Housing characteristics overview from the 2020 *Residential Energy Consumption Survey* (RECS)

Webinar

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By

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Agenda

- Introduction
  - Data release schedule
- Housing characteristics highlights
- Methodology
- Next steps
- Q&A

RECS measures the characteristics that contribute to energy consumption in primary, occupied housing units

- The 2020 RECS was fielded between September 2020 and April 2021 using self-administered web and mail questionnaires.
- The 2020 RECS resulted in the largest responding sample in RECS history, with 18,496 respondents completing surveys.
- For the first time, the RECS includes estimates for all 50 states and DC.
- We collaborated with IMG-Crown and RTI International on the 2020 RECS Household Survey.

2020 RECS Release Schedule

Product	Release Date
Housing characteristics tables, National and Regional – Group 1	March 2022
Housing characteristics tables, National and Regional – Group 2	May 2022
Housing characteristics tables - State tables Housing characteristics preliminary public use microdata and codebook Technical documentation	July 2022
Consumption and expenditure tables Final complete public use microdata and codebook	Spring 2023

2020 RECS and COVID

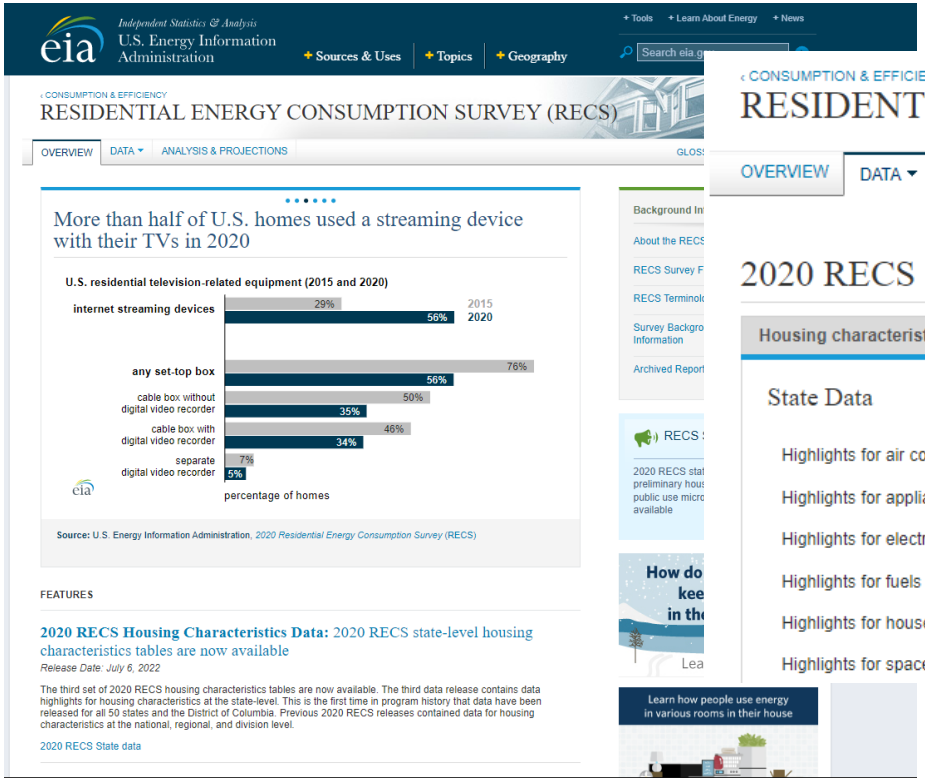
- According to the survey, about 30% of households (36 million) had at least one person working from home at least one day a week. In Washington, DC, nearly 60% of households had one person working from home at least one day per week. In West Virginia, less than 15% of households had someone working from home.

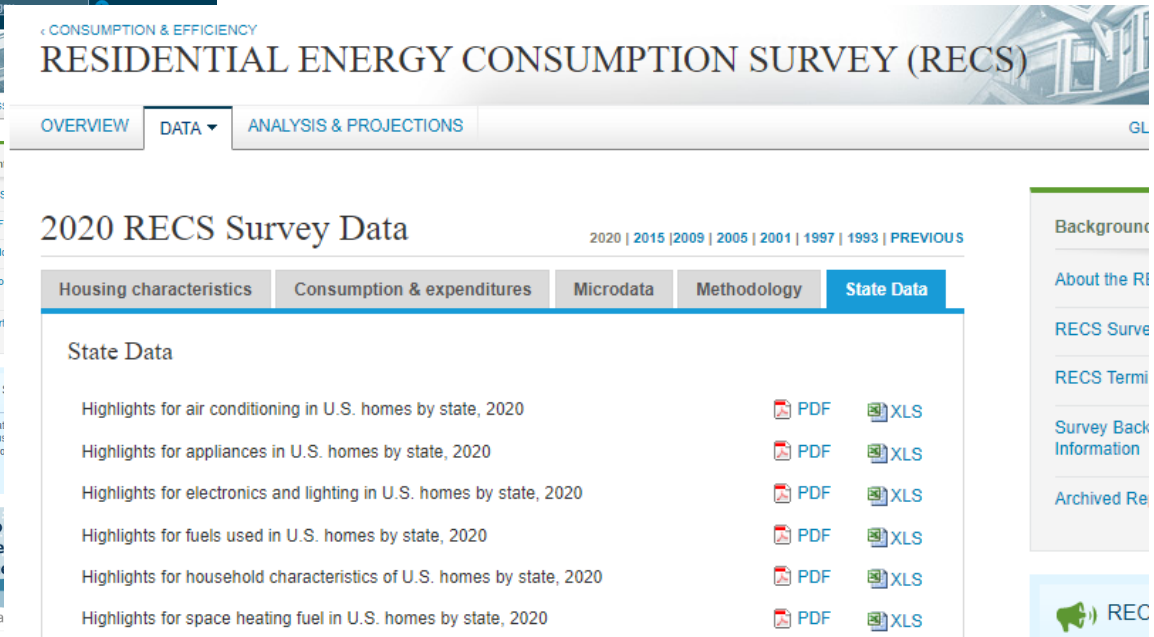
- Despite people spending more time at home, our supply-side surveys of natural gas, electricity, and petroleum product suppliers show residential energy use *declined* by 4% in 2020 from 2019. The warmer winter months in 2020 reduced heating demand, which typically accounts for about 40% of energy use in homes.

