COMMERCIAL END USE SURVEY REPORT

December 2021

ENBRIDGE

ONTARIO ENERGY BOARD

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Ipsos

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METHODOLOGY

Research Objectives

The overarching research objective is to inform electricity and natural gas demand forecasting and both Conservation and Demand Management (electricity) and Demand Side Management (natural gas) program design, outreach, and policy decisions.

Specifically, the Commercial End Use Survey (CEUS) aims to obtain insights in three key areas:

- **Firmographic Characteristics.** General building and business characteristics required to support downstream analysis of other survey outputs, and to provide a more detailed general picture of commercial sector building characteristics.
- **Equipment and Processes Characteristics.** End-use specific equipment and building processes characteristics such as equipment density (e.g., number of lighting fixtures), type (e.g., chiller vs multi-split system), operating characteristics (e.g., temperature set-points or run-time schedules), and efficiency level (e.g., fluorescent vs LED tube lighting).
- **Business Perception Characteristics.** Characteristics that define business awareness of and inclination to acquire energy efficiency measures and participate in conservation and demand management (CDM) programs such as internal payback requirements and non-financial barriers (e.g., approvals processes, inadequate staffing).

Data Collection Timing and Impact of COVID-19 Lockdown Measures

The survey was administered both online and by telephone.

The online survey fielded between January 27 and September 3, 2021. The telephone survey fielded between March 17 and September 3, 2021.

Fielding for both the online and telephone surveys were impacted by lockdown measures instituted by the Province of Ontario to curb the spread of the COVID-19 pandemic.

During this time, many commercial business establishments in Ontario were forced to shutdown or operate at a significantly reduced capacity. Lockdown measures impacted commercial and other establishments differently depending on the sector and location of the establishments. For example, establishments in tourism or hospitality sectors were forced to shut-down for certain periods of time, while other establishments operated from a remote working model or reduced capacity.

Fieldwork was paused for a substantial period of time during the Spring of 2021, in response to lockdowns and restrictions that were imposed on Ontario businesses due to the COVID-19 pandemic. Between April and the end of June, limited phone interviews and online surveys were completed. Fieldwork resumed at the end of June and continued until early September.

Sample Frame

For this survey, Ipsos sampled commercial establishments in the province of Ontario, including Enbridge Gas Inc. commercial customers and establishments located outside Enbridge's natural gas network. Sample for these non-gas customers was sourced by Ipsos according to NAICS code.

A total of n=1691 commercial customers completed the survey or a substantial portion of the survey (over 80%), including n=1425 from start to finish. Included within this sample are 1599 Enbridge Gas customers and 92 non-gas customers.

The sample cannot be considered to be a representative sample of all businesses in Ontario, rather the sample frame was designed to achieve specific confidence intervals by sector and region at 90% confidence at 10% precision (n=68 completed interviews stratified per region and sector).

Due to the limited availability of sample for certain sectors and regions (for example hospitals or universities) and low response rates due to the COVID-19 pandemic (for example among long-term care homes) the study was not able to achieve 90/10 in all regions and sectors.

Sample Frame by Sector and Region

- The below crosstabulation shows final counts by region & sector and associated confidence intervals.

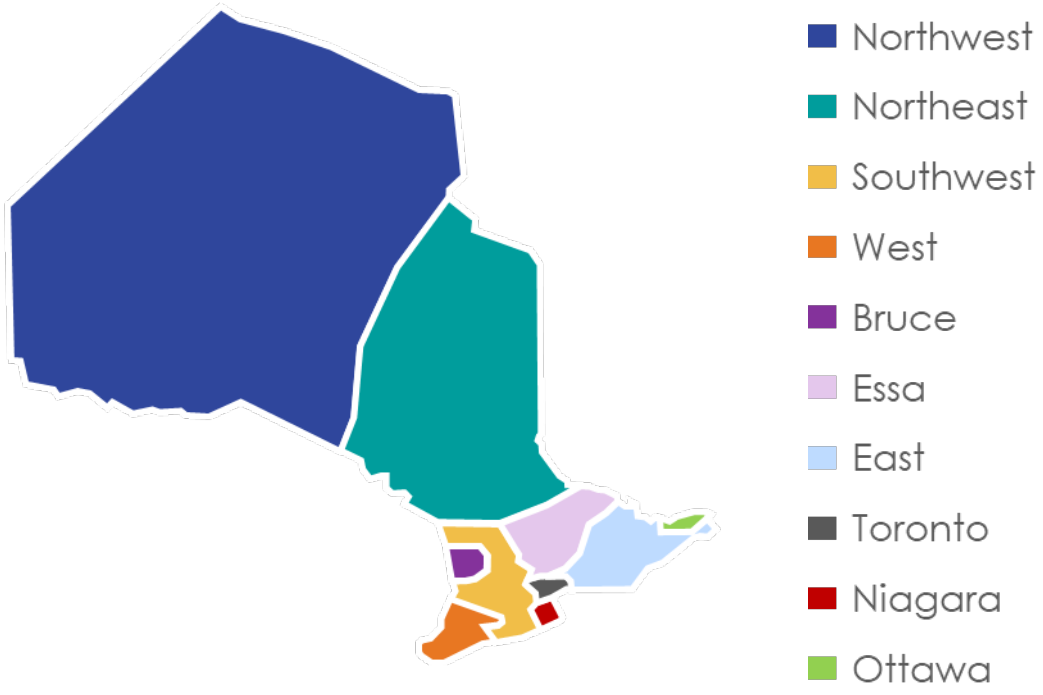
	Total	East	Essa	Niagara	North	Ottawa	Southwest	Toronto	West
Base: Total Answering	**1691**	**149**	**169**	**121**	**185**	**150**	**302**	**371**	**244**
Hotel	70	11	13	4	14	1	12	7	8
Food Service	182	19	24	15	14	22	34	32	22
Long-Term Care	42	8	-	3	3	4	10	5	9
Multiresidential	164	18	19	14	19	14	30	29	21
Large Office	100	4	5	5	12	13	14	37	10
Other Office	216	18	20	17	20	22	37	51	31
Other Commercial (+ Data Centre)	255	20	29	21	30	23	43	62	27
Retail Small	209	15	21	15	26	25	28	47	32
Retail Large	39	4	8	1	7	3	4	7	5
Schools	50	3	4	2	5	1	5	24	6
Transport and Warehouse	130	11	10	6	8	10	26	38	21
Utility	21	3	2	1	7	1	4	2	1
University	13	1	-	-	3	1	5	2	1
Hospital	19	2	1	1	5	-	1	6	3
Greenhouses	110	6	7	10	2	1	38	4	42
Automotive	71	6	6	6	10	9	11	18	5

Confidence Intervals	
90/10	n=68
90/20	n=17
80/10	n=41
80/20	n=11

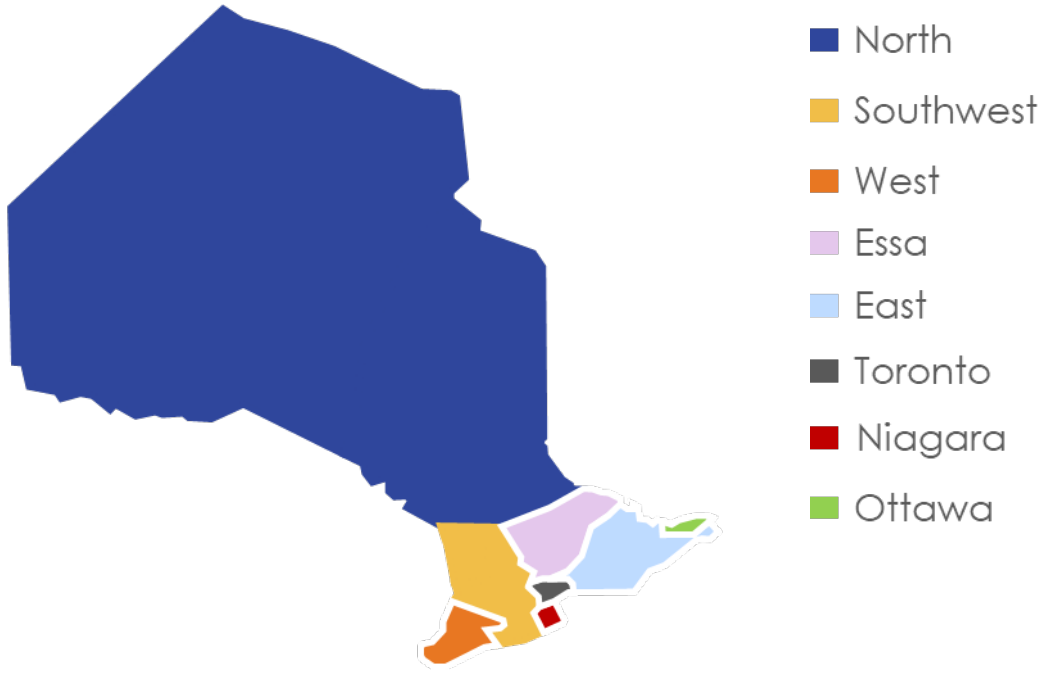
Sample Frame Regions

- For the purposes of this study, region has been defined in accordance with IESO zones. The following link provides more information on the IESO zones: https://www.ieso.ca/localContent/zonal.map/index.html. For sampling and analytical purposes, the Bruce and Southwest regions merged to become the new Southwest region. The Northeast and Northwest regions merged to become the North region.

IESO Zones



CEUS Regions



Questionnaire Design

- The phone survey took respondents, on average, about 35 minutes to complete.
- The online survey took respondents, on average, a little over 20 minutes to complete.

Data Collection Process

- Sample for the online survey was administered by Enbridge Gas Inc. in batches via online platforms. Each batch consisted of approximately n=2,500 commercial gas customers who receive a bill from Enbridge Gas. Ipsos appended unique survey links to Enbridge commercial customer contact lists.
- A sample of non-gas customers was sourced by Ipsos using NAICS codes for establishments located outside Enbridge Gas service network.
- Participation in the telephone survey was collected in two ways, initially commercial establishments were recruited to participate in the online and recruited to participate in the online survey by telephone (RTO approach). Due to a lower than desired conversion rate, hard to reach sectors were recruited by a telephone recruitment approach where respondents were only encouraged to participate in the survey via telephone. For this approach, a shorter telephone survey was administered that included only core survey questions as the initial survey that was designed to be administered only online was too long for a telephone-based approach.
- The following table details the total number of unique links generated for the online survey, the online dropout rate, the total number of establishments recruited to participate in the online survey via telephone, the number of interviews conducted by telephone, and the number of online completes. Only those who completed the survey from start to finish received an incentive.

Online			Telephone
Unique links (online survey)	190,220	Total dialed	7,355
Total accessing online survey (includes RTO & non-gas customers)	7,395	Recruited to do online survey by telephone	723
Total number of online completes	1,518	Total number of phone completes	173
Total number of online completes (start to finish)	1,269	Total number of phone completes (start to finish)	156
Total number of drop-outs (online survey)	5,877		

Survey Pre-Test and Incentive Strategy

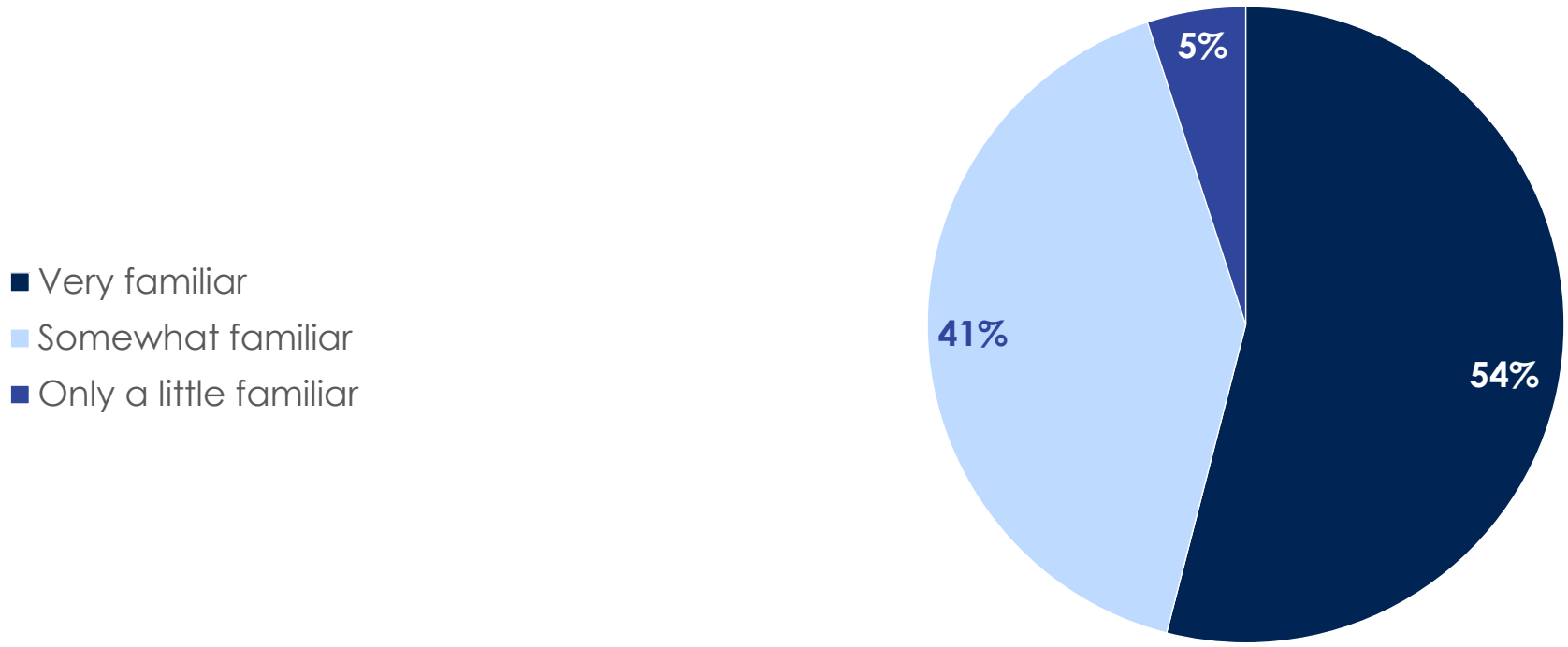
- The pre-test of the online and telephone survey was conducted in January 2021. A limited sample of Enbridge Gas customers were contacted by Enbridge Gas Inc. (EGI) via online platforms during this time, while Ipsos conducted a limited number of telephone interviews of non-gas customers.
- The overarching objectives of the pre-test were two-pronged, and as follows:
  - To gather feedback and data to improve survey, including:
    - Improving clarity of questions & response categories.
    - Gauging survey length & propensity to drop out of survey.
    - Add/remove questions and response categories as needed.
- Various incentive amounts were piloted during pre-testing to determine the optimal level of incentivization for survey participation. The following incentive scenarios were tested:
    - No incentive.
    - $15 Visa gift card incentive.
    - $25 Visa gift card incentive.
    - $50 Visa gift card incentive.
- Following the pre-test it was determined that the survey incentive would be $15 per participating establishment. The incentive amount was later increased to $40 when fieldwork resumed at the end of June, after pandemic lockdowns and restrictions were lifted.

Data Cleaning, Coding, & Analysis

- The survey design and scripting process considered appropriate responses and numeric range limits to ensure the accuracy of data collection and minimize the need to remove outlier data.
- The survey platform administered by Ipsos automatically removed straight liner respondents who completed the survey in too short of a period of time.
- Respondents who completed less than 80% of all survey questions were not counted towards the final number of completed interviews.
- Following the completion of data collection a thorough review of the dataset was conducted via SPSS and through cross-tabular analysis in Excel.
- Verbatim responses to open-ended questions were coded.
- Checked for responses logic (i.e., equipment age & ENERGY STAR). Full details on the logic checks and corrections can be found in the methodology report.

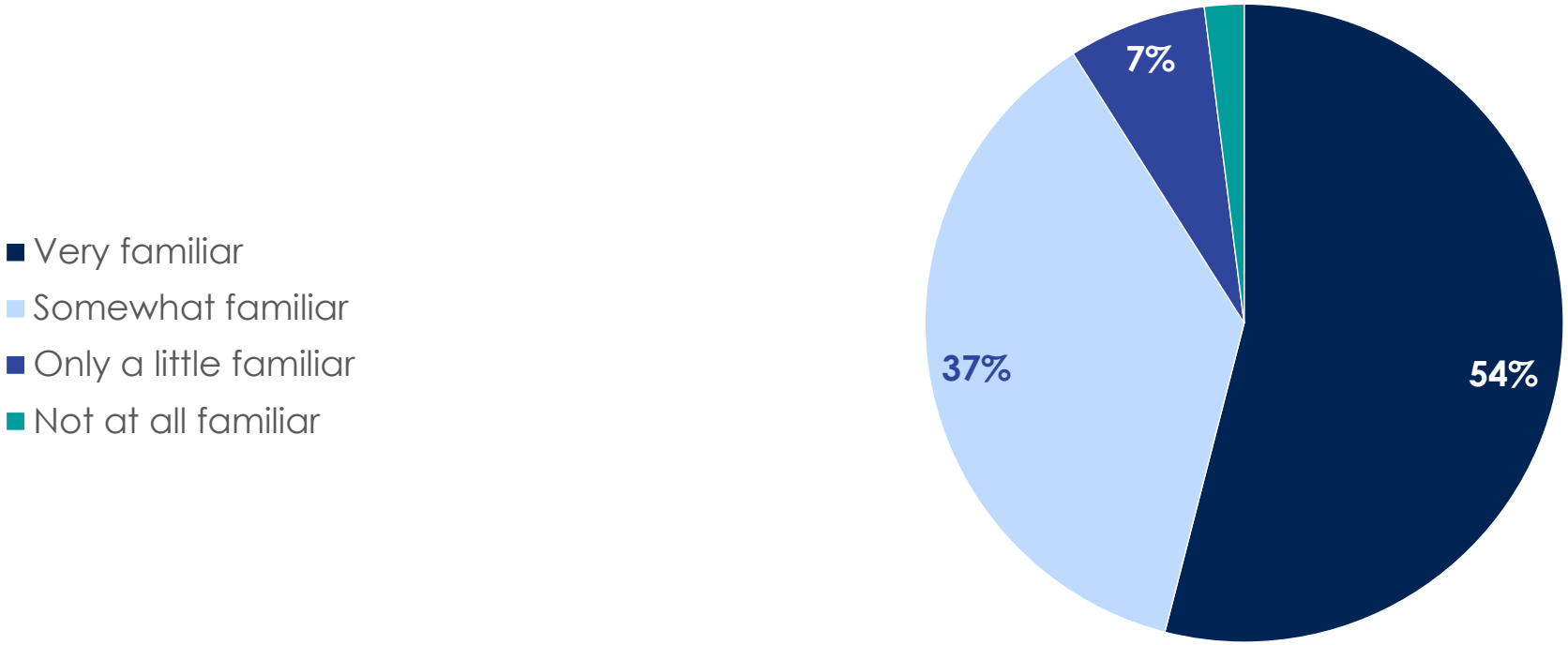
FIRMOGRAPHICS & SCREENERS

Familiarity With Operations / Maintenance of Energy-Using Equipment



Base: All respondents (n=1691)
Q1a. How familiar are you with the operations and maintenance of energy-using equipment (e.g., heating, cooling, lighting, refrigeration, etc.) at a building or the part of a building that your organization occupies?

Familiarity With Energy-Using Equipment Purchasing Process

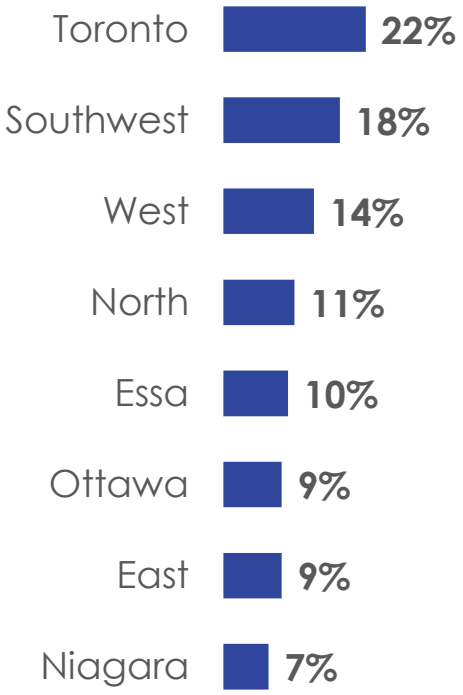


Data <3% not shown

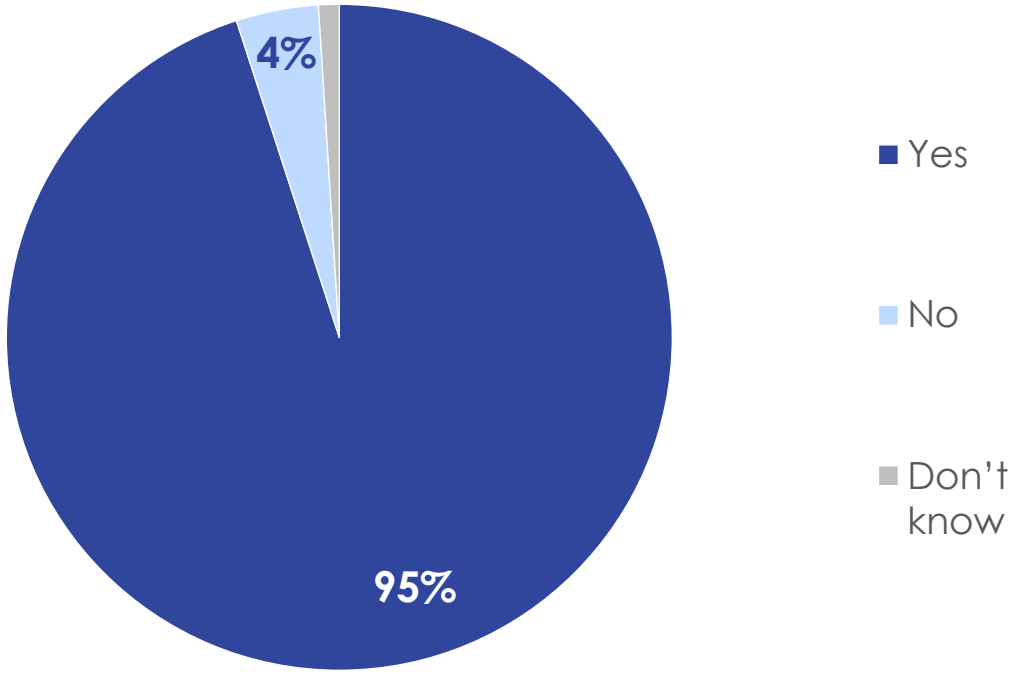
Base: All respondents (n=1691)
Q1b. How familiar are you with the energy-using equipment purchasing process at a building or the part of a building that your organization occupies? This equipment could include equipment such as heating, cooling, lighting, etc.

Region & Natural Gas Usage

Region

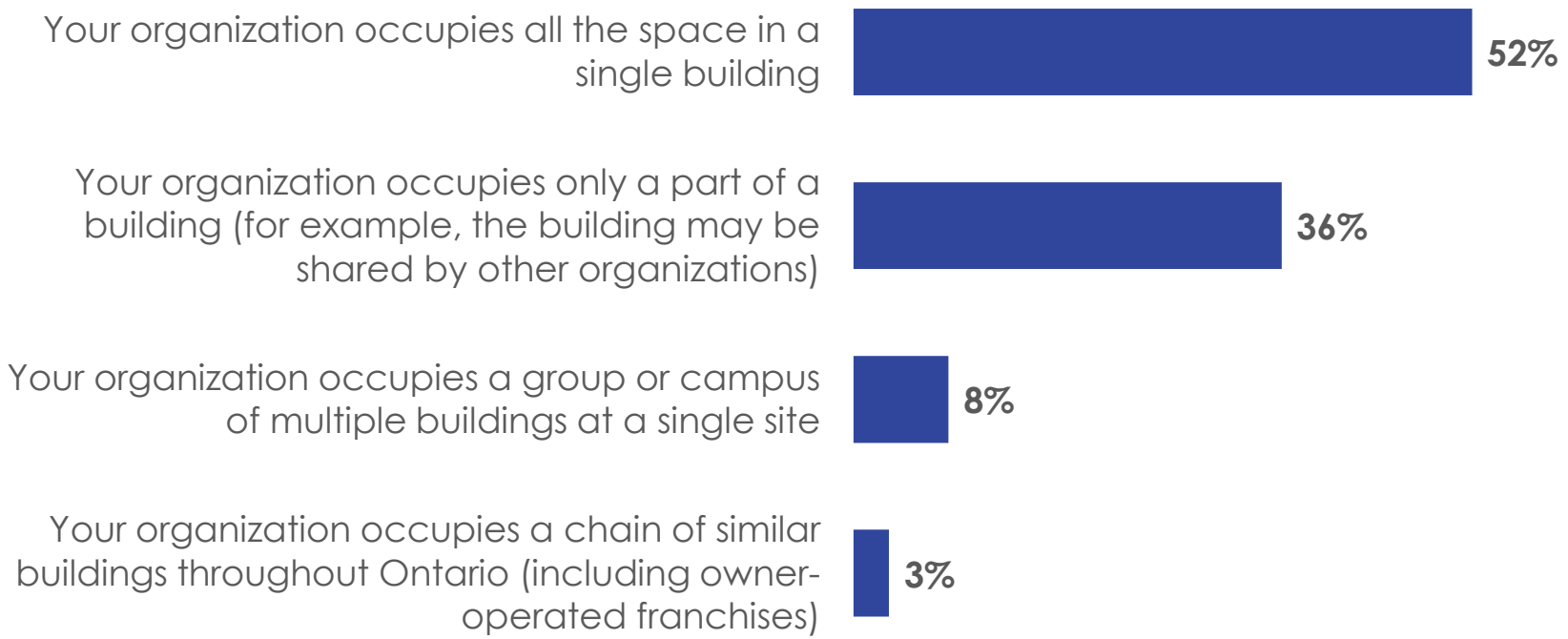


Natural Gas Usage



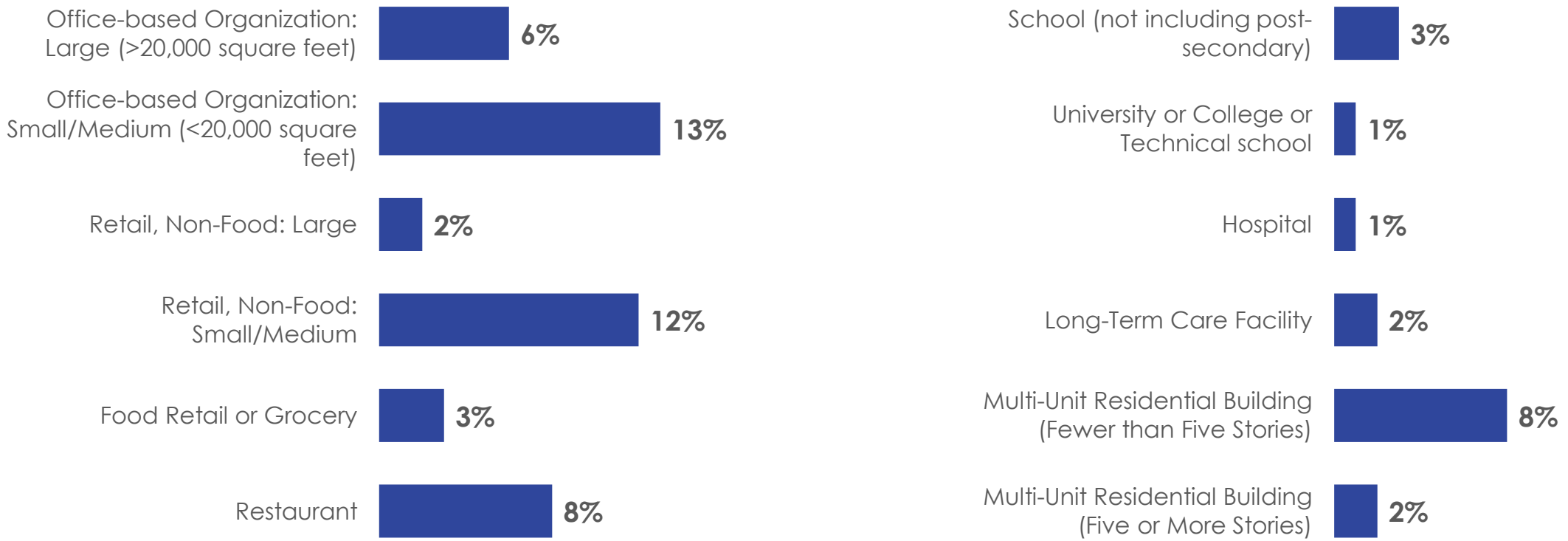
Base: All respondents (n=1691)
Q1c. What is the postal code for your organization where you are located (or if you are working from home as a result of the COVID-19 pandemic, where you are typically located)?
Q1cc. Do you have natural gas service in your building

Building Occupation



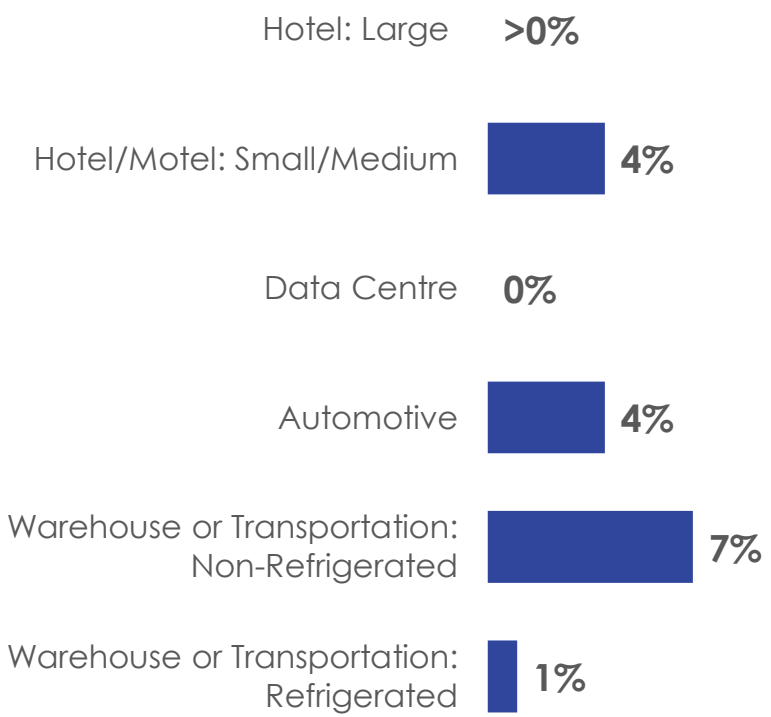
Base: Building has natural gas (n=1691)
Q2. Which of the following statements best describes the building(s) occupied by your organization?

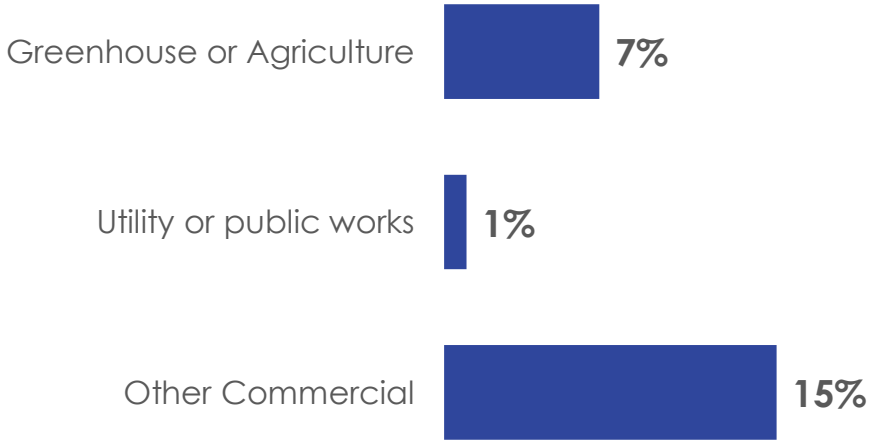
Business Type



Base: All respondents (n=1691)
Q1. Which of the following sector segments, or most closely matches the type of business that you operate? Relevant organizations for this survey would include commercial businesses, institutions and governments, multi-family residential, and greenhouses, but would exclude single-family housing, farms, manufacturing, and resource extraction.

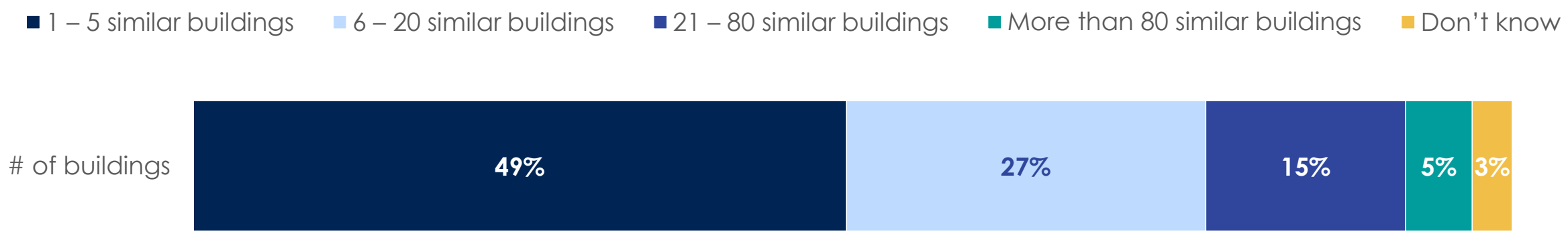
Business Type (cont.)





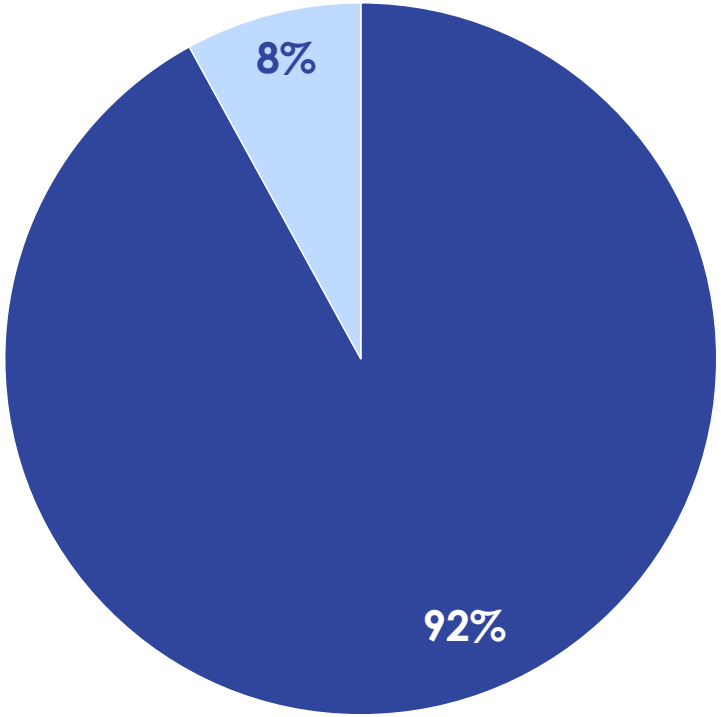
Base: All respondents (n=1691)
Q1. Which of the following sector segments, or most closely matches the type of business that you operate? Relevant organizations for this survey would include commercial businesses, institutions and governments, multi-family residential, and greenhouses, but would exclude single-family housing, farms, manufacturing, and resource extraction.

Number of Similar Buildings



Base: Your organization occupies a chain of similar buildings throughout Ontario (n=59)
Q4. How many similar buildings does your organization operate within Ontario? By "similar," we mean other buildings that are roughly the same size, contain the same types of activities and purposes, operate on similar schedules?

Building Represents Organization's Business Sector

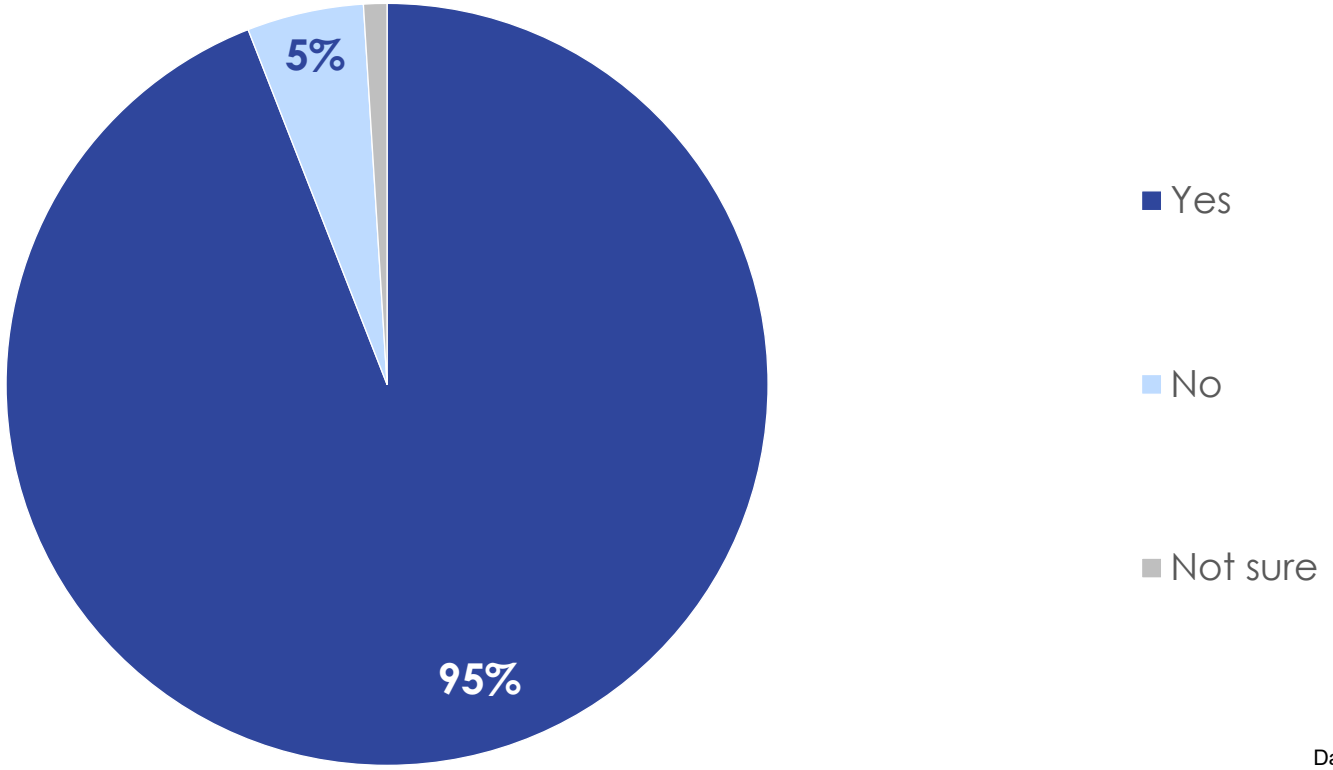


- Yes, this building is representative of business sector or market segment that we operate in
- No, my organization or business has another building that better matches our business sector or market segment that I am also familiar with
- No, my organization or business has another building that better matches our business sector or market segment and there is another individual that the survey should be sent to who is more familiar with that building

Data <3% not shown

Base: Your organization occupies a group or campus of multiple buildings at a single site / a chain of similar buildings throughout Ontario (n=202)
Q3. Is the building where you are located today (or typically located if working from home) generally representative of your organization's business sector or segment which you indicated is [insert response from Q1]? For example, if your organization is a university, the building at this address would be representative of your sector and other universities if it is used for academic activities. Or for example, you are a grocery store chain or fast food chain and the building at this address is representative of your grocery stores or restaurants?

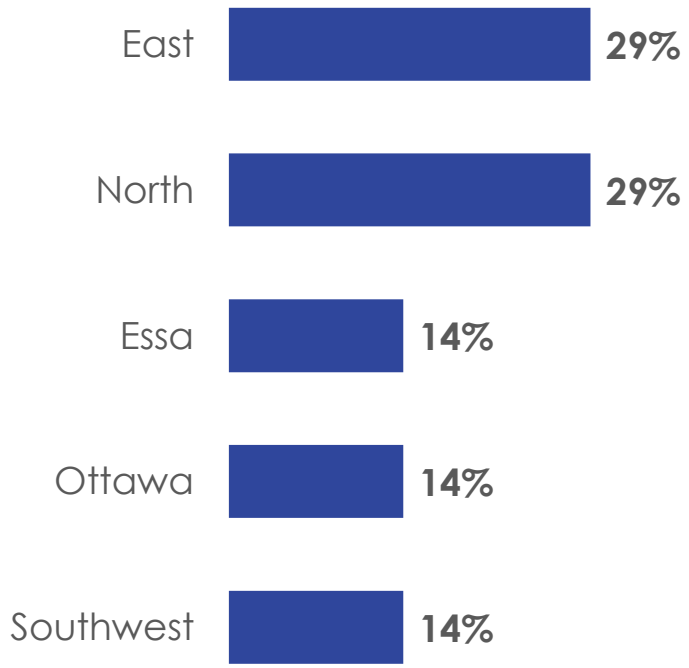
Building Postal Code



Data <3% not shown

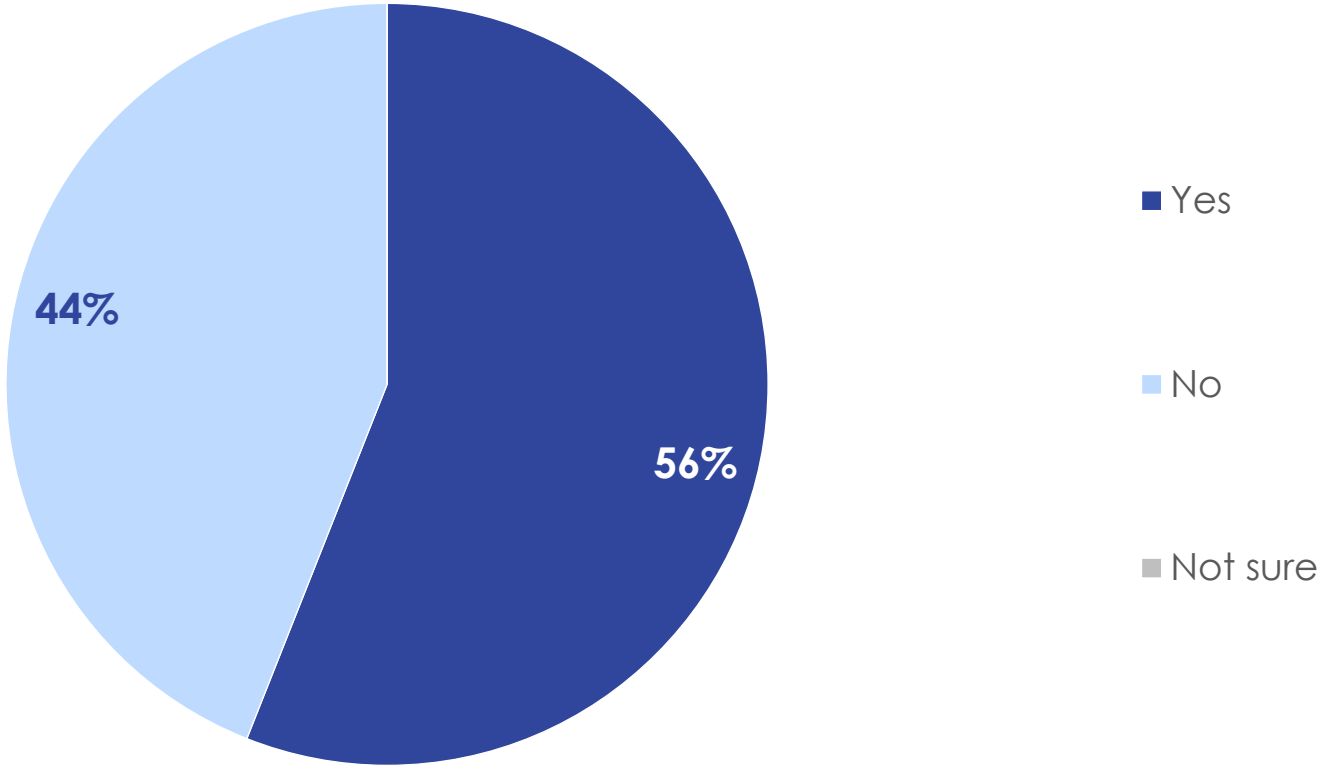
Base: Building is representative of business sector or market segment that we operate in (n=186)
Q3a. Can you confirm that this is the postal code where your building is located?

Correct Building Postal Code (If Previously Incorrect)



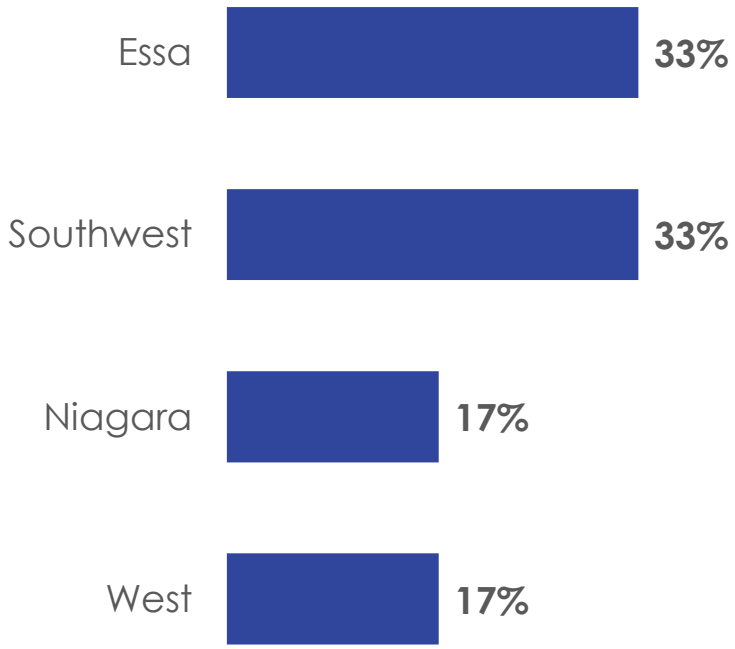
Base: Incorrect address (n=7)
Q3aa. Please enter the correct postal code (either first three digits or full postal code) where this building is located.

