



Independent Statistics and Analysis

**U.S. Energy Information
Administration**

Supporting Statement for Residential Energy Consumption Survey (RECS)

Part A: Justification

OMB No. 1905-0092

Form EIA-457A *Household Survey*

Form EIA-457D *Energy Supplier Survey: Household Propane Usage*

Form EIA-457E *Energy Supplier Survey: Household Electricity Usage*

Form EIA-457F *Energy Supplier Survey: Household Natural Gas Usage*

Form EIA-457G *Energy Supplier Survey: Household Fuel Oil/Kerosene Usage*

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Introduction

The U.S. Energy Information Administration (EIA) is the statistical and analytical agency within the U.S. Department of Energy (DOE). It collects, analyzes, and disseminates independent and impartial energy information to promote sound policymaking, efficient markets, and public understanding of energy and its interaction with the economy and the environment.

EIA reinstates and requests a three-year extension, with changes, to continue to collect residential energy data using the Residential Energy Consumption Survey (RECS), Forms EIA-457 A, D, E, F, and G, under OMB Control No. 1905-0092. These forms collect data on energy characteristics, consumption, and expenditures for the household sector of the U.S. economy during the 2024 calendar year. This Information Collection Request covers the following forms:

- *Form EIA-457A Household Survey*
- *Form EIA-457D Energy Supplier Survey: Household Propane Usage*
- *Form EIA-457E Energy Supplier Survey: Household Electricity Usage*
- *Form EIA-457F Energy Supplier Survey: Household Natural Gas Usage*
- *Form EIA-457G Energy Supplier Survey: Household Fuel Oil or Kerosene Usage*

The RECS program was initiated in 1978 and the request to reinstate the RECS represents the sixteenth collection cycle for this survey. The information obtained by RECS is used to produce estimates of energy characteristics, consumption, and expenditures in U.S. households. RECS estimates are based on a statistical sample using a stratified sampling design. The sampling unit is the housing unit, with the scope of the survey covering all occupied, primary housing units. Group quarters, vacant homes, and seasonal homes are excluded.

RECS is a two-part data collection. The first part uses voluntary collection authority and includes the Household Survey for collecting energy characteristics from sampled housing units. The second part uses EIA's mandatory data collection authority for the Energy Supplier Survey (ESS) forms to collect energy consumption and cost data for the housing units in the responding sample. EIA uses data from the Household Survey and ESS to model and estimate consumption and expenditures for individual energy end-uses in the residential sector. For the 2020 RECS, EIA published energy end-use estimates for more than twenty-five household activities including space heating, air conditioning, water heating, appliances, electronics, and lighting.

The 2024 RECS design allows EIA to once again produce benchmark estimates of residential energy characteristics, consumption, and expenditures at the following geographic levels: national, Census region, Census division, 50 states, and the District of Columbia. EIA also intends, for the first time, to target estimates for 10 Metropolitan Statistical Areas (MSAs).

Because of its comprehensiveness, RECS data are used throughout the government and the private sector for analysis of energy demand in the residential sector. The data are made available to the public in a variety of publications, data tables, analysis reports, an ArcGIS dashboard, and microdata files which have been inoculated to protect the identity of individual households. RECS products from prior studies are available from EIA's website at <https://www.eia.gov/recs>.

Overview of Forms

Data Collection Part 1: Household Survey

Form EIA-457A Household Survey collects energy-related characteristics of the housing unit and household members, and data on the fuels and equipment used. The Household Survey is collected on a voluntary basis from eligible, adult members of sampled households. EIA and its contractor intend to use self-administered, Web and paper modes as collection instruments for Form-457A.

The 2024 RECS Household Survey will be administered to sampled housing units using a responsive-design¹ approach beginning in September 2024. Approximately 20% of the overall sample will be mailed invitations during the first data collection phase (Phase 1). EIA and its contractor will monitor response rates and sample coverage during Phase 1, as well as results of embedded experiments. EIA and its contractor will then adapt the survey design, if necessary, before releasing Phase 2. The remaining 80% of the sample will be released for Phase 2 in early 2025. EIA expects 18,000 to 20,000 completed Household Surveys after the first two phases. EIA will select a starting sample of 56,000 to achieve the target sample completes. An additional sample will be held in reserve for an optional, third data collection phase. This optional Phase 3 will be used, as needed and if resources are available, if we do not achieve the target completes or to help mitigate any coverage issues identified during the first two phases.