Highlights from the 2020 RECS Household Survey

Where can you find these results (and more)?

www.eia.gov/recs





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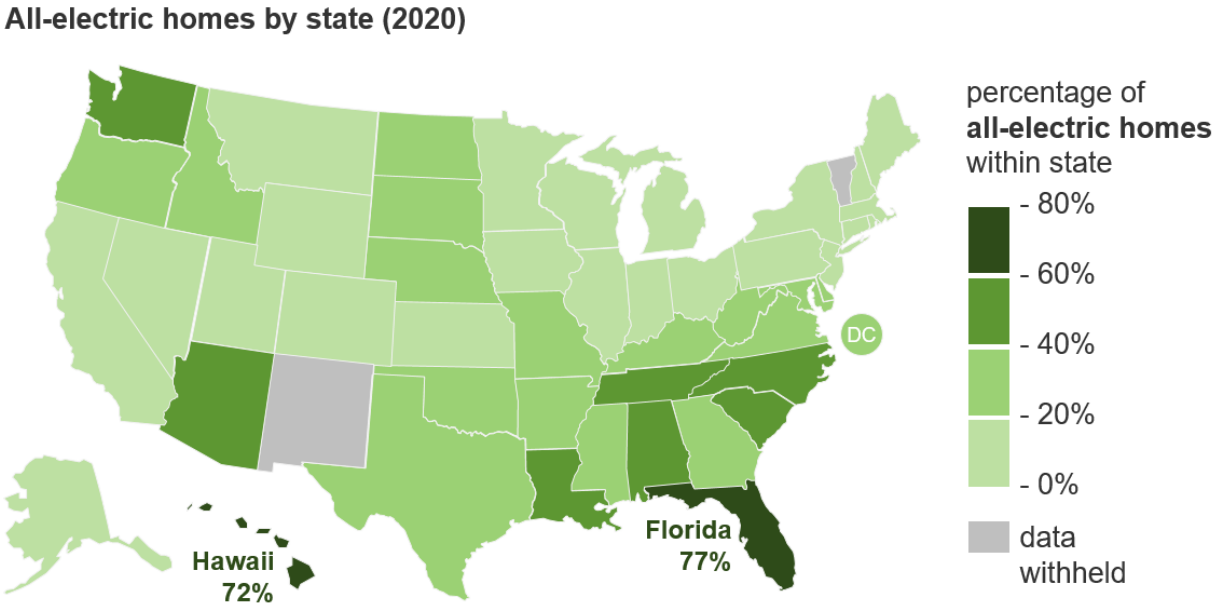
Preliminary data release date: June 2022

Highlights for fuels used in U.S. homes by state, 2020

Number (million) and percentage of housing units

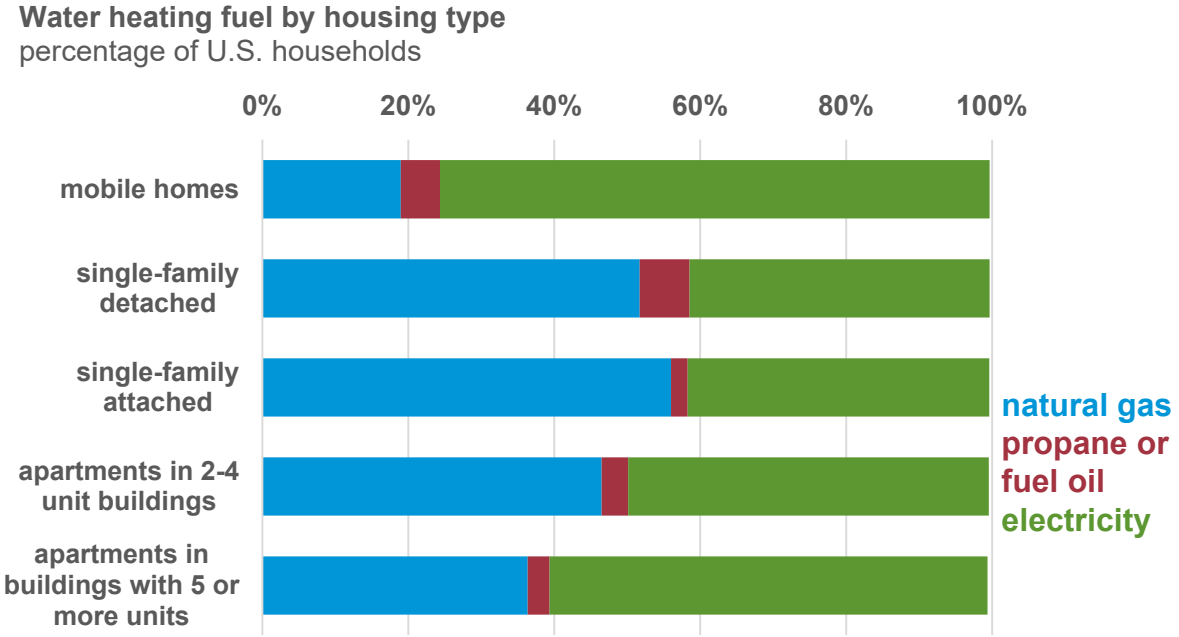
				Fuels used in home for any use							
	Total[a]	Home is all-electric[b]		Natural gas		Propane[c]		Wood		Fuel oil or kerosene	
All homes	123.53	32.25	26%	74.65	60%	11.68	9%	10.83	9%	5.72	5%
Alabama	1.90	0.77	41%	0.80	42%	0.25	13%	0.20	10%	Q	Q
Alaska	0.26	0.03	11%	0.16	62%	0.03	10%	0.06	23%	0.07	26%
Arizona	2.68	1.07	40%	1.37	51%	0.17	6%	0.19	7%	Q	Q
Arkansas	1.14	0.36	32%	0.57	50%	0.17	15%	0.16	14%	N	N
California	13.18	1.11	8%	11.54	88%	0.77	6%	1.00	8%	Q	Q
Colorado	2.26	0.26	11%	1.85	82%	0.14	6%	0.20	9%	Q	Q
Connecticut	1.38	0.15	11%	0.66	48%	0.20	15%	0.21	15%	0.55	40%
Delaware	0.38	0.11	29%	0.18	47%	0.08	22%	Q	Q	0.04	10%
District of Columbia	0.32	0.08	24%	0.23	74%	Q	Q	Q	Q	Q	Q
Florida	8.06	6.22	77%	1.25	16%	0.38	5%	0.34	4%	N	N

Florida and Hawaii had the highest percentage of all-electric homes in 2020



Data source: U.S. Energy Information Administration, 2020 *Residential Energy Consumption Survey*