Building Postal Code For Other Building



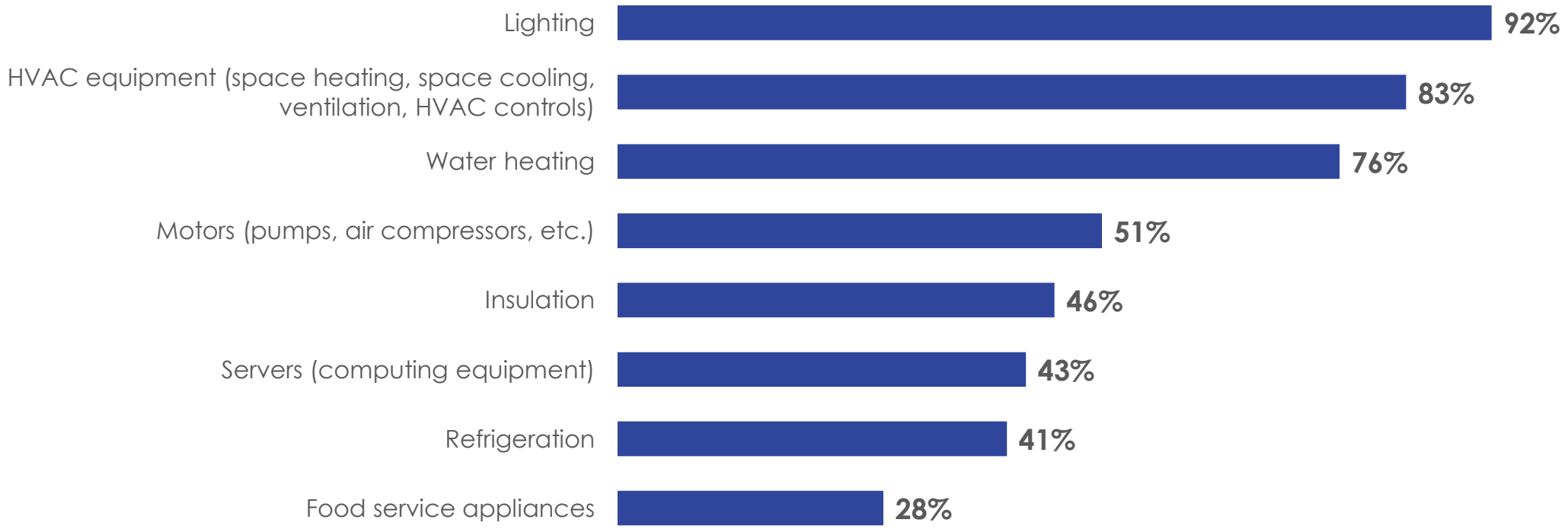
Base: All respondents (n=16)
Q3ab. In order to better understand where this other building is located, can you confirm if this is the postal code for this other building?

Correct Building Postal Code For Other Building (If Previously Incorrect)



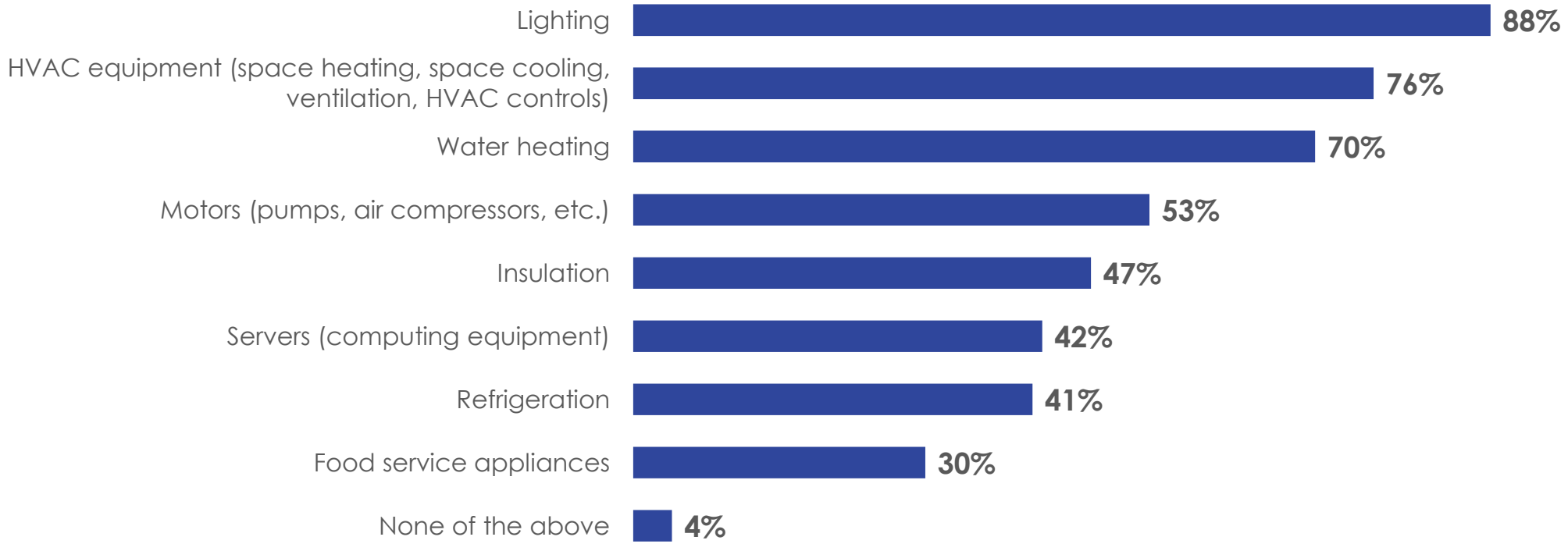
Base: All respondents (n=6)
Q3ac. Please provide the postal code for this other building. At a minimum, please enter at least the first three digits of the postal code.

Involvement in Operation / Maintenance of Equipment



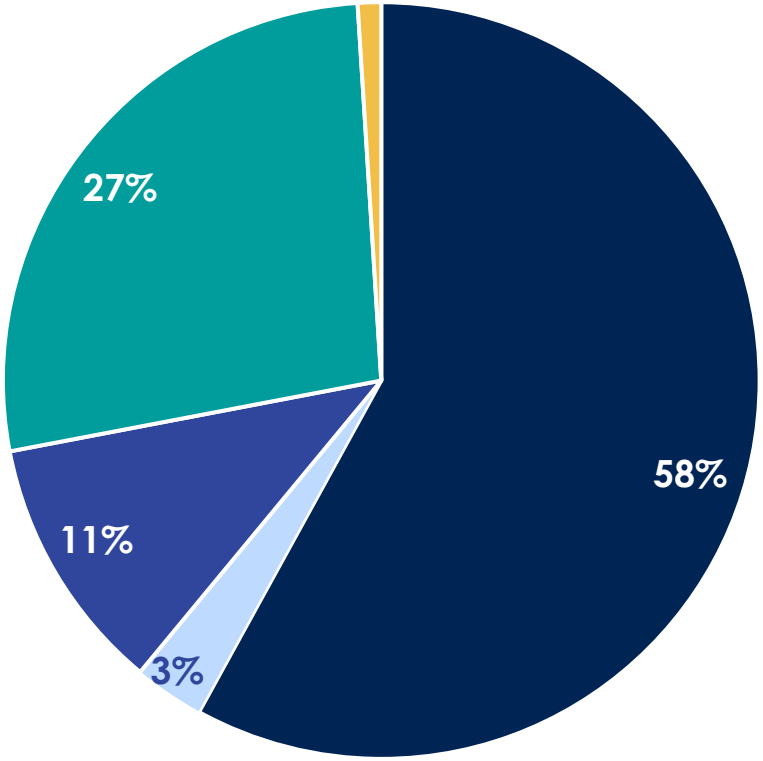
Base: All respondents (n=1691)
Q5. Are you familiar with or responsible for the operation and/or maintenance of any of the following equipment types in this building?

Involvement in Equipment Purchasing



Base: Familiar with the energy-using equipment purchasing process (n=1536)
Q6. Are you directly involved with or familiar with the purchase of any of the same equipment as detailed below?

Building Ownership

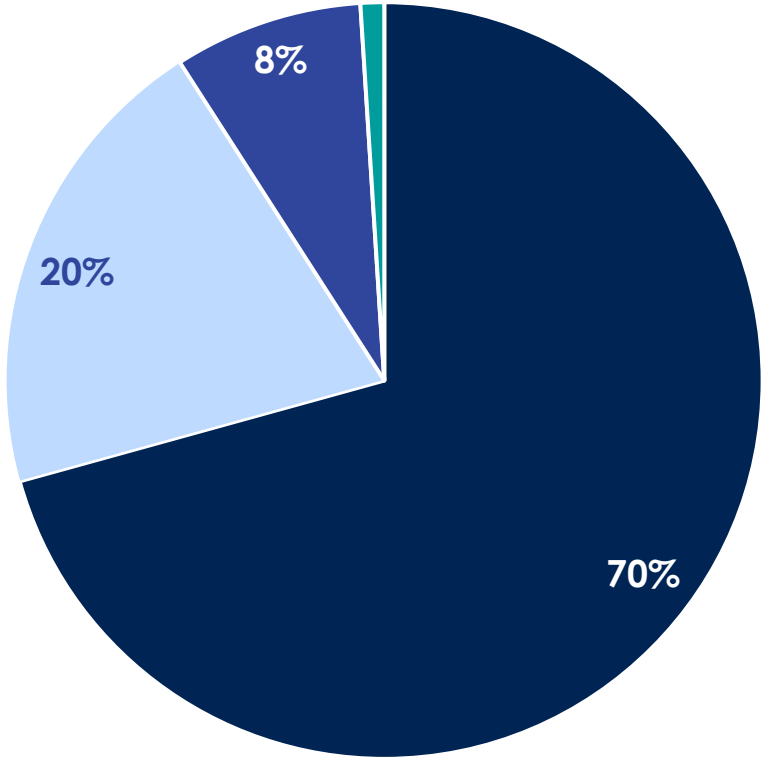


- My organization owns this building
- I work for a property management company that manages this building on behalf of the property owner
- My organization leases all of this building
- My organization leases part of this building
- Don't know

Data <3% not shown

Base: All respondents (n=1691)
Q11. Which of the following statements best describes the ownership of your building?

Building Usage

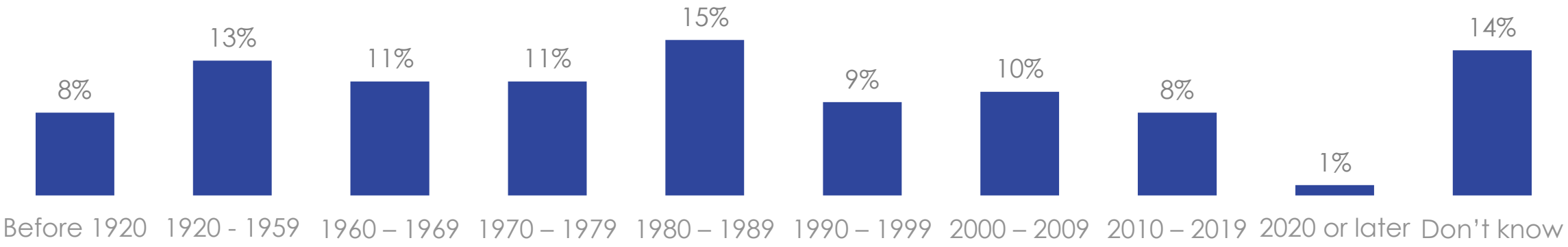


- My organization occupies this entire building
- My organization occupies part of this building and leases the rest of the building to one or more other organizations
- My organization leases the entire building to one or more other organizations
- Don't know

Data <3% not shown

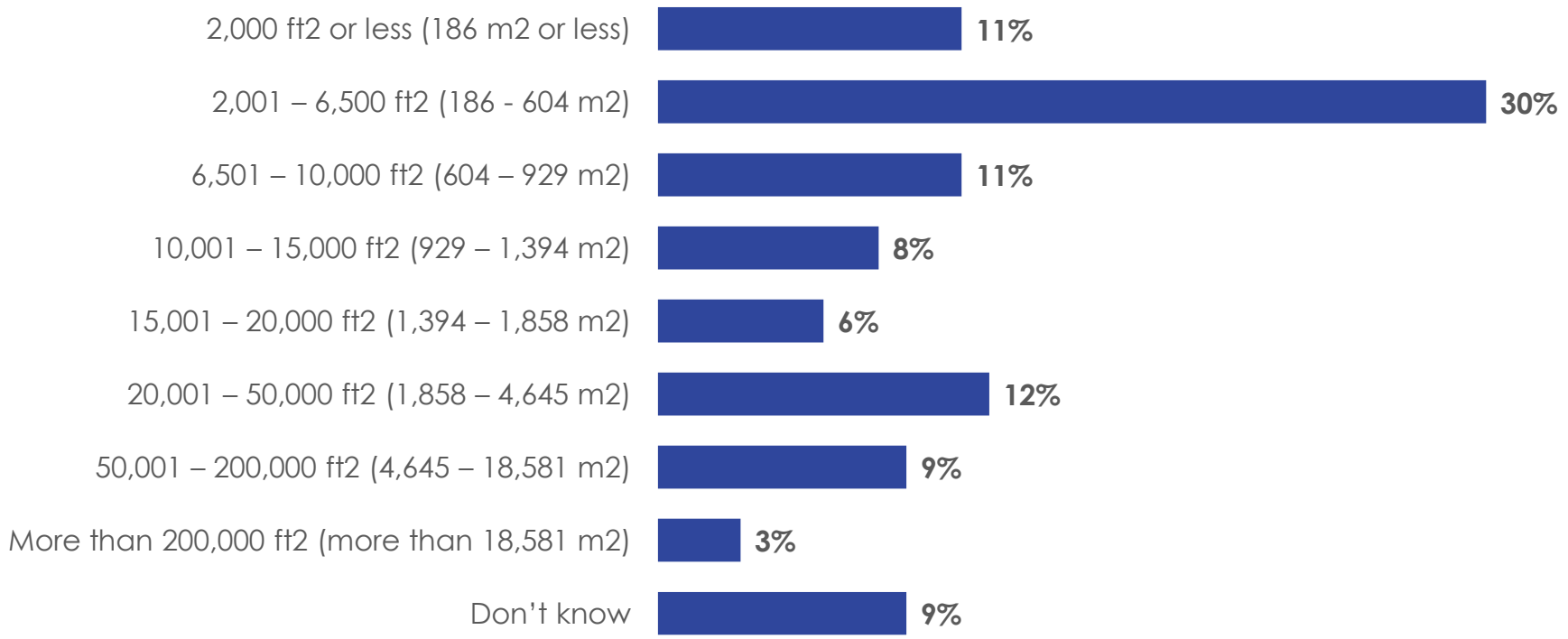
Base: Organization owns building or works for property management company that manages building (n=1040)
Q12. Does your organization occupy some or all of this building or do you lease it to one or more other organizations?

Building Age



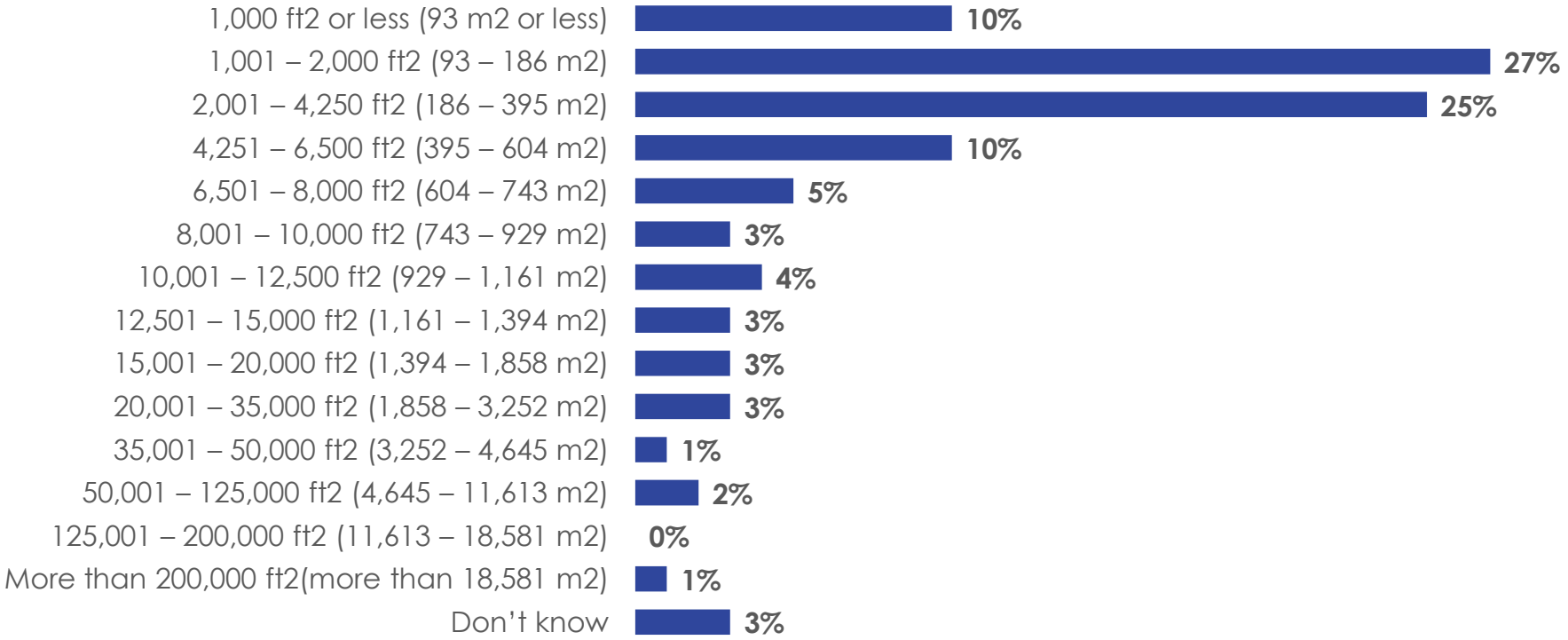
Base: All respondents (n=1691)
Q13. When was this building originally constructed? If the building has had additions, please answer for the largest portion of the building.

Square Footage of Building



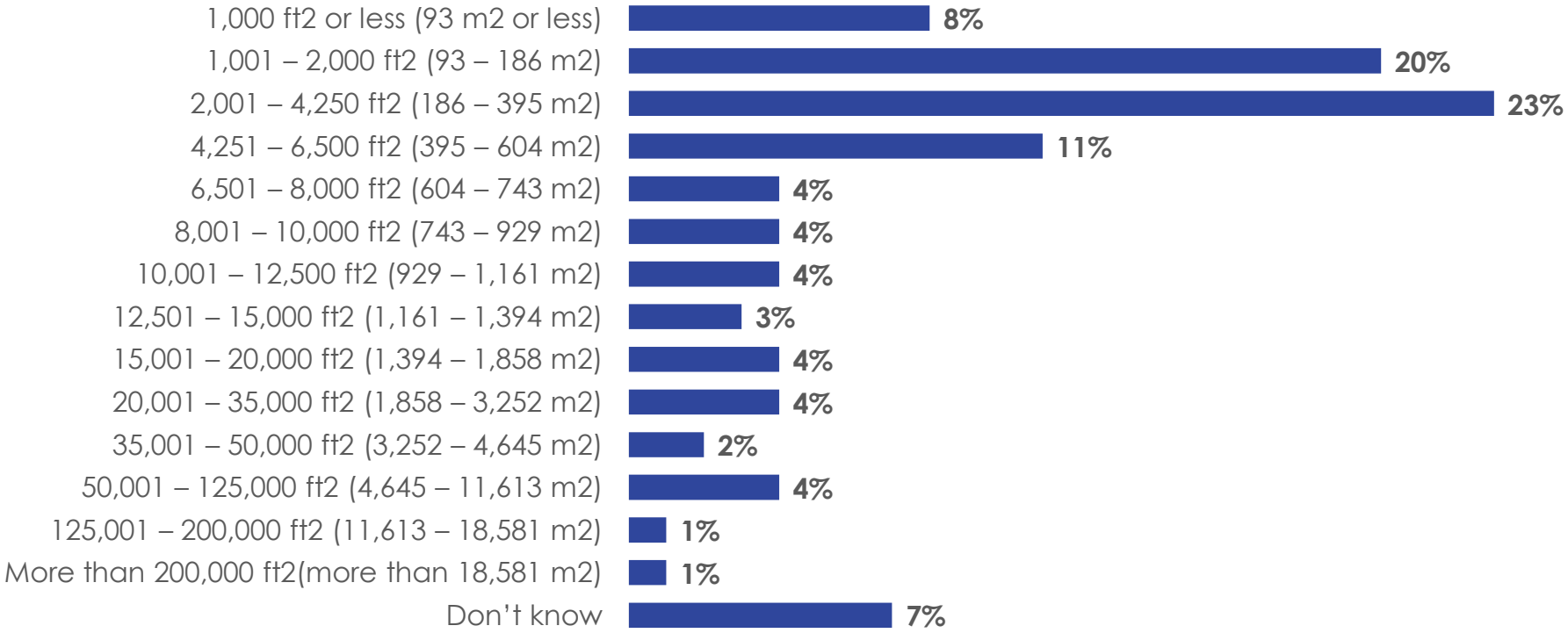
Base: Owns at least part of the building (n=945)
Q14. What is the approximate square footage or floorspace of this building?

Square Footage Occupied By Organization



Base: Leases building (n=746)
Q16. What is the approximate square footage or floorspace of the area within this building occupied by your organization, including any common areas for which you are responsible?

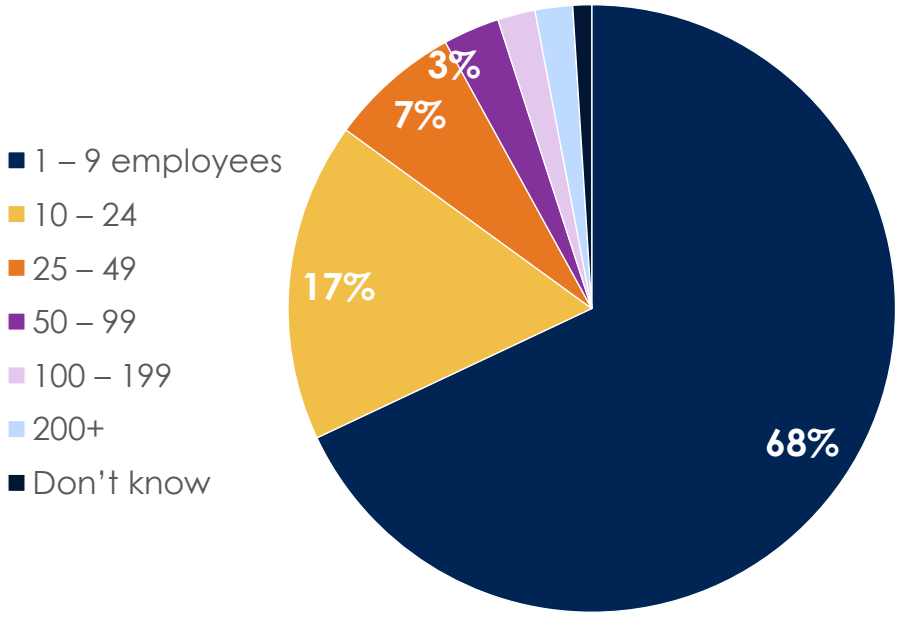
Square Footage or Floorspace of Heated Area



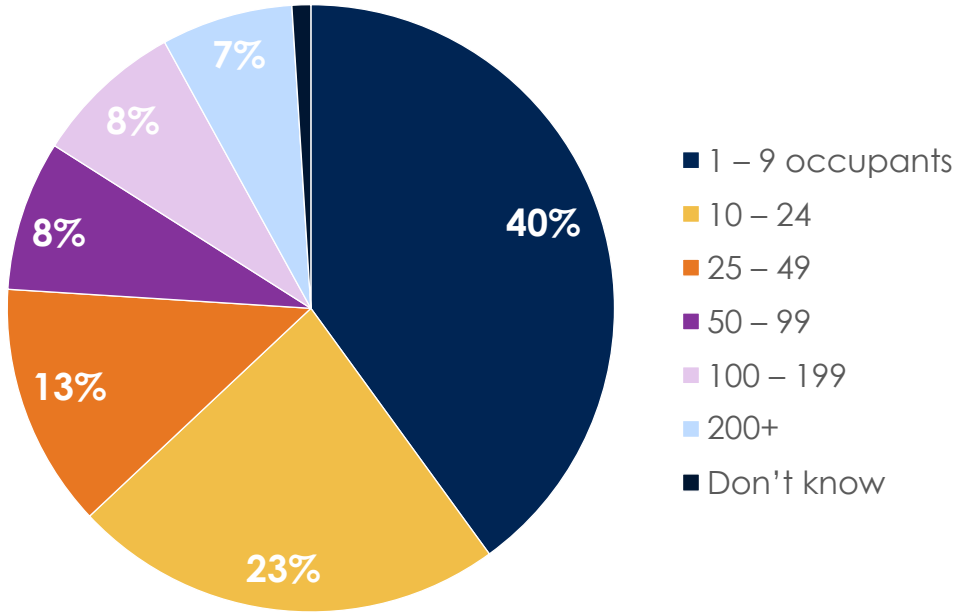
Base: All respondents (n=1547)
Q15a. What is the approximate square footage or floorspace of the heated area within [this building]?

Building Population During Standard Hours of Operation

Number of Employees



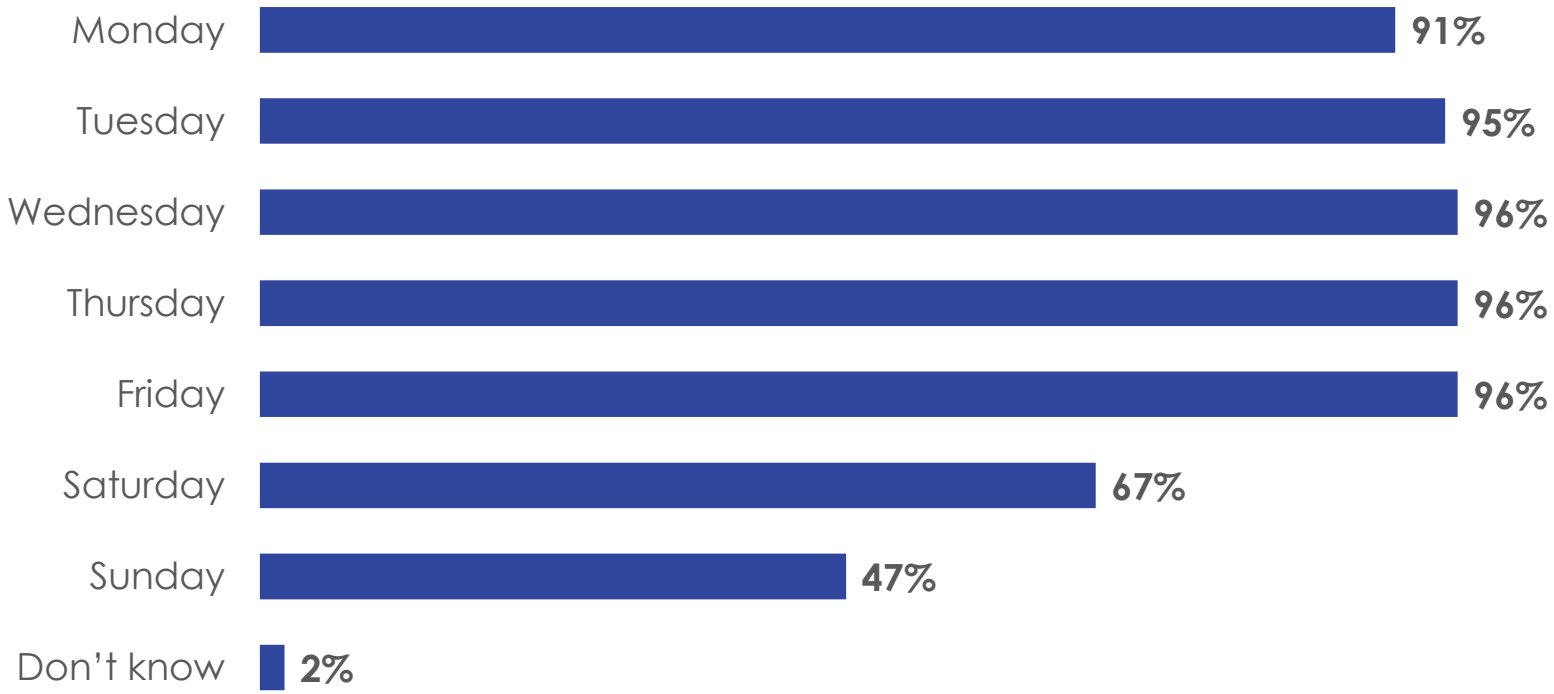
Number of Occupants



Data <3% not shown

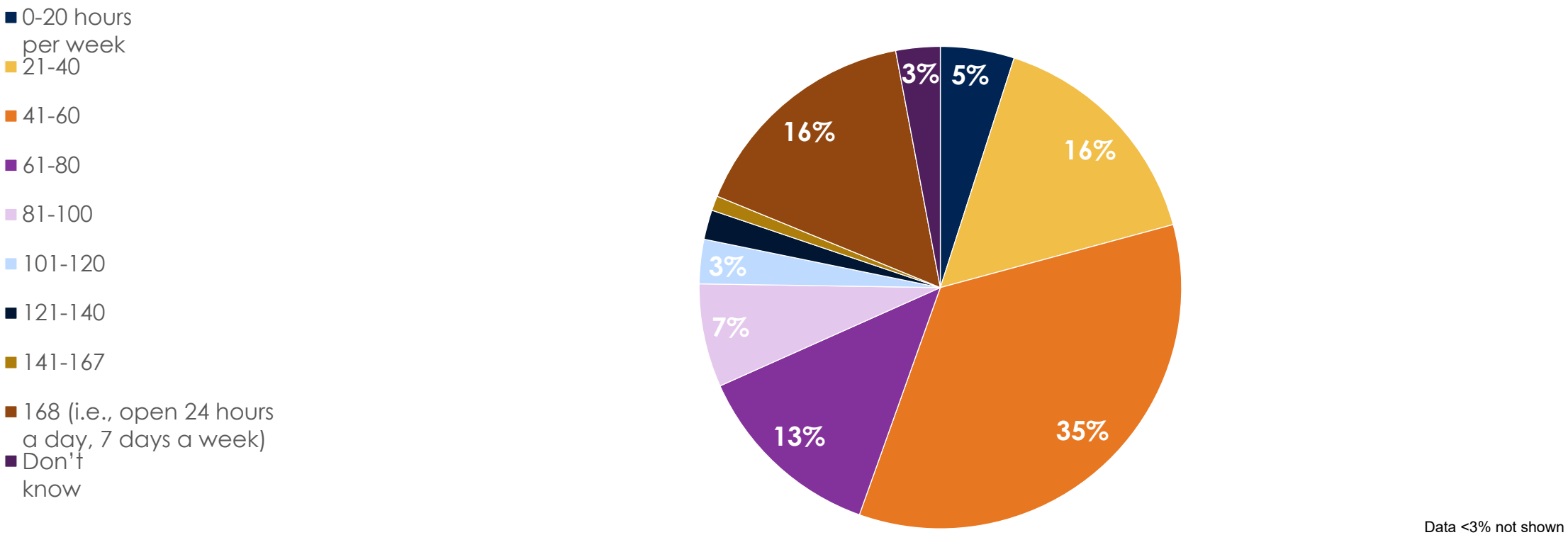
Base: All respondents (n=1691)
Q17. How many employees typically work in [this building] during standard hours of operation? If the number of employees working on-site has changed as a result of the COVID-19 pandemic, please answer based on your typical pre-COVID occupancy. [If Q12=2 or 3, replace the bracketed text with "this building (including tenant-occupied spaces)."
Base: Non-office based organization (n=724)
Q18. How many people typically occupy [this building] (including employees and customers or clients) during standard hours of operation? If occupancy has changed as a result of the COVID-19 pandemic, please answer based on your typical pre-COVID occupancy.

Days of the Week Building is Occupied



Base: All respondents (n=1691)
Q19. Which days of the week is this building typically occupied (not including after-hours operations such as cleaning or security patrols)?

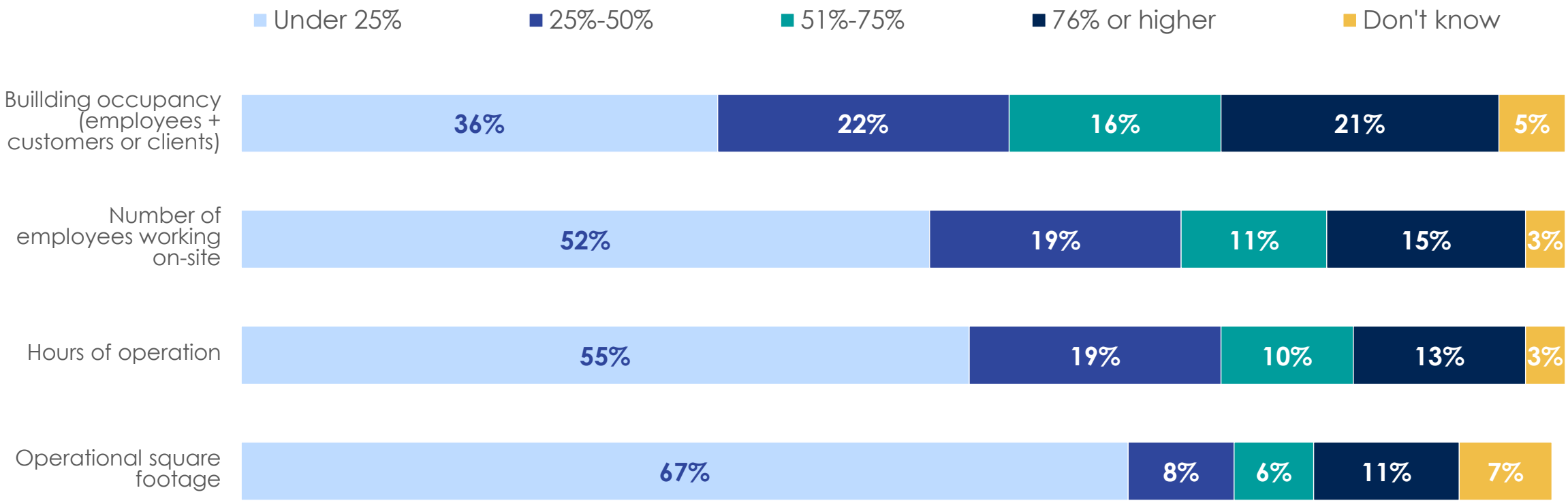
Operating Hours Per Week



Data <3% not shown

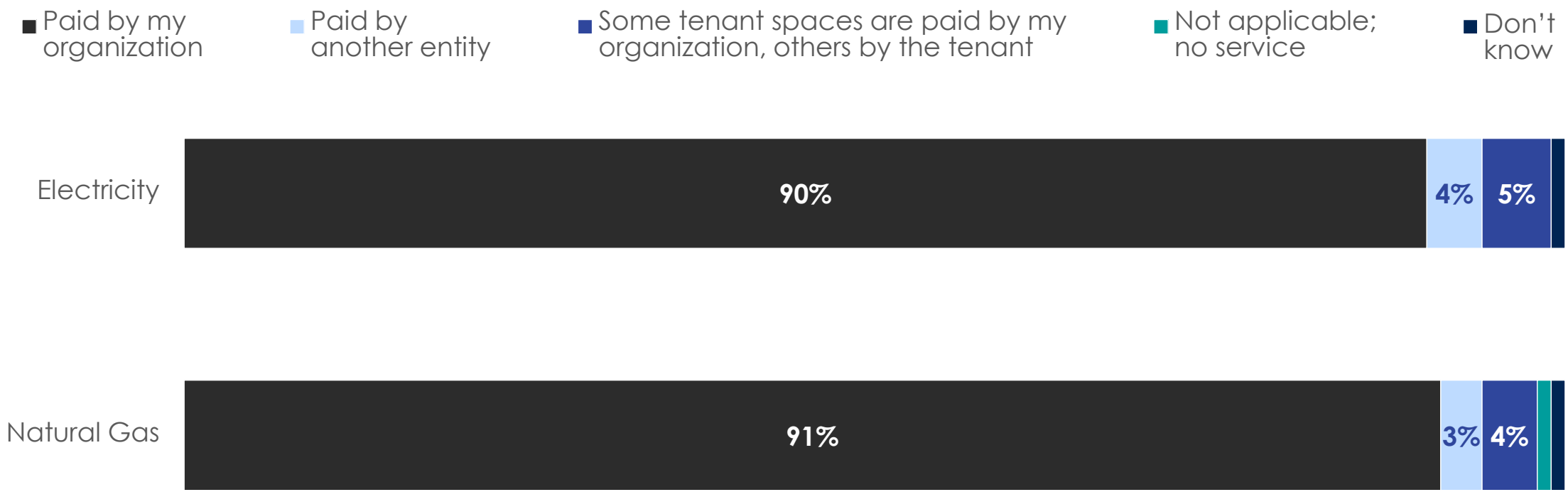
Base: All respondents (n=1691)
Q20. How many hours per week is this building typically operating? By "typically operating" we mean the hours in which the building is used for the primary building activity and most energy-using equipment is in operation. After-hours operations such as cleaning or security patrols should be excluded.

Effect of COVID-19 on Operating Reductions



Base: All respondents (n=1547)
Q21. Did the COVID-19 pandemic result in any of the following operating reductions at this location? What, if any, percentage reduction have you observed in these metrics since March 15th, 2020.

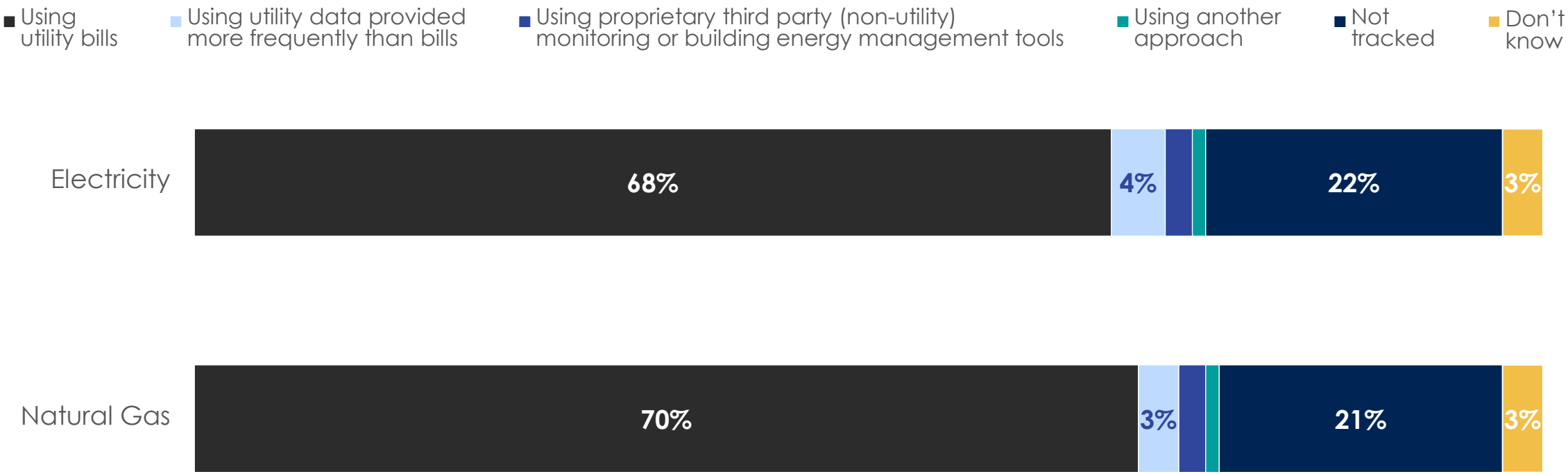
Utility Bill Responsibility



Data <3% not shown

Base: All respondents (Base Varies)
Q23. Who pays the utility bills for [this building] or the % of the building occupied by your organization?

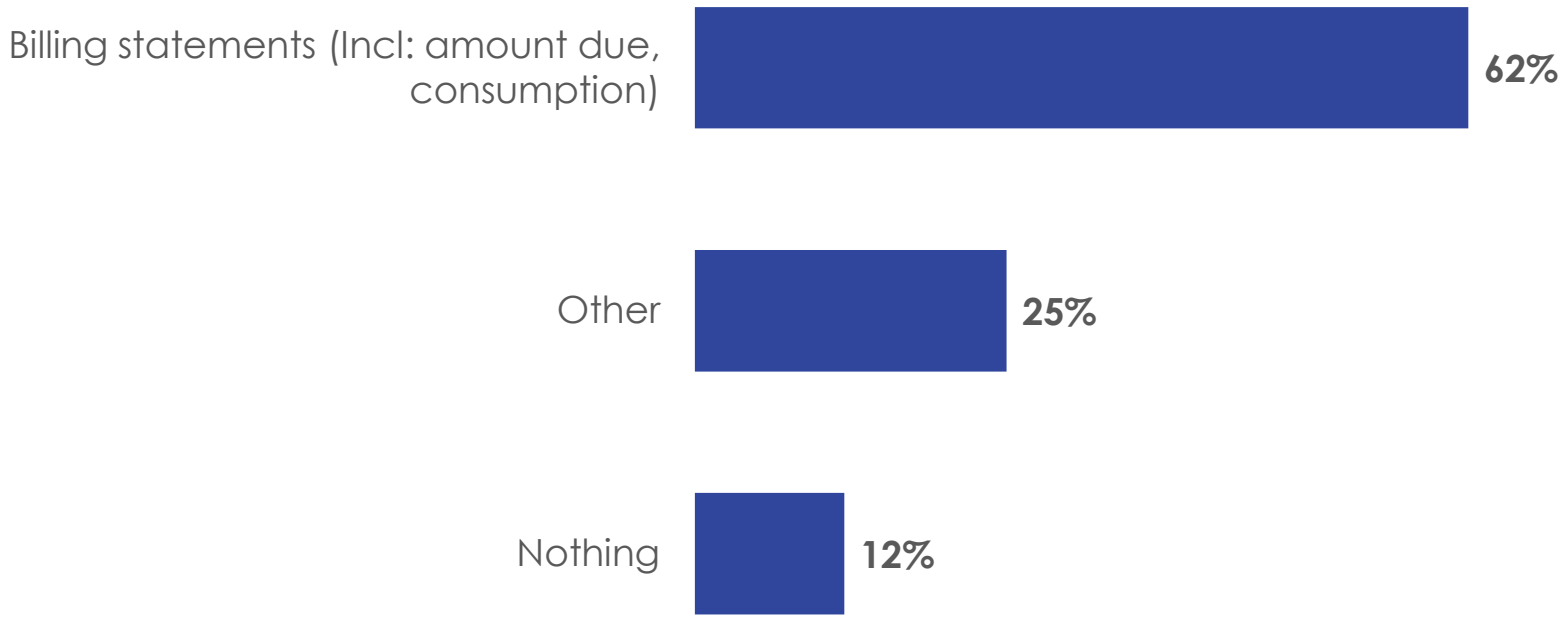
Method Used to Track Energy Consumption Data



Data <3% not shown

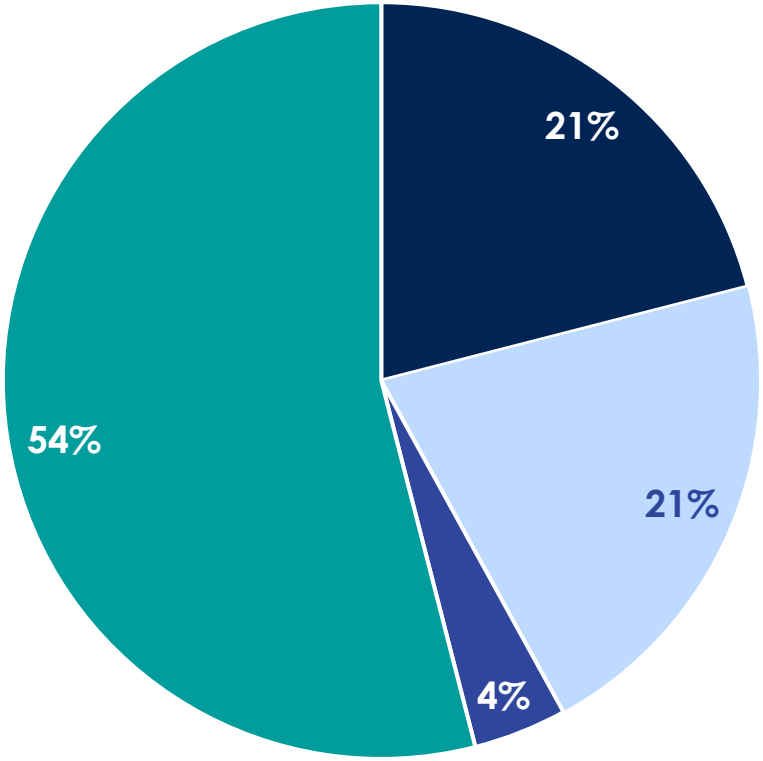
Base: Organization pays bill (n=Base Varies)
Q24. Does your organization track energy consumption data for [this building] by using the following?

Other Approaches to Tracking Energy Consumption



Base: Use other approach to tracking energy consumption (n=8)
Q24aa. And what other approach does your organization use to track energy consumption?