Form EIA-457A includes the following sections:

- Your Home: housing unit type, structural features, size, and age of the housing unit.
- Appliances: presence and usage patterns of kitchen and laundry devices.
- Electronics: presence and usage patterns of televisions, computers, and small electronic devices.
- Space Heating: main and secondary equipment types and fuels used to heat the home, as well as usage indicators.
- Air Conditioning: cooling equipment types and usage indicators.
- Thermostats and Temperatures: type and use of thermostats; typical temperature settings in the home.
- Water Heating: type and fuel used to heat water.
- Lighting: number and types of bulbs used inside and outside the home, as well as usage indicators.
- Energy Bills: how energy bills are paid and whether non-household costs are included in bills; bulk fuel delivery information; presence of onsite solar.
- Other Energy Uses: miscellaneous energy-consuming devices, including medical devices and electric vehicles.

¹ Responsive Survey Design is a risk mitigation strategy used to address uncertainties about key parameters, such as coverage error and non-response rates. It is a technique that can be used to control costs and errors associated with data collections.

- Household Characteristics: basic demographic information about the people living in the household.
- Energy Assistance: challenges and coping mechanisms households may have faced paying energy bills or keeping home at a comfortable temperature.
- Final Questions: energy supplier names for each fuel used in the home.

Data Collection Part 2: Energy Supplier Survey

During the second part of RECS, EIA conducts the ESS using Forms EIA-457D, E, F, and G. For these data collections, we ask energy suppliers to report fuel billing or usage data for Household Survey respondents. Data are collected electronically through an ESS Website. Suppliers can choose to upload a single data file for all units or input information into individual Web forms for each unit. The 2024 RECS ESS will be conducted July 2025 through December 2025 and request utility billing and bulk fuel usage data for the 20-month period September 2023 to April 2025.

Questionnaire Updates for the 2024 RECS

EIA is updating the Household Survey to reduce respondent burden, improve response quality, and update questions to reflect current energy trends. The following questionnaire updates are based on data quality analysis of the 2020 RECS, changes in the residential housing market, respondent pretesting, and stakeholder feedback. New questions reflect EIA's effort to collect the most relevant information necessary to estimate household energy use and to inform energy end-use analysis. Revised questions will improve response quality, minimize reporting burden, and reflect changes in technology. Deleted questions were those with poor response quality from the last collection, were for outdated technologies, or were data that are now available from alternative sources.

The following changes apply to Form EIA-457A Household Survey. Note that EIA strongly considered the overall respondent burden when choosing to add, revise, and delete questions. Although there may have been some analytical value to a deleted question, we chose to remove it to allow for an additional question of more value for EIA's energy estimation and for our stakeholders.

Question additions and reinstatements (sections in parentheses)

- (Your Home) Added a question asking how many months a respondent's pool is heated. Pool heating can account for considerable energy use for a home and this question will improve EIA's ability to model pool energy end-use consumption and expenditures.
- (Appliances) Added a question asking about the presence of air fryers to the small kitchen appliances section.
- (Electronics) Added a question asking about the presence of external computer monitors.
- (Space Heating) Added a set of questions asking about third heating sources used in the home.

- (Space Heating) Added a question asking respondents if they use their heat pump for cooling as well as heating. This should improve our estimates of heat pumps used for both heating and cooling.
- (Space Heating and Air Conditioning) Added a question to each section about how people use their heating and cooling equipment. RECS asked this question in the 2009 survey about air conditioning only, but it would be useful to reinstate this for heating, as well, to understand how often respondents use their equipment. This is useful for modeling energy consumption for space heating and space cooling, which are the largest end uses in the household.
- (Water Heating) Added a question about the presence of heat pump/hybrid water heaters. Heat pump/hybrid water heaters are an emerging technology and can result in significant energy savings for a household if installed.
- (Water Heating) Added a question about the fuel for solar water heater backups. RECS asks about the presence of solar water heaters, but no information is currently collected about the fuel used to supplement or backup the solar water heaters. This will improve EIA's modeling of water heating end-use consumption.
- (Energy Bills) Reinstated a series of questions for bulk fuels asking respondents to estimate the amount that had been delivered in the past year. These questions are used for validating and imputing bulk fuel consumption.
- (Other Energy Uses) Added a question about the number of solar panels if a respondent indicates that they have solar panels.
- (Other Energy Uses) Added a question about battery storage for solar.
- (Other Energy Uses) Added a question asking about the number of electric vehicles owned or leased. This replaces the question from the 2020 RECS that asked only if a respondent had an electric vehicle.
- (Energy Assistance) Added a question related to inability to pay an energy bill in part or in full. While the RECS gathers information about people forgoing expenses to help pay for energy bills and information about the receipt of disconnection notices, there is a gap in knowledge about people who still face difficulties with energy bills but pay enough to not receive a notice.
- (Final Questions) Added a question asking respondents for their inverter company if they have solar generation. To improve our electricity consumption estimates for homes with solar EIA will pilot a data collection from those companies as part of the Energy Supplier Survey.