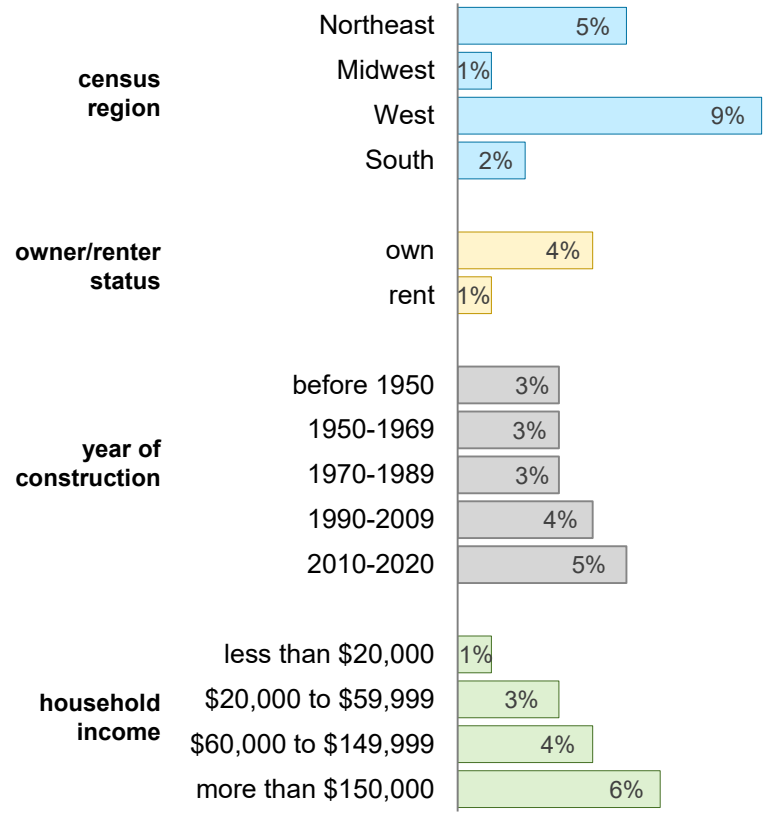
Single family homes are more likely to use natural gas for water heating, mobile homes are more likely to use electricity



Data source: U.S. Energy Information Administration, 2020 *Residential Energy Consumption Survey*

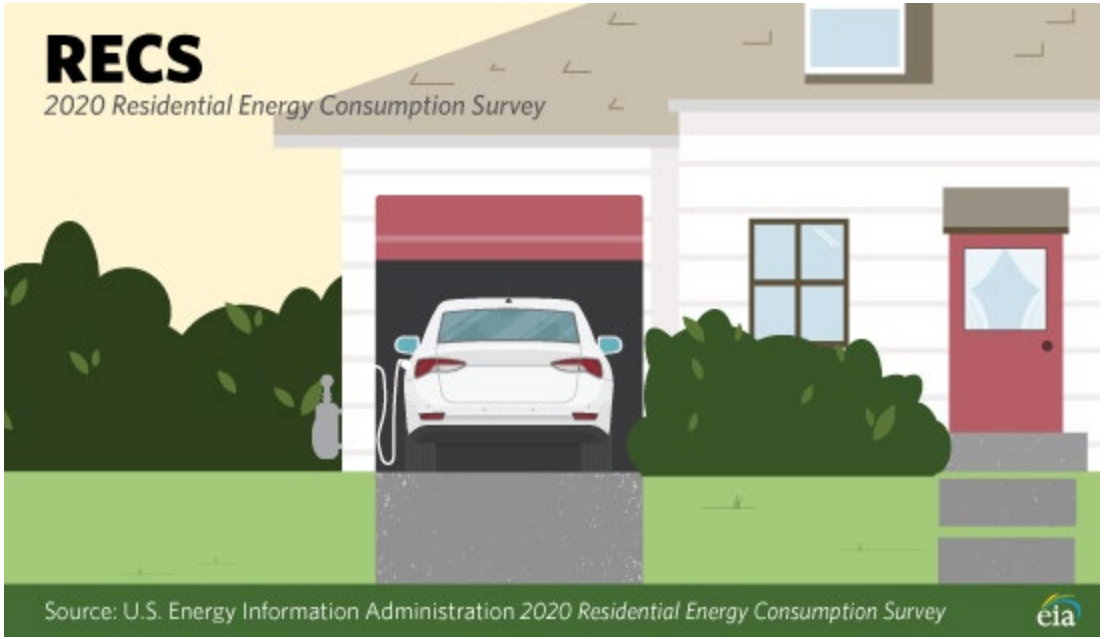
2020 RECS beginning to reveal more about characteristics of single-family homes with solar

U.S. single-family households that reported solar equipment (2020)
percentage of U.S. single-family households within each category