Building Electricity Rate Class

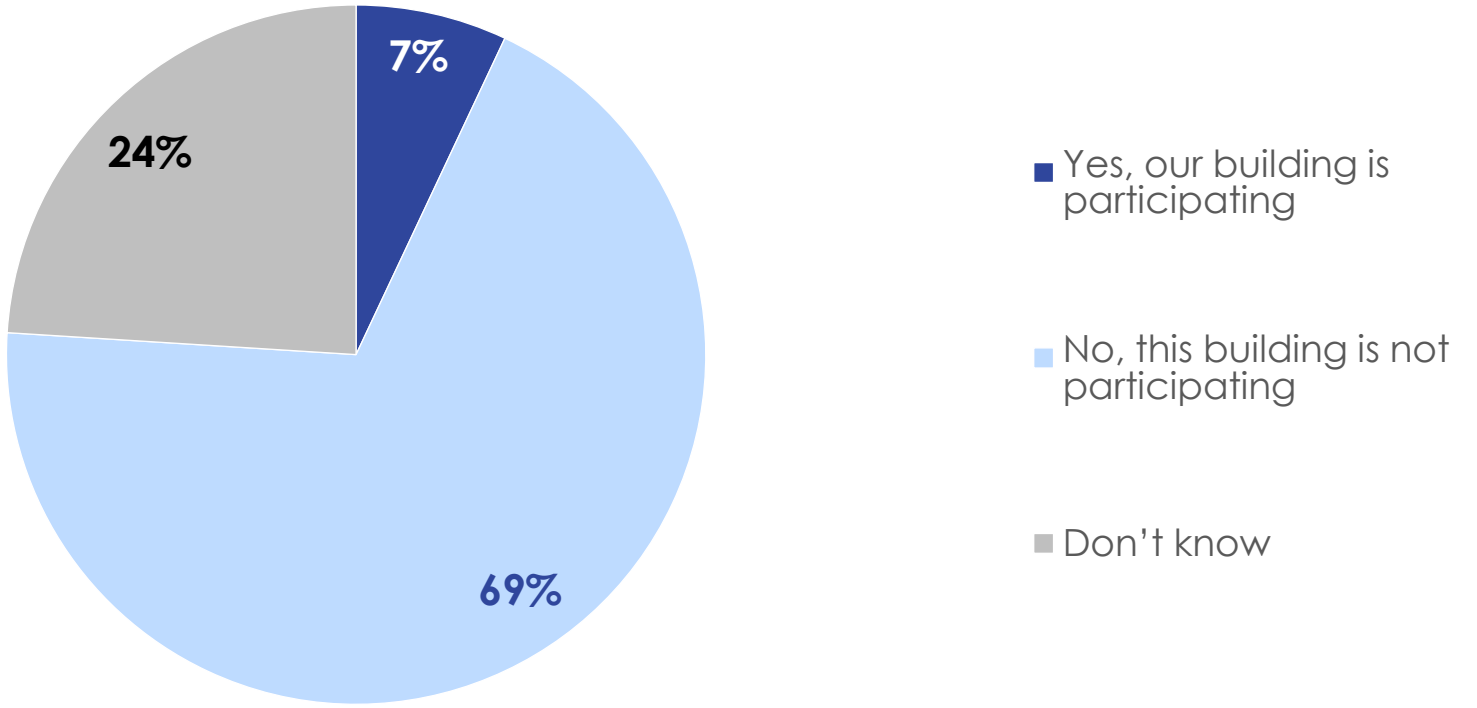


- General Service (less than 50 kW)
- General Service (more than 50 kW)
- Large Use (Sub Transmission)
- Don't know

Base: Organization pays bill (n=1609)
Q25. What electricity rate class is [this building] in?

Participation in IESO Industrial Conservation Initiative

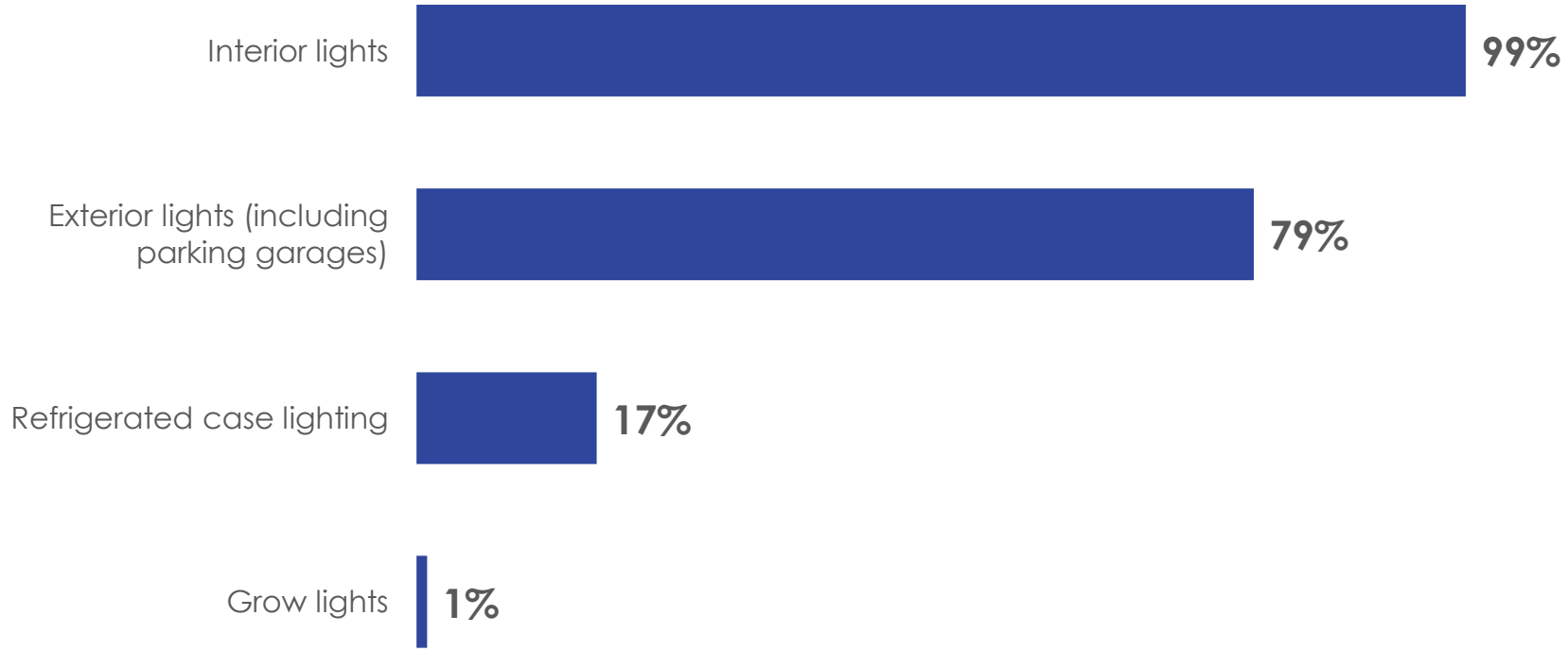
Program Definition: The Industrial Conservation Initiative (ICI) is a form of demand response that allows participating customers to manage their global adjustment (GA) costs by reducing demand during peak periods. Customers who participate in the ICI, referred to as Class A, pay GA based on their percentage contribution to the top five peak Ontario demand hours (i.e., peak demand factor) over a 12-month 1base period.



Base: Electricity rate class more than 50kW (n=402)
Q26. Are you currently participating in the IESO Industrial Conservation Initiative? <include program definition text below question as text box> This program is related to electricity use, and allows participating customers, known as "Class A" customers to manage their global adjustment electricity costs by reducing demand during five peak periods per year.

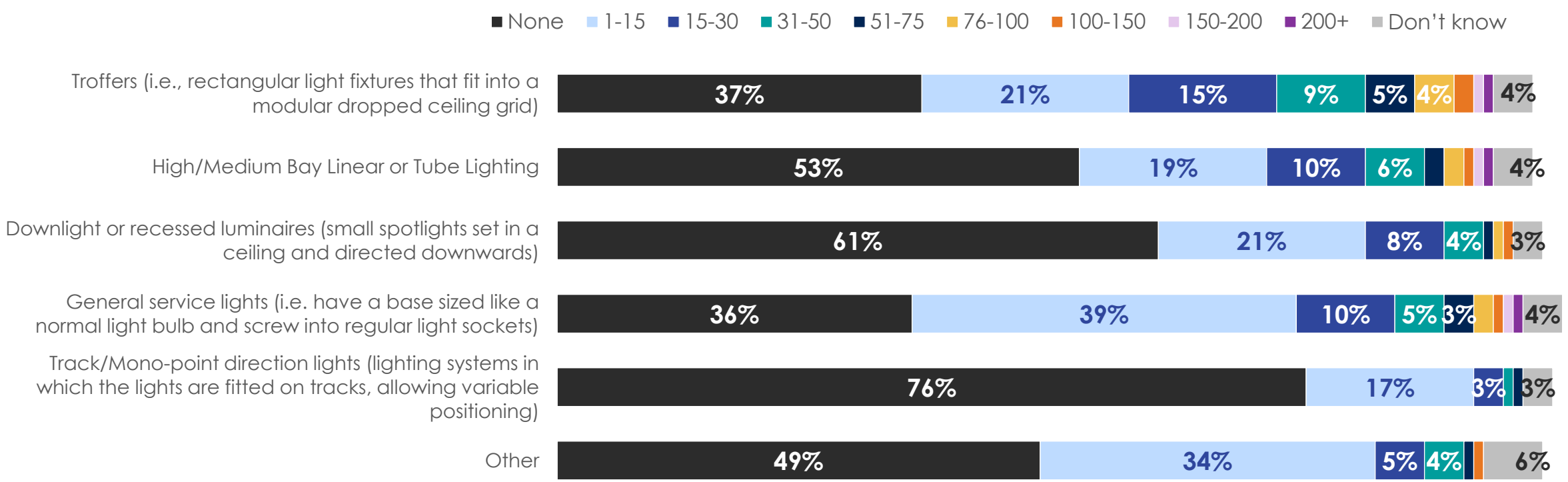
LIGHTING

Lighting Types



Base: All respondents (n=1552)
Q27. Which of the following types of lighting are present at this building?

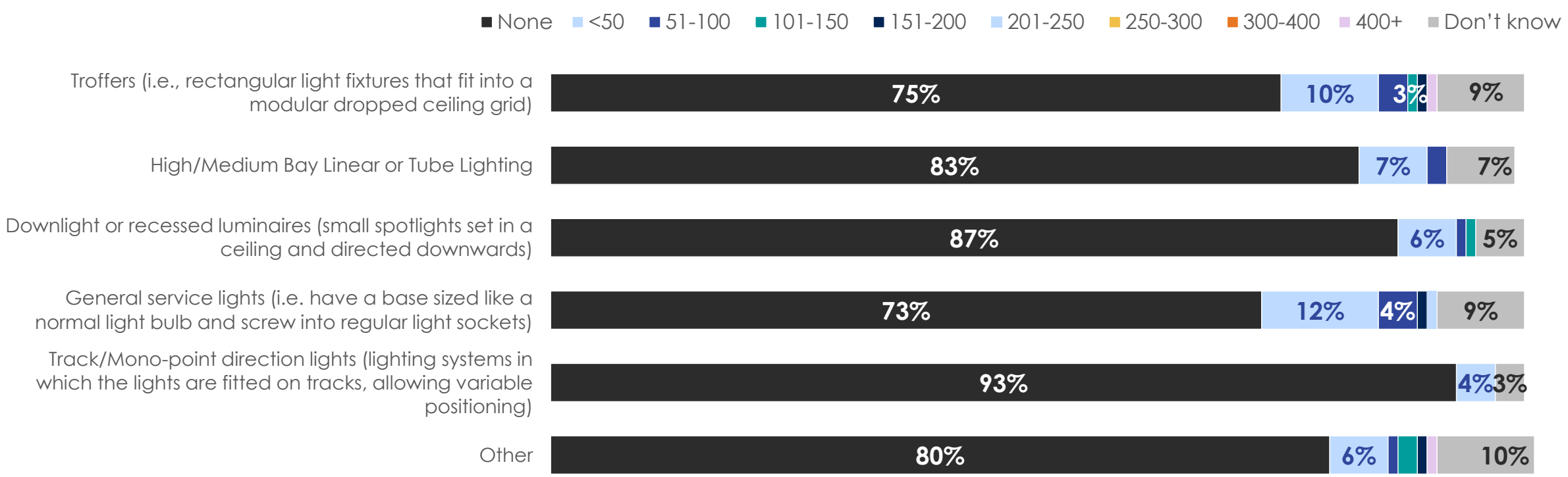
Number of Interior Light Bulbs (Smaller Square Footage)



Data <3% not shown

Base: Interior lights used in building (Base varies)
Q28. Approximately how many interior light bulbs do you have inside this building by fixture type? For each fixture type, think about the average number of bulbs per fixture and the approximate total number of fixtures in the building, and then multiply those two numbers to estimate the total number of bulbs. For example, if you have 10 fixtures of this type, and 2 bulbs per fixture, you would have 20 bulbs. [Matrix style question; answer categories in columns will vary based on response to Q14 or Q16 (square footage)]

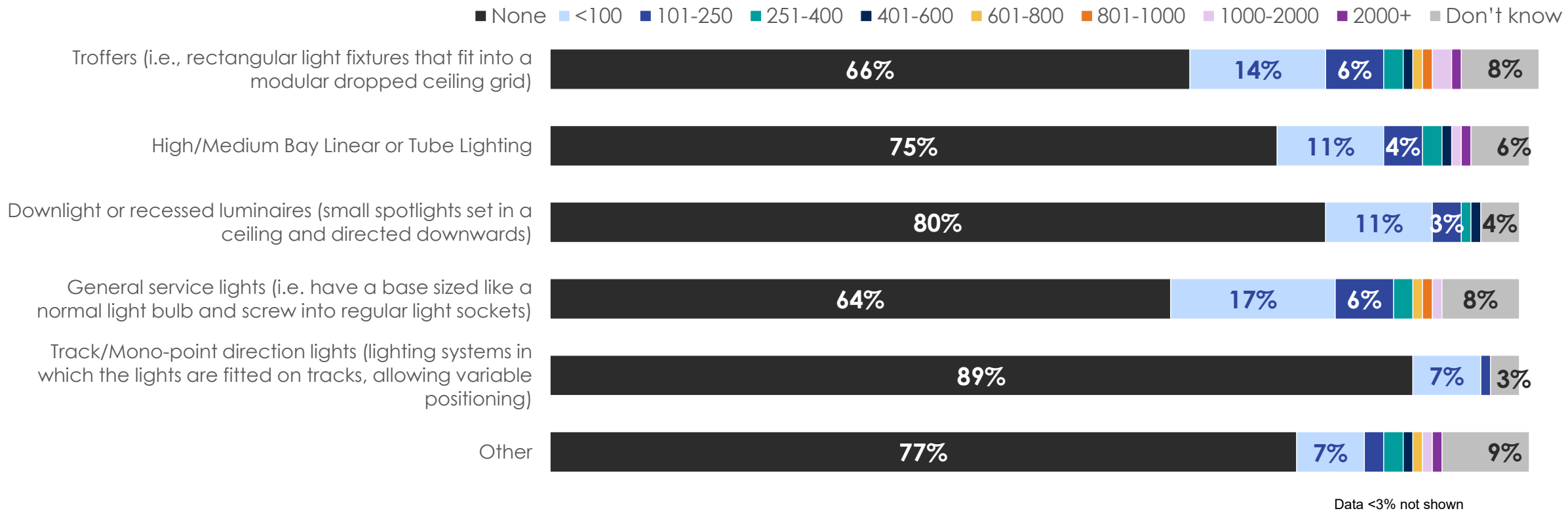
Number of Interior Light Bulbs (Medium Square Footage)



Data <3% not shown

Base: Interior lights used in building (Base varies)
Q28. Approximately how many interior light bulbs do you have inside this building by fixture type? For each fixture type, think about the average number of bulbs per fixture and the approximate total number of fixtures in the building, and then multiply those two numbers to estimate the total number of bulbs. For example, if you have 10 fixtures of this type, and 2 bulbs per fixture, you would have 20 bulbs. [Matrix style question; answer categories in columns will vary based on response to Q14 or Q16 (square footage)]

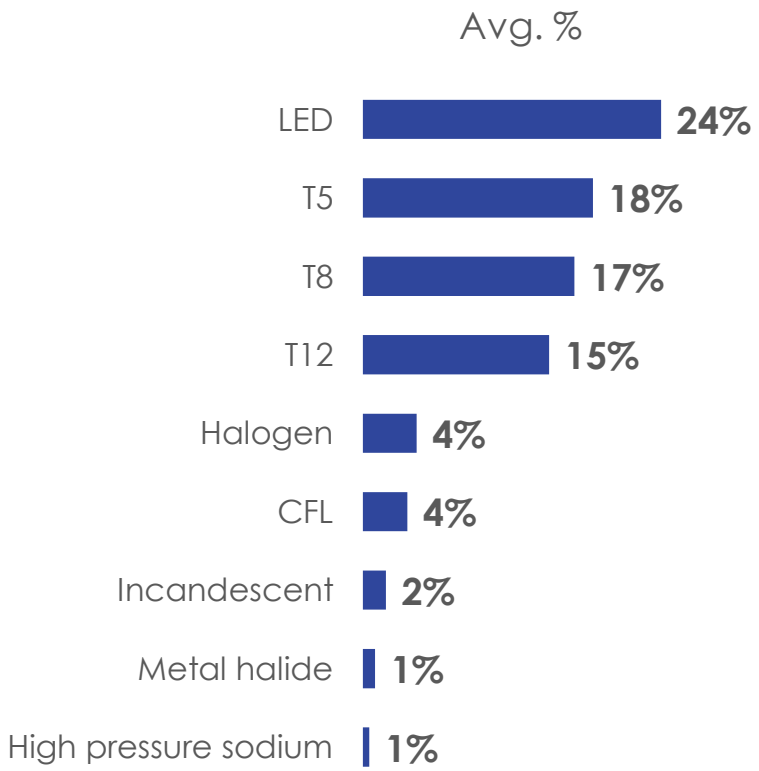
Number of Interior Light Bulbs (Larger Square Footage)



Data <3% not shown

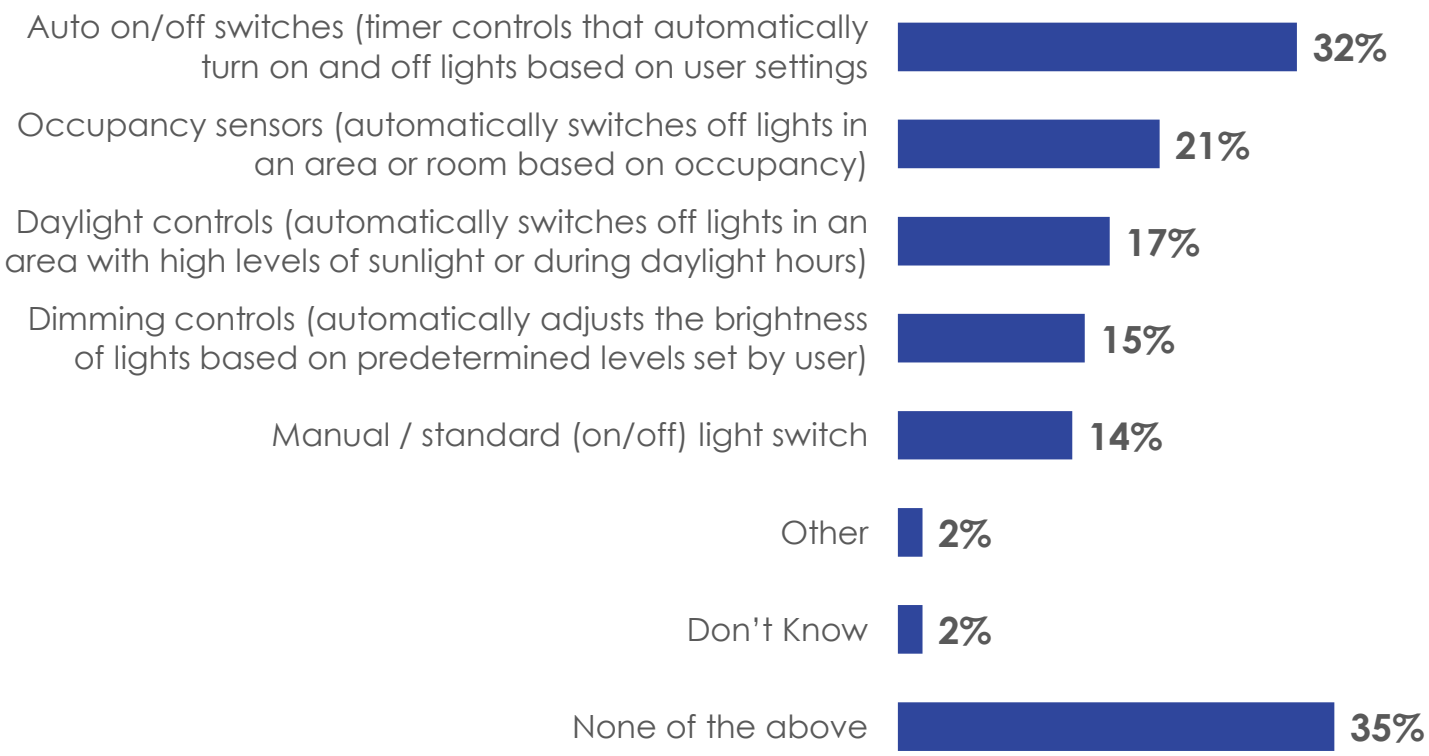
Base: Interior lights used in building (Base varies)
Q28. Approximately how many interior light bulbs do you have inside this building by fixture type? For each fixture type, think about the average number of bulbs per fixture and the approximate total number of fixtures in the building, and then multiply those two numbers to estimate the total number of bulbs. For example, if you have 10 fixtures of this type, and 2 bulbs per fixture, you would have 20 bulbs. [Matrix style question; answer categories in columns will vary based on response to Q14 or Q16 (square footage)]

Interior Lighting Bulb Types



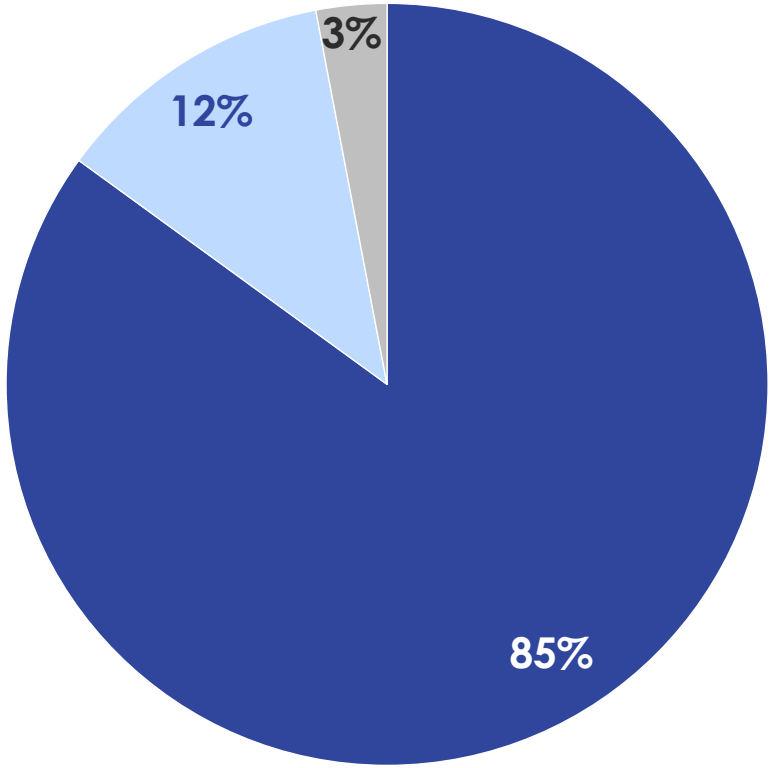
Base: Interior lights used in building (n=1538)
Q29. What percentage of the interior lighting in this building falls into the following bulb type categories? [Constant sum slider question type similar to that shown below; responses must add up to 100%; show increments of 5%; include Don't Know option]

Interior Lighting Controls



Base: Interior lights used in building (n=1538)
Q30. What types of lighting controls are used to control the interior lights in this building, if any?

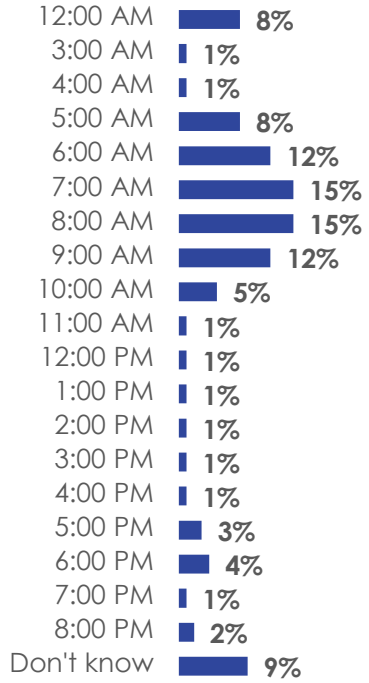
Interior Lighting Hours vs. Building Hours



Base: Interior lights used in building (n=1538)
Q31. Do the hours of use for the interior lights generally align with the building hours of use?

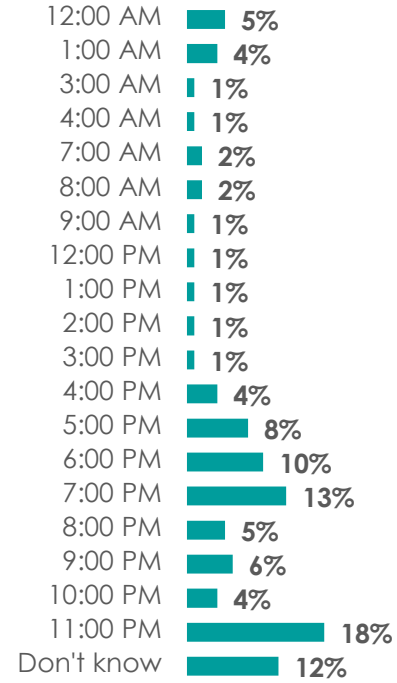
Interior Lights: Weekdays

WEEKDAY TURN ON TIME



Base: Interior lights on different schedule than rest of building (n=182)
Q32. On weekdays, what time do most interior lights typically turn on?

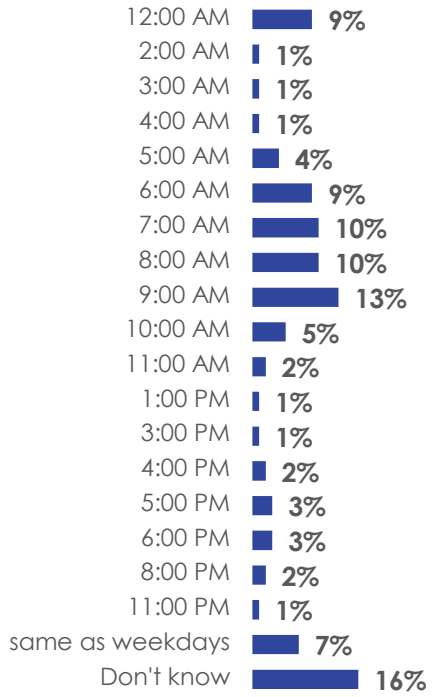
WEEKDAY TURN OFF TIME



Base: Interior lights on different schedule than rest of building (n=182)
Q33. On weekdays, what time do most interior lights typically turn off?

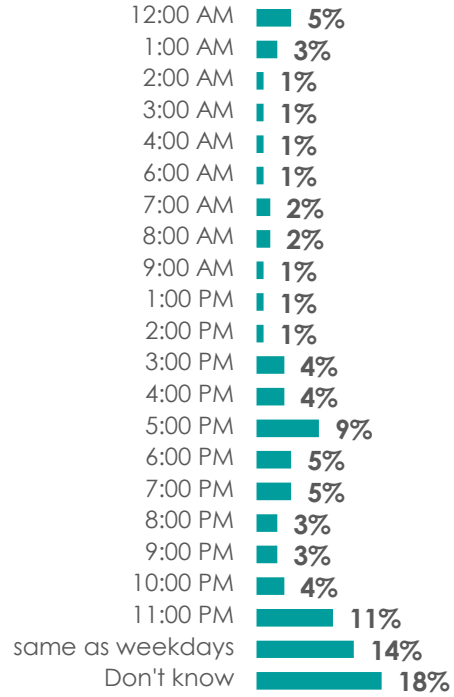
Interior Lights: Weekends

WEEKEND TURN ON TIME



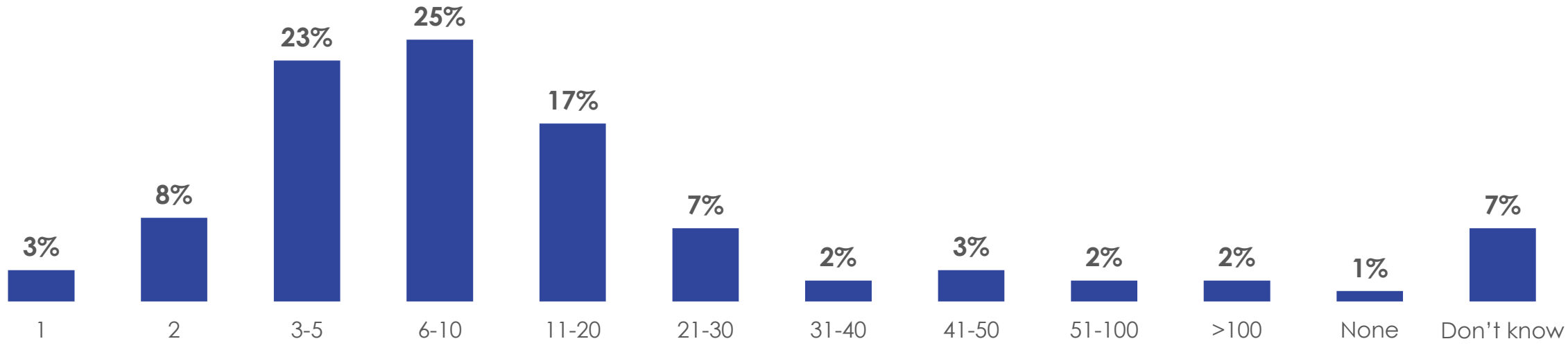
Base: Interior lights on different schedule than rest of building (n=182)
Q34. On weekends, what time do most interior lights typically turn on?

WEEKEND TURN OFF TIME



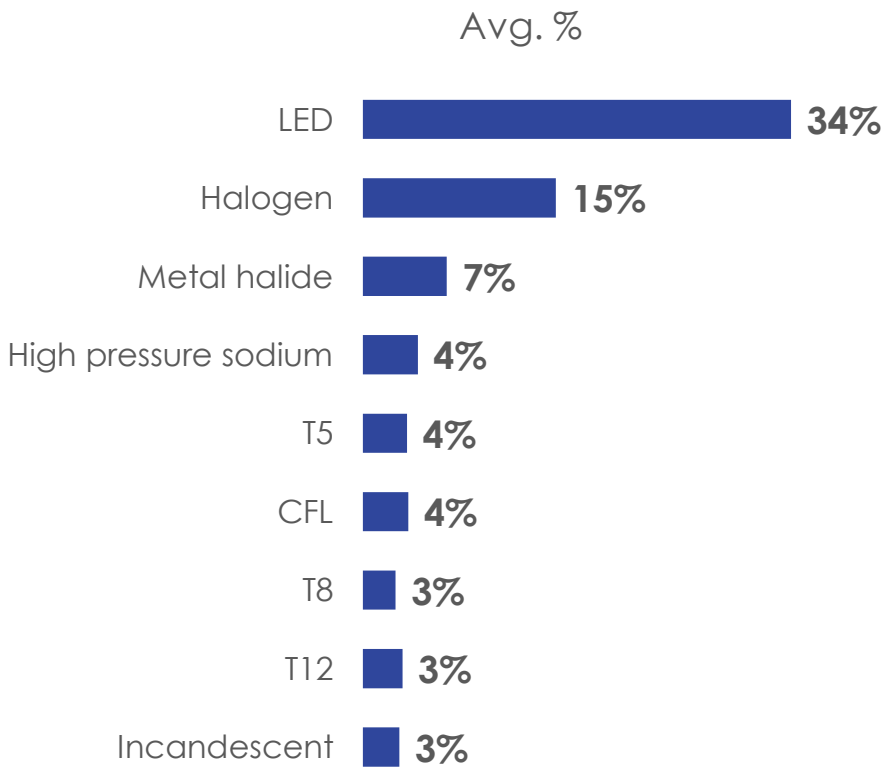
Base: Interior lights on different schedule than rest of building (n=182)
Q35. On weekends, what time do most interior lights typically turn off?

Number of Exterior Light Bulbs



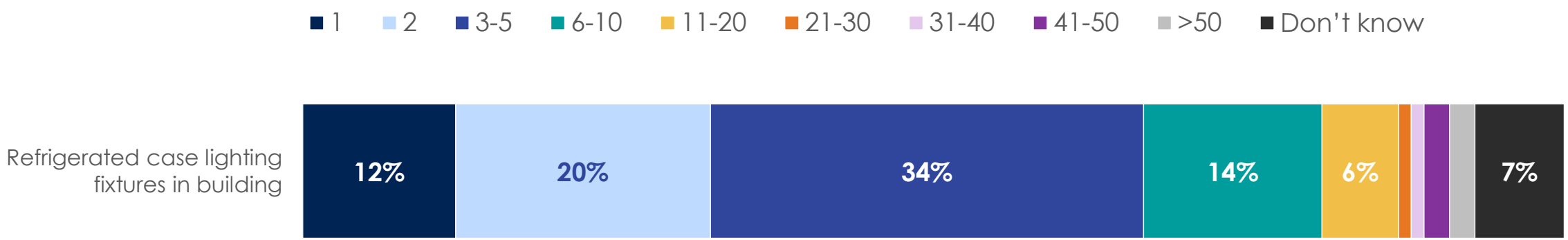
Base: Exterior lights used in building (n=1100)
Q36. Approximately how many exterior light bulbs are there at this building?

Exterior Lighting Bulb Types



Base: Exterior lights used in building (n=1027)
Q37. What percentage of the exterior lighting in this building falls into the following bulb type categories?

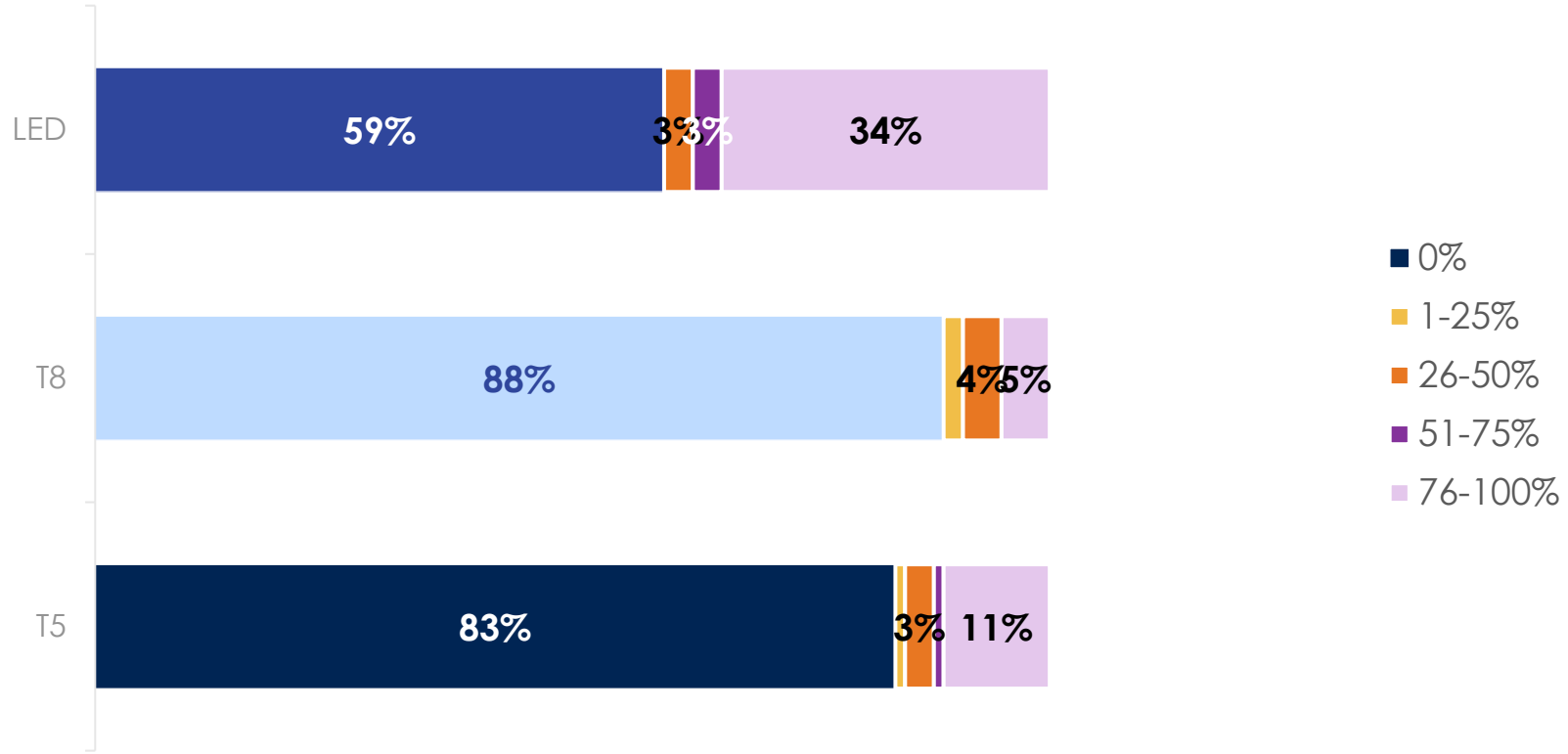
Refrigerated Case Lighting Fixtures



Data<3% not shown

Base: Refrigerated case lighting used in building (n=271)
Q38. Approximately how many refrigerated case lighting fixtures are there in this building?

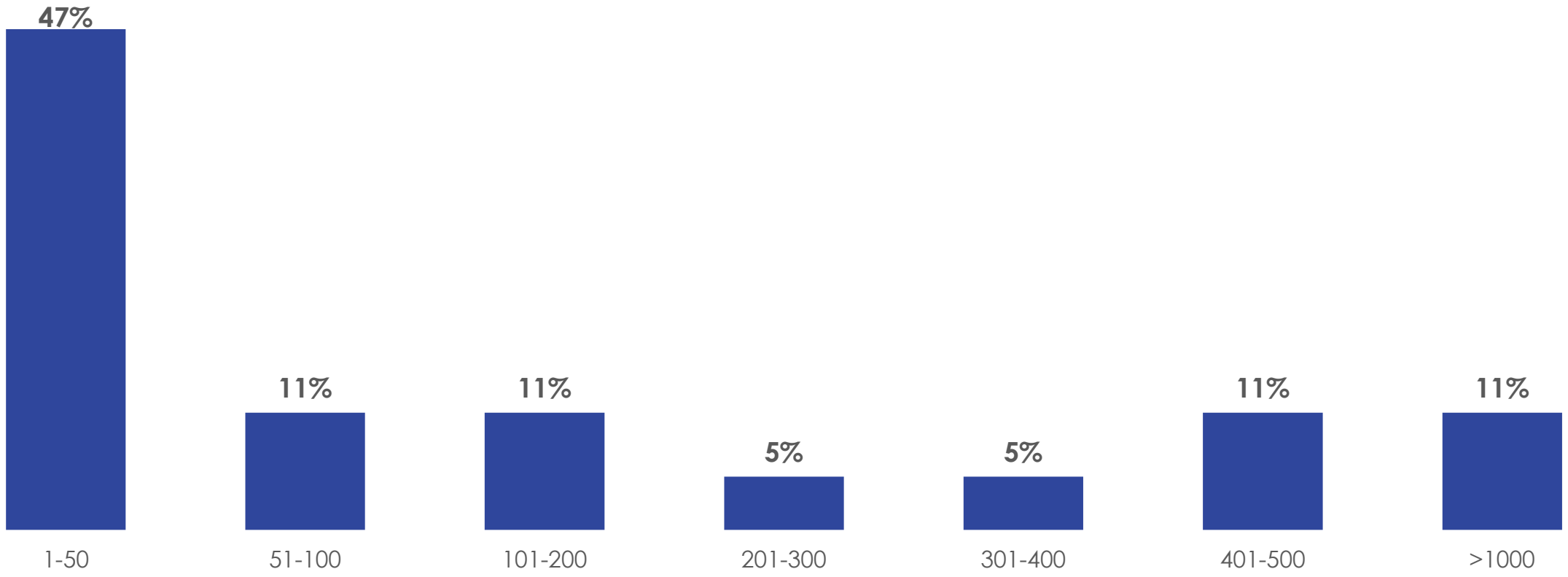
Refrigerated Case Lighting Bulb Types



Data<3% not shown

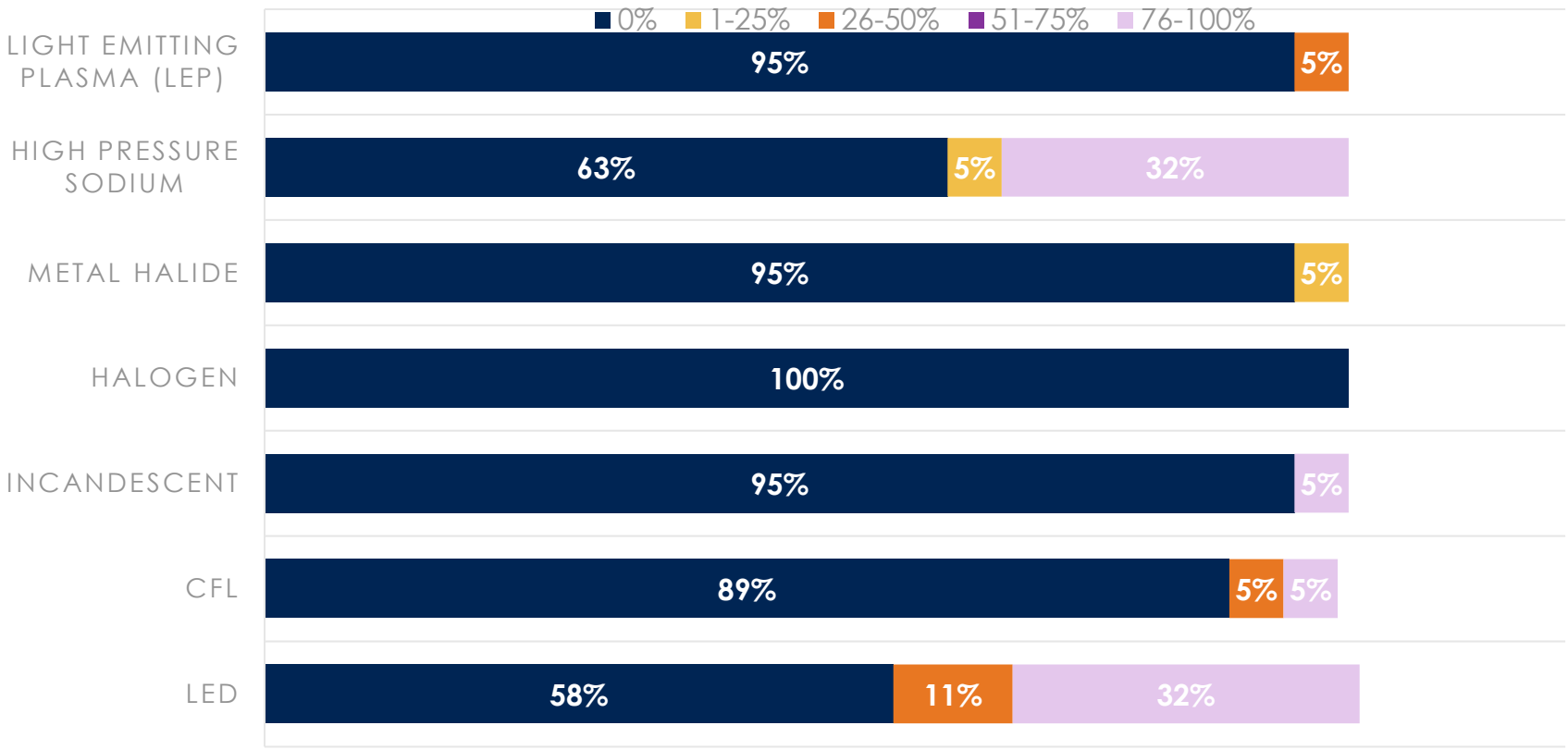
Base: Refrigerated case lighting used in building (n=271)
Q39. What percentage of the refrigerated case lighting in this building falls into the following bulb type categories?

Number of Grow Lights



Base: Grow lights used in building (n=19)
Q40. Approximately how many grow lights are there in this building?

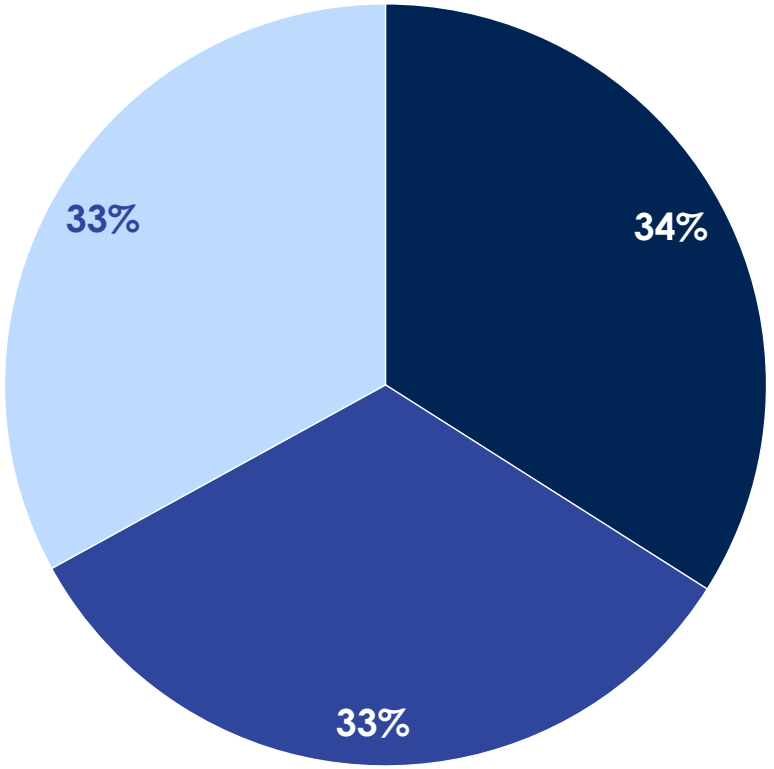
Grow Light Bulb Types



Base: Grow lights used in building (n=19)
Q41. What percentage of the grow lights in this building falls into the following bulb type categories?

