◆ ENTER all that apply</li> </ul> <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 10%;">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/Diesel/Kerosene}</td> <td style="text-align: right;"><i>FKUSED</i></td> </tr> <tr> <td>14</td> <td>{Bottled gas}</td> <td style="text-align: right;"><i>PRUSED</i></td> </tr> <tr> <td>15</td> <td>{District steam}</td> <td style="text-align: right;"><i>STUSED</i></td> </tr> <tr> <td>16</td> <td>{District hot water}</td> <td style="text-align: right;"><i>HWUSED</i></td> </tr> <tr> <td>17</td> <td>{District chilled water}</td> <td style="text-align: right;"><i>CWUSED</i></td> </tr> <tr> <td>18</td> <td>{Wood}</td> <td style="text-align: right;"><i>WOUSED</i></td> </tr> <tr> <td>19</td> <td>{Coal}</td> <td style="text-align: right;"><i>COUSED</i></td> </tr> <tr> <td>20</td> <td>{Solar}</td> <td style="text-align: right;"><i>SOUSED</i></td> </tr> <tr> <td>24</td> <td>Other</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/Diesel/Kerosene}	<i>FKUSED</i>	14	{Bottled gas}	<i>PRUSED</i>	15	{District steam}	<i>STUSED</i>	16	{District hot water}	<i>HWUSED</i>	17	{District chilled water}	<i>CWUSED</i>	18	{Wood}	<i>WOUSED</i>	19	{Coal}	<i>COUSED</i>	20	{Solar}	<i>SOUSED</i>	24	Other	<i>OTUSED</i>
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<b>D89</b>	<b>{Energy source} use</b>	<i>see below where {XX} is the energy source abbreviation</i>																								
<b>ASK</b>	For each source selected in D88 [Other sources]																									
<b>FILL</b>	<p><b>{EnergySource}</b>  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><b>{Cooling}</b>  Does not appear as a choice for Wood use, Coal use, OR Solar use</p> <p><b>{Electricity generation}</b>  Does not appear as a choice for Electricity use, District steam use, OR District hot water use</p>																									
<p>What was the {EnergySource} used for?</p> <table border="0"> <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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<b>D90</b>	<b>Missed {energy source} use</b> <i>see below where {XX} is the energy source abbreviation</i>																
<b>ASK</b>	For every energy source given in D9 [Energy sources used] that was not assigned an end use (other than electricity)																
<b>FILL</b>	<p><b>{EnergySource}</b>  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”)  <b>{Heating}, {Water heating}, {Cooking}, {Manufacturing}</b>  Do not appear as a choice for District chilled water use  <b>{Cooling}</b>  Does not appear as a choice for Wood use, Coal use, OR Solar use  <b>{Electricity generation}</b>  Does not appear as a choice for District chilled water use, District steam use OR District hot water use</p>																
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7 Some other use	{XX}OTH																
8 Incorrectly recorded--source not used																	
<b>NEXT</b>	IF Electricity used ⇒ D91 [AMI smart metering] OTHERWISE: IF Heating OR Cooling → D92 [Energy management plan] OTHERWISE → L1 [Response effort]																

<b>D91</b>	<b>AMI smart metering</b>	<i>AMIMETER</i>
<b>ASK</b>	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>		
<b>NEXT</b>	IF Heating OR Cooling → D92 [Energy management plan] OTHERWISE → L1 [Response effort]	

<b>D92</b>	<b>Energy management plan</b>	<i>ENERGYPLN</i>
<b>ASK</b>	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>		
<b>NEXT</b>	→ L1 [Response effort]	

DRAFT (9/5/12)



## SECTION L. COLLECT MATERIALS

<b>L1</b>	<b>Response effort</b>	<i>REFFORT</i>
<b>ASK</b>	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.		
<b>RANGE</b>	1 to 99	
<b>NEXT</b>	→ L2 [Green building certification]	

<b>L2</b>	<b>Green building certification</b>	<i>GRNCRT</i>
<b>ASK</b>	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"> <li>1 Yes</li> <li>2 No</li> </ul>		
<b>NEXT</b>	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]	

<b>L3</b>	<b>Type of green certification</b>	<i>see below</i>
<b>ASK</b>	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"> <li>1 Energy Star <span style="float: right;"><i>ENGYSTR</i></span></li> <li>2 LEED <span style="float: right;"><i>LEED</i></span></li> <li>3 Green Globes <span style="float: right;"><i>GRNGLBS</i></span></li> <li>4 Other <span style="float: right;"><i>OTCERT</i></span></li> </ul>		
<b>NEXT</b>	IF Other selected → L4 [Other certification] OTHERWISE: IF R2 [Worksheet 1] = Yes → L5 [Collect Worksheet 1] IF R2 [Worksheet 1] ≠ Yes → L6 [Thank you]	

<b>L4</b>	<b>Other certification</b>	<i>GRNCRTX</i>
<b>ASK</b>	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>		
<b>NEXT</b>	IF R2 [Worksheet 1] = Yes → L5 [Collect Worksheet 1] IF R2 [Worksheet 1] ≠ Yes → L6 [Thank you]	

<b>L5</b>	<b>Collect Worksheet 1</b>	
<b>ASK</b>	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>		
<b>NEXT</b>	INTERVIEW COMPLETE	

<b>L6</b>	<b>Thank you</b>	
<b>ASK</b>	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>		
<b>NEXT</b>	INTERVIEW COMPLETE	