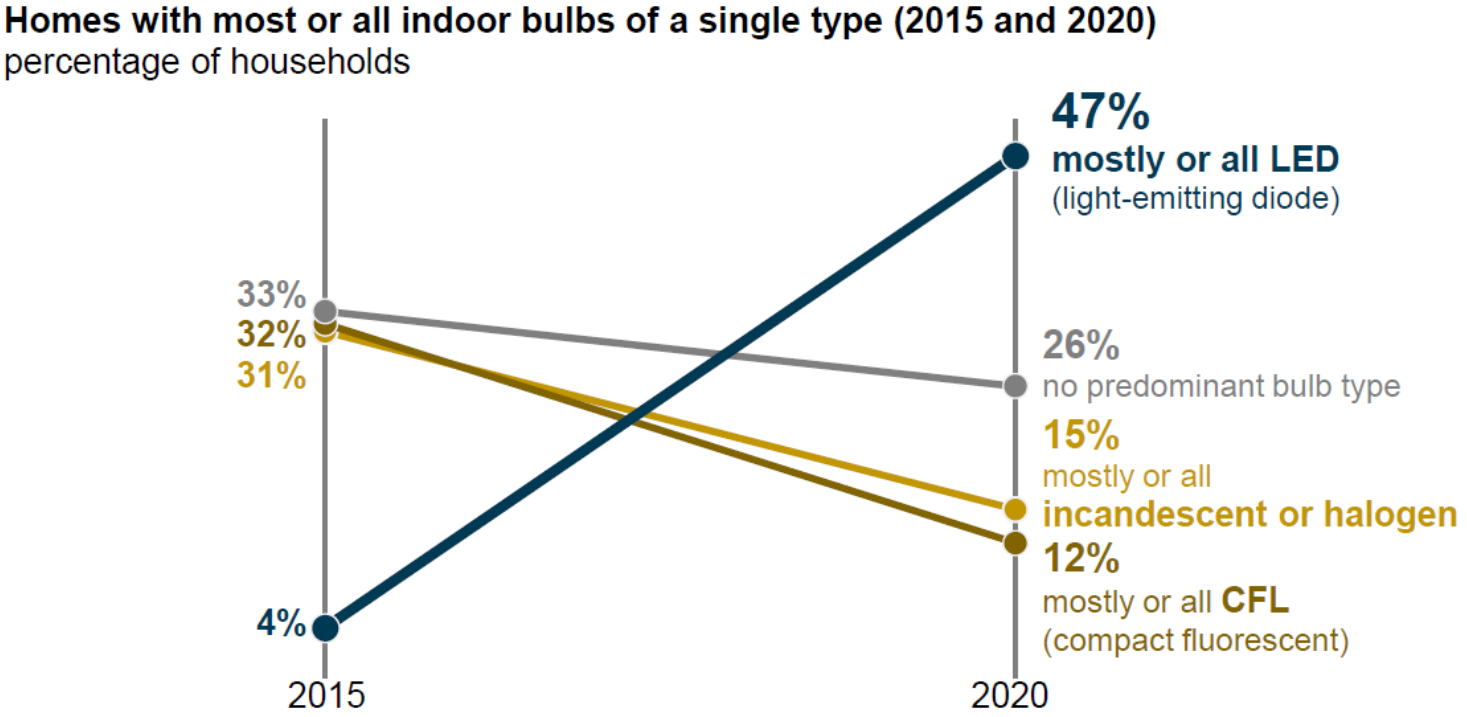


Data source: U.S. Energy Information Administration, 2020 *Residential Energy Consumption Survey*

More than three-quarters of electric vehicle owners reported that they charged their electric vehicle at home

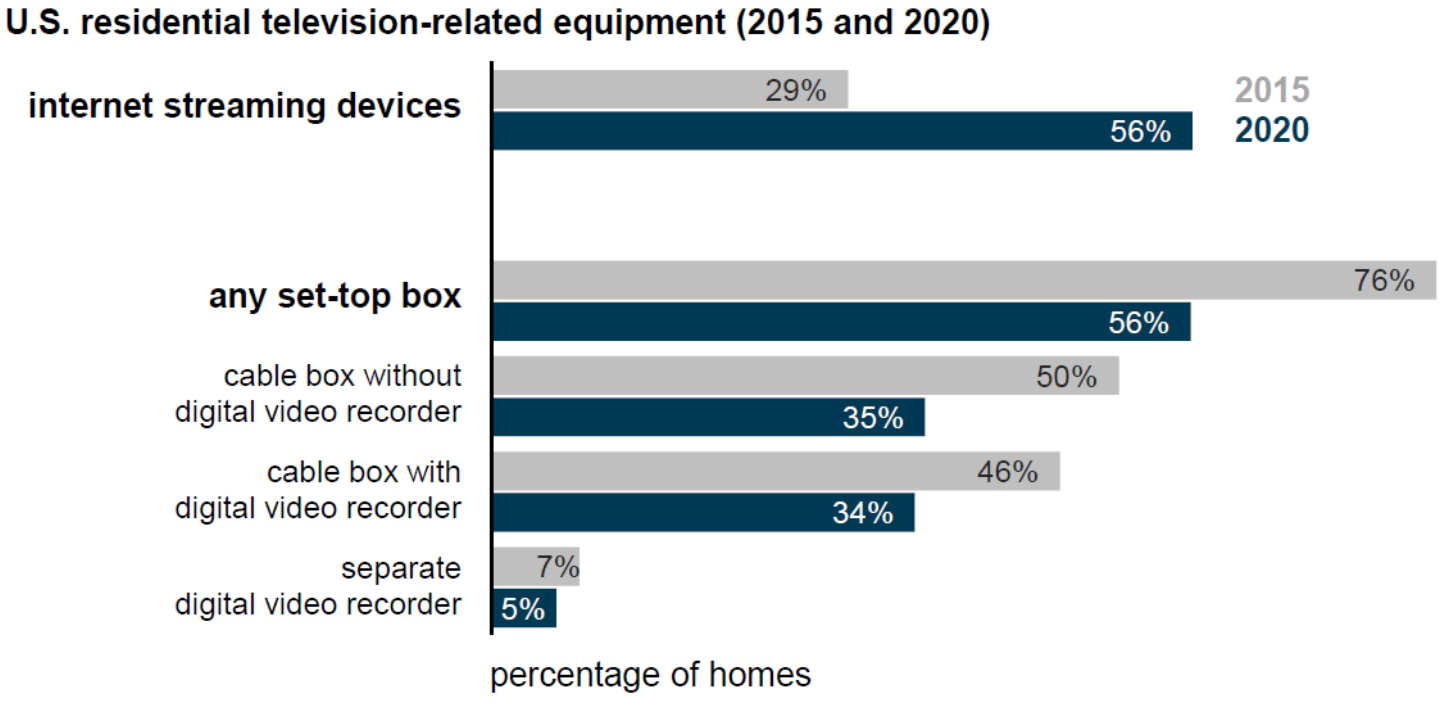


Households using LED lights for most or all of their lighting increased from 4% in 2015 to 47% in 2020