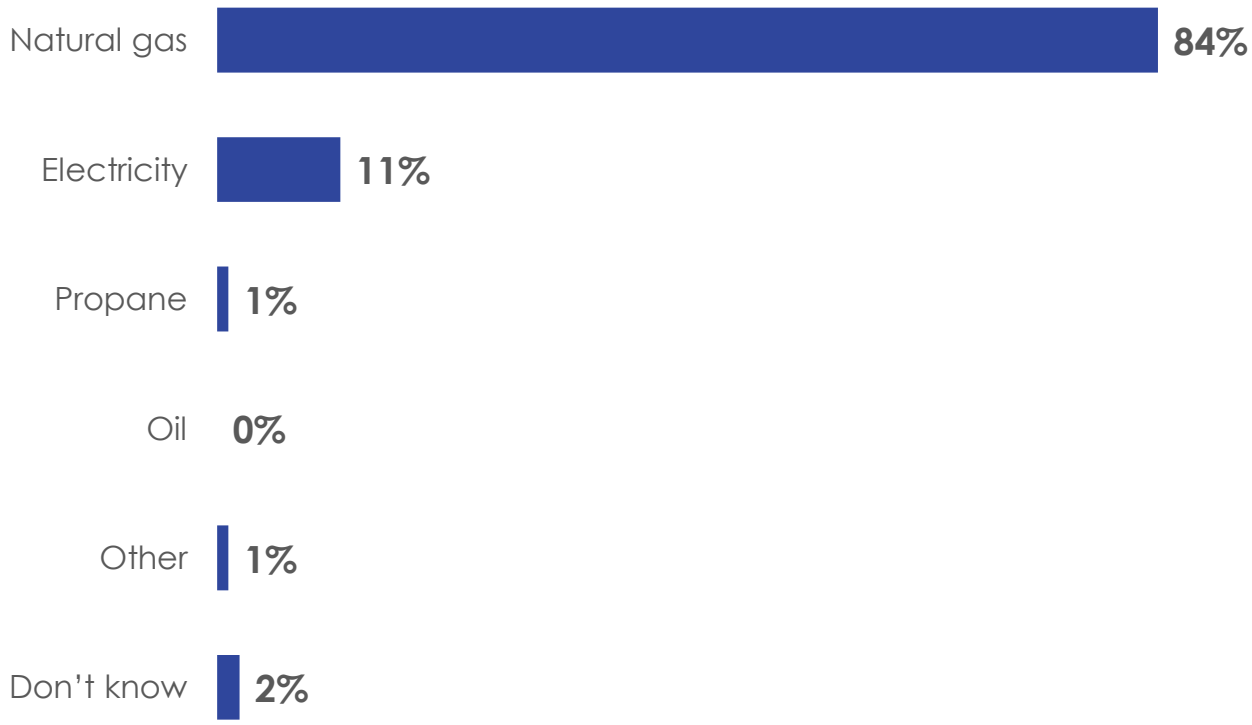
SPACE HEATING

Space Heating



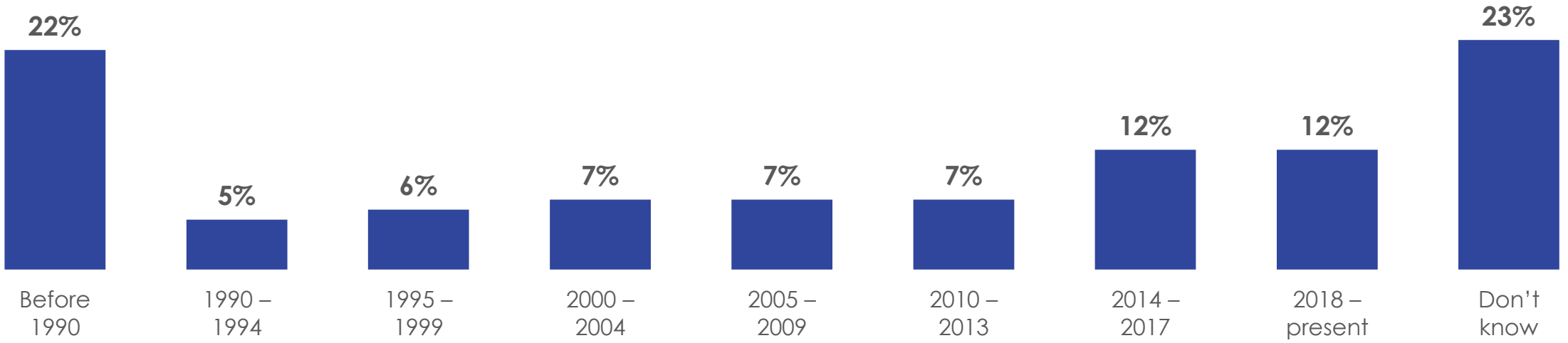
Base: Familiar with operation and/or maintenance of HVAC equipment (n=1407)
Q42. Do you have space heating in this building? If so, do you also have any supplementary heating systems in addition to the primary system?

Heating System Fuel Type



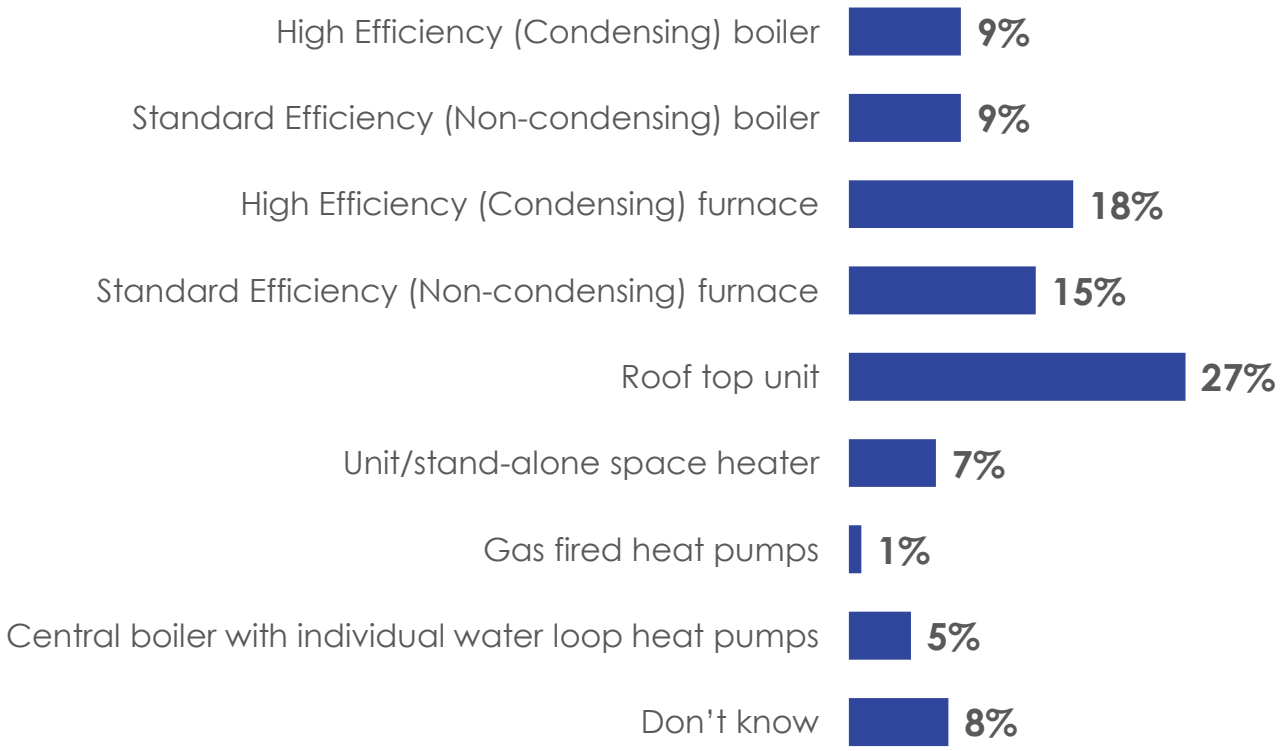
Base: Familiar with operation and/or maintenance of HVAC equipment (n=945)
Q43. What type of fuel does the primary heating system use?

Year of Primary Electricity Heating System Installation



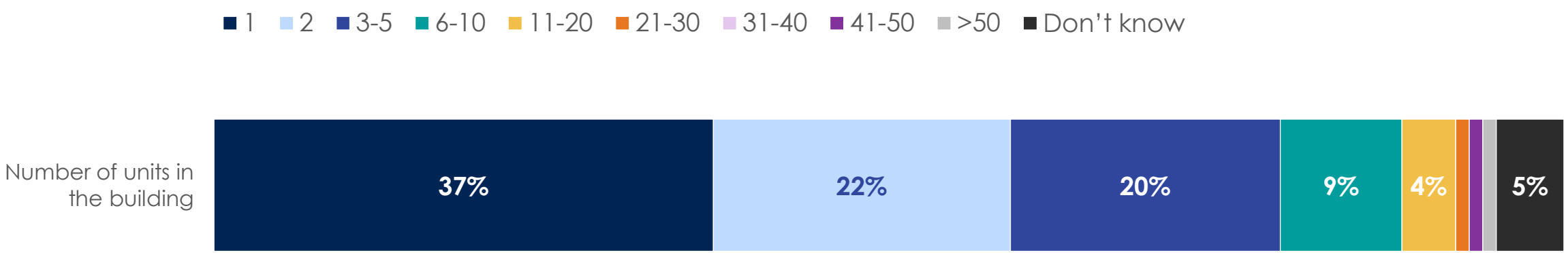
Base: Primary heating system uses electricity (n=103)
Q48. When was the primary heating system installed?

Primary Heating System Type (Natural Gas)



Base: Primary heating system uses natural gas (n=797)
Q49. What is the system type of the primary heating system for this building?

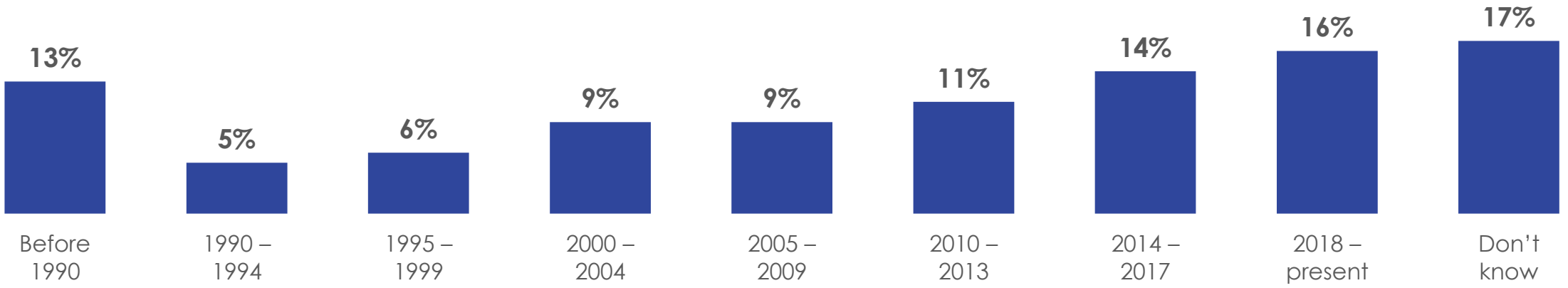
Number of Natural Gas Units



Data<3% not shown

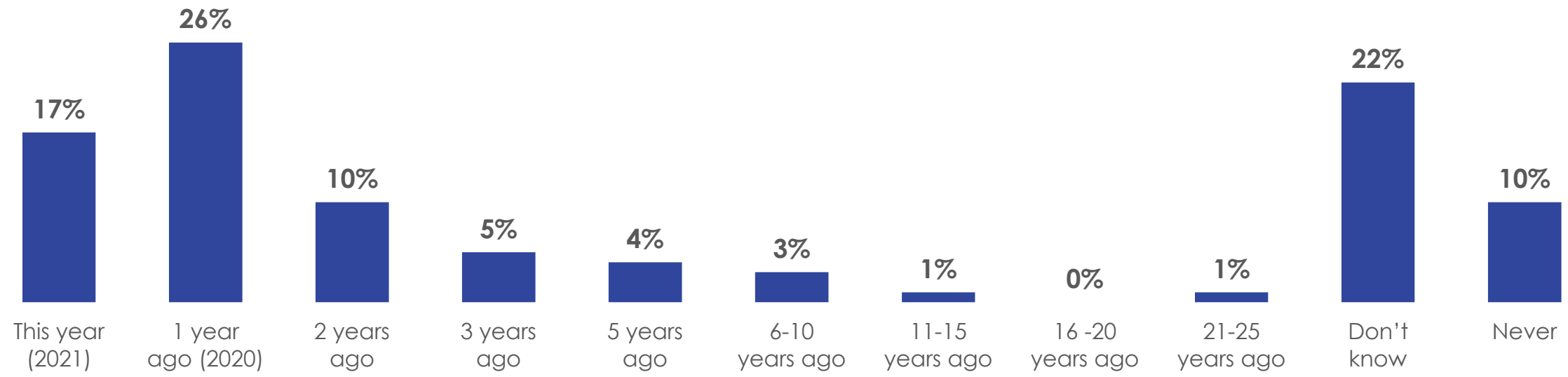
Base: Primary heating system uses natural gas (n=797)
Q50. How many [insert: response to Q49, if DK then no insert] units are in this building?

Year of Primary Natural Gas Heating System Installation



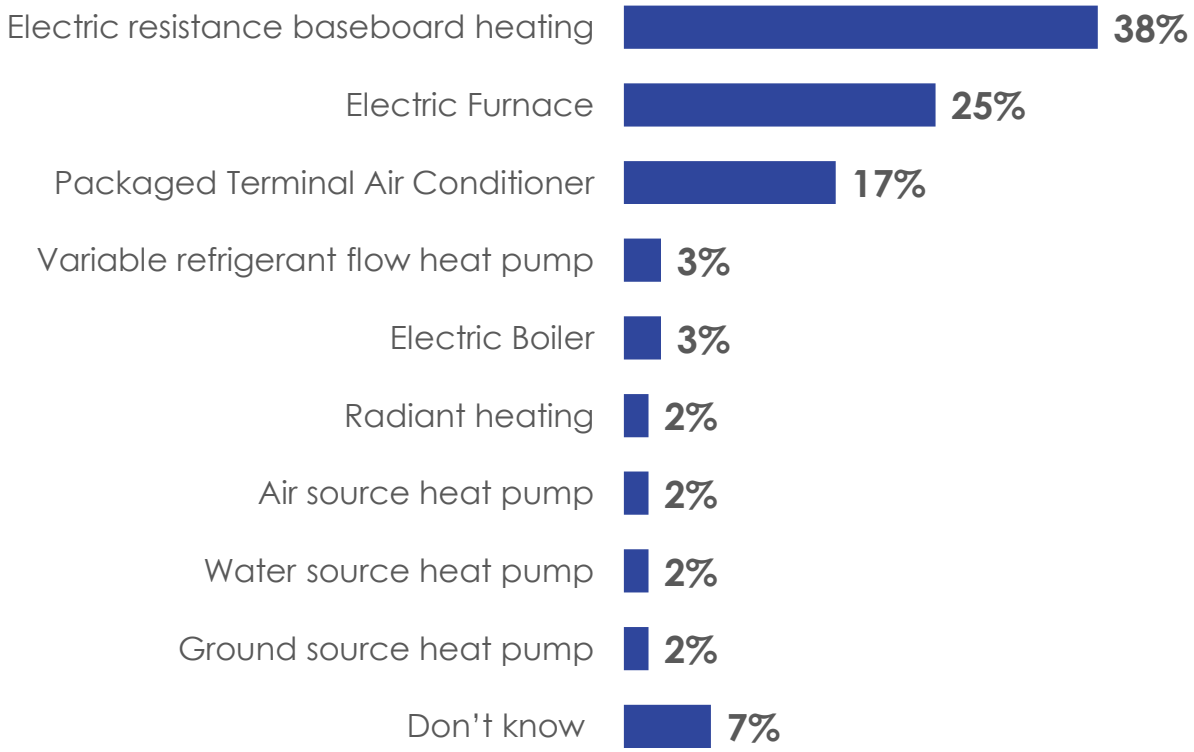
Base: Primary heating system uses natural gas (n=797)
Q51. When was the primary heating system installed?

Years Since Primary Gas Equipment Tuned or Optimized



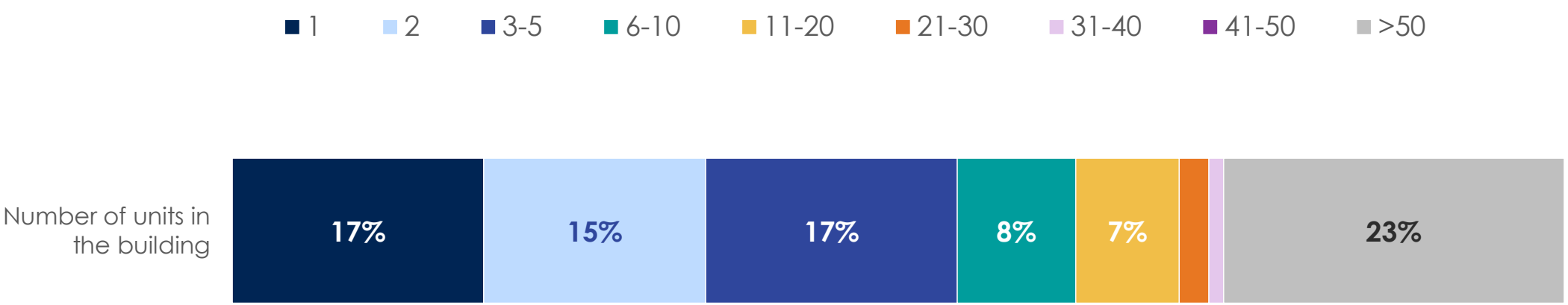
Base: Primary heating system uses natural gas (n=797)
Q52. How many years ago was the primary gas space heating equipment tuned up or optimized, if ever?

Primary Heating System Type (Electricity)



Base: Primary heating system uses electricity (n=103)
Q44. What is the system type of the primary heating system for this building?

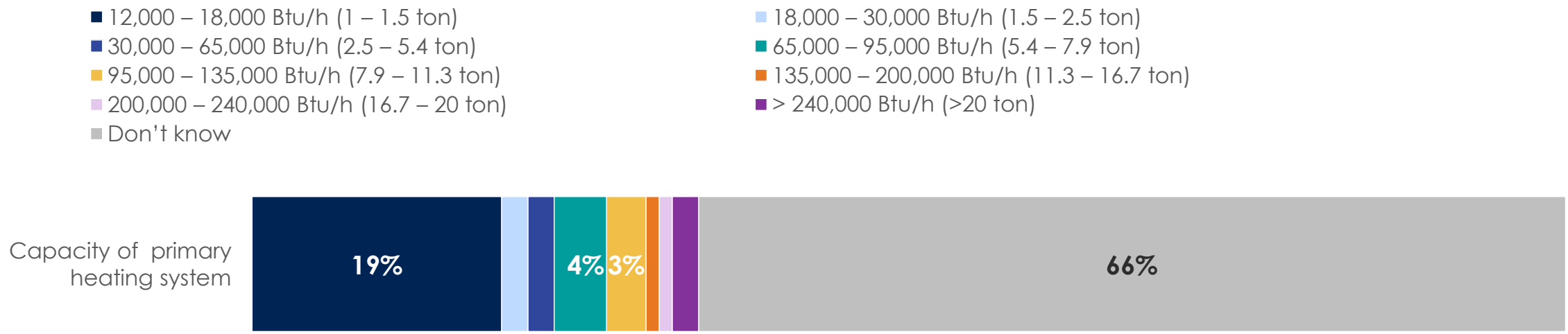
Number of Electricity Units



Data<3% not shown

Base: Primary heating system uses electricity (n=103)
Q45. How many [insert: response to Q44, if DK then no insert] units are in this building?

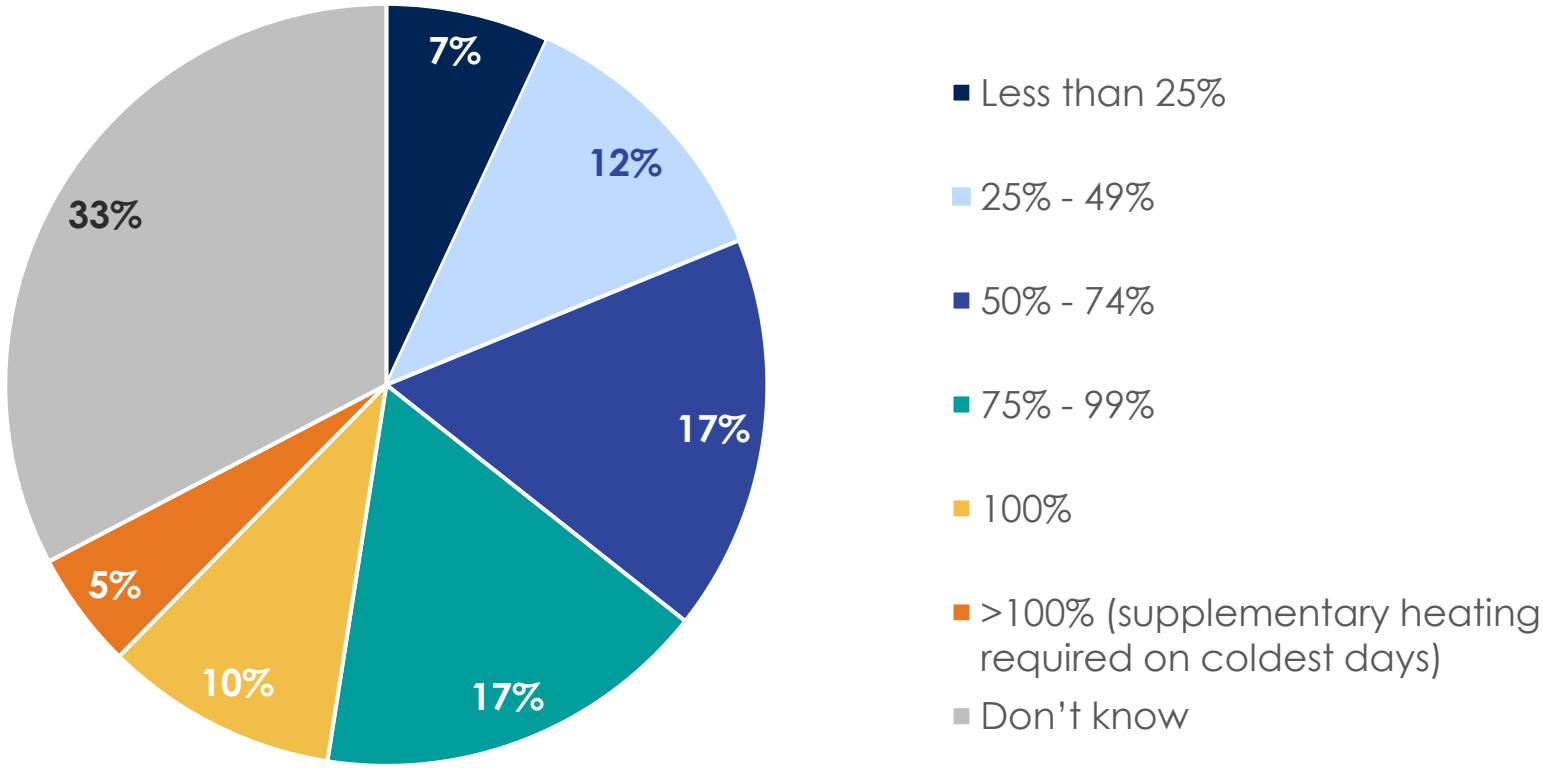
Primary Heating System Capacity



Data<3% not shown

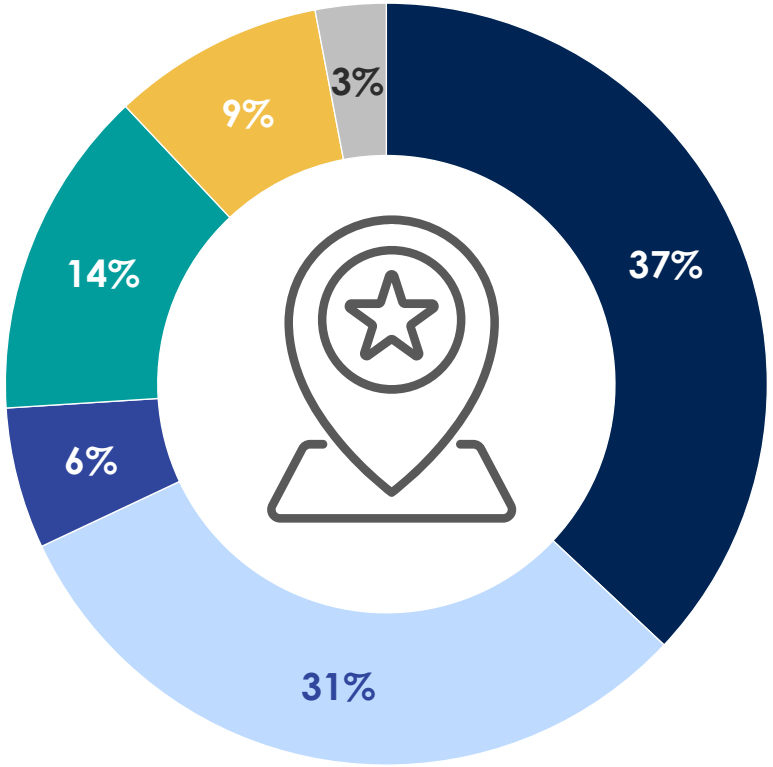
Base: Primary heating system uses electricity (n=103)
Q46. What is the capacity of the primary heating system?

Maximum Capacity Needed in Winter



Base: Primary heating system uses electricity (n=103)
Q47. Approximately what percentage of the primary heating equipment's maximum capacity is required to heat this building during the coldest months of the winter?

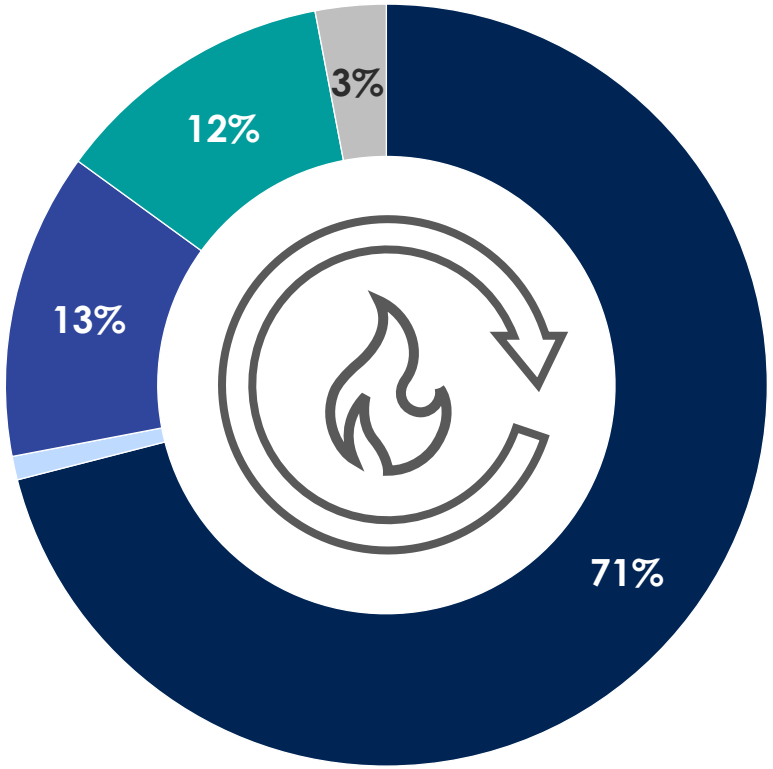
Location of Primary Heating System



- Boiler/furnace room
- Rooftop
- Closet or utility room on each floor
- Distributed system – located in each heated area
- Other
- Don't know

Base: Primary heating system uses electricity or natural gas (n=733)
Q53. Where is the heating system located within the building?

Heat Delivery Method



- Hot/Forced air
- Steam
- Hydronic system (Hot water fan coils radiators)
- Distributed system – located in each heated area (includes electric baseboard and radiant heating)
- Don't know

Data<3% not shown

Base: Primary heating system uses electricity or natural gas (n=807)
Q54. How is heat delivered through this building?

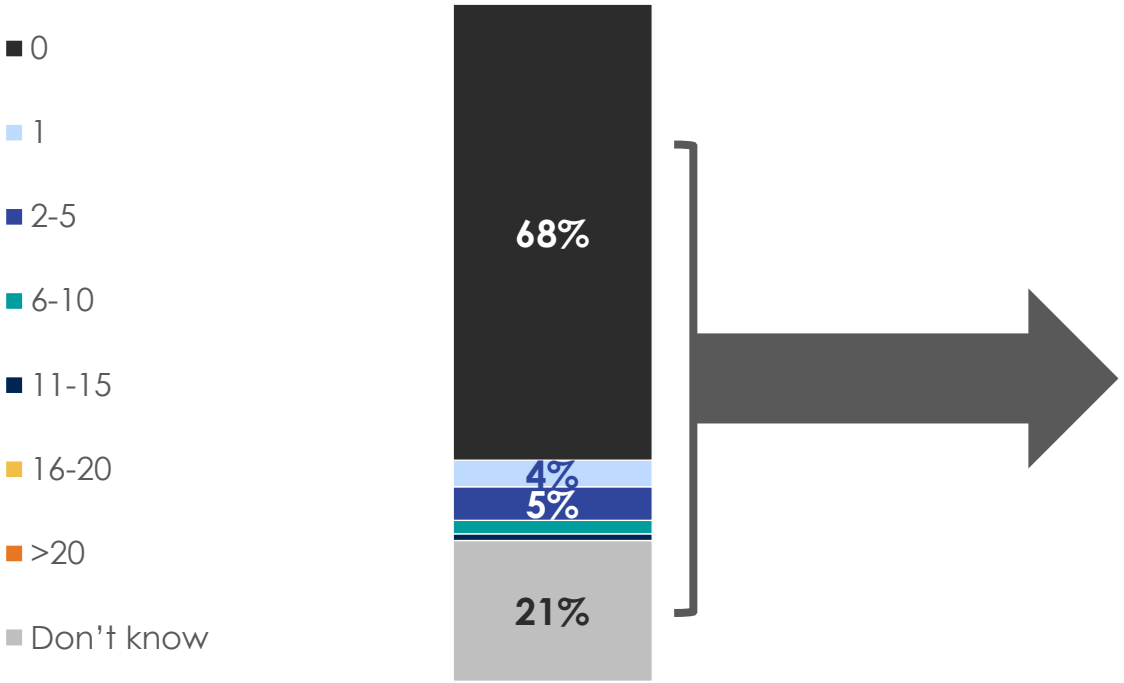
Supplementary Heating System Type

Data<3% not shown

Base: Building has primary and supplementary heating systems (n=432)
Q55. What is the system type of supplementary heating for this building?

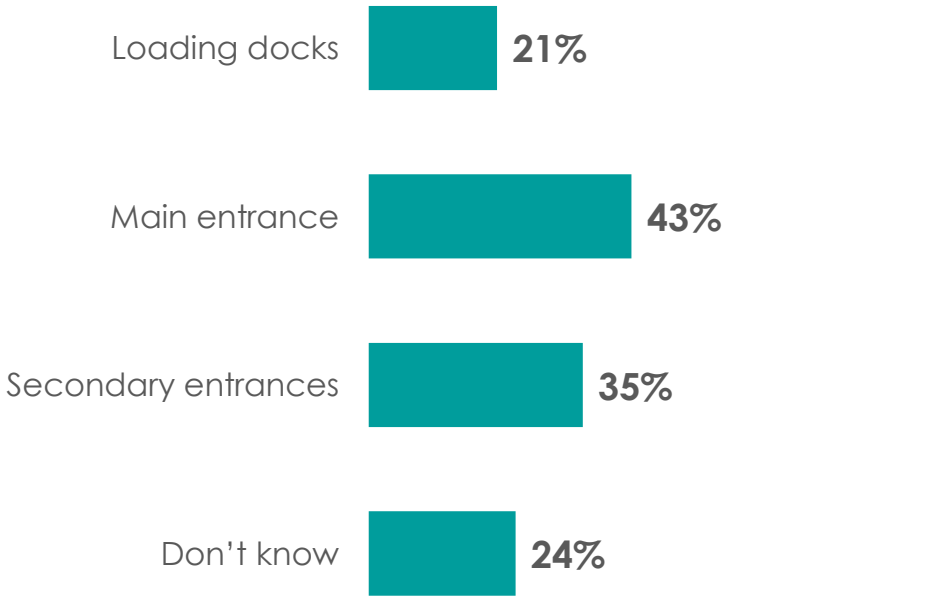
Air Curtains

NUMBER OF AIR CURTAINS



Base: Familiar with operation and/or maintenance of HVAC equipment (n=945)
Q56. How many air curtains do you have in this building, if any?

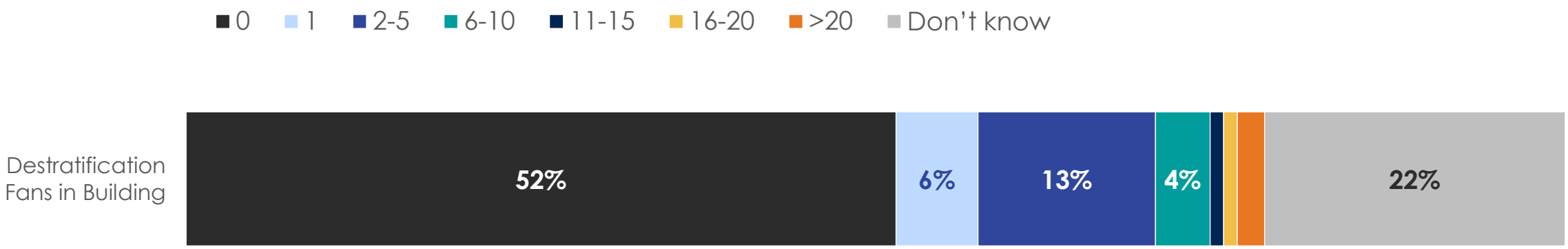
LOCATION OF AIR CURTAINS



Data<3% not shown

Base: Building has air curtains (n=94)
Q57. Where are the air curtains located? Select all that apply. [Allow multiple responses]

Destratification Fans

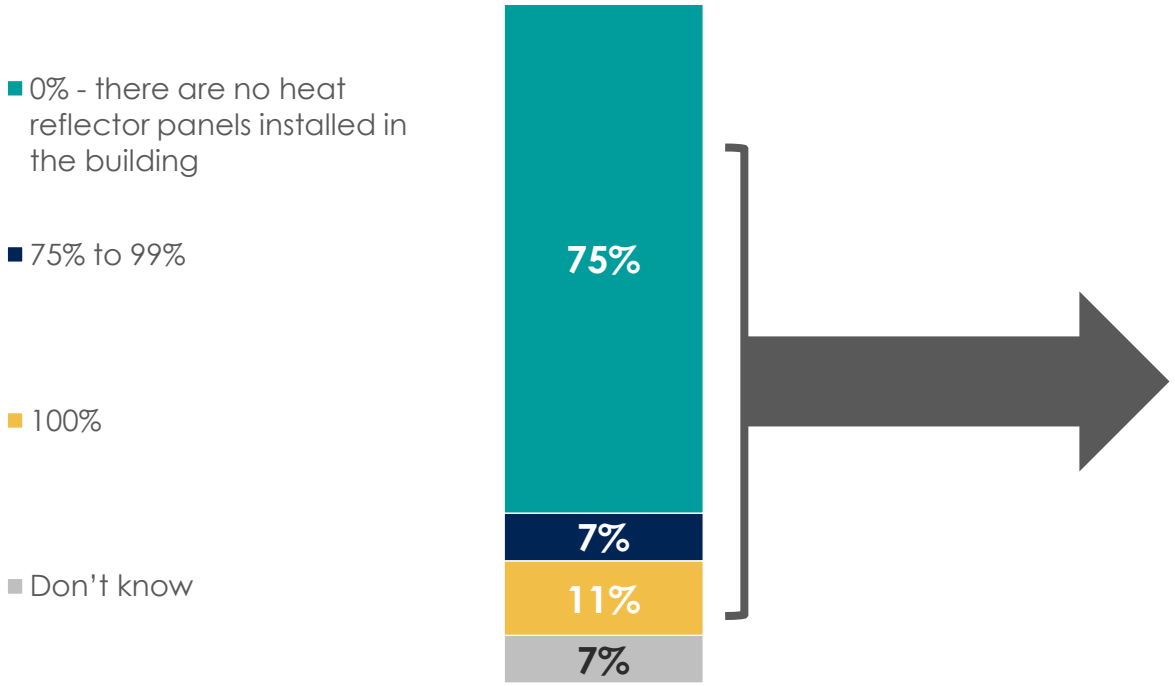


Data<3% not shown

Base: Familiar with operation and/or maintenance of HVAC equipment (n=945)
Q58. How many destratification fans do you have in this building, if any? [show as pop-up text box that appears when hovering over the word "destratification fans": Destratification fans are suspended from ceilings and used to reduce the difference in temperature between air in the highest and lowest points of a room. They may resemble a standard ceiling fan (paddle blade fan), or a round cased (cylinder) fan.]

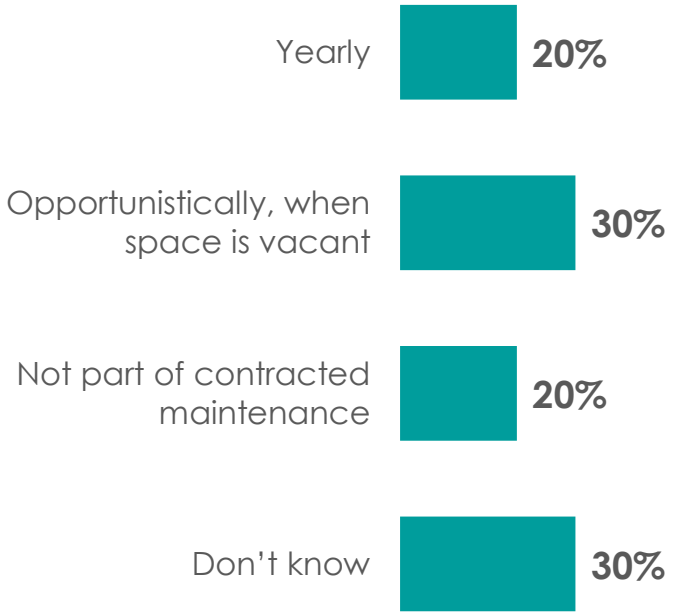
Radiator Heat Reflector Panels

OF RADIATORS WITH HEAT REFLECTOR PANELS



Base: Multi-Unit Residential Building with boiler (n=44)
Q59. What percentage of the radiators in the building have heat reflector panels?

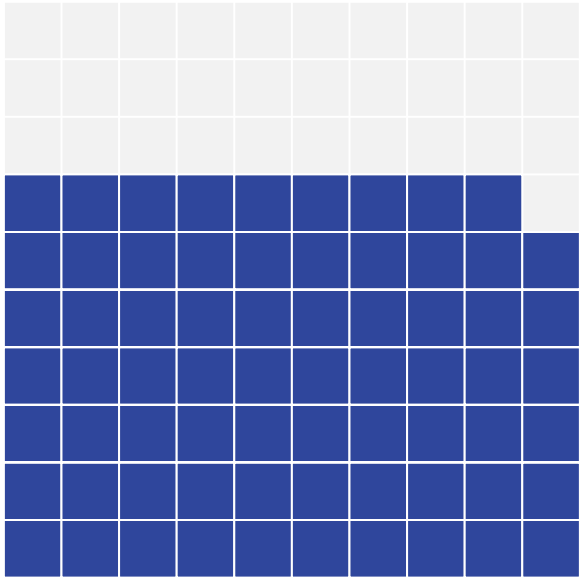
FREQUENCY OF CLEANING



Base: Building has heat reflector panels (n=10)
Q60. How frequently are the hydronic baseboard radiators contracted to be cleaned?

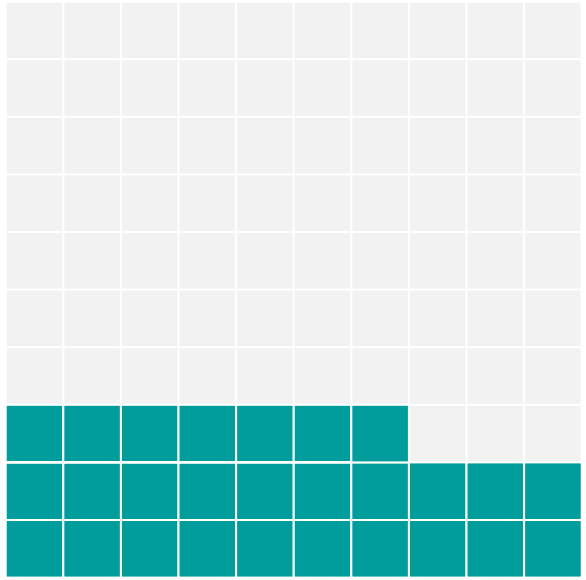
SPACE COOLING

Space Cooling



69%

Have space cooling in building (% Yes)



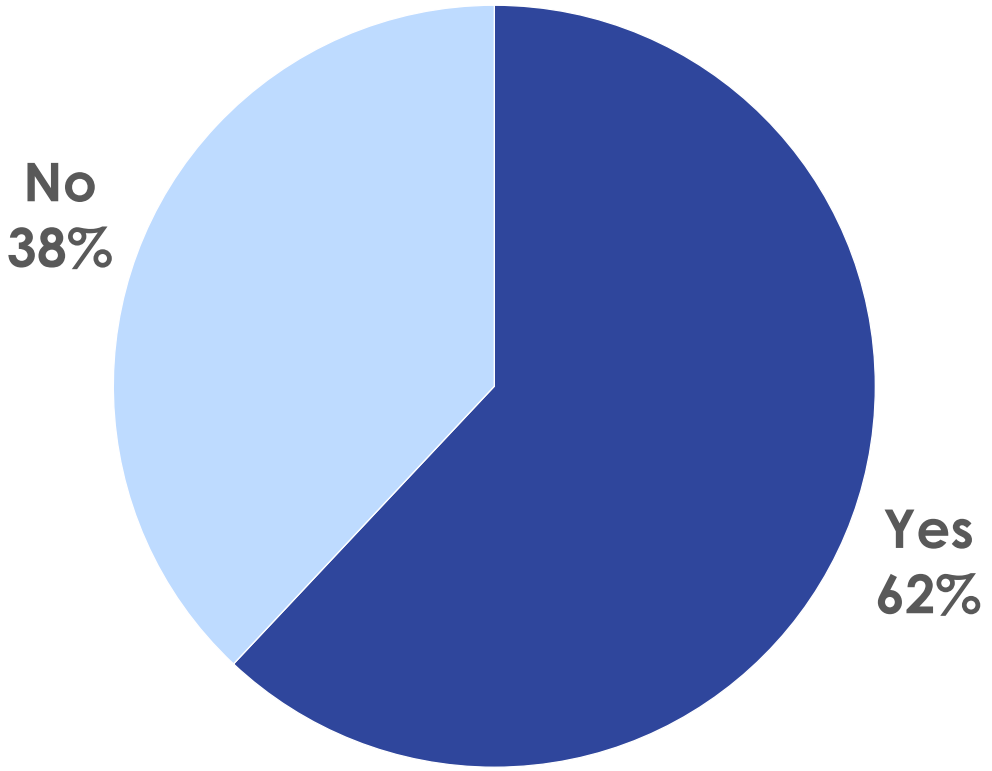
27%

Have supplementary cooling system in building (% Yes)

Base: Familiar with operation and/or maintenance of HVAC equipment (n=1407)
Q61. Do you have space cooling (air conditioning) in this building?

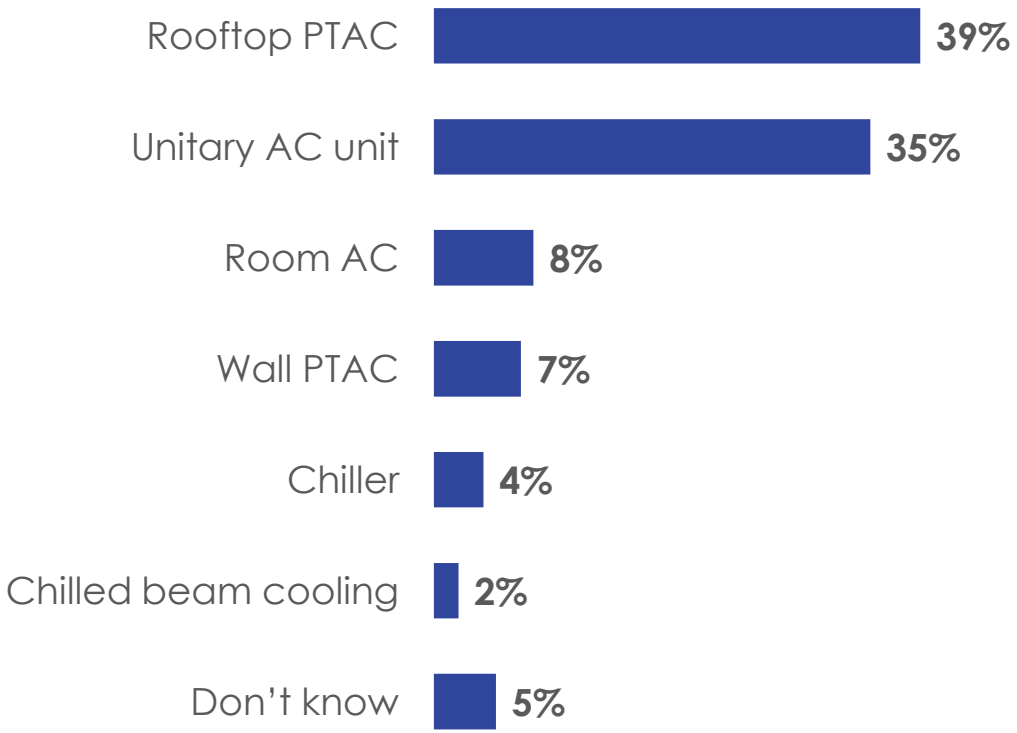
Base: Building has space cooling (air conditioning) (n=967)
Q62. In addition to your primary cooling system, do you also have any supplementary cooling systems?

Space Cooling Using the Same Heat Pumps as Space Heating



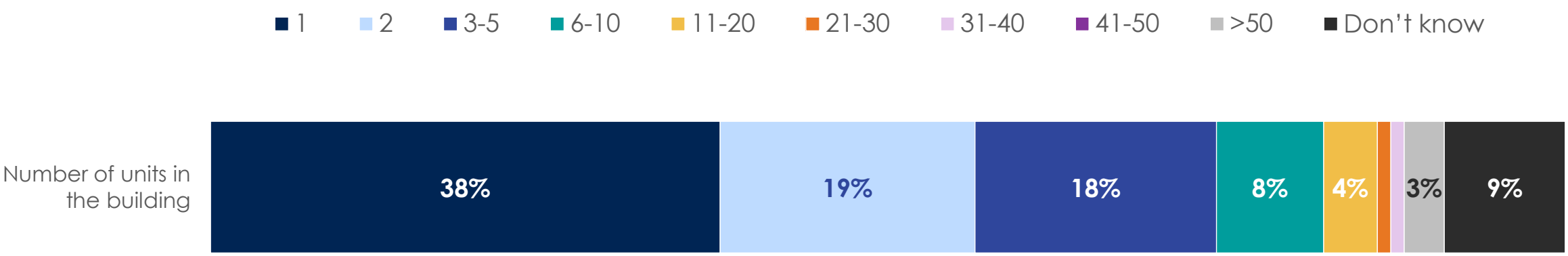
Base: Building has space cooling (air conditioning) and a heat pump (n=8)
Q63. Is the primary space cooling system the same heat pump(s) that is(are) used for space heating?

Primary Cooling System Type



Base: Building has space cooling (air conditioning) not the same as heat pumps used for space heating (n=962)
Q64. What is the system type of the primary cooling system for this building?

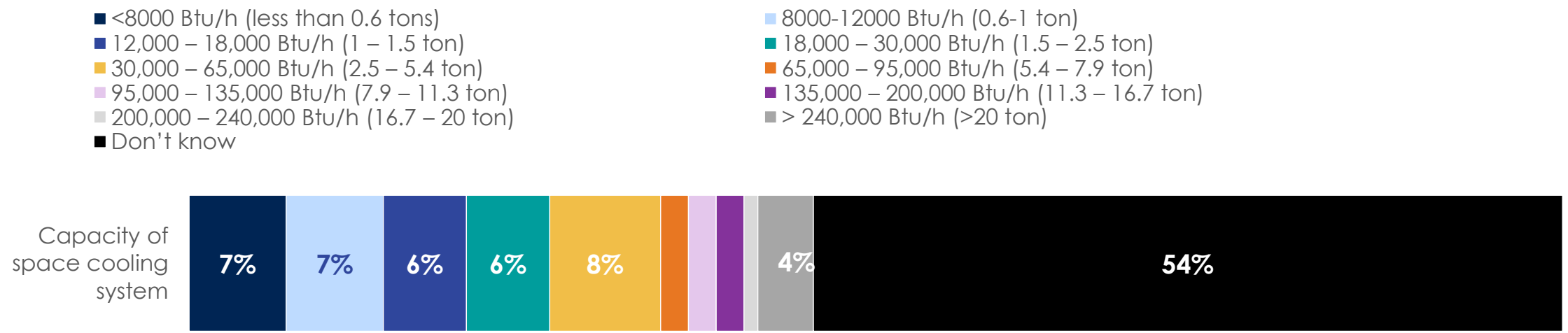
Number of Space Cooling Units



Data<3% not shown

Base: Building has space cooling (air conditioning) not the same as heat pumps used for space heating (n=915)
Q65. How many <response to Q64> units are in this building?

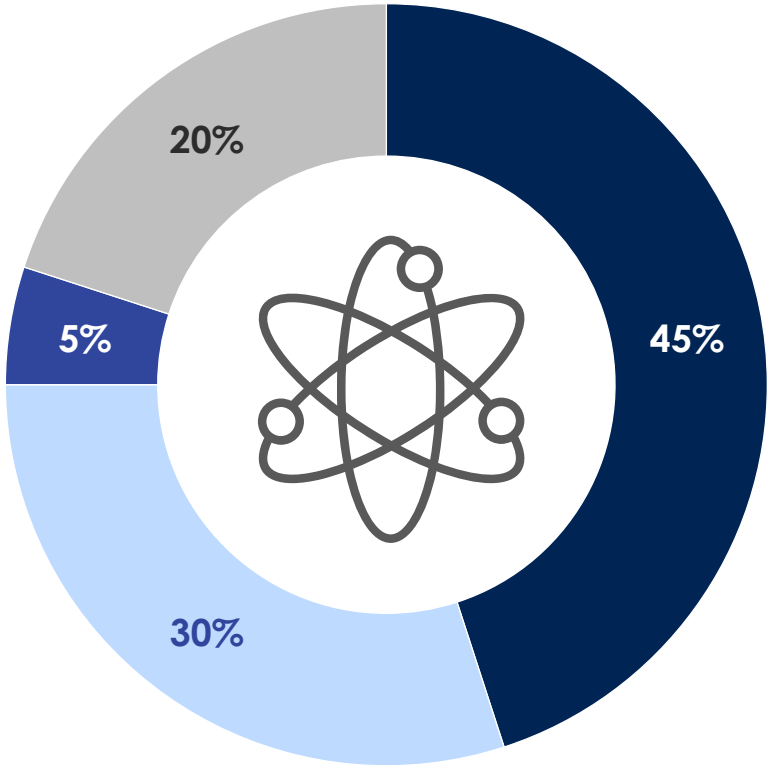
Capacity of Primary Space Cooling System



Data<3% not shown

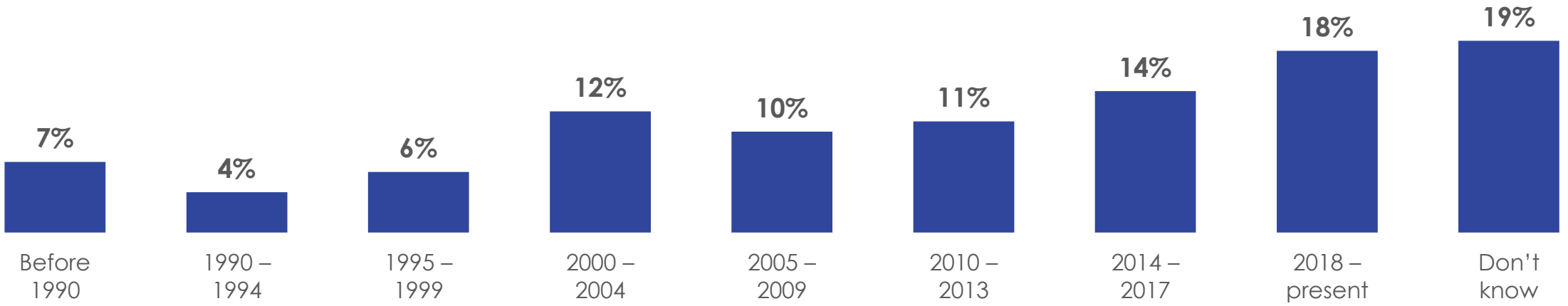
Base: Familiar with operation and/or maintenance of HVAC equipment (n=962)
Q66. What is the capacity of the total primary space cooling system?

Efficiency of Primary Space Cooling System



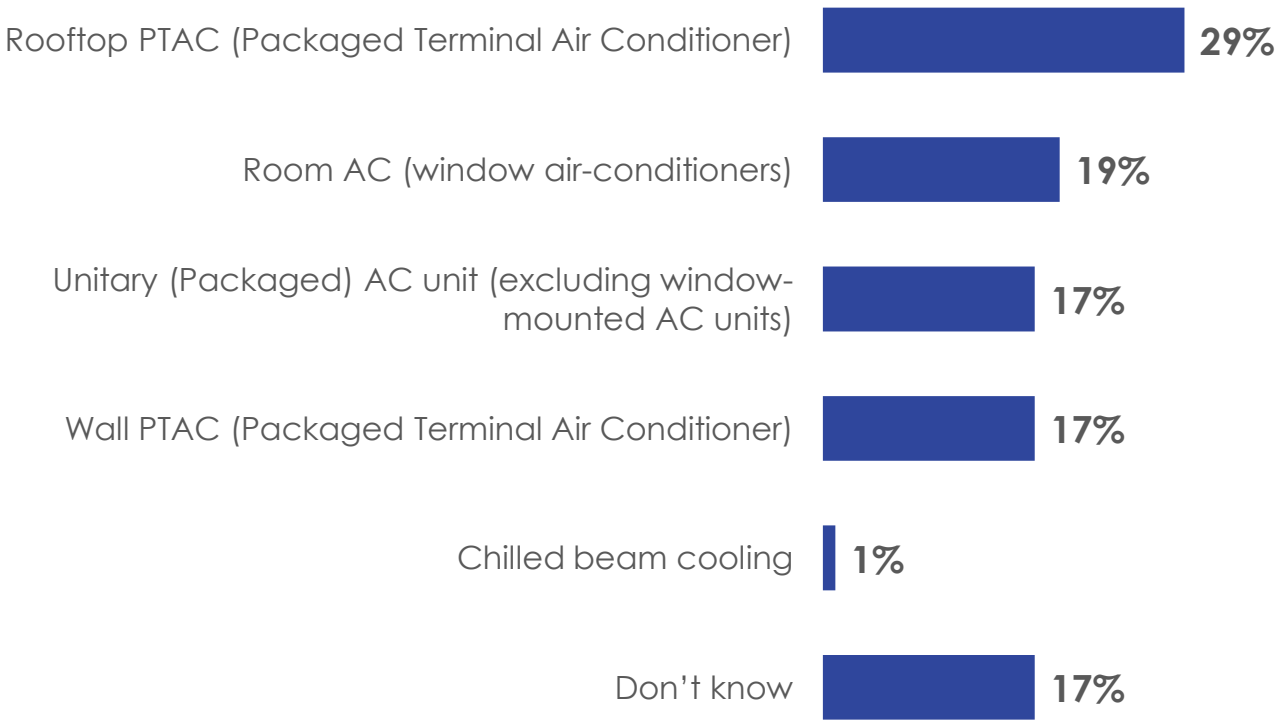
Base: Familiar with operation and/or maintenance of HVAC equipment (n=962)
Q67. How efficient is the primary space cooling system? Think in terms of its efficiency relative to what else was available in the market at the time of purchase, not in comparison to efficiencies available today.

Year of Primary Cooling System Installation



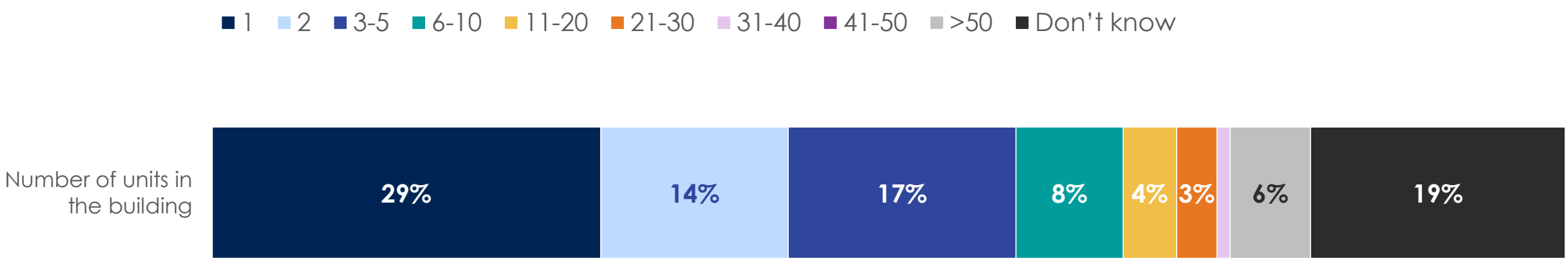
Base: Familiar with operation and/or maintenance of HVAC equipment (n=962)
Q68. When was the primary cooling system installed?

Type of Supplementary Cooling System



Base: Building has supplementary cooling system (n=236)
Q69. What type of system provides your supplementary cooling for this building?

Number of Supplementary Cooling Units



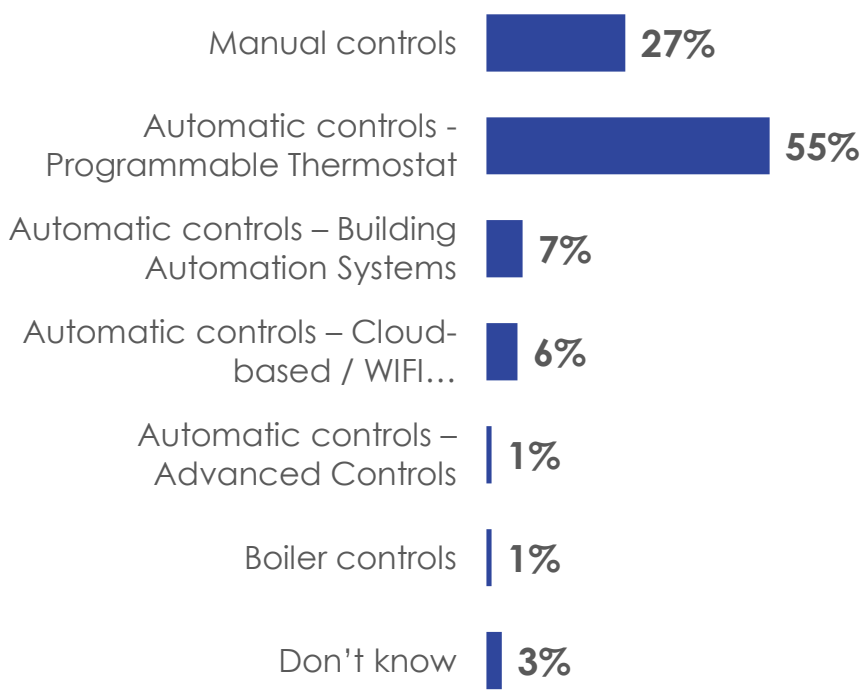
Data<3% not shown

Base: Building has supplementary cooling system (n=236)
Q70. How many supplementary <response to Q69 unless DK then no insert> units are in this building?

THERMOSTATS & HVAC CONTROLS

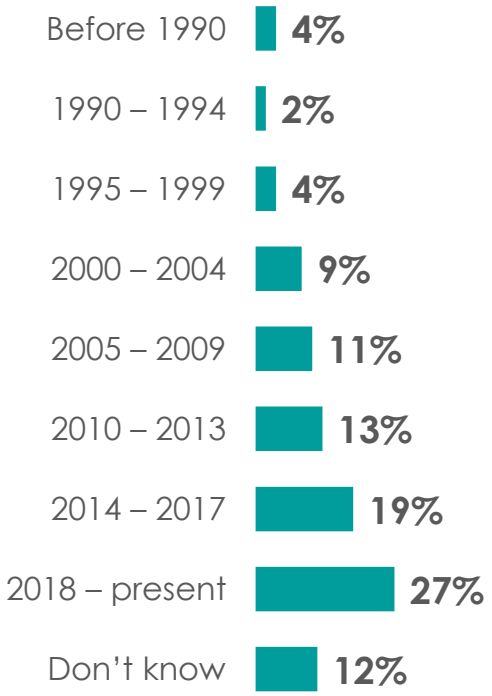
Thermostat/System Controls For Primary Space Heating

TYPE OF THERMOSTAT/SYSTEM CONTROLS



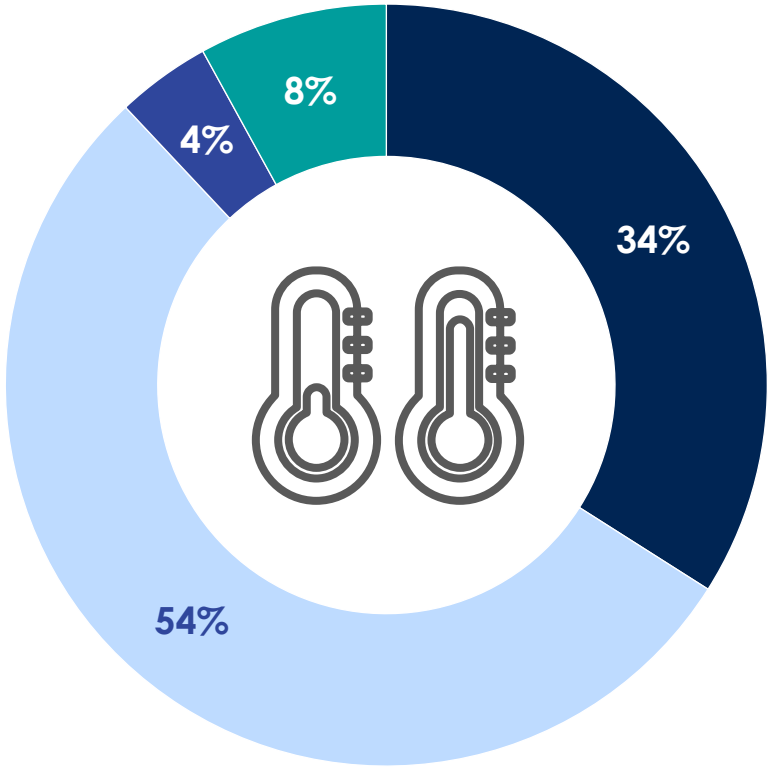
Base: Familiar with operation and/or maintenance of HVAC equipment (n=1407)
Q71. What type of thermostat or other system controls the primary space heating equipment?

YEAR OF INSTALLATION



Base: Building has thermostat/other system controls for primary space heating (n=992)
Q72. When was the control system installed?

Temperature Control Strategy

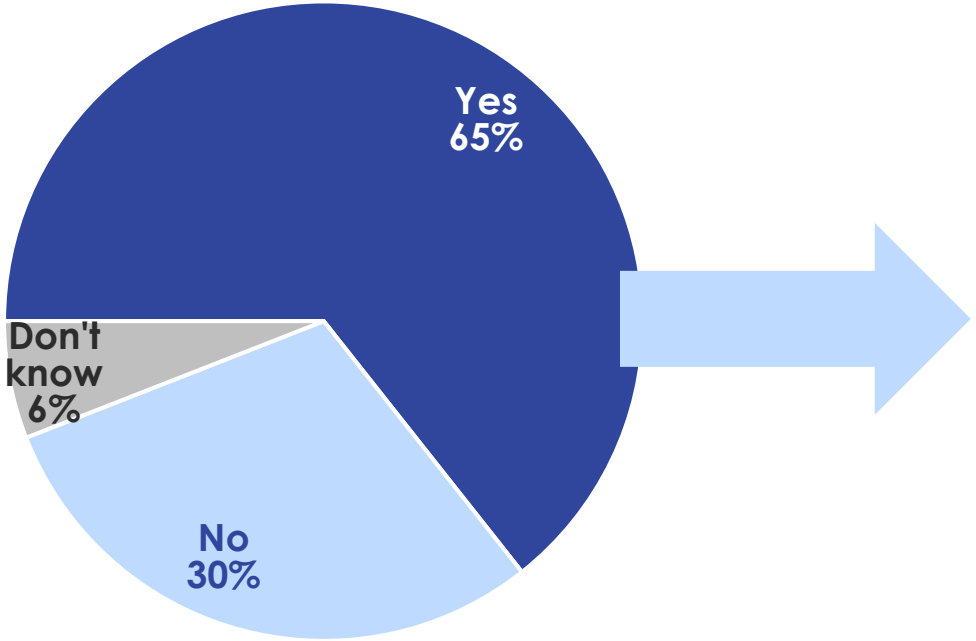


- Always at a constant temperature regardless of time of day or occupancy
- Temperature is lowered when building is unoccupied
- Heating system is turned off altogether when building is unoccupied
- Heating system set point is increased as outdoor temperature decreases

Base: Familiar with operation and/or maintenance of HVAC equipment (n=1407)
Q73. Which of the following statements most closely matches the primary space heating control strategy for this building?

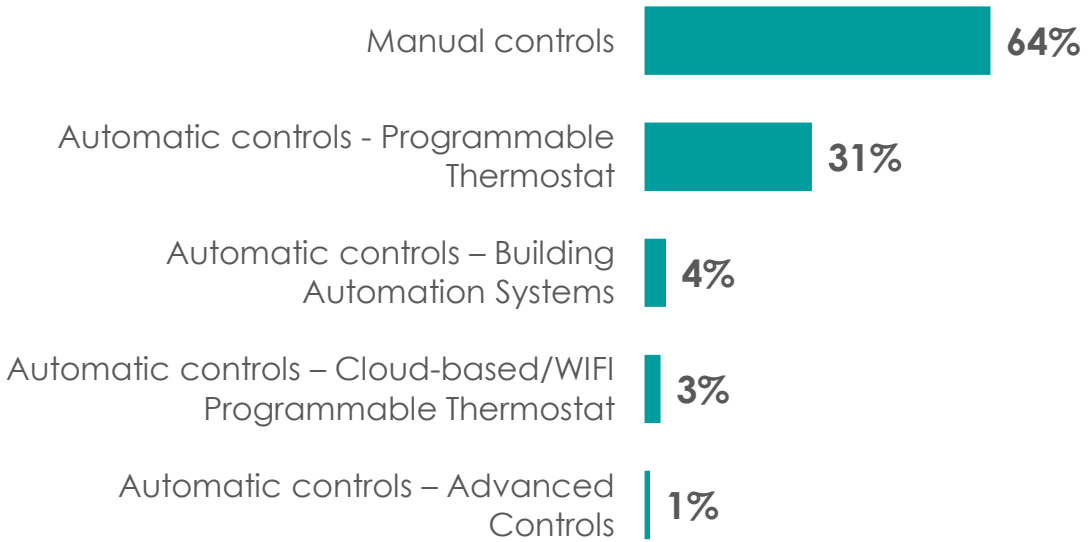
Heating/Cooling System Controls & Thermostat Type

HEATING/COOLING USE SAME CONTROLS?



Base: Building has primary heating system (n=945)
Q74. Does the system that controls the primary heating system also control the primary space cooling system?

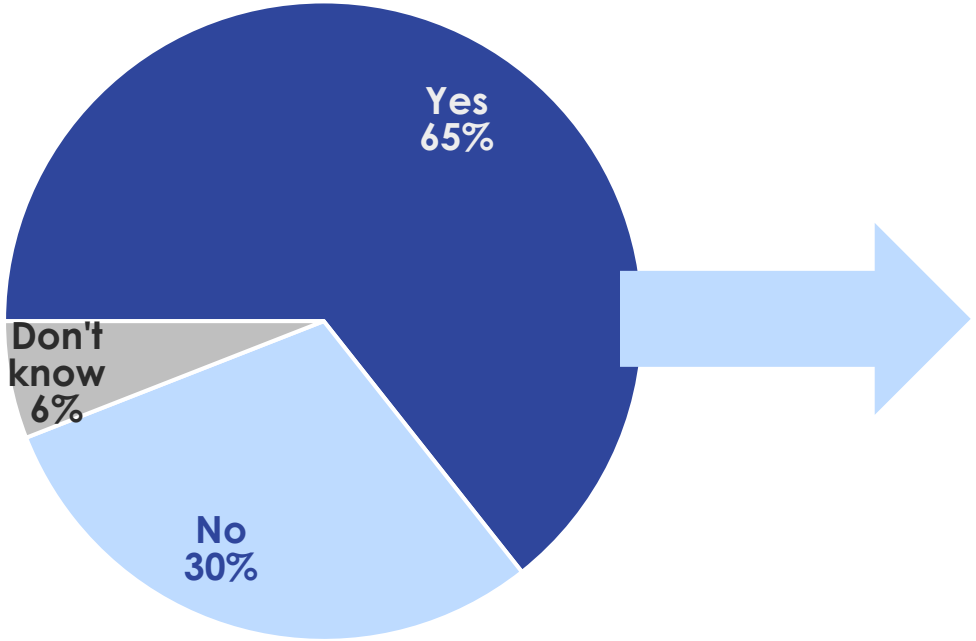
TYPE OF THERMOSTAT USED FOR COOLING SYSTEM



Base: Heating and cooling system controlled separately (n=332)
Q75. What type of thermostat or other control system controls the primary space cooling equipment?

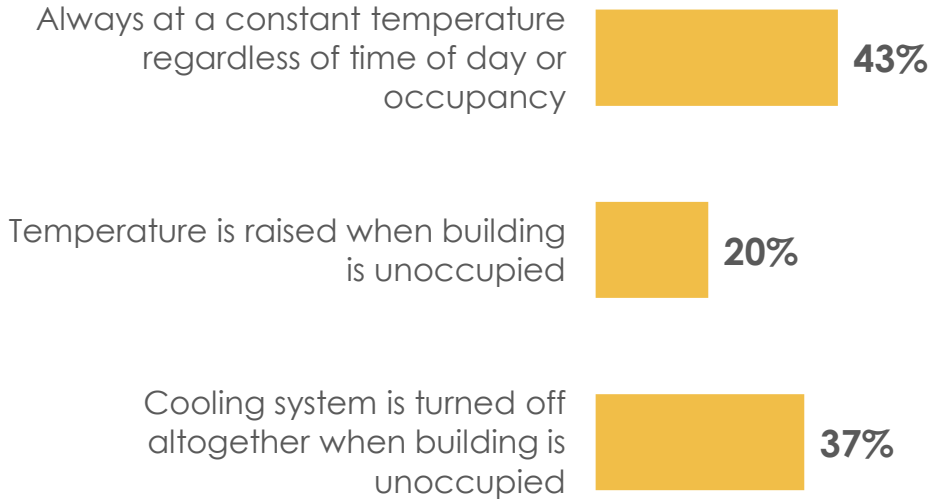
Heating/Cooling System Controls & Cooling System Strategy

HEATING/COOLING USE SAME CONTROLS?



Base: Building has primary heating system (n=945)
Q74. Does the system that controls the primary heating system also control the primary space cooling system?

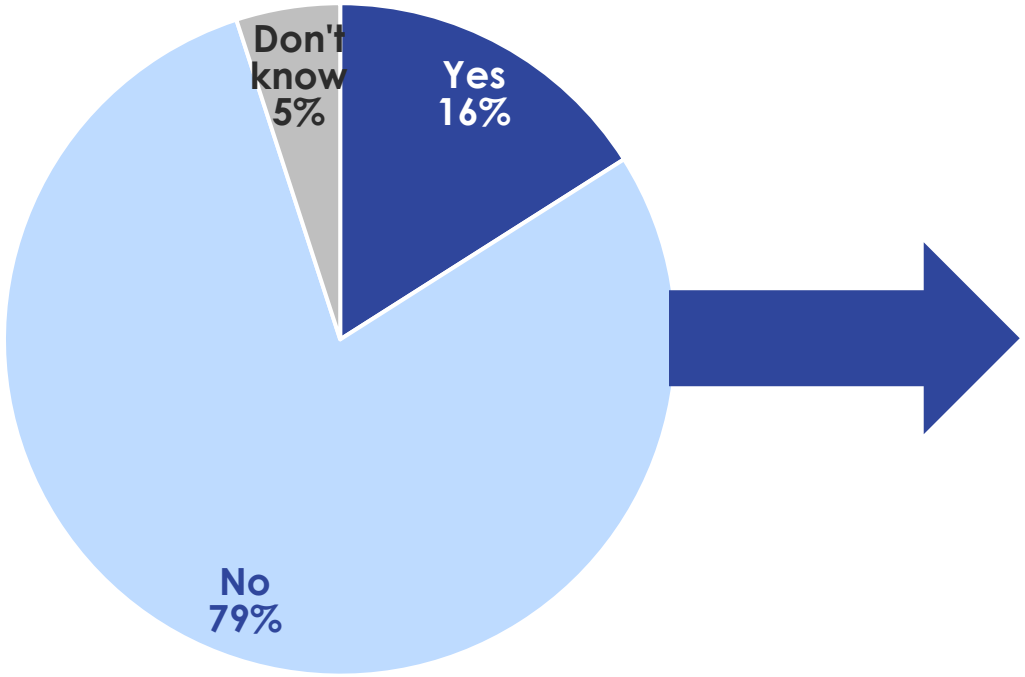
COOLING SYSTEM STRATEGY



Base: Heating and cooling system controlled separately (n=332)
Q76. Which of the following statements most closely matches the primary space cooling control strategy for this building?

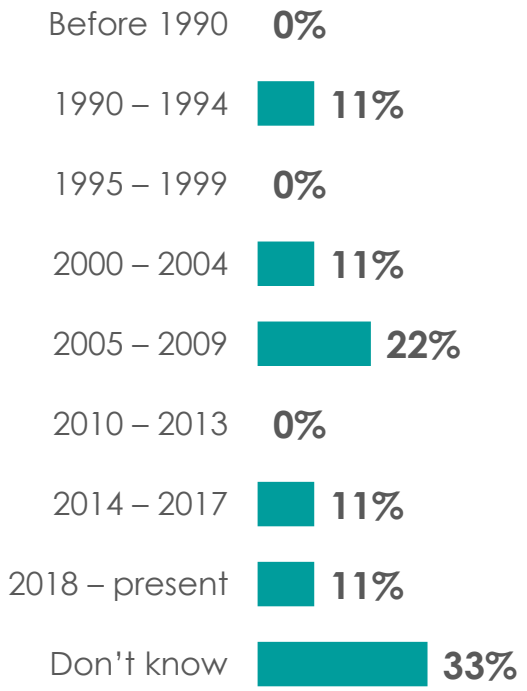
Occupancy Sensors

OCCUPANCY SENSORS IN BUILDING



Base: Hotel / Motel (n=58)
Q77. Are there occupancy sensors that control heating, cooling and/or ventilation?

YEAR OF INSTALLATION

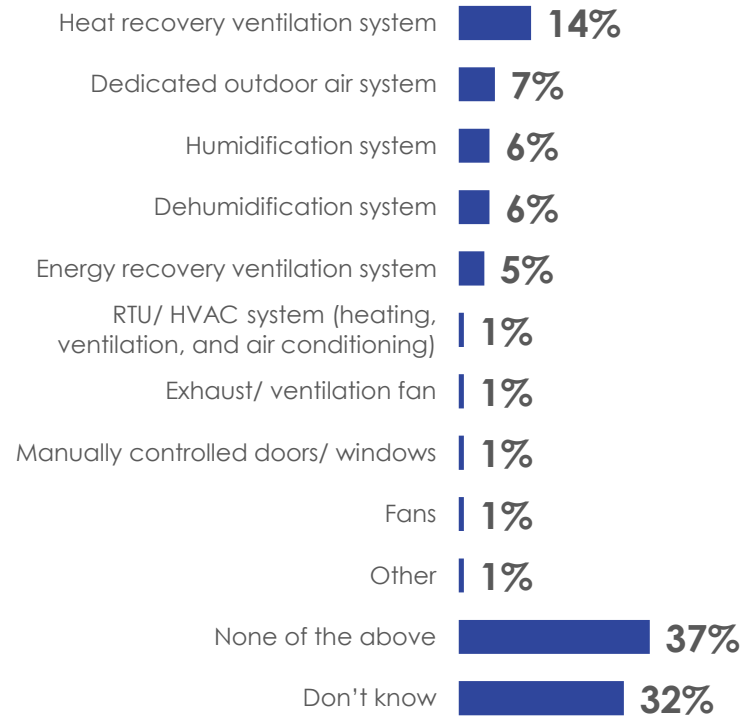


Base: Hotel / Motel has occupancy sensors (n=9)
Q78. When were most of the hotel room occupancy sensors installed?

VENTILATION & CIRCULATION

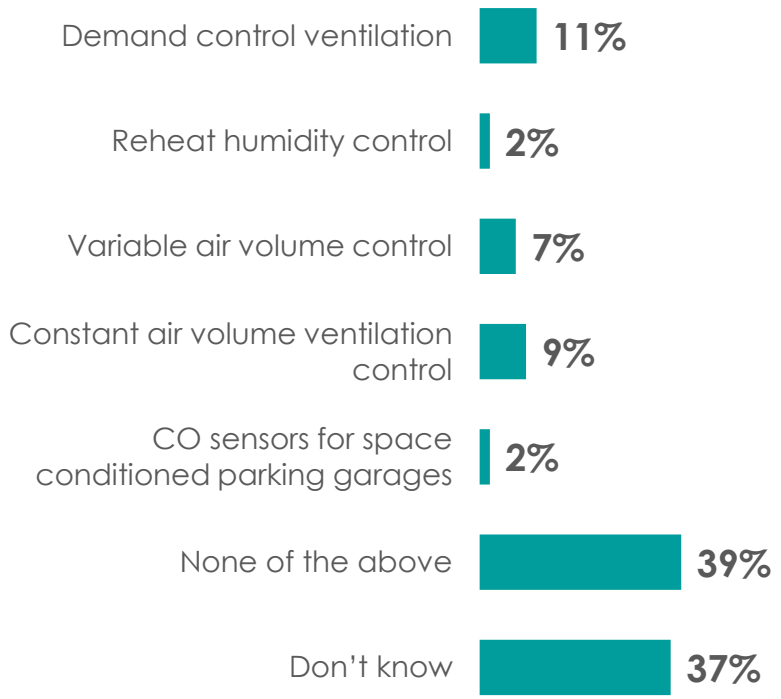
Ventilation Systems & Control Types

VENTILATION SYSTEMS



Base: Familiar with operation and/or maintenance of HVAC equipment (n=1407)
Q79. What types of ventilation systems do you have in this building, if any?

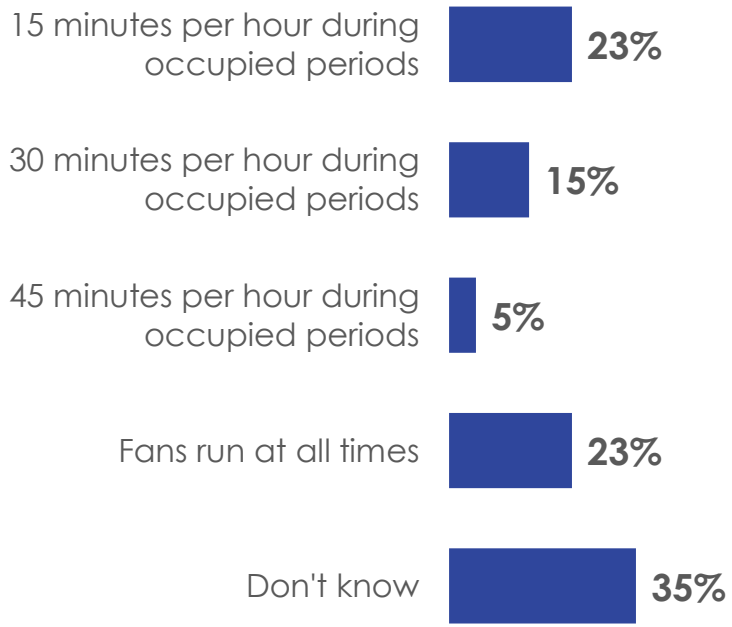
VENTILATION CONTROLS



Base: Familiar with operation and/or maintenance of HVAC equipment (n=1407)
Q80. What types of ventilation controls do you have in this building, if any?

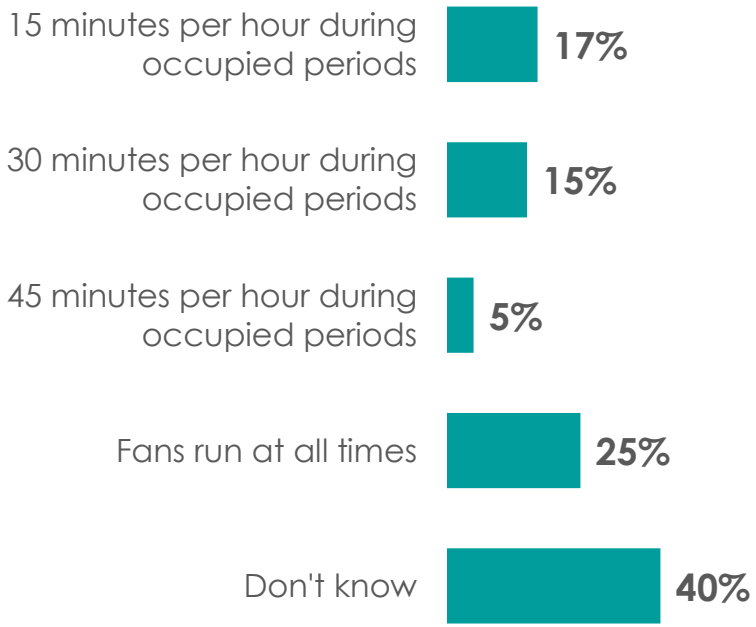
HVAC Fan Run Time During Heating/Cooling Season

DURING HEATING SEASON



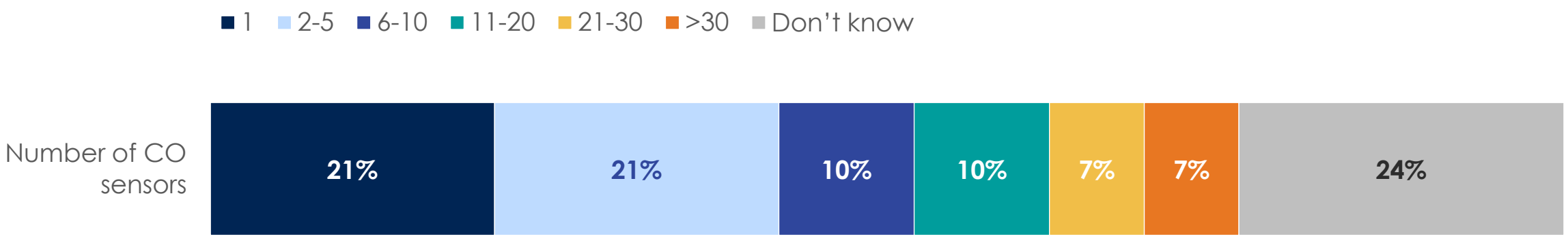
Base: Familiar with operation and/or maintenance of HVAC equipment (n=1407)
Q81. Which of the following statements best describes the operation of the HVAC fan run time in the heating season? In the heating season, HVAC system fans run as required by the heating system, and at least:

DURING COOLING SEASON



Base: Familiar with operation and/or maintenance of HVAC equipment (n=1407)
Q82. Which of the following statements best describes the operation of the HVAC fan run time in the cooling season? In the cooling season, HVAC system fans run as required by the cooling system, and at least:

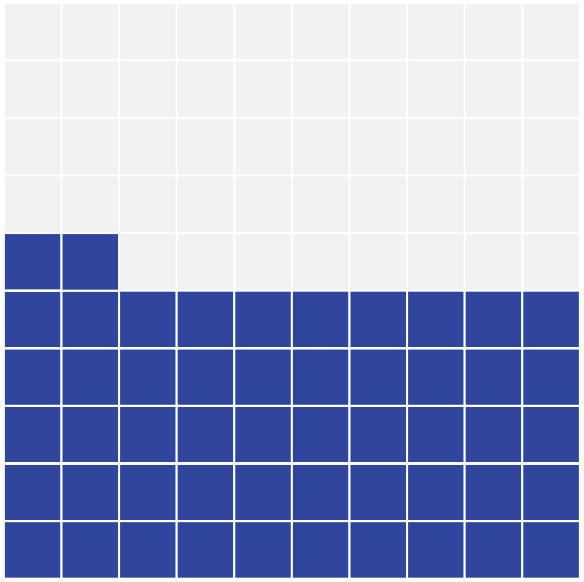
Number of CO Sensors



Base: Has CO sensors for space conditioned parking garages (n=29)
Q83. How many CO sensors for space conditioned parking garages are there in this building?

Building Parking Garage

PARKING GARAGE

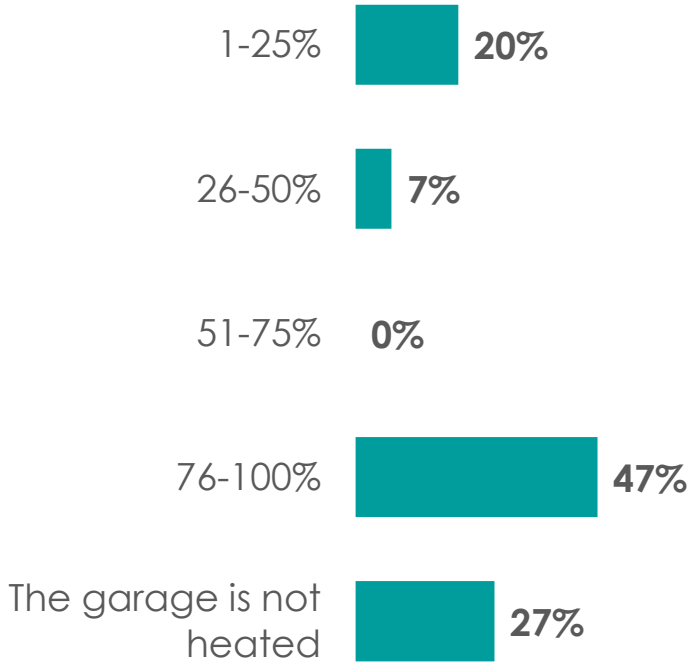


52%

Building has a parking garage (% Yes)

Base: Familiar with operation and/or maintenance of HVAC equipment (n=29)
Q84a. Does your building have a parking garage?

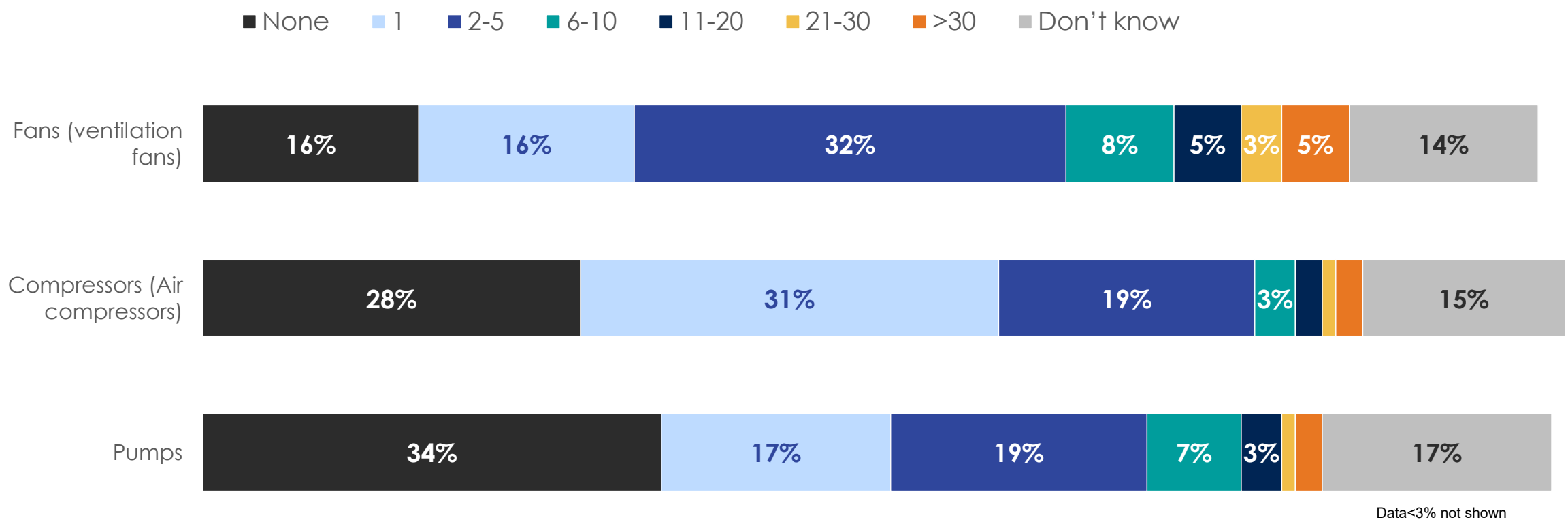
PARKING GARAGE HEATED?



Base: Building has parking garage (n=15)
Q84. What portion of the parking garage is heated?

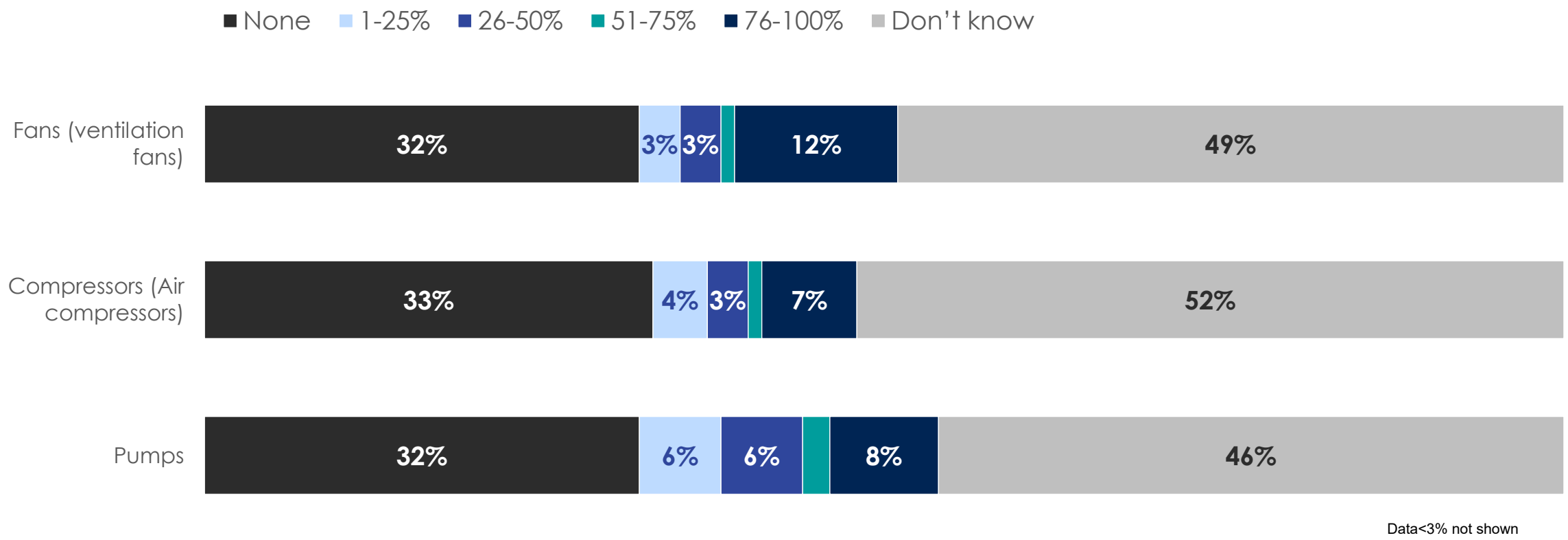
MOTORS

Number of Fans/Compressors/Pumps



Base: Familiar with operation and/or maintenance of motors (n=868)
Q85. How many fans, compressors, and pumps are there in this building, if any?