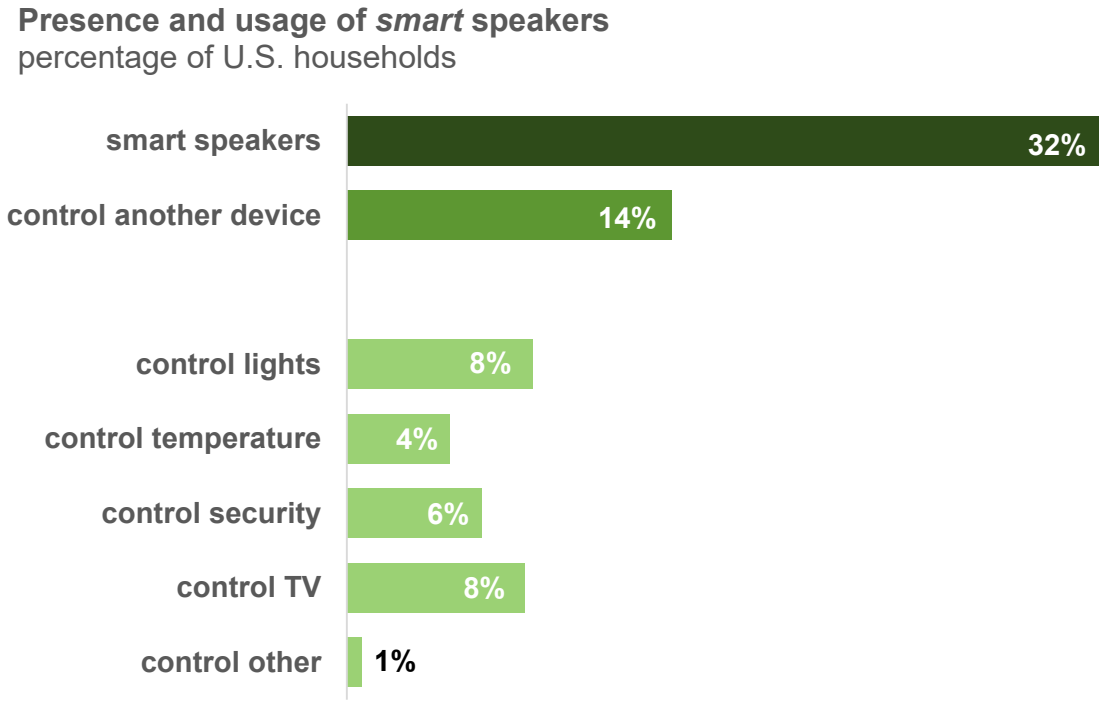
Data source: U.S. Energy Information Administration, 2020 *Residential Energy Consumption Survey*

Use of internet streaming devices increased from 29% of homes in 2015 to 56% in 2020



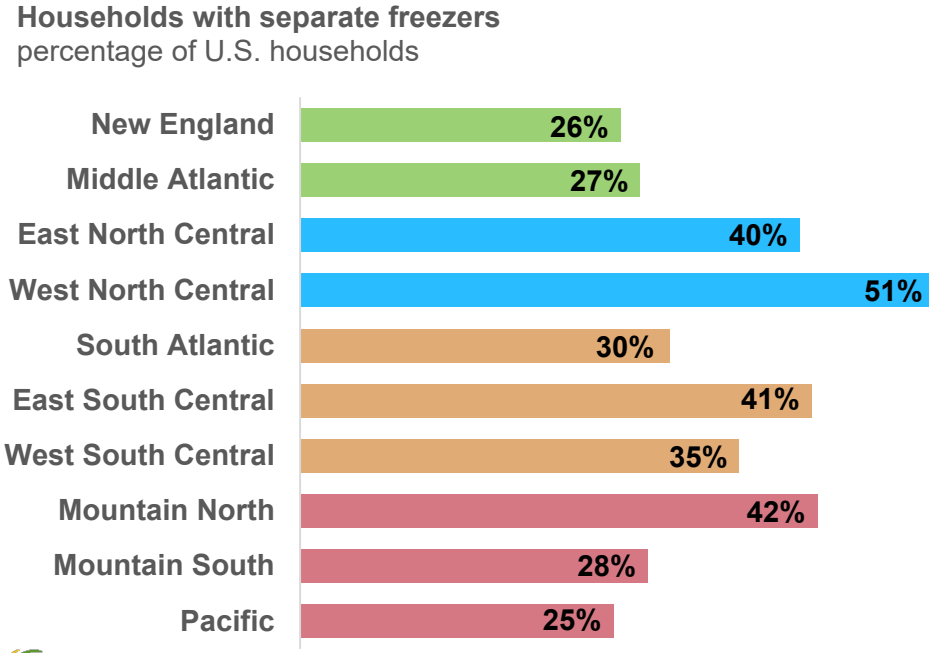
Data source: U.S. Energy Information Administration, 2020 *Residential Energy Consumption Survey*

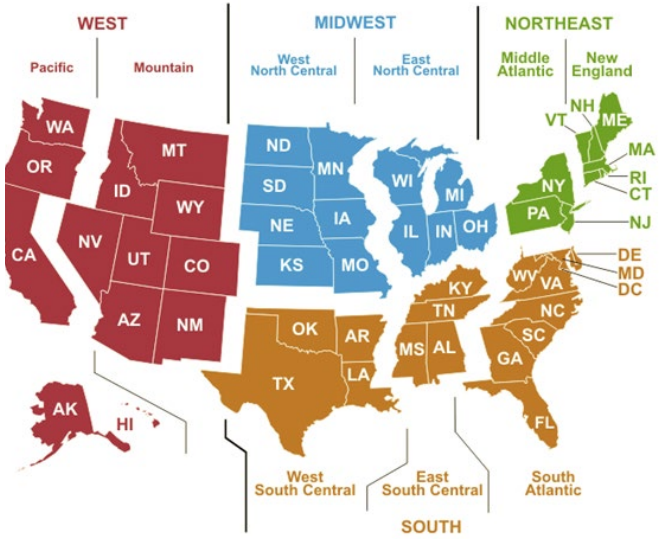
About 40 million households had smart speakers in 2020



Data source: U.S. Energy Information Administration, 2020 *Residential Energy Consumption Survey*

Half of homes in the West North Central division had separate freezers



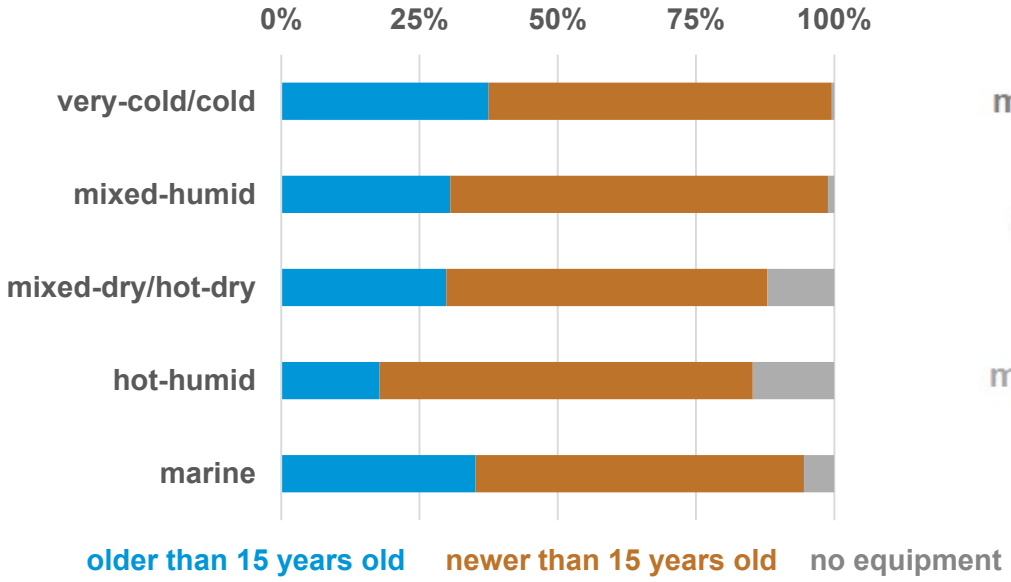


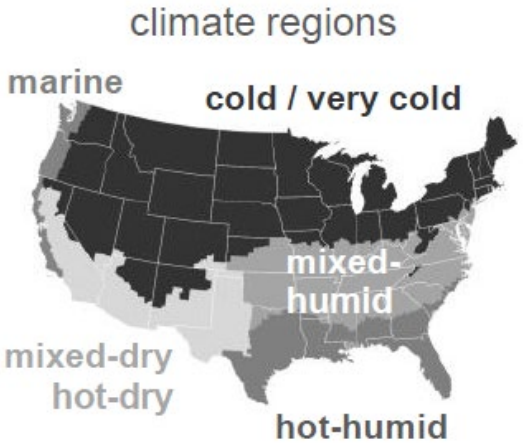
Mountain North contains MT, ID, WY, UT, and CO.
Mountain South contains NV, AZ, and NM.

Data source: U.S. Energy Information Administration, 2020 *Residential Energy Consumption Survey*

31% of households reported that their main heating equipment was 15 years old or older

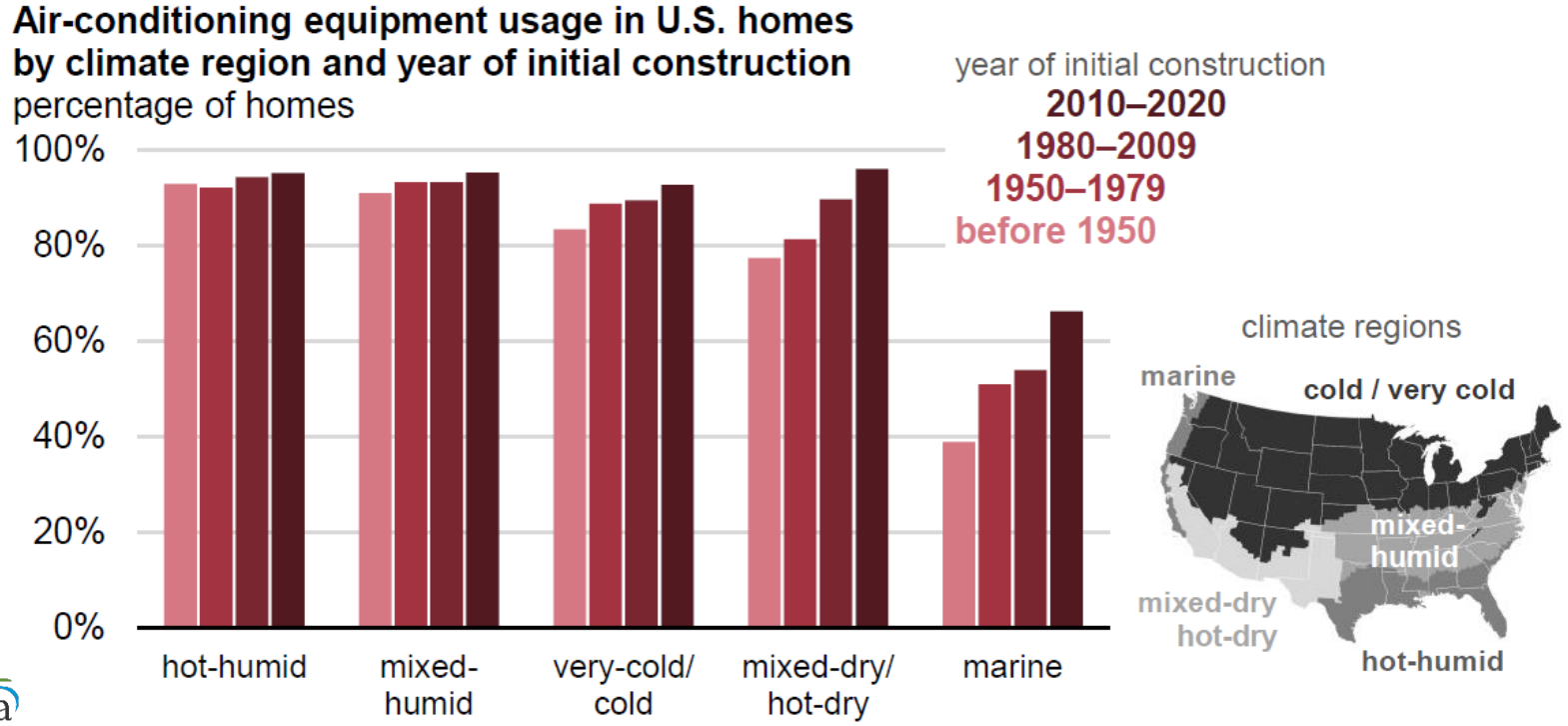
Presence and age of heating equipment by climate region
percentage of U.S. households





Data source: U.S. Energy Information Administration, 2020 *Residential Energy Consumption Survey*