Variable Frequency Drives Used (VFDs)

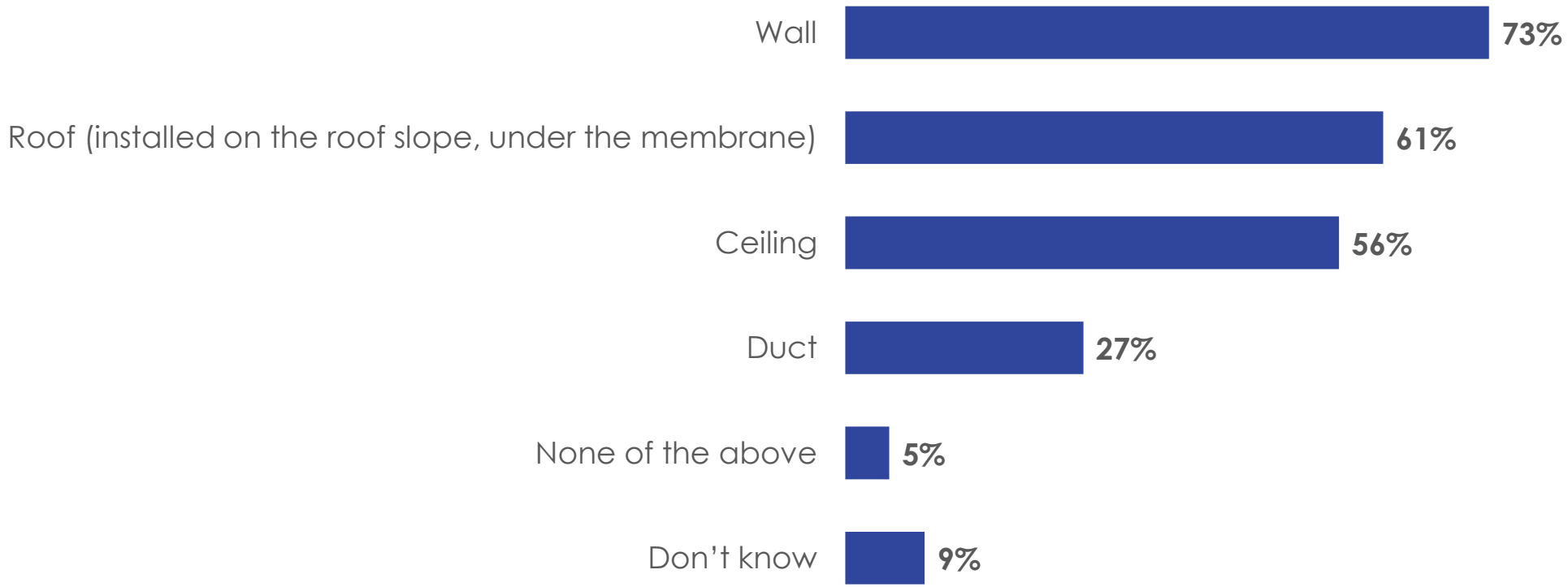


Data<3% not shown

Base: Familiar with operation and/or maintenance of motors (Base Varies)
Q86. What percentage of these units have variable frequency drives (VFDs) on them?

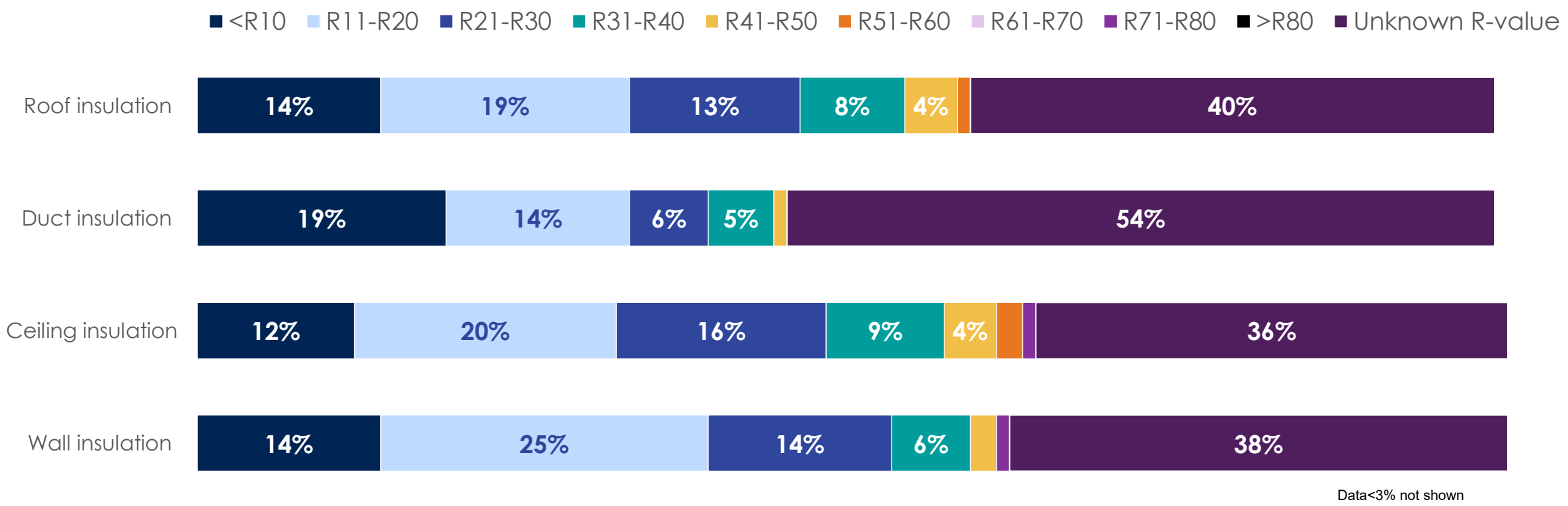
INSULATION

Building Components Insulated



Base: Familiar with operation and/or maintenance of insulation (n=786)
Q87. What components of the building are insulated, if any?

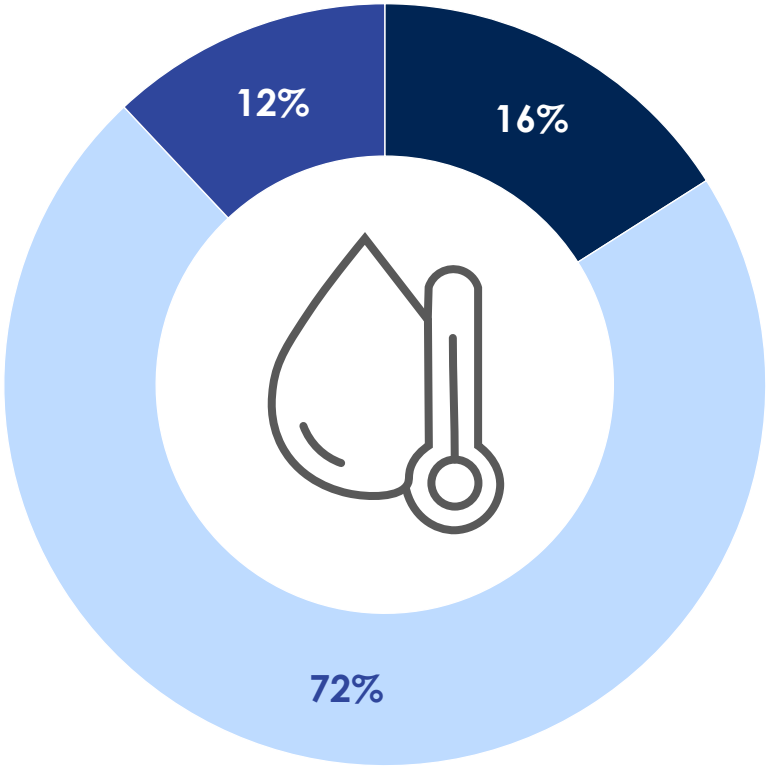
R-Value of Building Insulation



Base: Insulation components insulated (Base Varies)
Q88. What is the R-value of majority of the insulation in your building?

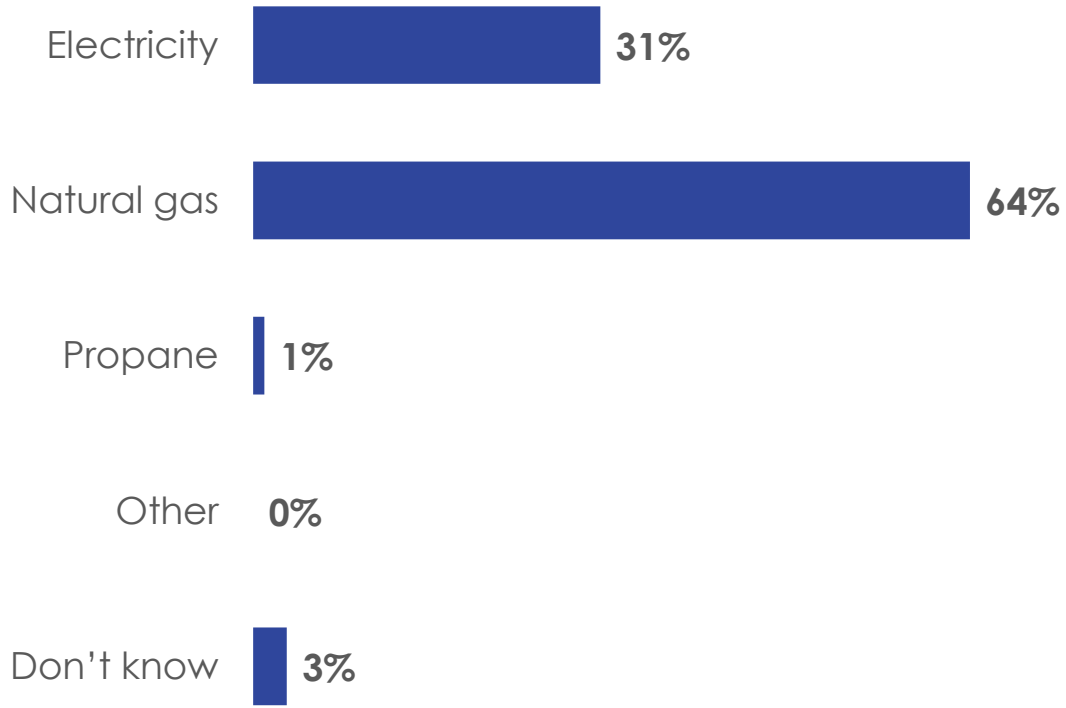
DOMESTIC WATER HEATING

Primary/Supplementary Water Heating System in Building



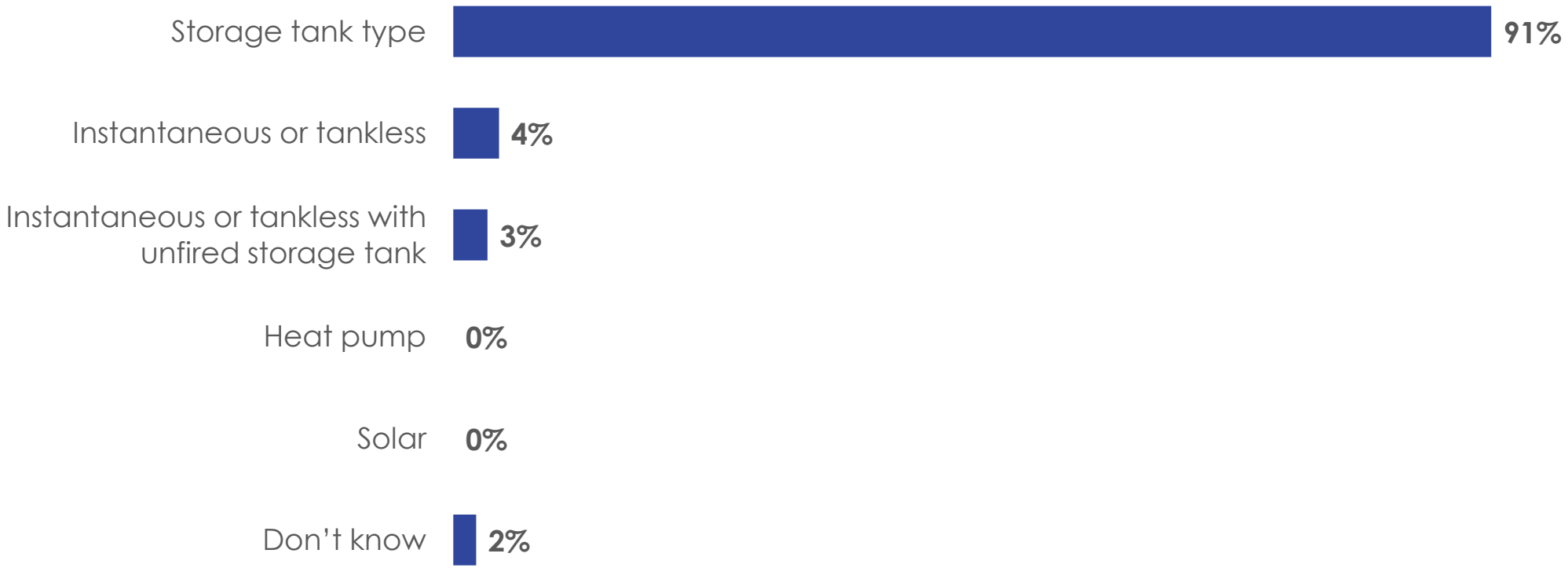
Base: Familiar with operation and/or maintenance of water heating (n=1291)
Q89. Does this building contain a primary and supplementary water heating system?

Fuel Type Used in Primary Water Heater



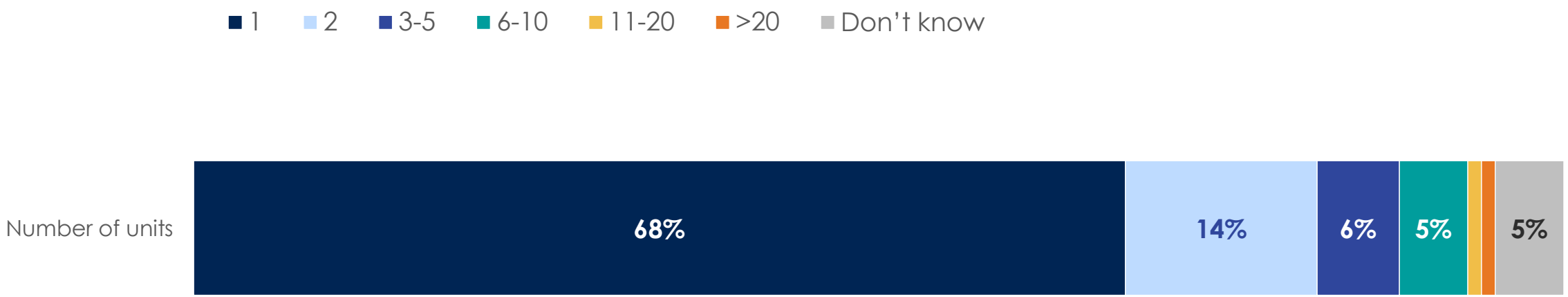
Base: Building has primary / supplementary water heating system (n=1090)
Q90. What type of fuel does the primary water heater use?

System Type Used in Electric Primary Water Heater



Base: Water heater uses electricity (n=340)
Q91. What is the system type of the primary water heater?

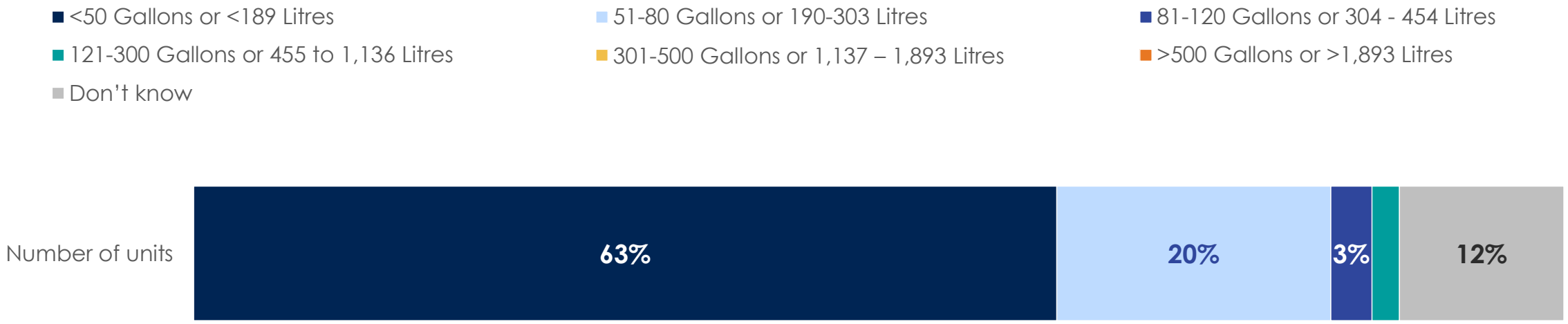
Number of Electric Primary Water Heater Systems



Data<3% not shown

Base: Water heater uses electricity (n=340)
Q92. How many <response to Q91> units are in this building?

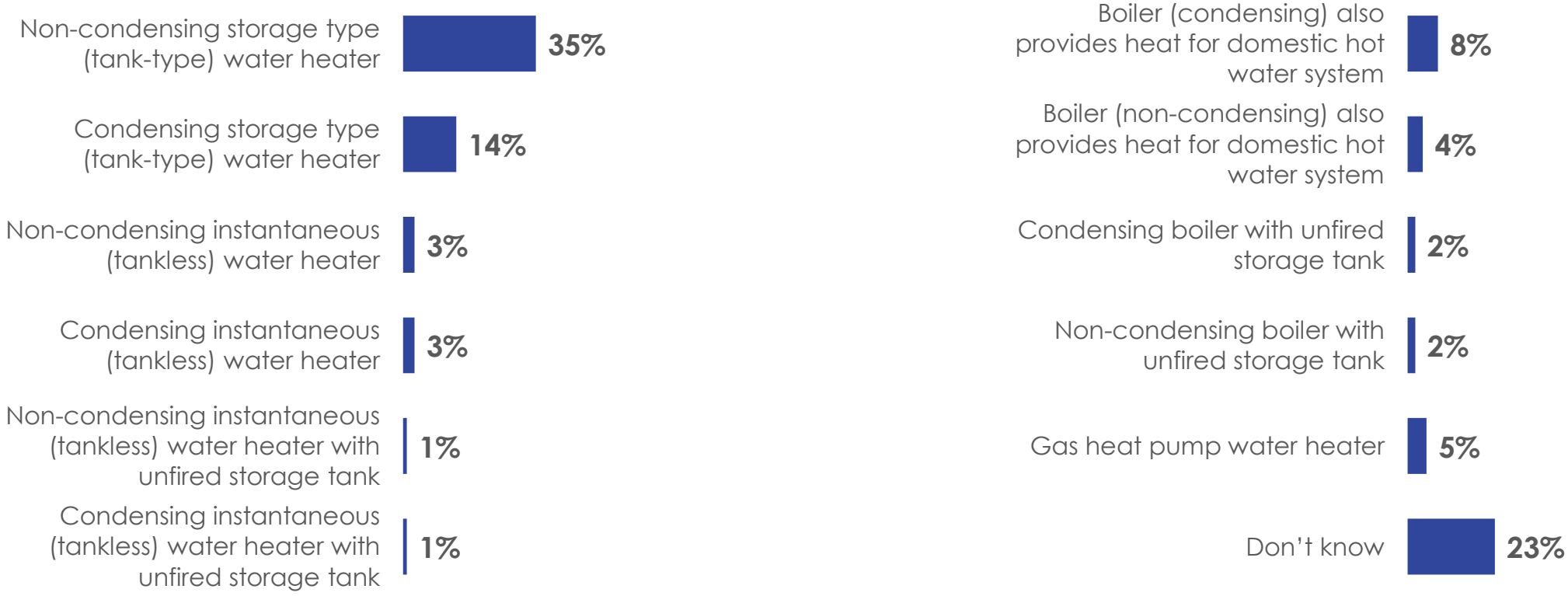
Storage Capacity of Primary Water Heater



Data<3% not shown

Base: Familiar with operation and/or maintenance of water heating (n=318)
Q93. What is the storage capacity of the primary water heater? If more than one, what is the average storage capacity per water heater across the group of primary water heaters?

System Type Used in Primary Natural Gas Water Heater



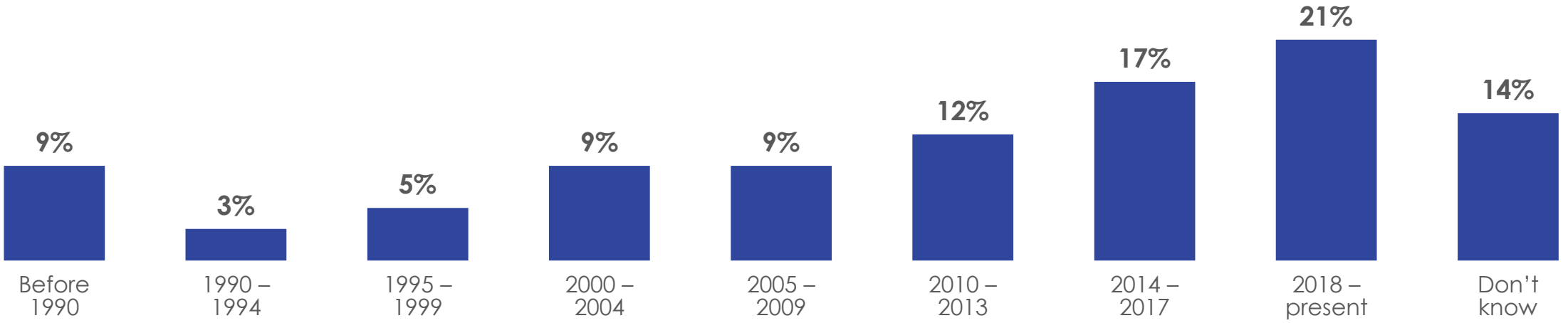
Base: Water heater uses natural gas (n=701)
Q94. What is the system type of the primary water heater?

Number of Natural Gas Primary Water Heater Systems

Data<3% not shown

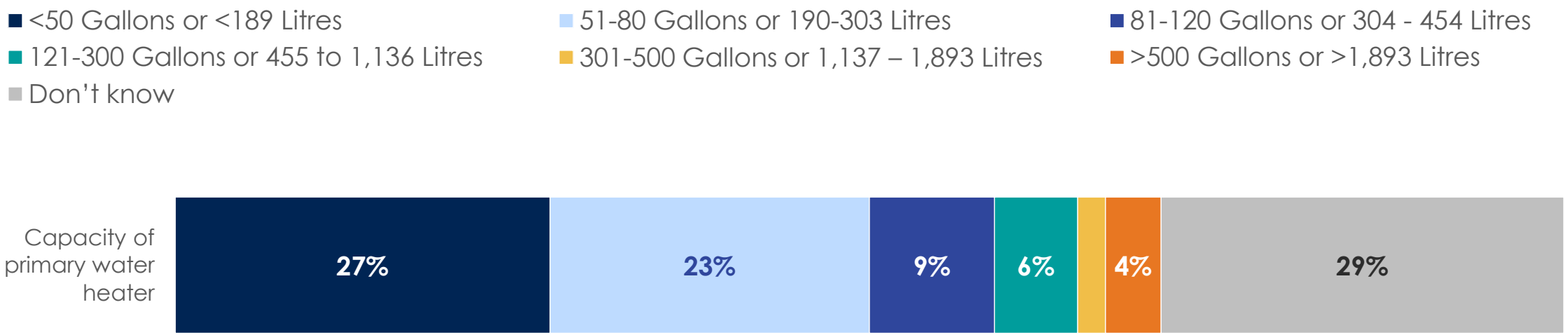
Base: Water heater uses natural gas (n=701)
Q95. How many <response to Q94, if DK do not insert> units are in this building?

Year of Primary Water Heating System Installation



Base: Water heater uses natural gas (n=701)
Q96. When was the primary water heating system installed?

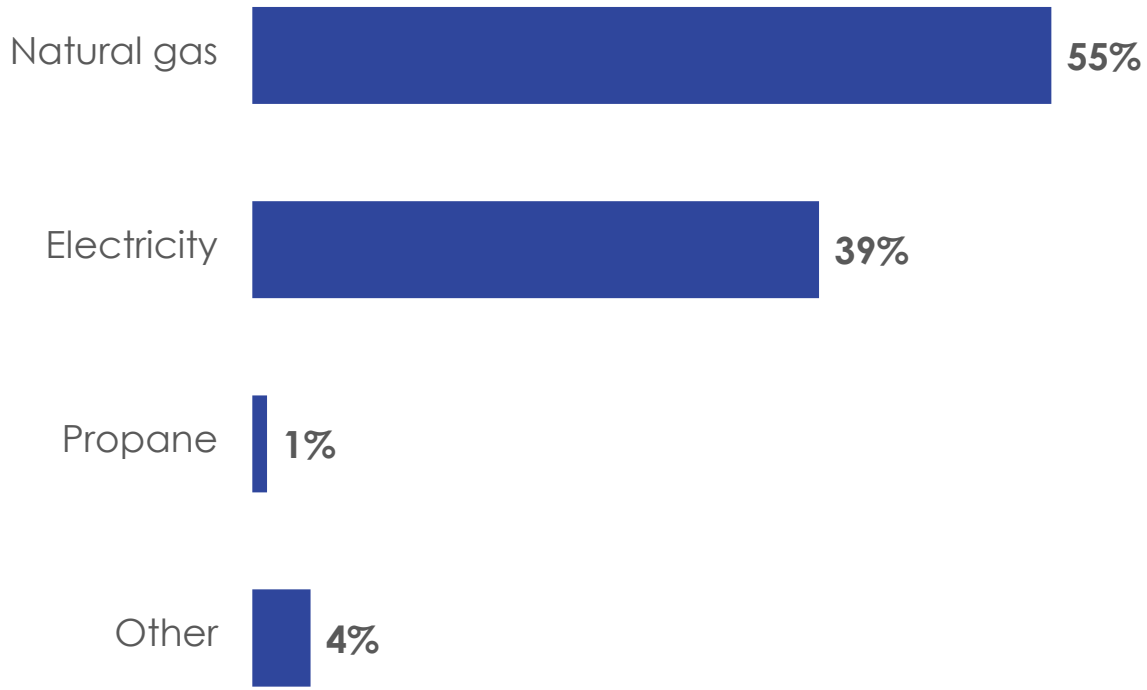
Capacity of Primary Water Heater



Data<3% not shown

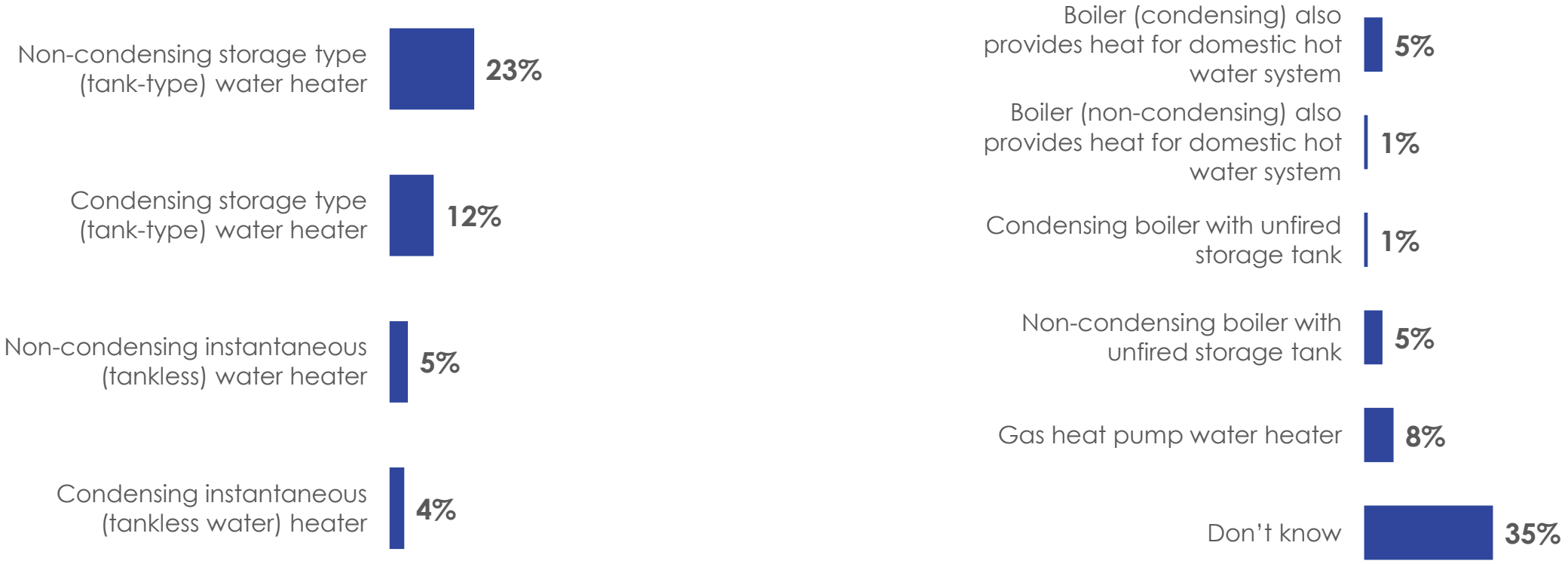
Base: Water heater uses natural gas (n=649)
Q97. What is the storage capacity of the primary water heater? If more than one, what is the average storage capacity per water heater across the group of primary water heaters?

Fuel Type Used in Supplementary Water Heater



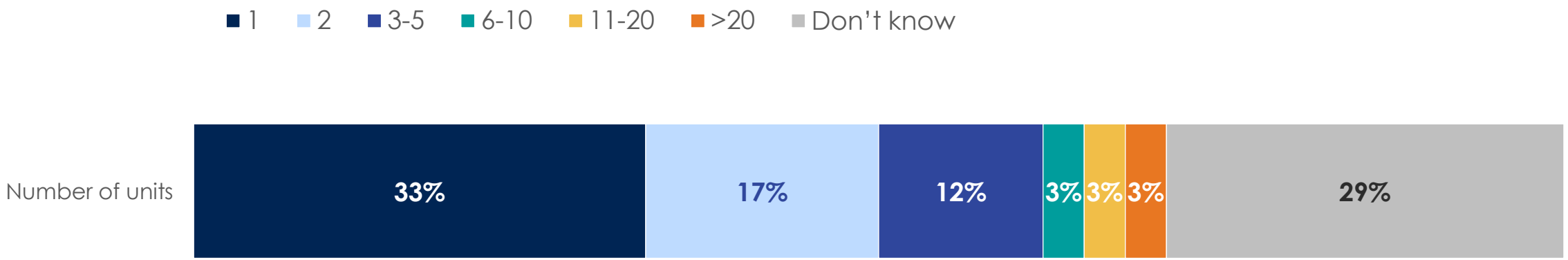
Base: Building has primary and supplementary water heating system (n=137)
Q98. What type of fuel does the supplementary water heater use?

System Type Used in Supplementary Natural Gas Water Heater



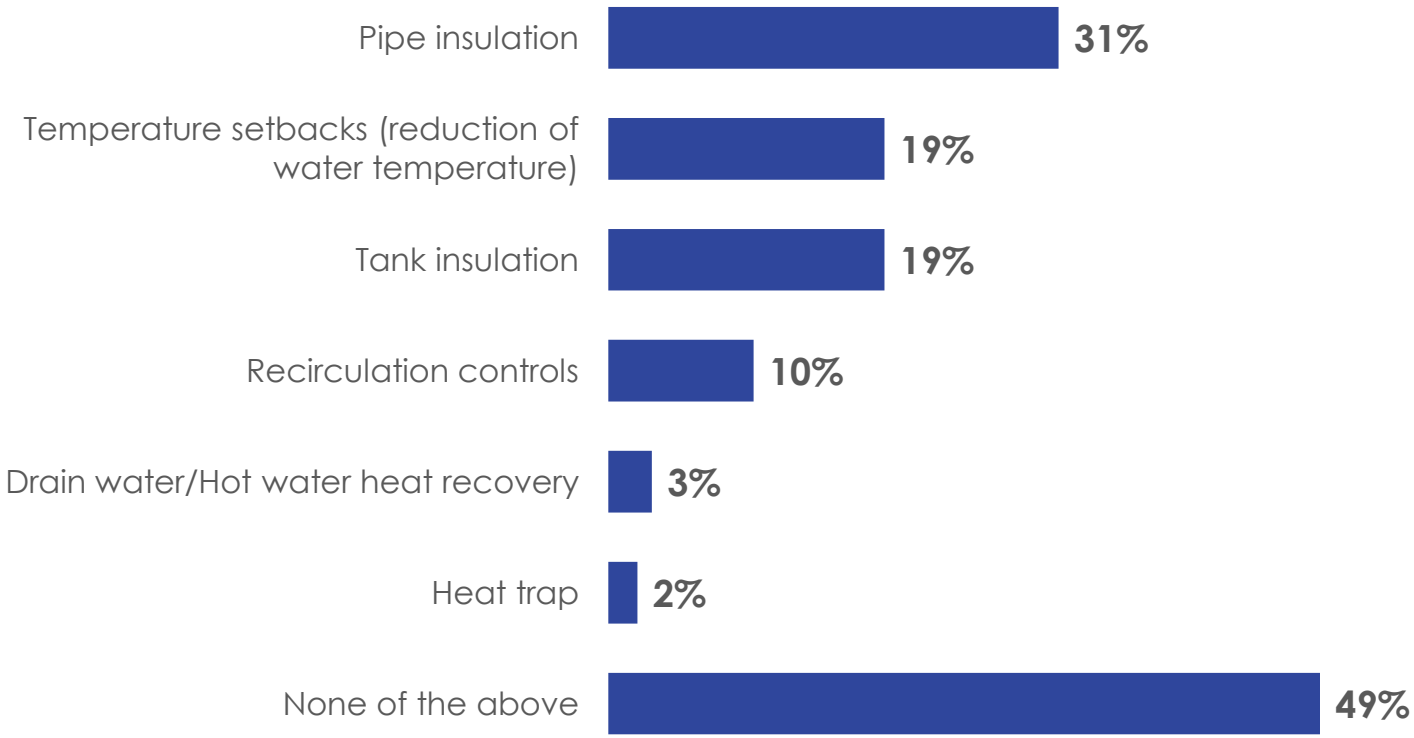
Base: Water heater uses natural gas (n=75)
Q99. What is the system type of the supplementary water heater?

Number of Natural Gas Supplementary Water Heater Systems



Base: Water heater uses natural gas (n=75)
Q100. How many supplementary <response to Q99, if DK no insert> units are in this building?

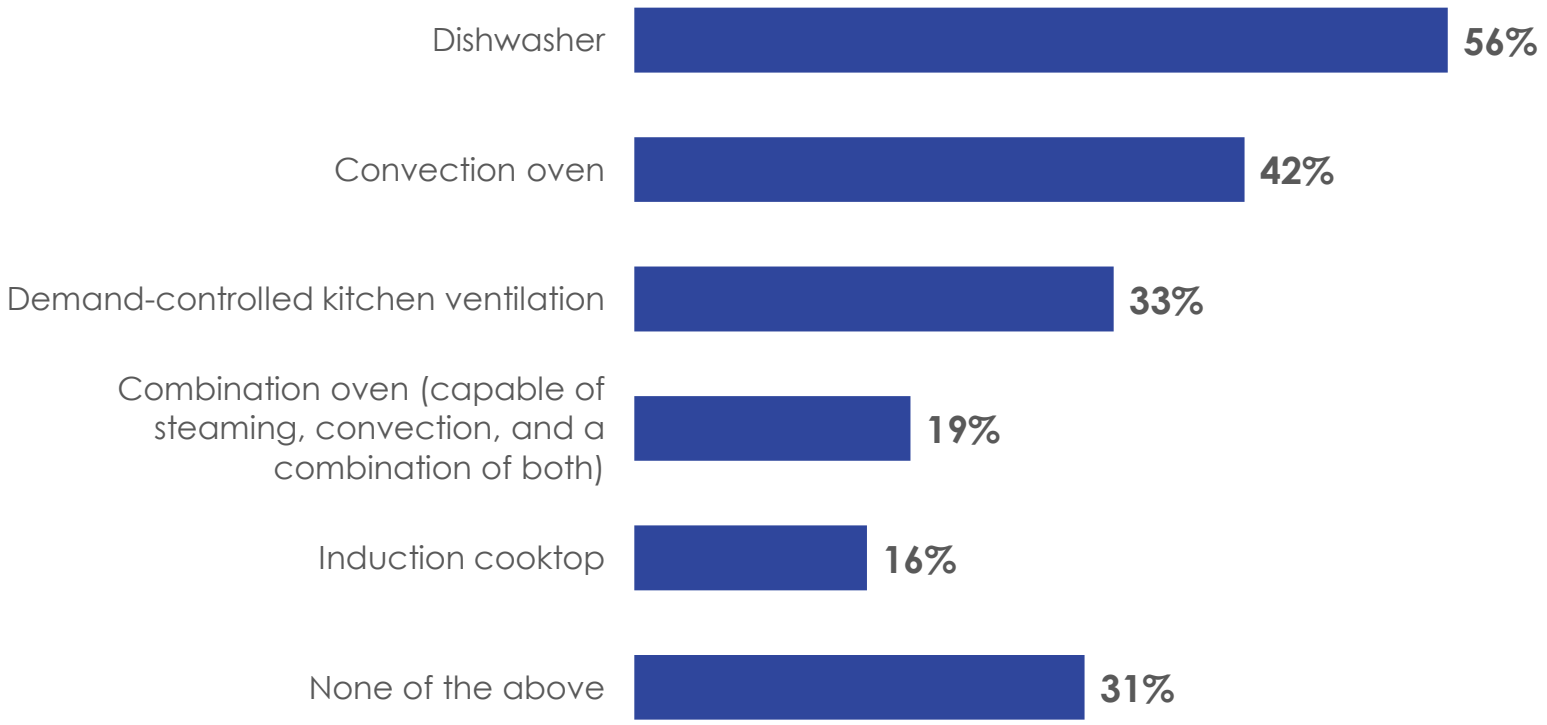
Energy-Saving Measures For Primary Water Heating System



Base: Familiar with operation and/or maintenance of water heating (n=1090)
Q101. Which of the following energy-saving measures have you implemented on your primary water heating system, if any?

FOOD SERVICE

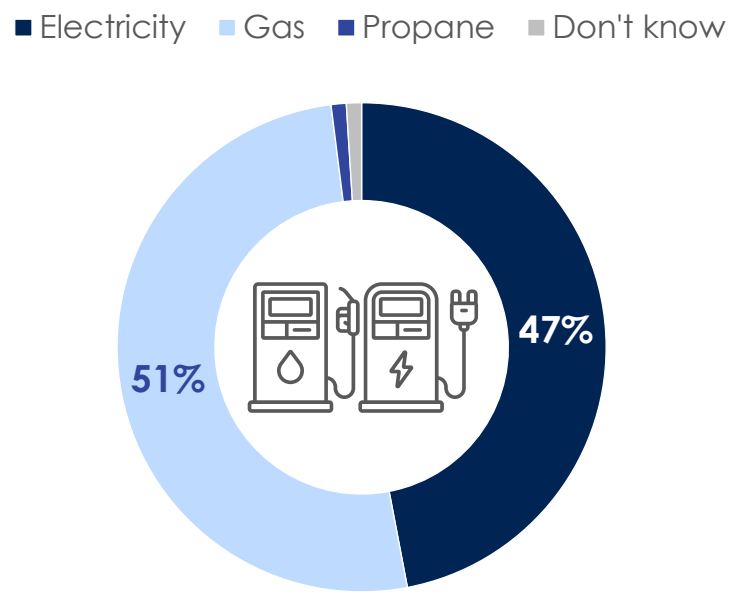
Food Service Equipment & Appliances



Base: Familiar with operation and/or maintenance of food service appliances (n=480)
Q102. What types of food service equipment/appliance are present in this building, if any?

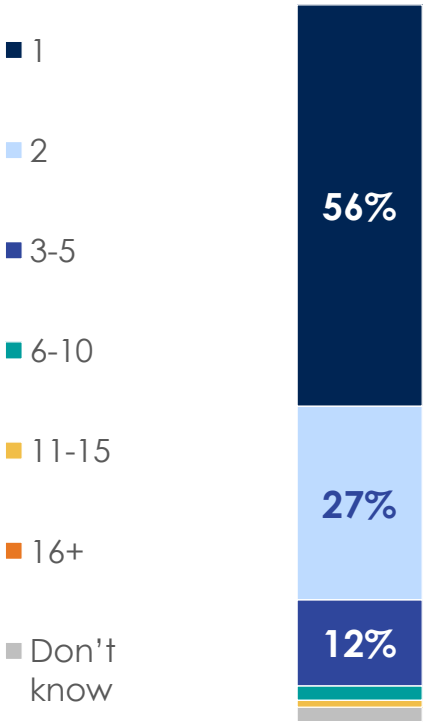
Convection Ovens

TYPE OF FUEL USED



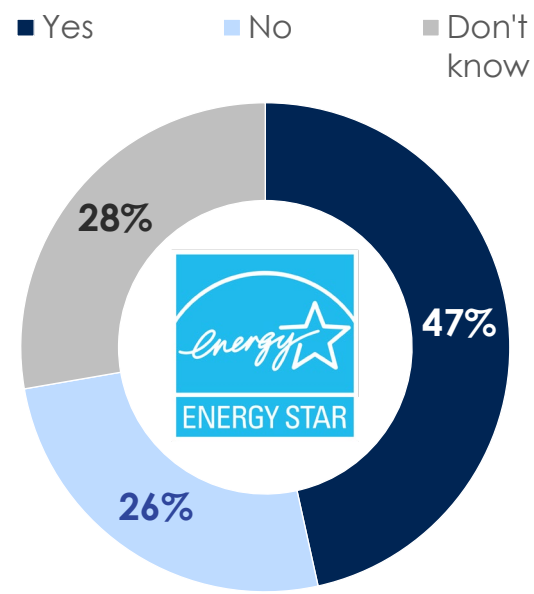
Base: Building has convection oven (n=202)
Q103. What type of fuel does the convection oven use?

OF UNITS IN BUILDING



Base: Building has convection oven (n=202)
Q104. How many convection ovens are there in this building?

ENERGY STAR LABEL

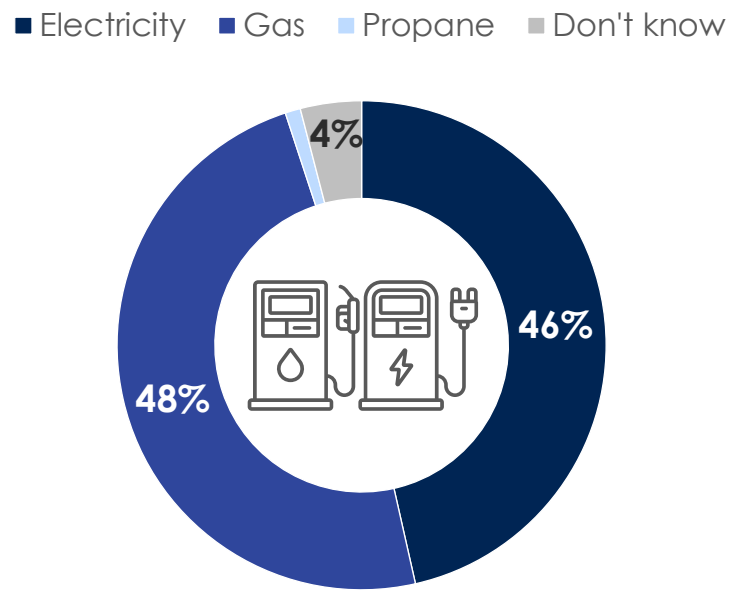


Data<3% not shown

Base: Building has convection oven (n=202)
Q105. Is the convection oven Energy Star labeled? If multiple, are more than half of the convection ovens Energy Star labeled?

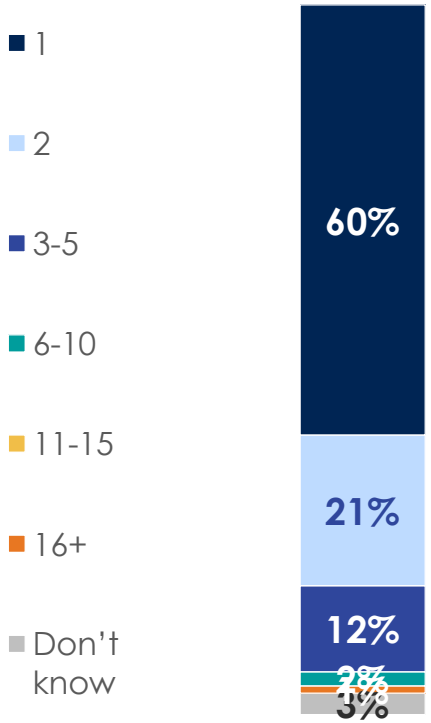
Combination Ovens

TYPE OF FUEL USED



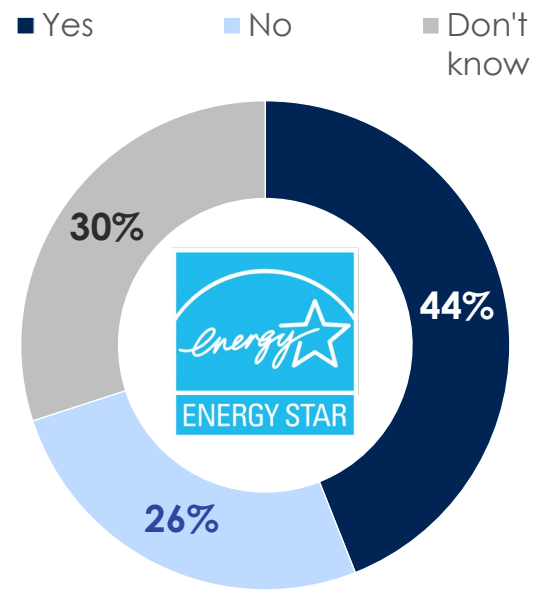
Base: Building has combination oven (n=91)
Q106. What type of fuel does the combination oven use?

OF UNITS IN BUILDING



Base: Building has combination oven (n=91)
Q107. How many combination ovens are there in this building?

ENERGY STAR LABEL

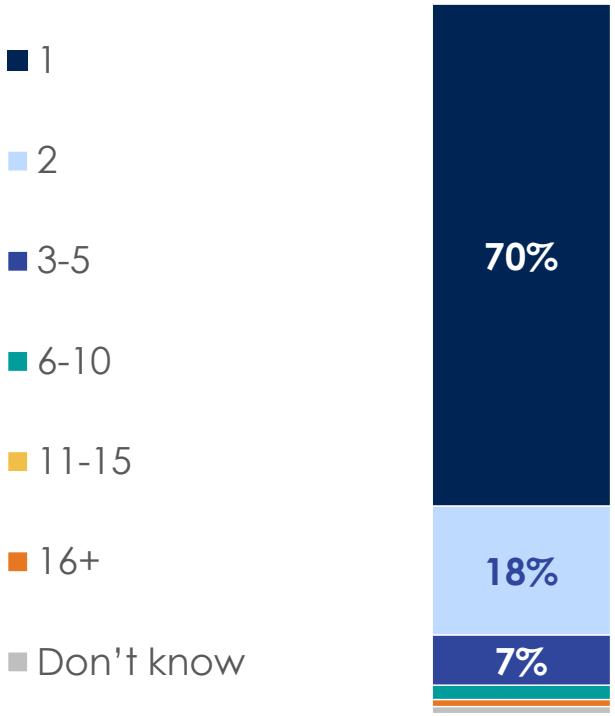


Data<3% not shown

Base: Building has combination oven (n=91)
Q108. Is the combination oven Energy Star labeled? If multiple, are more than half of the combination ovens Energy Star labeled?