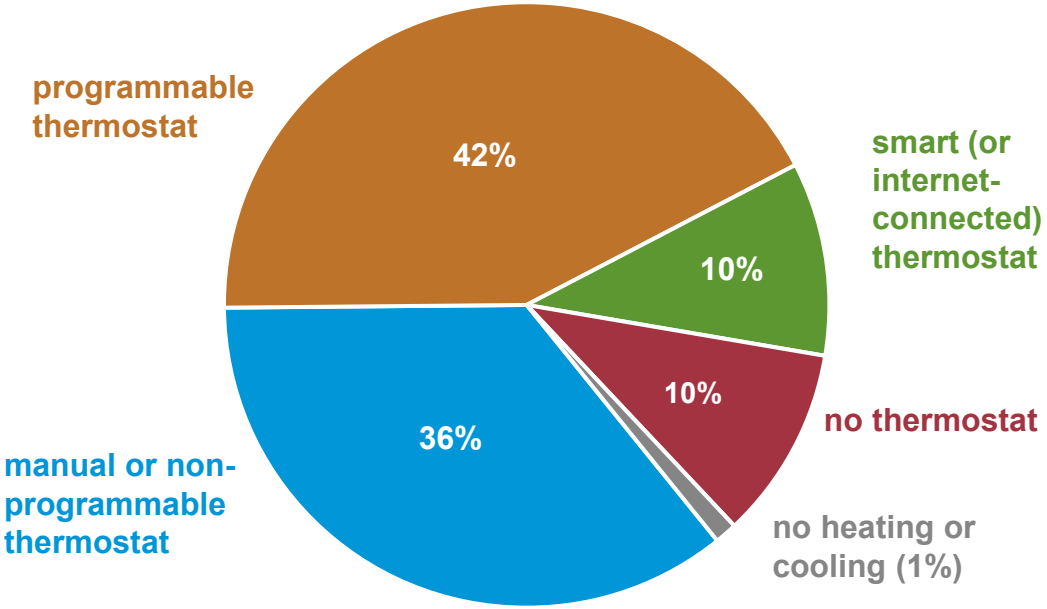
Near 90% of households used air conditioning in 2020



Data source: U.S. Energy Information Administration, 2020 *Residential Energy Consumption Survey*

Programmable or smart thermostats were used in 53% of households

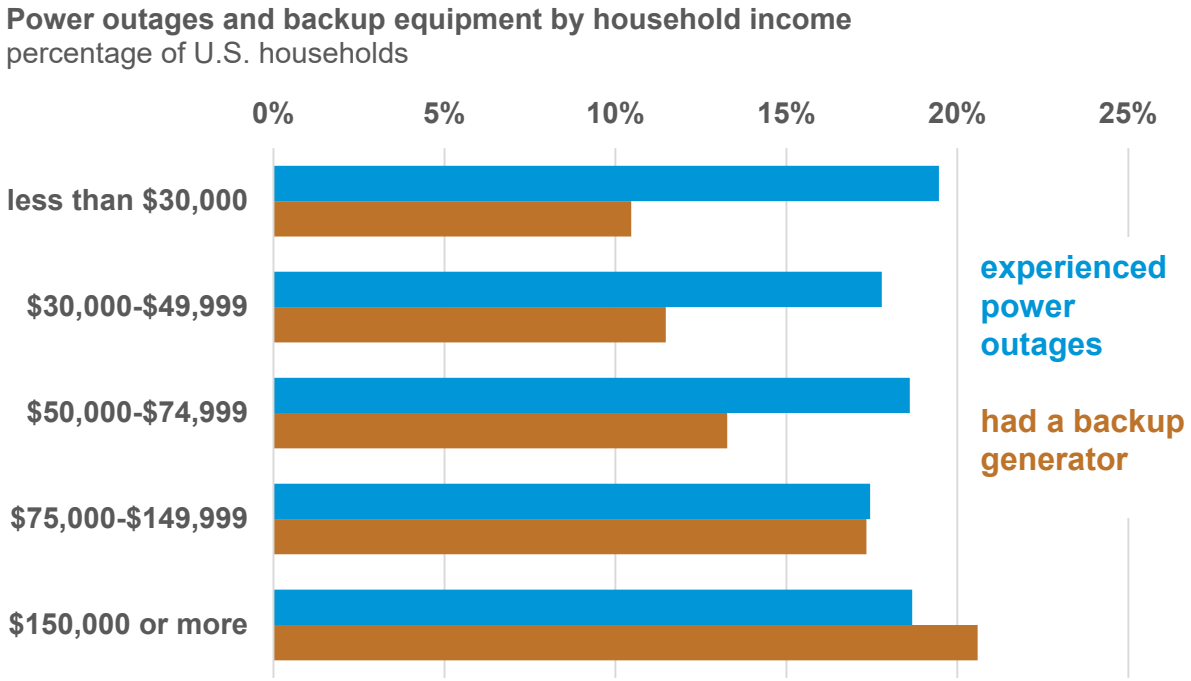
Type of thermostat used to control household temperature
percentage of U.S. households



Only one-third of households with programmable or smart thermostats actually use the programmable or smart capabilities to control the temperature.

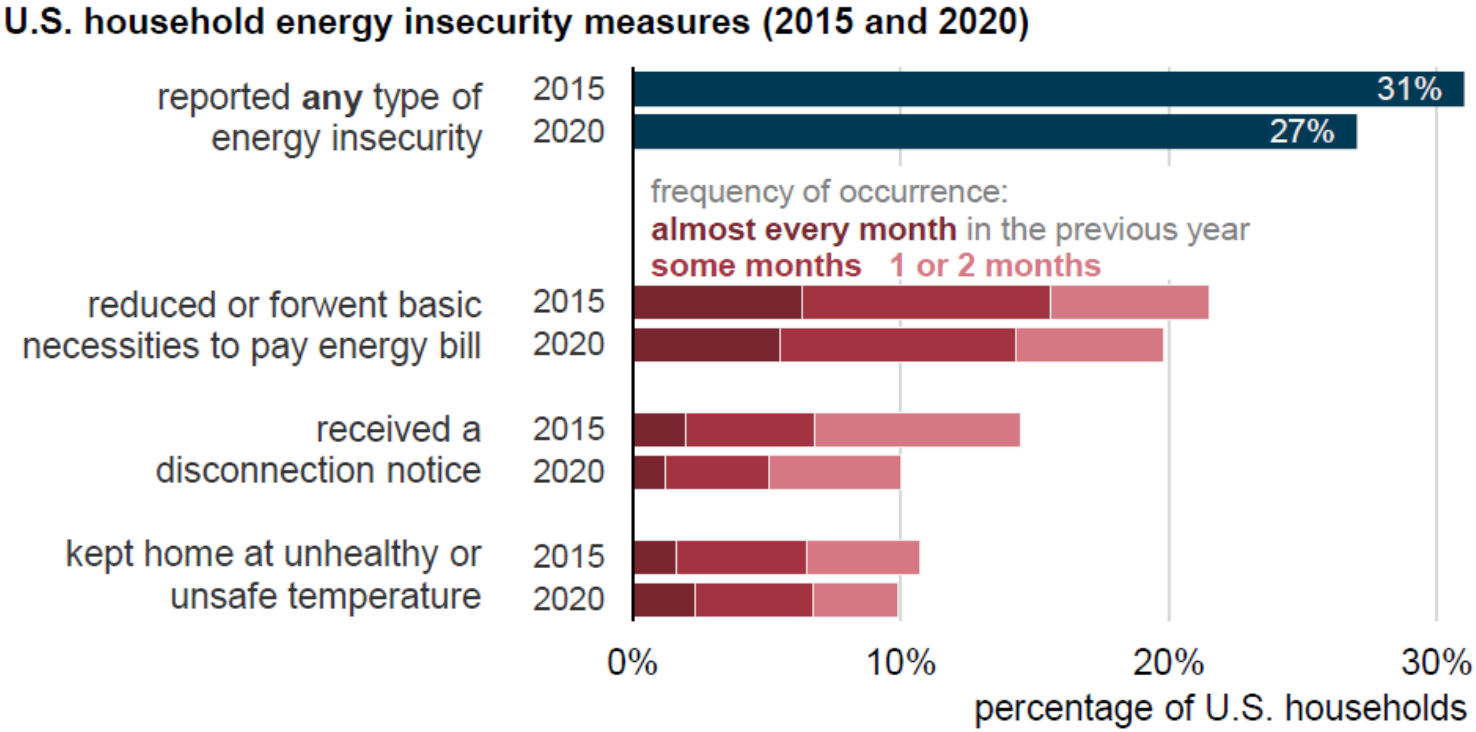
Data source: U.S. Energy Information Administration, 2020 *Residential Energy Consumption Survey*

Households with higher incomes were more likely to have backup generation



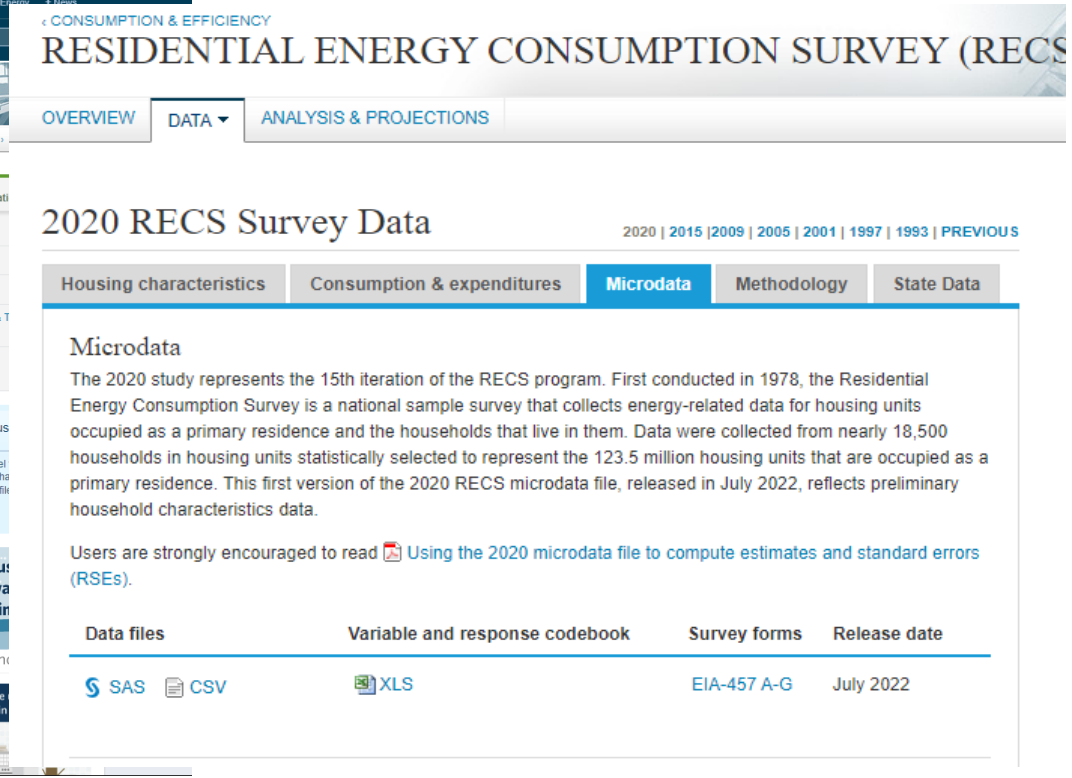
Data source: U.S. Energy Information Administration, 2020 *Residential Energy Consumption Survey*

27% of households experienced energy insecurity in 2020



Data source: U.S. Energy Information Administration, 2020 *Residential Energy Consumption Survey*

Where can you find microdata to do your own analysis?



Methodology

Where can you find technical details on our survey methods?

We selected a representative sample from a list of housing unit addresses in each state

- The survey frame is based on the USPS Computerized Delivery Sequence File, which covers 99.6% of eligible RECS addresses in the United States.

- We selected a sample of addresses to represent the 123.5 million occupied, primary residences in the 50 states and DC.

- Our 2020 RECS sampling method changed from what was used for the 2015 RECS.
  - The 2015 RECS used a multistage sample to select addresses. This method allowed for geographic clustering, which is needed to make cost-efficient in-person interviewer assignments.
  - The 2020 RECS used an unclustered sample design because the survey was self-administered.

The 2020 RECS adopted an entirely self-administered questionnaire

- The questionnaire design process included:
  - Reviewing content from 2015 RECS
  - Adding and dropping questions based on current household technologies
  - Soliciting data user input
  - Pretesting most of the new or substantially revised questions
- Households completed the RECS questionnaire using one of two self-administered methods: web or mail

We filled missing responses using hot deck imputation

- We used item imputation to fill in missing values in the data set.
  - Variables imputed: 263
  - Median imputation rate: 3.0%

- **Hot-deck** imputation method was used, meaning that a *recipient* household was matched with a similar *donor* household and borrowed its value.

Responding cases are assigned weights to represent entire population of primary, occupied housing units

- Weights are calculated for each responding housing unit.
- The sum of all weights is 123.53 million, which is the total number of U.S. primary, occupied housing units in 2020.
- If you're using the public microdata file, use the NWEIGHT variable.
  - If you're not sure how to do this, you can review our documentation or ask us how to accurately use the weights.

Next steps

2020 RECS consumption and expenditures estimates are coming in 2023

- Finish processing billing data from the Energy Supplier Survey.
- Produce consumption and expenditures estimates.
- Complete end-use modeling tasks.
- Release final data file with consumption and expenditures data and updated characteristics data.

We are exploring options for the next RECS

- Increased frequency and timeliness.
- Similar design to 2020, 50-state sample, all self-administered.
- Explore opportunities to expand our Residential Demand Program.
  - Puerto Rico and territories? Multifamily building study? Community estimation?

Q&A

Contact us

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