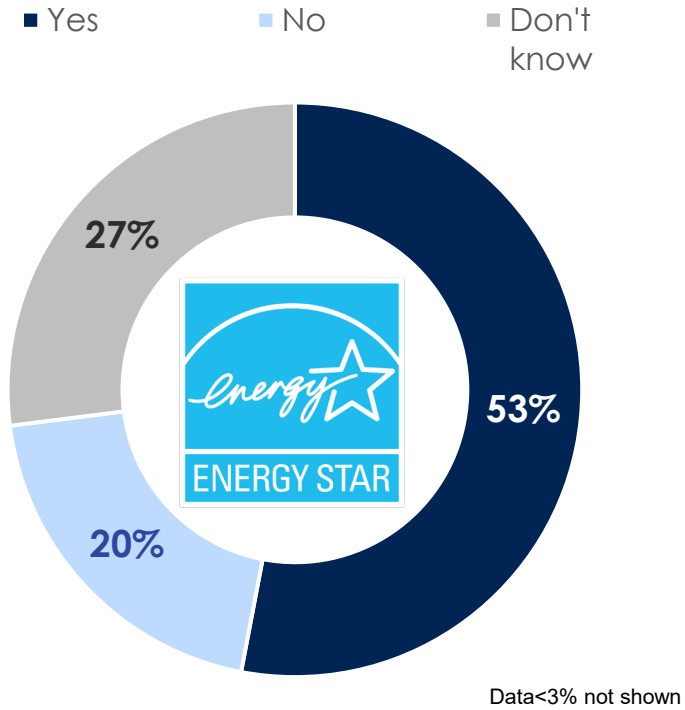
Dishwashers

OF UNITS IN BUILDING



Base: Building has dishwasher (n=271)
Q109. How many dishwashers are there in this building?

ENERGY STAR LABEL

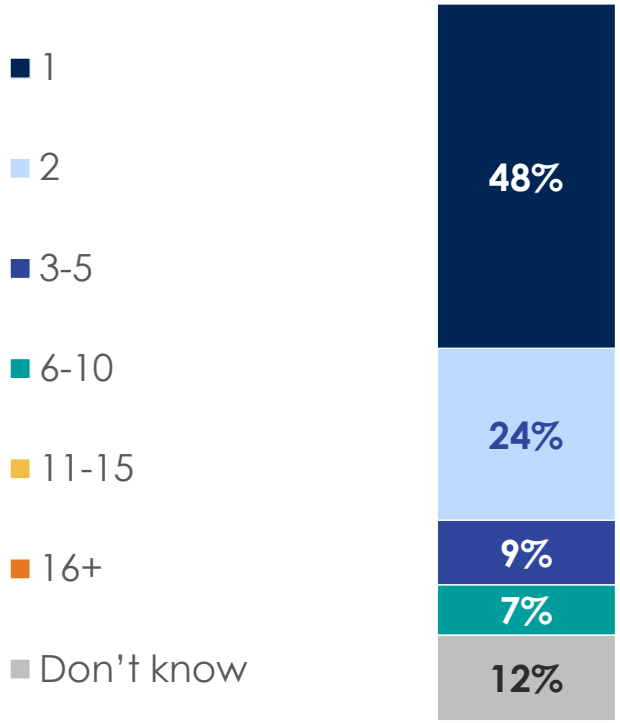


Data<3% not shown

Base: Building has dishwasher (n=271)
Q110. Is the dishwasher Energy Star labeled? If multiple, are more than half of the dishwashers Energy Star labeled?

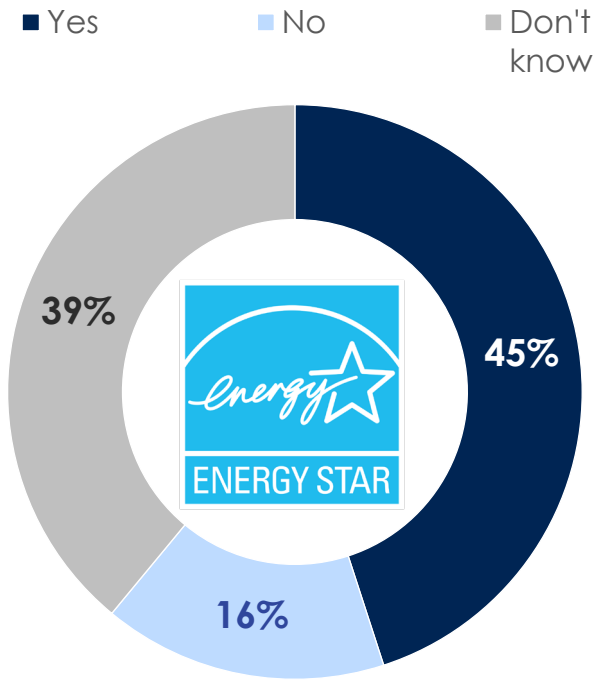
Induction Cooktop

OF UNITS IN BUILDING



Base: Building has induction cooktop (n=75)
Q111. How many induction cooktops are there in this building?

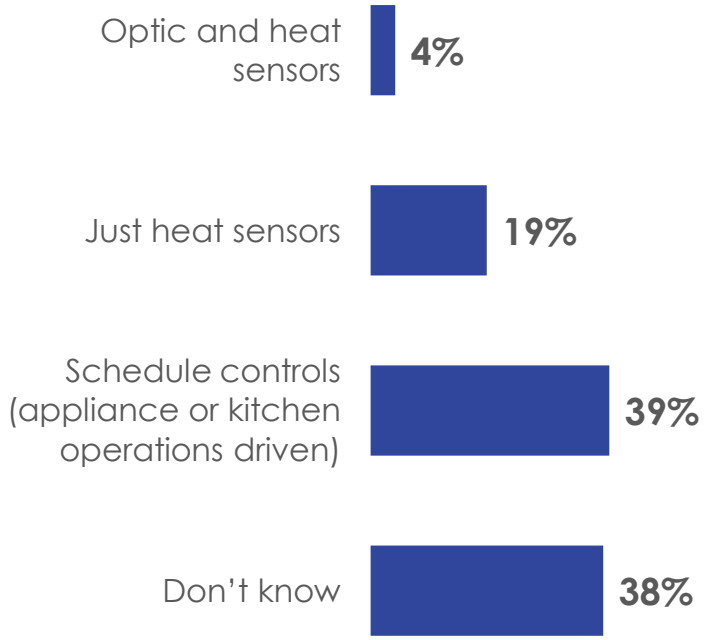
ENERGY STAR LABEL



Base: Building has induction cooktop (n=75)
Q112. Is the induction cooktop Energy Star labeled? If multiple, are more than half of the induction cooktops Energy Star labeled?

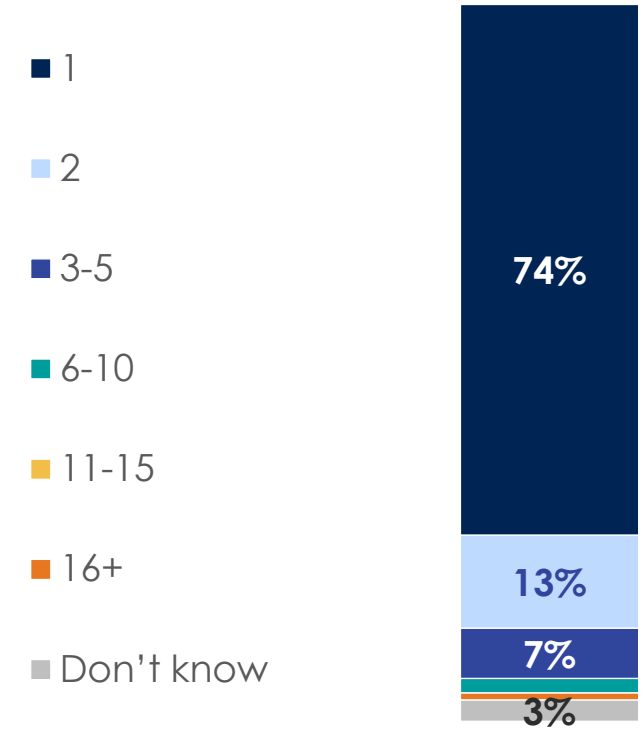
Demand-Controlled Kitchen Ventilation

TYPE OF SENSORS USED



Base: Building has demand-controlled kitchen ventilation (n=157)
Q113. What type of sensors are used by the demand-controlled kitchen ventilation?

OF UNITS IN BUILDING

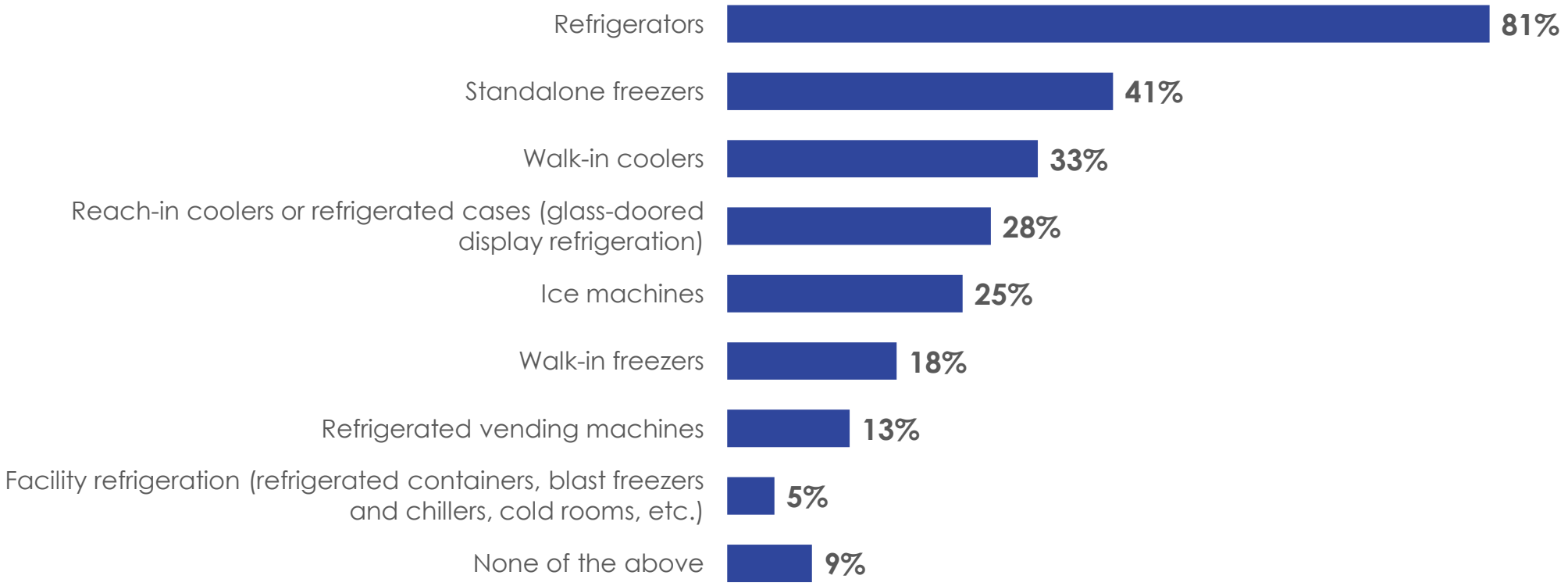


Data<3% not shown

Base: Building has demand-controlled kitchen ventilation (n=157)
Q114. How many kitchen hood exhausts are demand-controlled in this building?

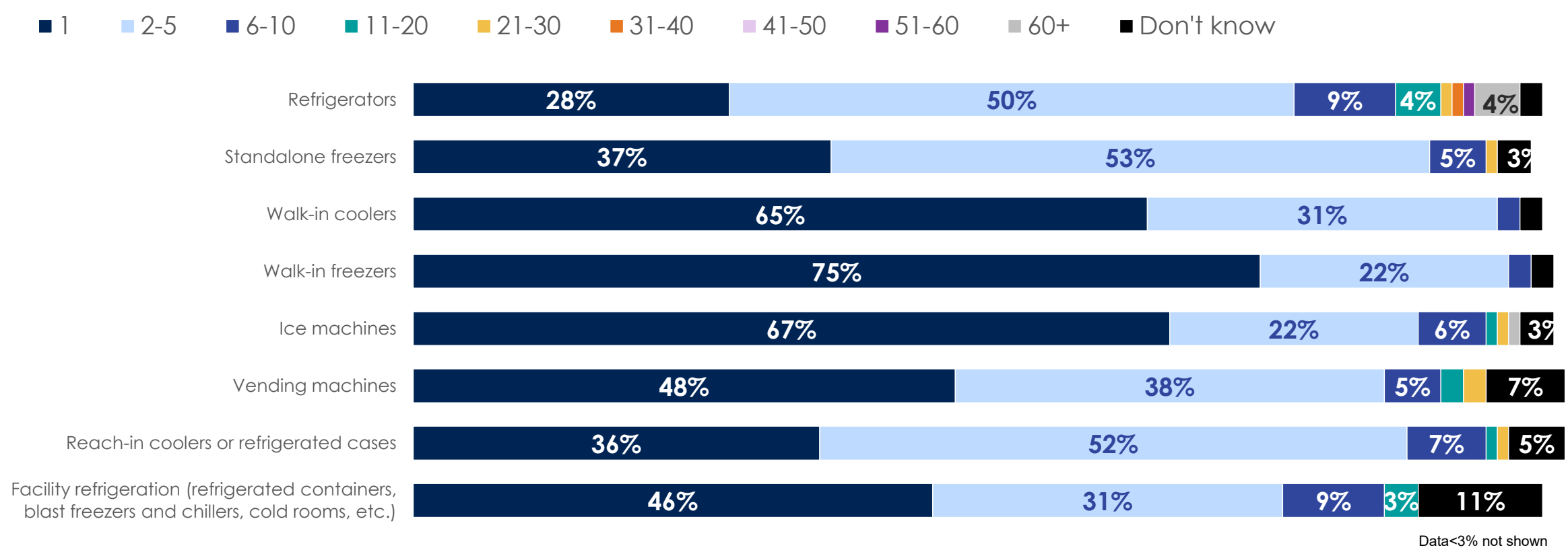
REFRIGERATION

Refrigeration Equipment Types Used



Base: Familiar with operation and/or maintenance of refrigeration equipment (n=694)
Q115. What types of refrigeration equipment are present in this building, if any?

Number of Refrigeration Equipment Units

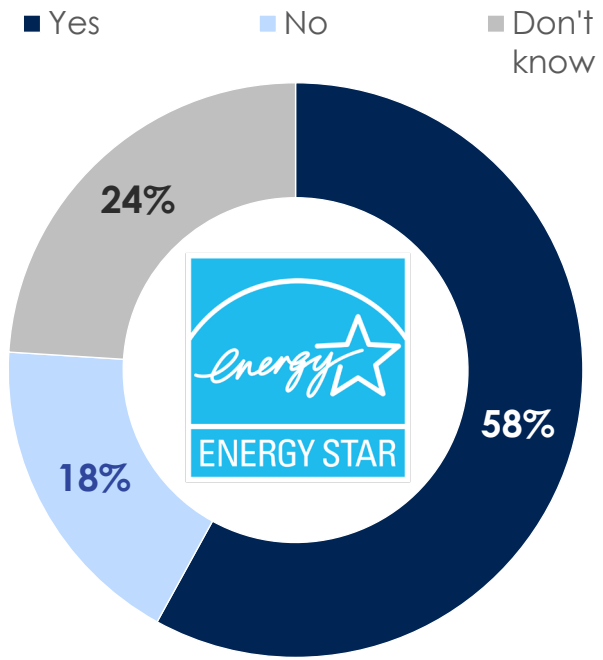


Data<3% not shown

Base: Refrigeration equipment used in building (Base Varies)
Q116. How many units of refrigeration equipment are in this building?

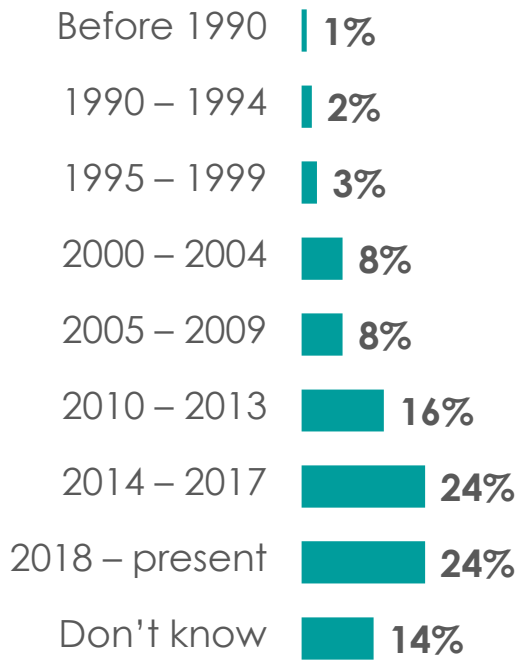
Refrigerator: Energy Star Label & Age

ENERGY STAR LABEL



Base: Building has refrigerators (n=561)
Q117. Is the refrigerator Energy Star labeled? If multiple, are more than half of refrigerators Energy Star labeled?

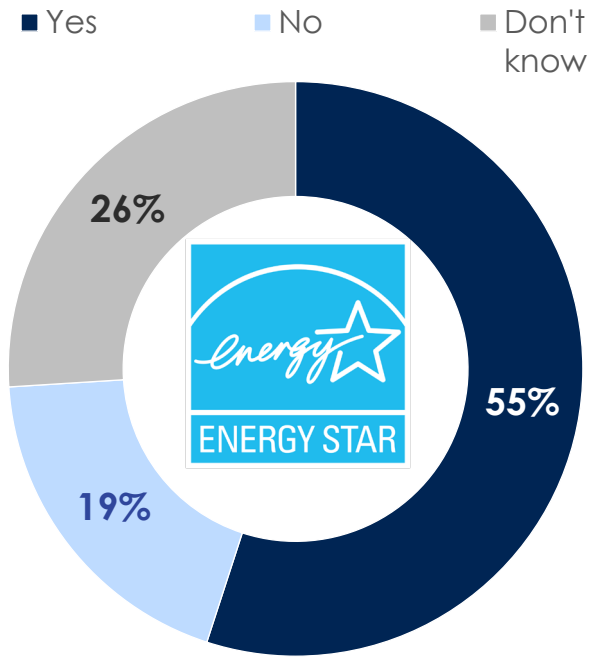
YEAR OF INSTALLATION



Base: Building has refrigerators (n=477)
Q118. When was the refrigerator installed? If multiple, please select the range of years in which most refrigerators were installed.

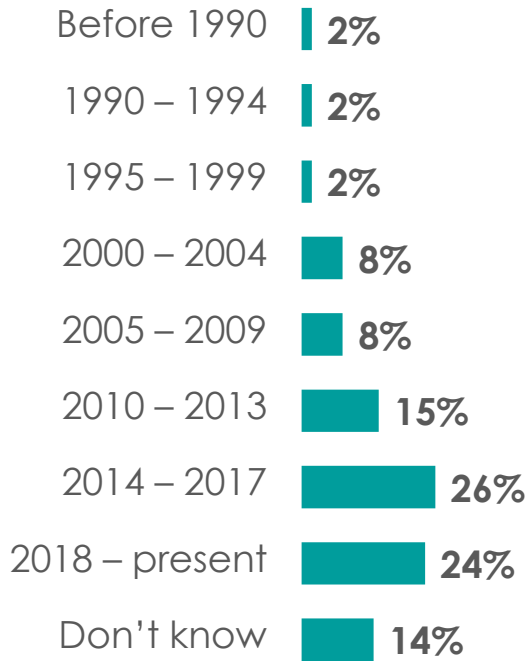
Standalone Freezer: Energy Star Label & Age

ENERGY STAR LABEL



Base: Building has standalone freezers (n=288)
Q119. Is the standalone freezer Energy Star labeled? If multiple, are more than half of standalone freezers Energy Star labeled?

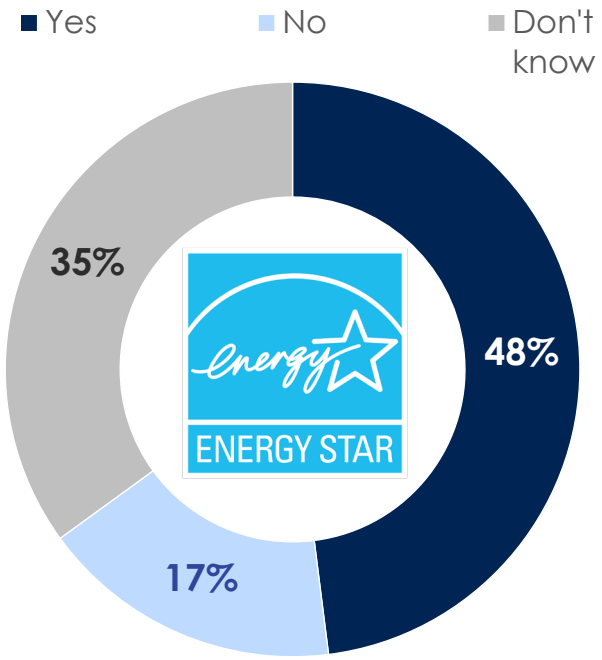
YEAR OF INSTALLATION



Base: Building has standalone freezers (n=242)
Q120. When was the standalone freezer installed? If multiple, please select the range of years in which most standalone freezers were installed.

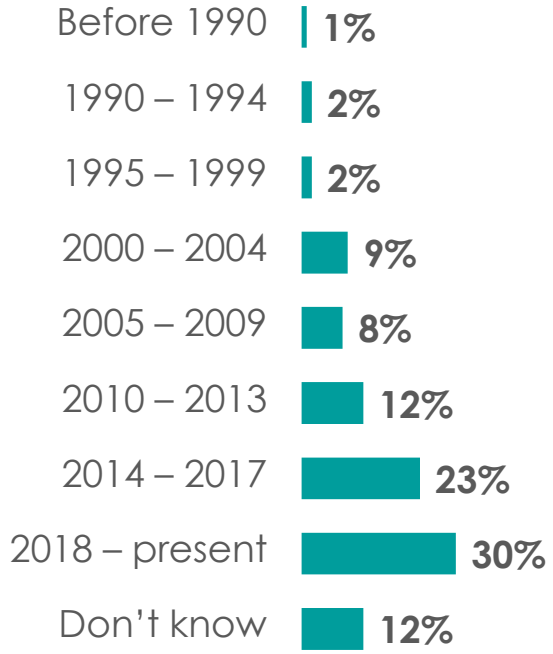
Ice Machine: Energy Star Label & Age

ENERGY STAR LABEL



Base: Building has ice machines (n=172)
Q121. Is the ice machine Energy Star labeled? If multiple, are more than half of ice machines Energy Star labeled?

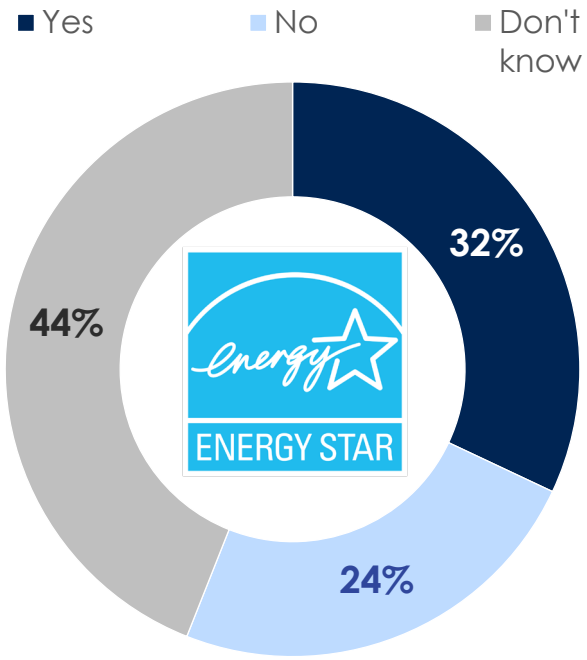
YEAR OF INSTALLATION



Base: Building has ice machines (n=138)
Q122. When was the ice machine installed? If multiple, please select the range of years in which most ice machines were installed.

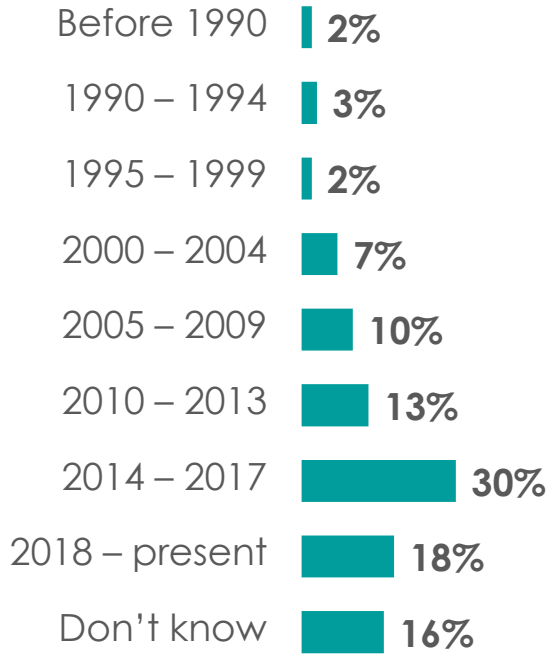
Refrigerated Vending Machine: Energy Star Label & Age

ENERGY STAR LABEL



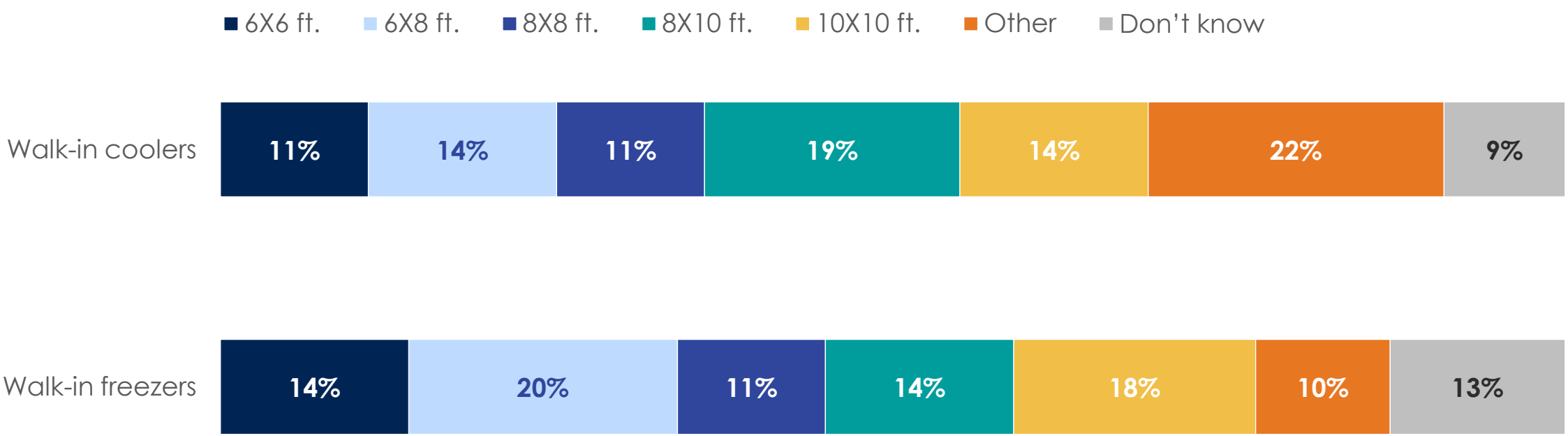
Base: Building has refrigerated vending machines (n=88)
Q123. Is the refrigerated vending machine Energy Star labeled? If multiple, are more than half of the refrigerated vending machines Energy Star labeled?

YEAR OF INSTALLATION



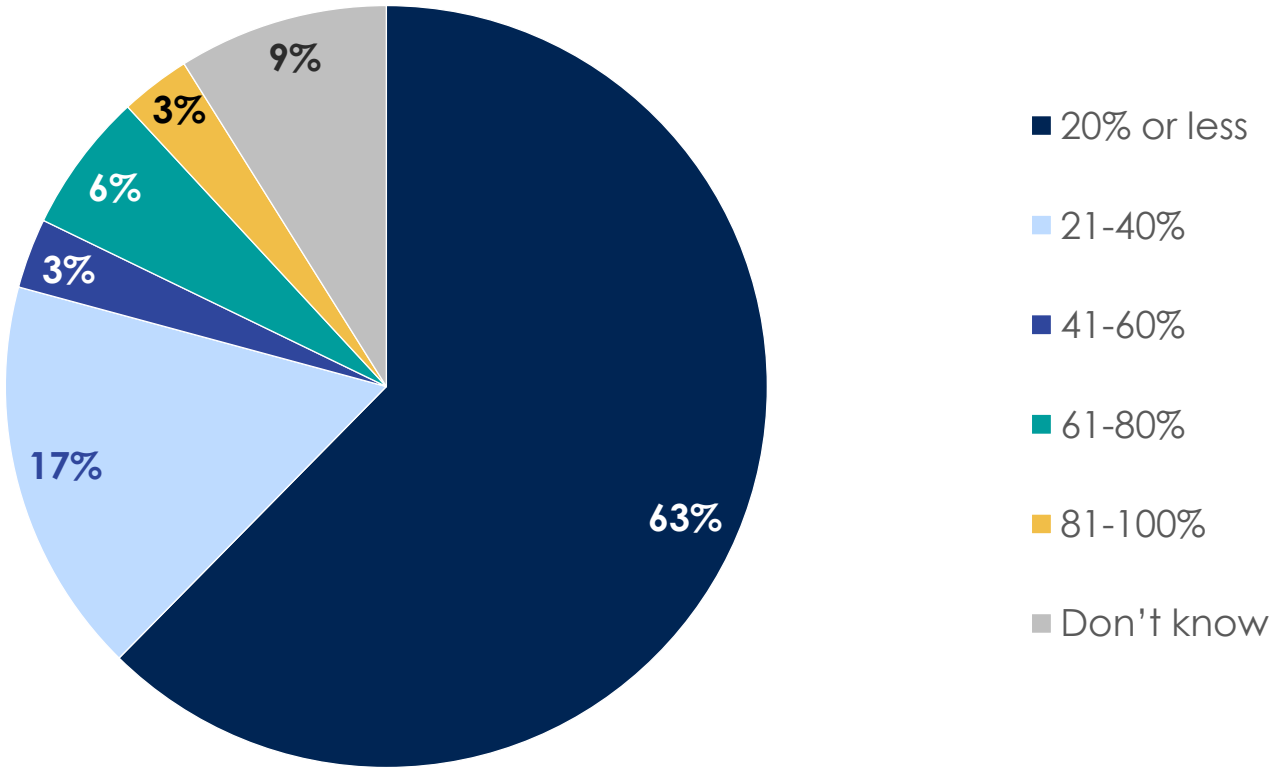
Base: Building has refrigerated vending machines (n=61)
Q124. When was the refrigerated vending machine installed? If multiple, please select the range of years in which most vending machines were installed.

Size of Walk-In Refrigerated Spaces



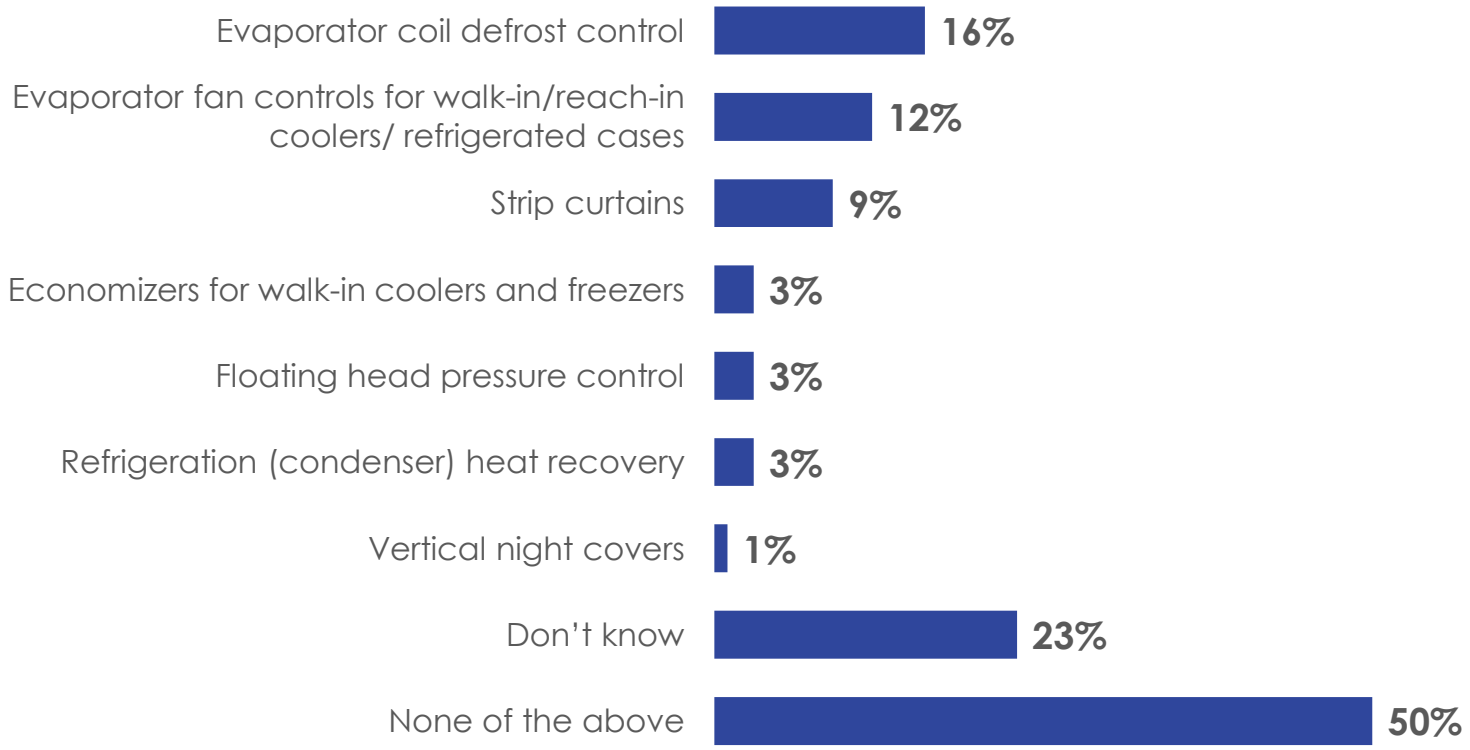
Base: Building has walk-in refrigerated spaces (Base Varies)
Q125. How large are these walk-in refrigerated spaces? If multiple, answer for the average size or the size of the majority of spaces.

Floorspace Refrigeration



Base: Building has facility refrigeration (n=35)
Q126. What percentage of your building's floorspace is refrigerated?

Refrigeration Energy Saving Technologies



Base: Refrigeration equipment used in building (n=634)
Q127. Do you operate any of the following refrigeration energy saving technologies in this building?

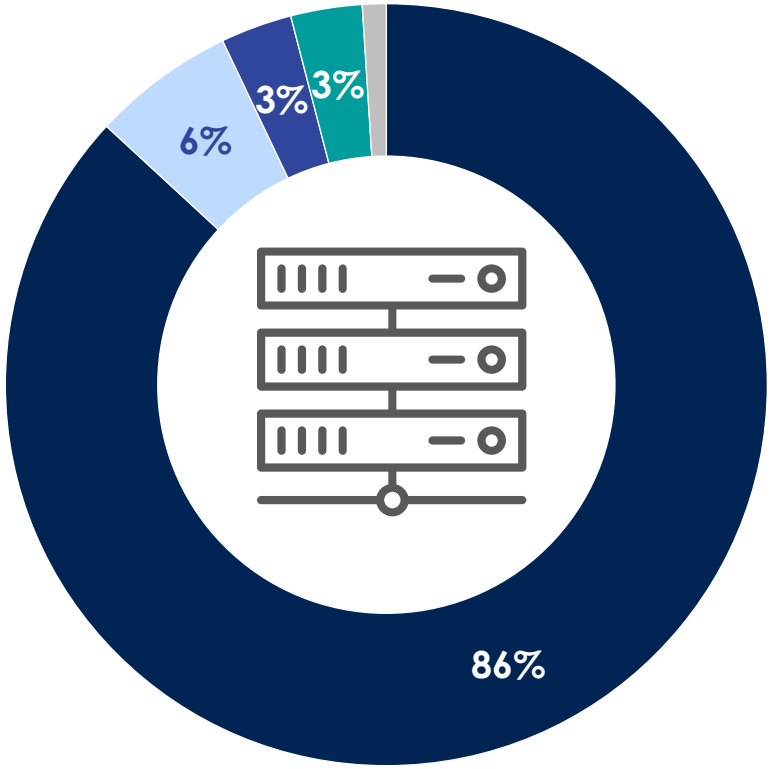
SERVERS

Number of Server Racks

Data<3% not shown

Base: Familiar with operation and/or maintenance of servers (n=728)
Q128. How many server racks do you have, if any?

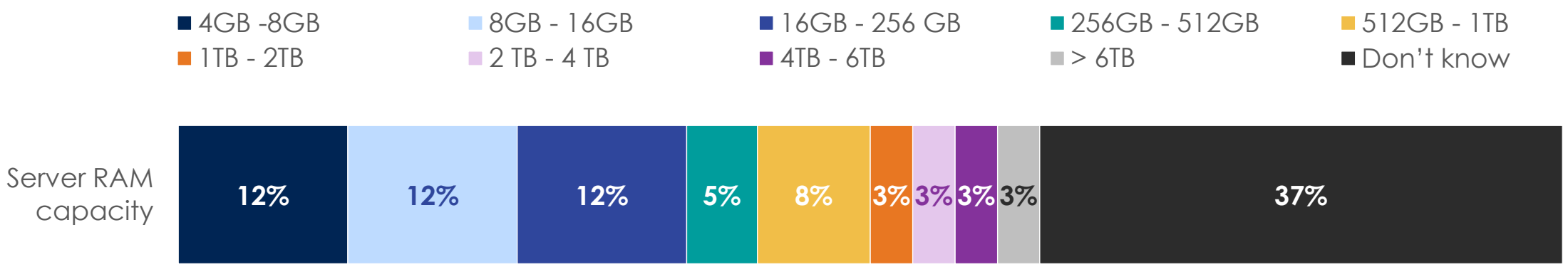
Server Rack Units Per Rack



Data<3% not shown

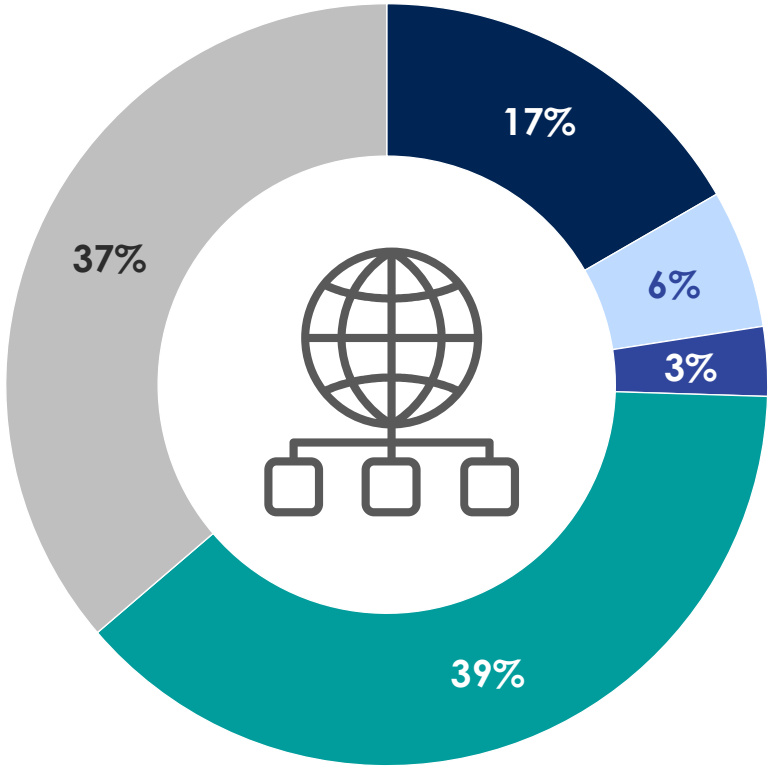
Base: Has server racks (n=273)
Q129. How many server rack units are in each rack?

Server RAM Capacity



Base: Has server racks (n=273)
Q130. What is the capacity or RAM of each server?

Server Virtualization or Consolidation



- Yes – both server virtualization and consolidation
- Yes – virtualization only
- Yes – consolidation only
- No, neither virtualization nor consolidation
- Don't know

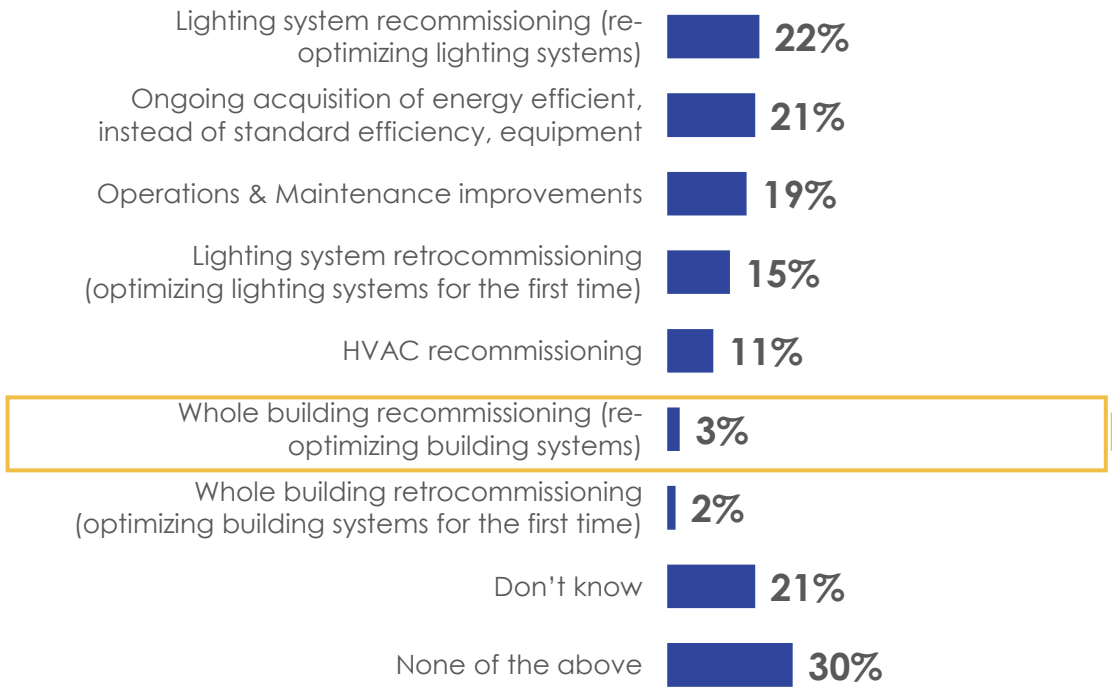
Base: Has server racks (n=309)
Q131. Have you implemented any server virtualization or consolidation efforts?

BUSINESS PERCEPTIONS & ENERGY CONSERVATION PRACTICES

These questions assess business adoption of energy conservation practices, awareness of and inclination to acquire energy efficiency measures and participate in energy conservation programs, and barriers to improving energy efficiency

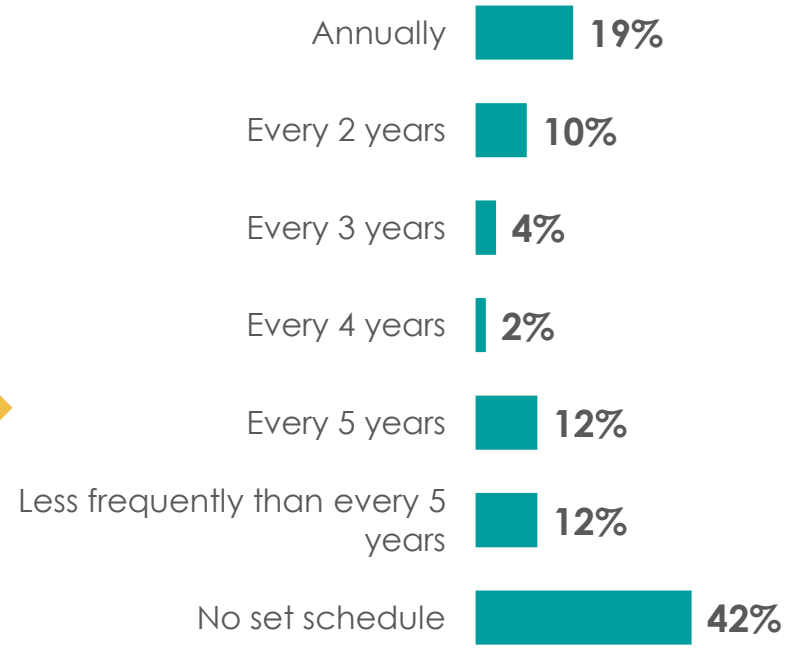
Equipment-Based Energy Conservation Strategies

ENERGY CONSERVATION STRATEGY



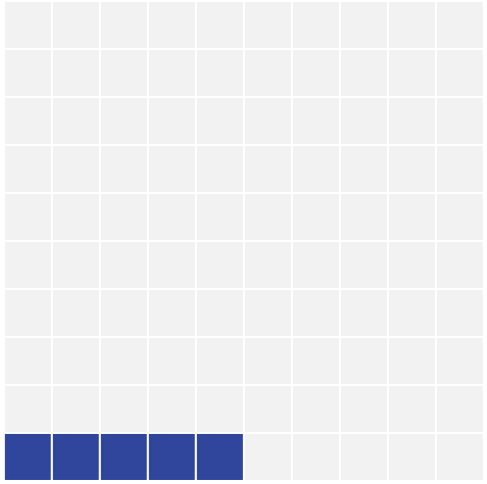
Base: Familiar with operation and/or maintenance of any equipment (n=1691)
Q132. Have you implemented any of the following equipment-based energy conservation strategies for this building?

YEAR OF INSTALLATION



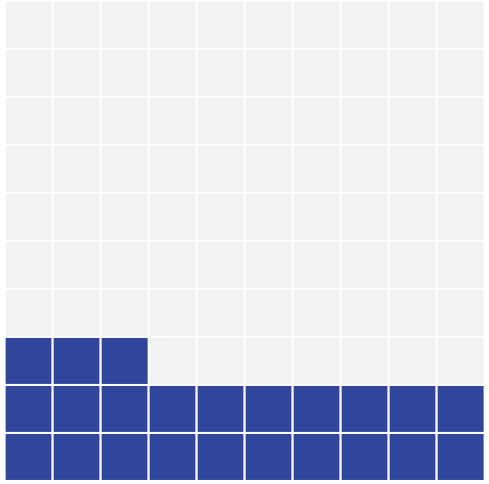
Base: Have implemented whole building recommissioning (n=52)
Q133. How frequently is building recommissioning scheduled for this building?

Organizational Energy Conservation Practices



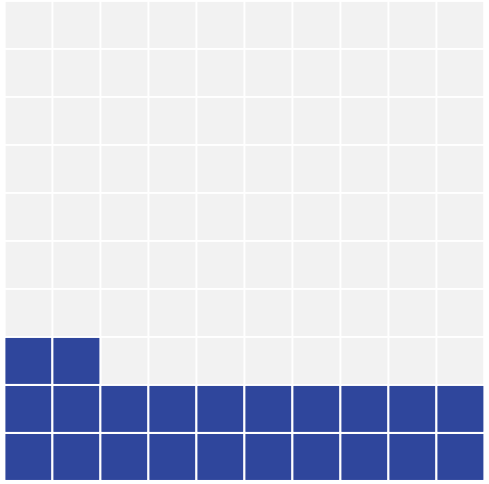
5%

Benchmarking



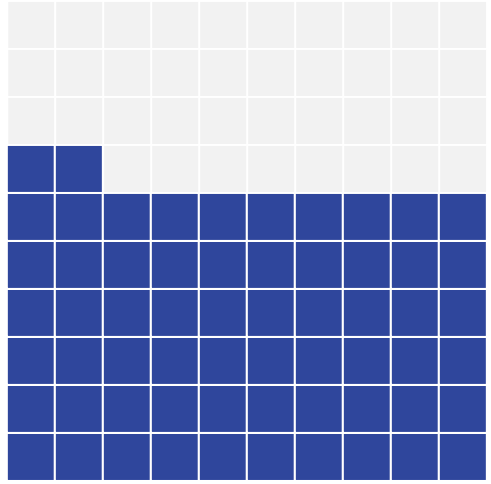
23%

Energy monitoring



22%

Employee awareness programs

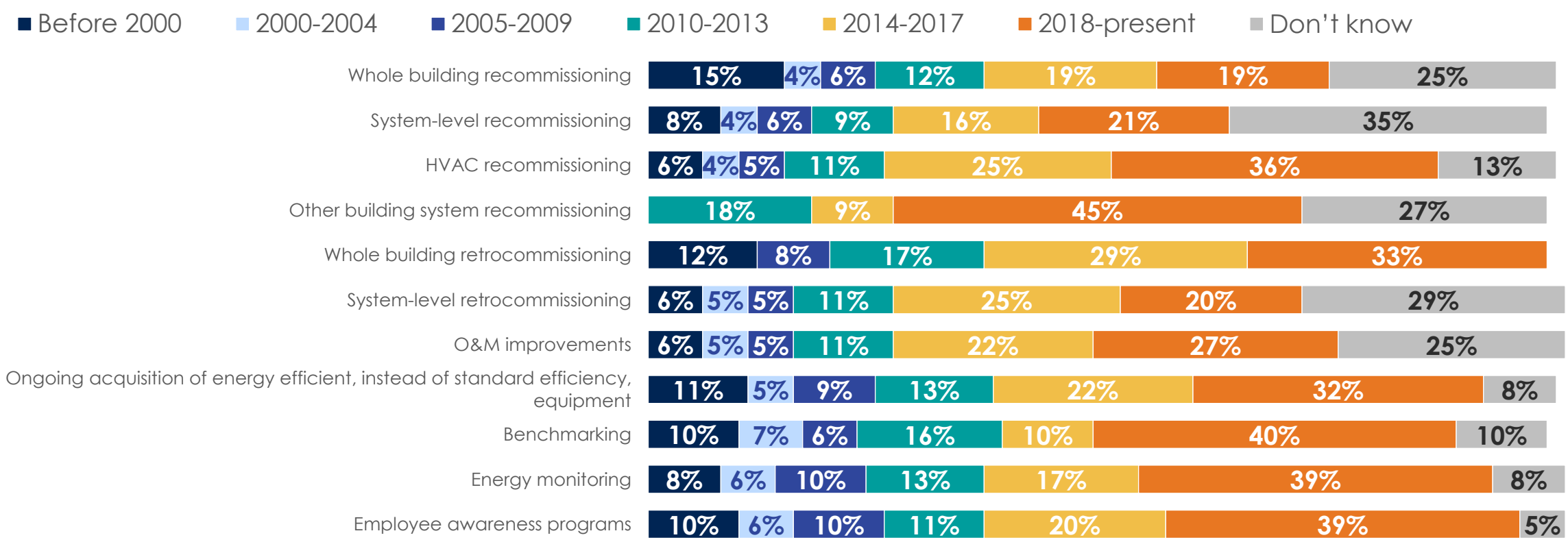


62%

None of the above

Base: Familiar with operation and/or maintenance of any equipment (n=1691)
Q134. Have you implemented any of the following organizational energy conservation practices for this building?

Organizational Energy Conservation Practices: Year of Implementation

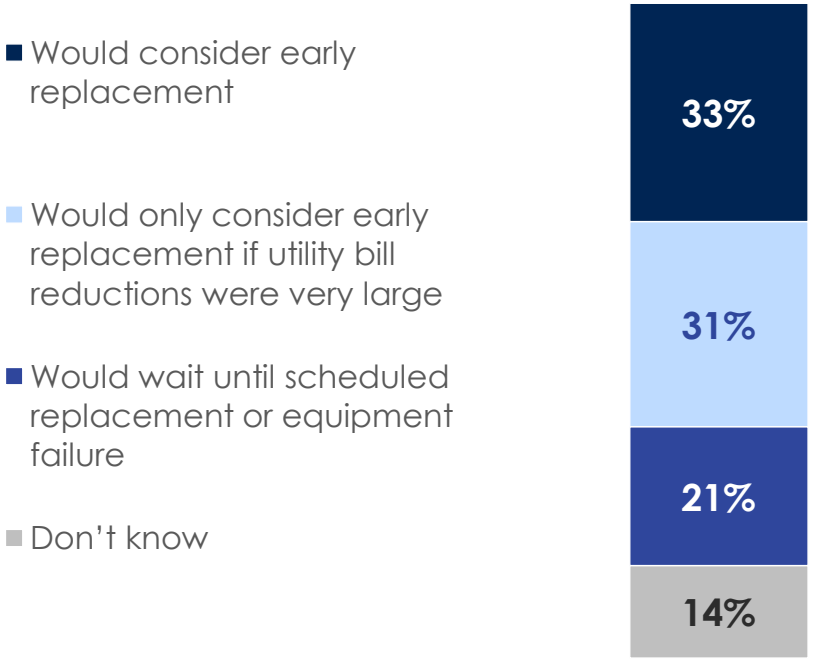


Base: Have implemented any organizational energy conservation practices (Base Varies)
Q135. Approximately when did you begin implementing this practice?

Replacing Equipment Ahead of Scheduled Replacement Date

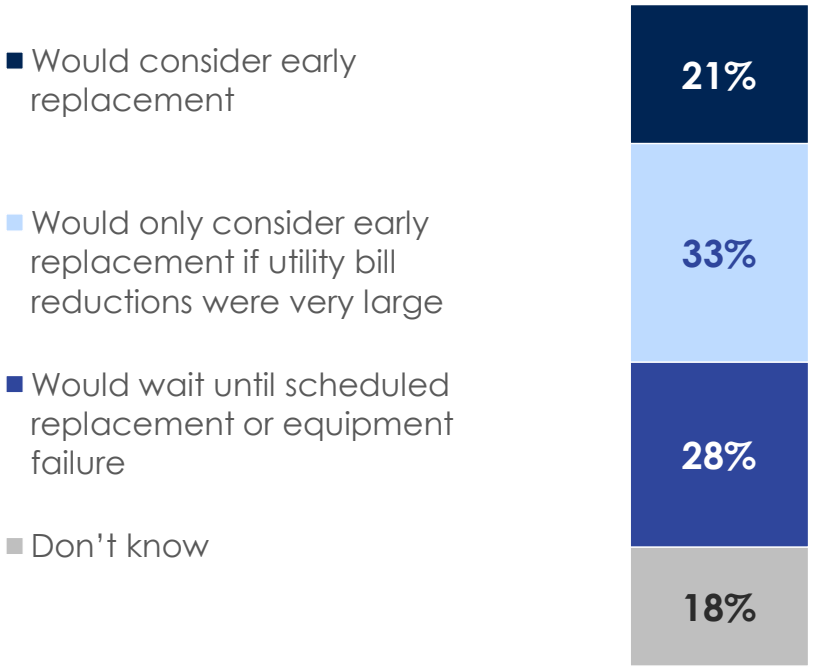
- Many businesses are reluctant to replace equipment before end of life, even if a more energy-efficient replacement is available.

REPLACING LOWER COST EQUIPMENT



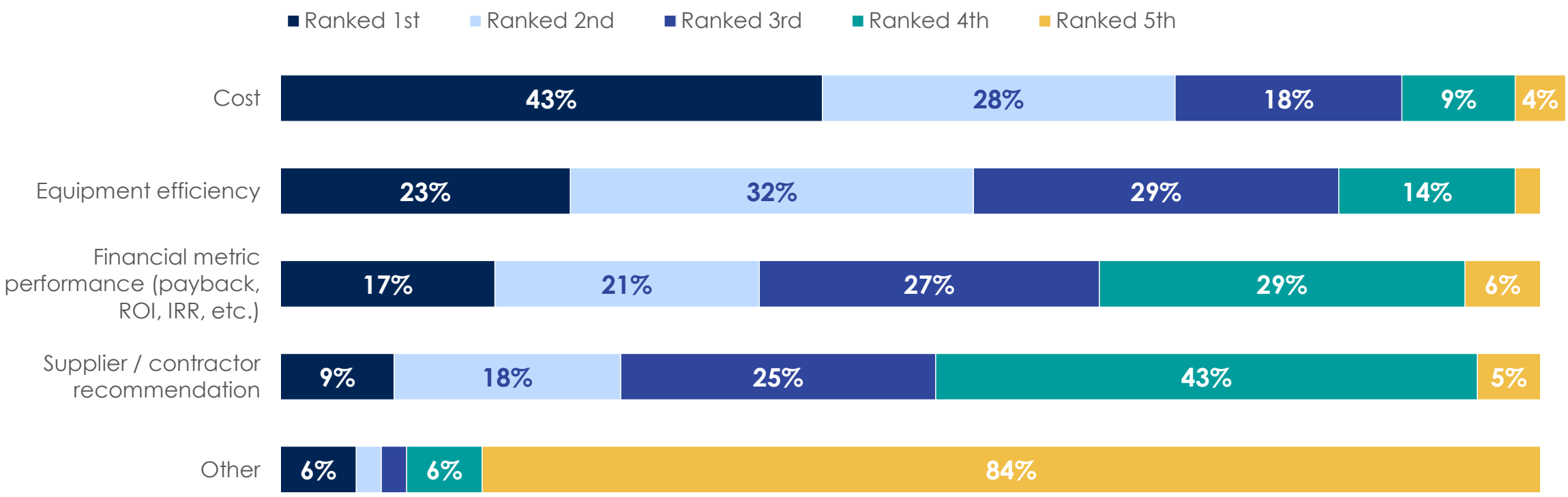
Base: Familiar with and directly involved in energy-using equipment purchasing process (n=1468)
Q137. Would you consider replacing lower cost equipment, like light fixtures, ahead of the scheduled replacement date (or equipment failure) if doing so could reduce your utility bills?

REPLACING HIGHER COST EQUIPMENT



Base: Familiar with and directly involved in energy-using equipment purchasing process (n=1466)
Q138. Would you consider replacing higher cost equipment, like a boiler, ahead of the scheduled replacement date or its end-of-life, if doing so could significantly reduce your utility bills?

Equipment Purchasing Priorities

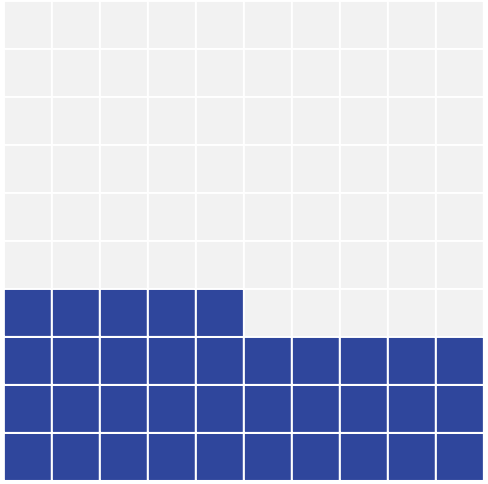


Data<3% not shown

Base: Familiar with and directly involved in energy-using equipment purchasing process (Base Varies)
Q139. Please identify what your organization prioritizes when purchasing equipment (1 being most important, 5 being least important).

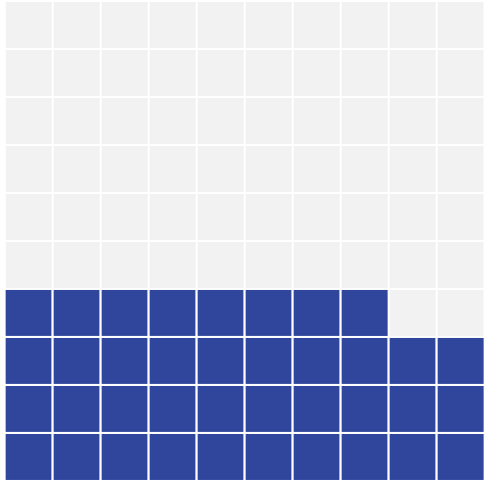
Energy Efficiency Investment Decisions

- Many businesses use a financial metric to compare the costs of energy efficiency investments with the forecast benefits, including energy bill savings.



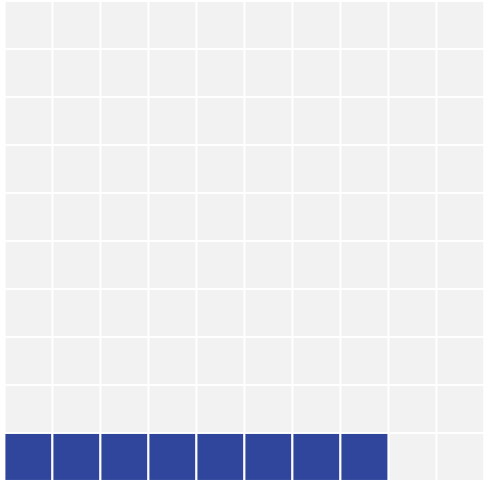
35%

Payback period



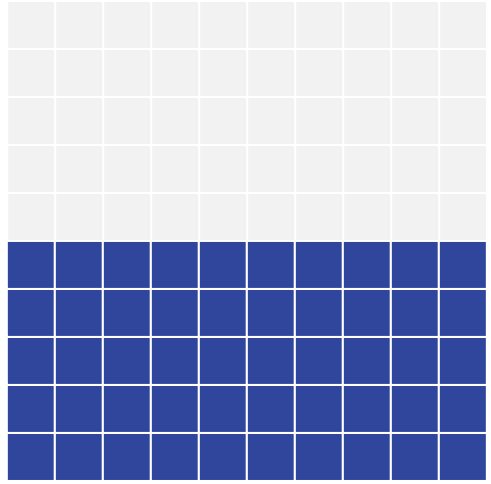
38%

Return on investment (ROI)



8%

Internal rate of return (IRR)



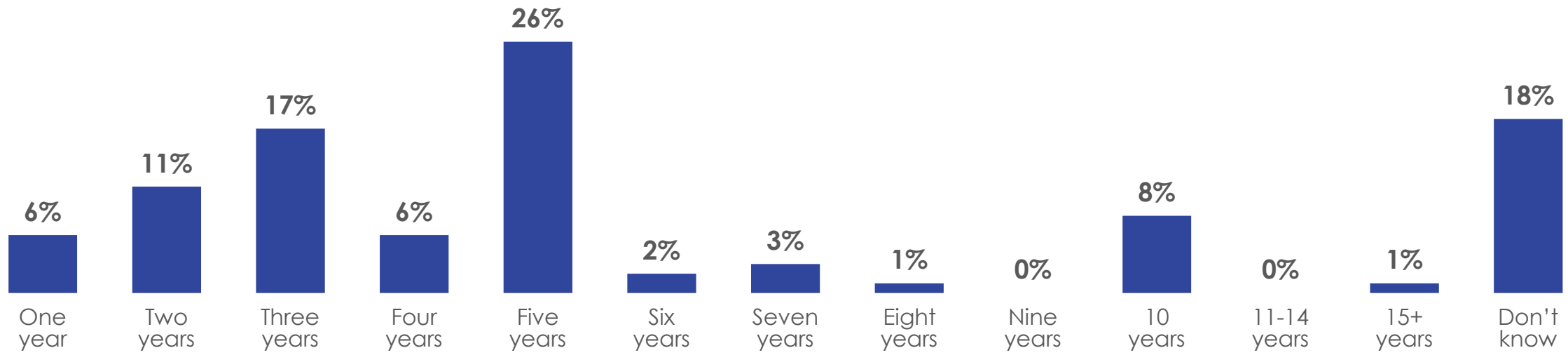
50%

Varies from project to project

Base: Familiar with and directly involved in energy-using equipment purchasing process (n=1402)
Q140. Which financial metric(s) do you use to guide energy efficiency investment decisions?

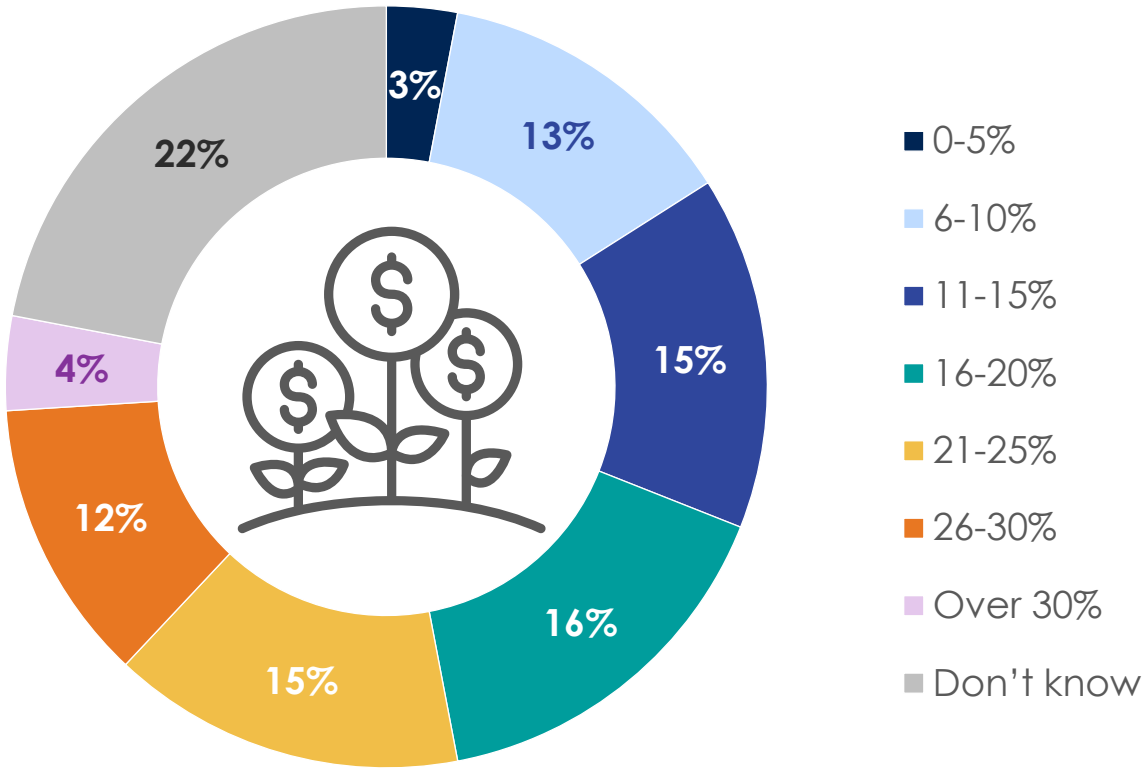
Longest Acceptable Payback Period For Organization

- Most organizations will not consider a more efficient model of equipment if the incremental cost is not recovered within five years through energy bill savings."



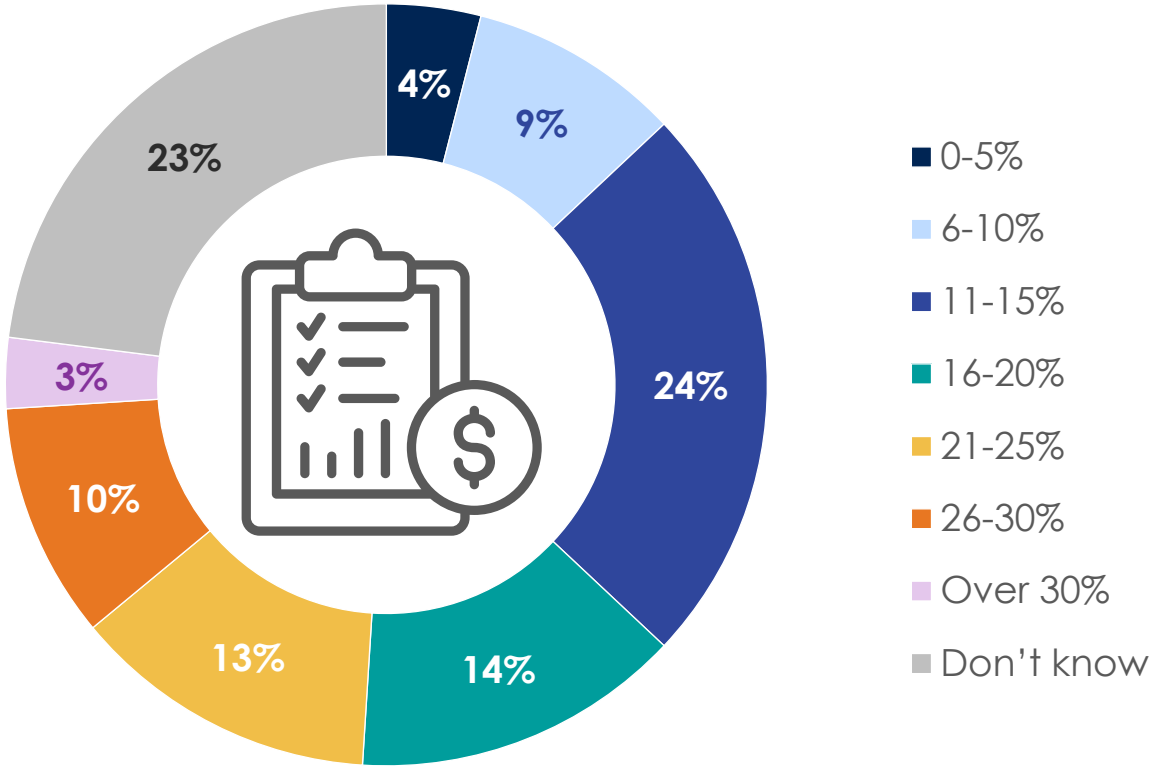
Base: Payback period financial metric used (n=1081)
Q141. What is the longest acceptable payback period for your organization to consider making an energy efficiency upgrade? Assume payback is calculated as the number of years it takes for energy cost savings to exceed any additional costs of investing in the energy efficient equipment (over and above the costs associated with the "standard" version of that equipment). Costs may include the equipment purchase price, cost of installation, and maintenance costs.

Minimum Return On Investment Needed On Project To Consider



Base: Return on investment financial metric used (n=533)
Q142. What is the minimum Return on Investment or ROI a project would need to achieve for your organization to consider making an energy efficiency upgrade?

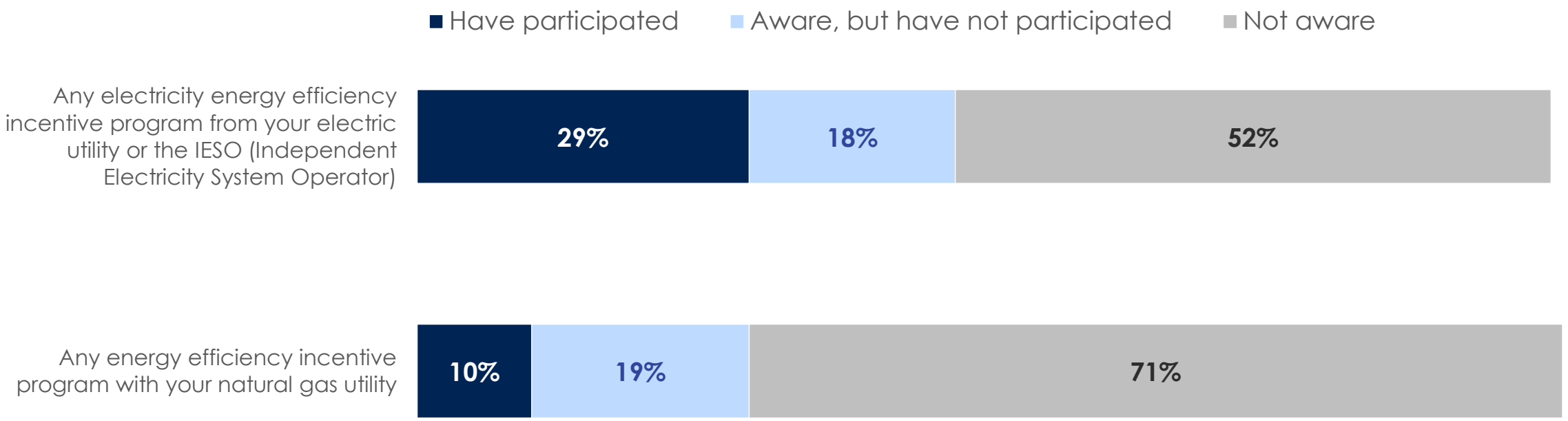
Minimum Initial Rate of Return Needed On Project To Consider



Base: Initial rate of return financial metric used (n=115)
Q143. What is the minimum annualized Initial Rate of Return or IRR a project would need to achieve for your organization to consider making an energy efficiency upgrade?

Awareness of Energy Efficiency Programs

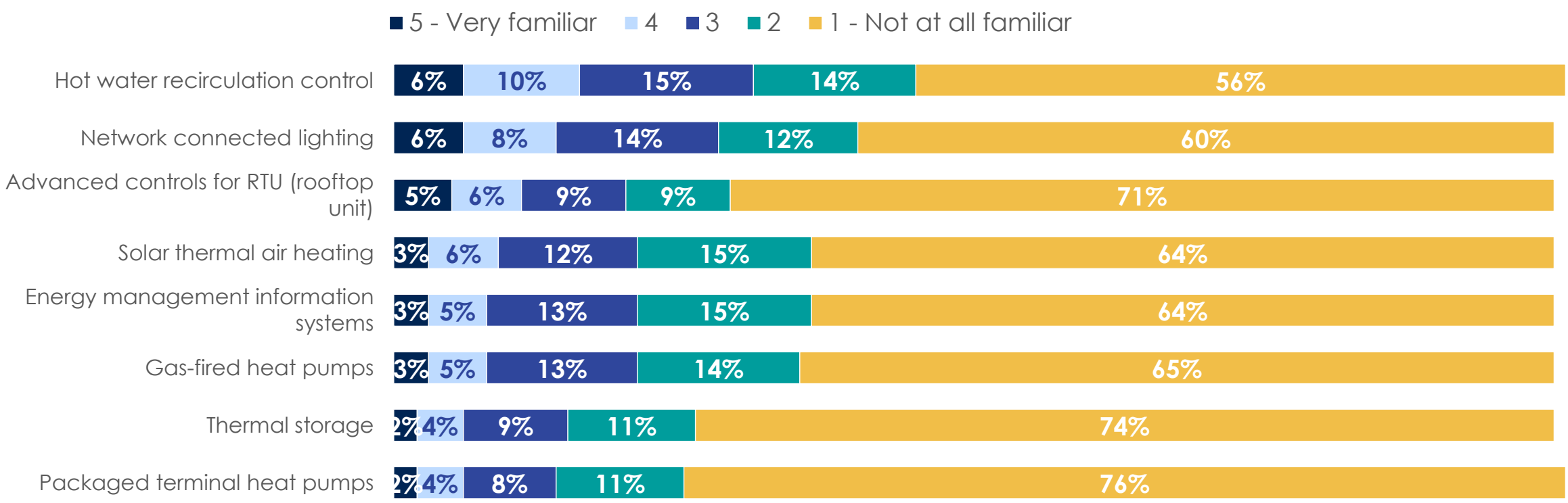
- More than half of respondents are unfamiliar with business energy conservation programs offered in Ontario.



Base: Familiar with and directly involved in energy-using equipment purchasing process (Base Varies)
Q144. Which of the following energy efficiency programs are you aware of or have you participated in?

Familiarity With Energy Efficiency Measures

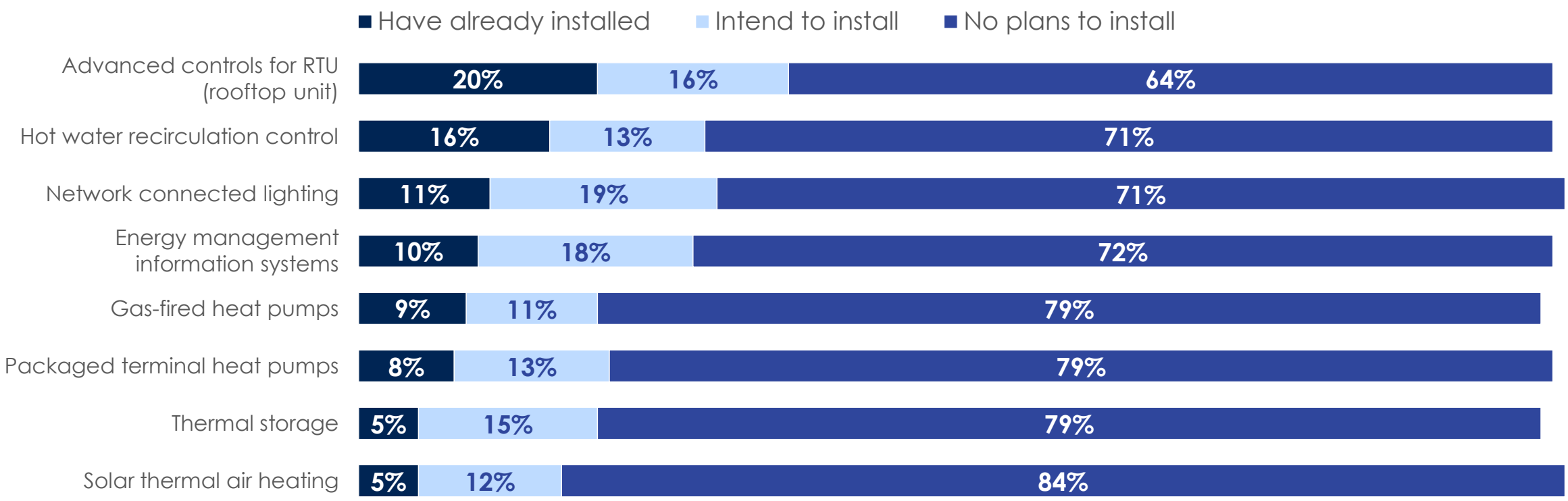
- Awareness and adoption of emerging energy efficiency measures is relatively low.



Data<3% not shown

Base: Familiar with and directly involved in energy-using equipment purchasing process (n=1343)
Q145. Please rate your familiarity with the following energy efficiency measures on a scale of 1 to 5, where 1 means "not at all familiar with this type of equipment" and 5 means "very familiar with this type of equipment and its operation and benefits."

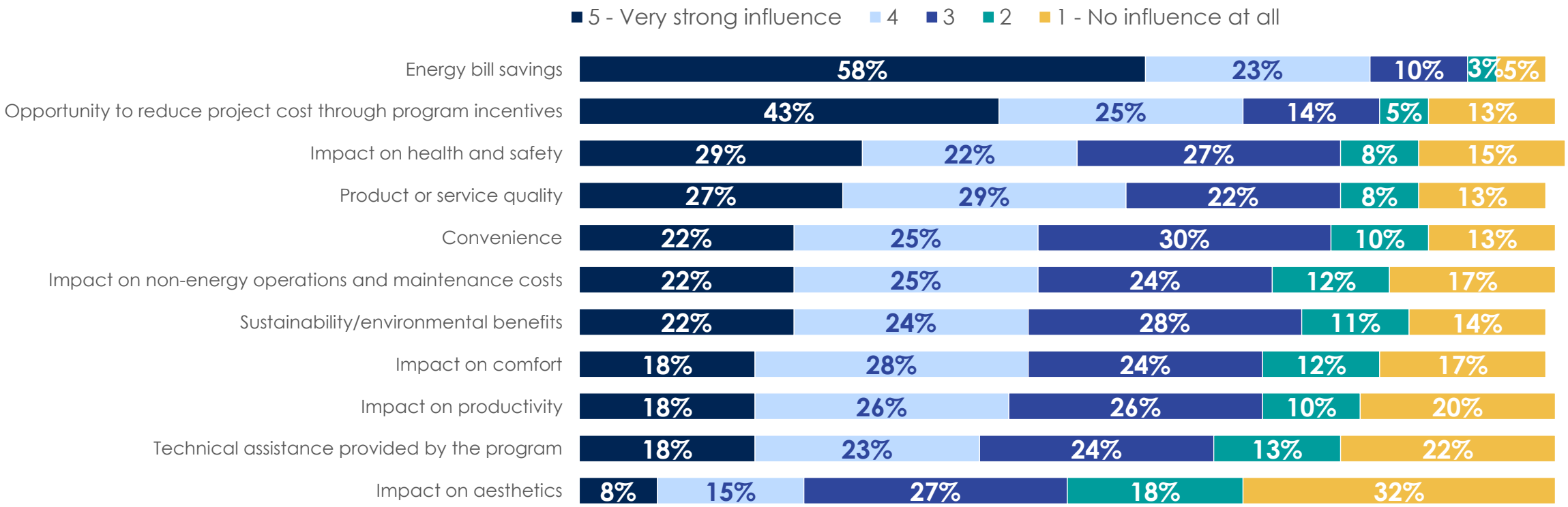
Plans to Install Energy Efficiency Measures



Base: Familiar with and directly involved in energy-using equipment purchasing process (Base Varies)
Q146. Have you installed or intend to install any of these technologies?

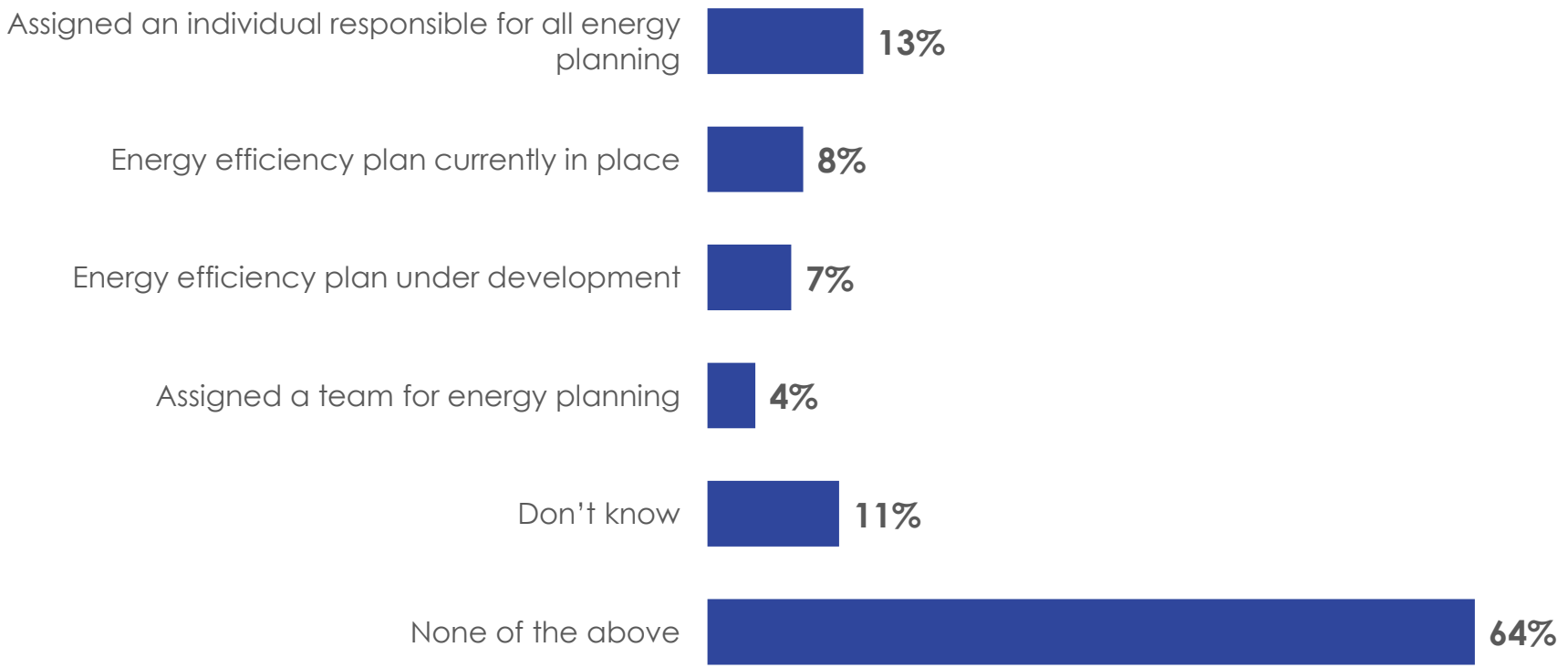
Influencing Factors For Energy Efficiency Program Participation

- Energy bill savings is the most important motivating factor for participation in energy efficiency programs and installing energy-efficient equipment



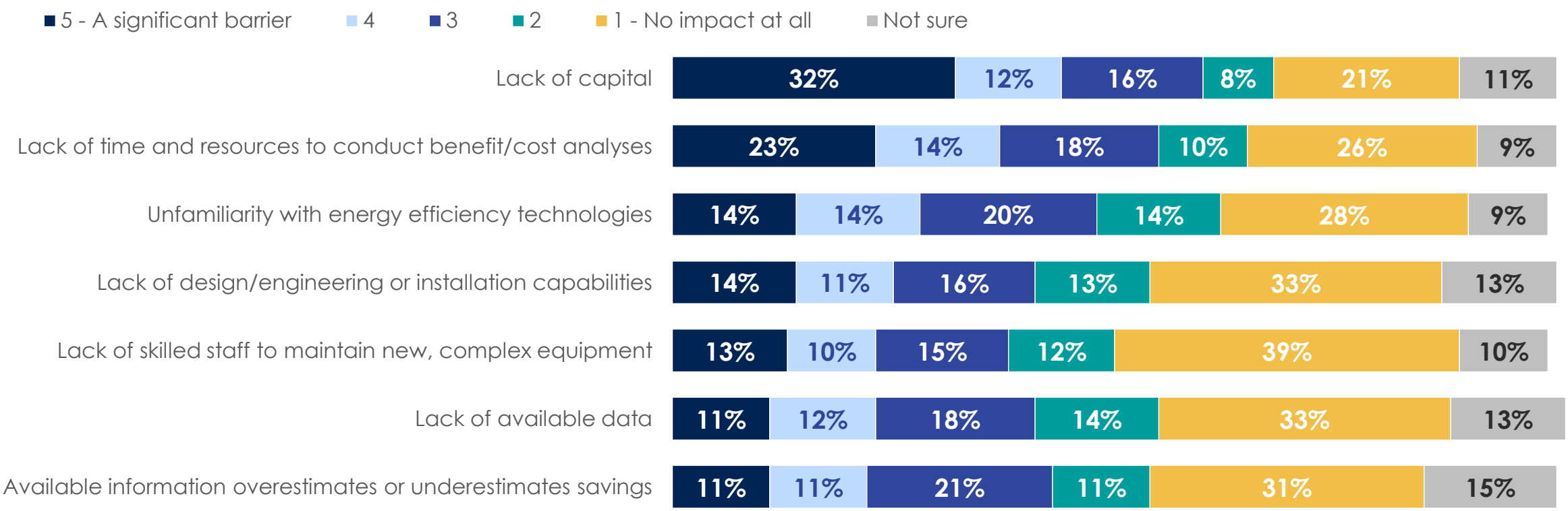
Base: Have participated and installed any energy efficiency incentive programs (n=504)
Q147. To what extent have the following benefits influenced your decision to participate in energy efficiency incentive programs and/or install energy efficient equipment?

Energy Efficiency Implementations



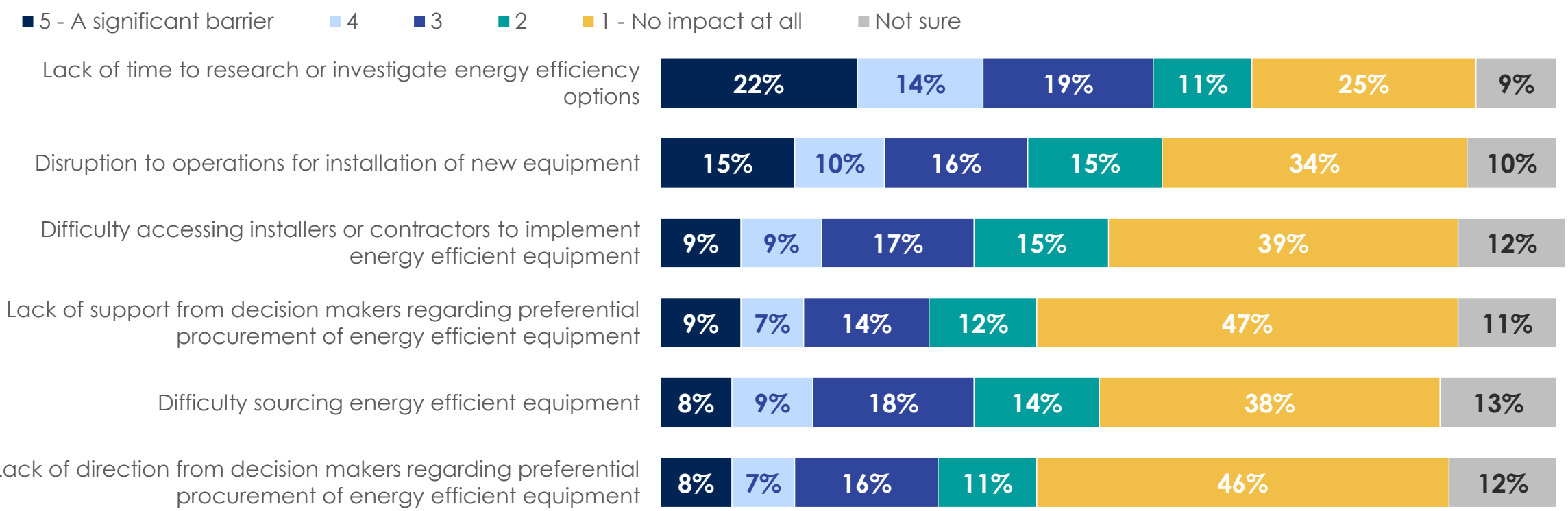
Base: Familiar with and directly involved in energy-using equipment purchasing process (n=1308)
Q148. Has your organization implemented any of the following energy efficiency actions?

Barriers to Pursuing Energy Efficiency Upgrades



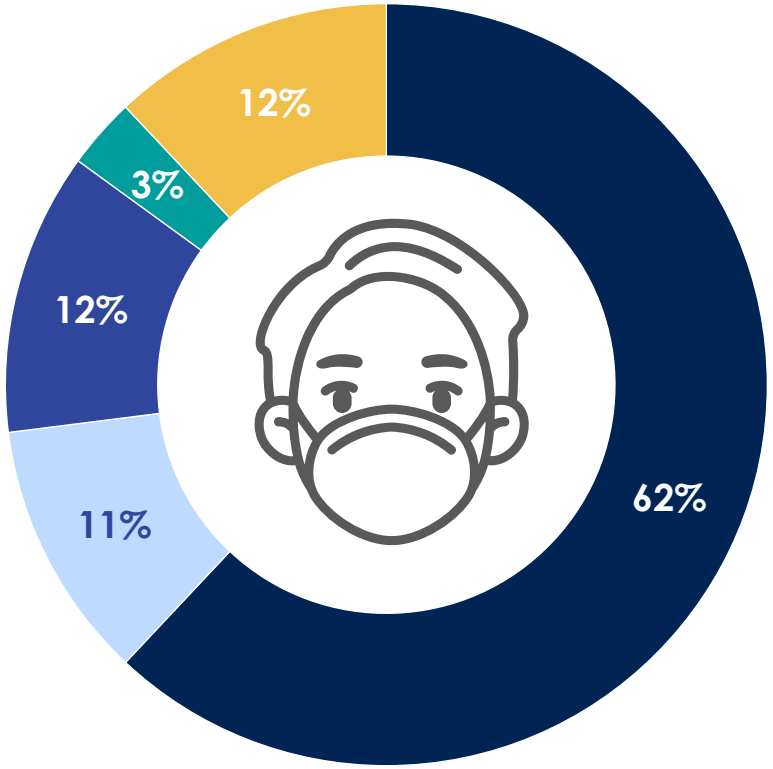
Base: Familiar with and directly involved in energy-using equipment purchasing process (Base Varies)
Q149. To what extent have the following conditions prevented you from pursuing energy efficiency upgrades? Please rate on a scale from 1 to 5, where 1 means "no impact at all" and 5 means "a significant barrier to adopting energy efficiency upgrades."

Barriers to Pursuing Energy Efficiency Upgrades (cont'd)



Base: Familiar with and directly involved in energy-using equipment purchasing process (Base Varies)
Q149. To what extent have the following conditions prevented you from pursuing energy efficiency upgrades? Please rate on a scale from 1 to 5, where 1 means "no impact at all" and 5 means "a significant barrier to adopting energy efficiency upgrades."

Effect of COVID-19 on Adoption of Energy Efficient Equipment



- I was not planning to make energy efficiency upgrades anyways
- I had plans to make energy efficiency upgrades that had to be canceled due to the pandemic
- I had plans to make energy efficiency upgrades that had to be delayed due to the pandemic
- I was able to make upgrades sooner than expected due to my business being closed or operating on a reduced schedule
- I am proceeding as planned with energy efficiency upgrades

Base: Familiar with and directly involved in energy-using equipment purchasing process (n=1227)
Q150. Has the COVID-19 pandemic impacted your intent to adopt energy efficient equipment and practices in the near term? Please select the statement that most closely matches your current situation.

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