Revisions:

- (Your Home) Changed questions asking how many months your pool and hot tub were "in use" to how many months the pool pump/hot tub were "turned on." This change should better capture when pool equipment is running.
- (Appliances) Changed the phrasing of a question option for the location of the second refrigerator. "Main living area" was confusing and unclear. The option will be reworded as "anywhere/somewhere else in the house."

- (Appliances) Provided an option for dual-fuel ranges to have fuels other than natural gas. Propane dual-fuel ranges are common enough to warrant this change.
- (Appliances) Removed the word “rare” from the induction cooktop question.
- (Appliances) Revised wording on the question asking about the number of microwaves from “have” to “use.” This change will better capture microwaves that are actively drawing power.
- (Electronics) Collapsed TV type categories into fewer options to reflect current technologies.
- (Space Heating) Added fireplace as a response option for main heating equipment. Similarly, added more response options to secondary heating equipment so that it is consistent with main heating equipment options.
- (Space Heating) Allow respondents to indicate using both wood cords and wood pellets.
- (Energy Bills) Adjusted the question focused on energy use for “non-household purposes.”
- (Other Energy Uses) Revised the generator question to separately capture presence of whole-home or portable generators.
- (Household Characteristics) Revised the gender question as per guidance in OMB Executive Order 14075 (June 2022).
- (Household Characteristics) Adjusted the response categories for the household income question to reflect current income levels.

Deletions

- (Your Home) Removed a question asking respondents if they have natural gas available in their neighborhood. Our evaluation of missing rates and overall response quality indicates that many respondents who do not use natural gas are not aware if they have natural gas available to them.
- (Appliances) Removed a question about the number of months a respondent used a secondary refrigerator. Responses have been inconsistent, and 2020 RECS data indicate that nearly all households with a second refrigerator use them all year.
- (Electronics) Removed a series of questions about the purpose of TV usage. This series was added to the 2020 RECS, but EIA determined there is little analytical value of this information with regard to energy usage in homes.
- (Electronics) Removed a question asking about VCRs. Few respondents have them and they do not consume a lot of energy.
- (Electronics) Removed a series of questions about the use of equipment for teleworking. These questions were added at the beginning of the COVID-19 pandemic to assess a potential change in household behavior due to the pandemic.
- (Thermostats and Temperatures) Removed a series of questions asking how respondents control their thermostats. This information was not used in modeling end-use energy usage. RECS plans

to replace this question with the above addition about how people use their heating and cooling equipment.

- (Water Heating) Removed a question about whether respondents use a blanket for their water heater.
- (Other Energy Uses) Removed a series of questions about non-solar renewable energy. On-site residential wind energy generation and combined heat and power systems are rare. We have retained a question about presence of on-site solar.
- (Household Characteristics) Removed a question asking about the total number of household members. RECS already asks questions about how many adults and how many children live in the household and gives those questions primacy.
- (Final Questions) Removed a series of questions asking respondents in large apartment buildings about their landlord information. This was used in the 2020 RECS to conduct a Multifamily Buildings Study, which has been discontinued.

The following change applies to the *Energy Supplier Survey*.

Question revision

- Change the number of customer (household) billing and delivery months requested from 24 to 20 months. In the 2020 collection, the additional four months of data were added to potentially facilitate EIA's analysis of consumption patterns before and during COVID-19; however, we have determined that the additional months are no longer needed for the 2024 collection.

A.1. Legal Justification

The authority for this mandatory data collection is provided by the following provisions:

- a. Title 15 U.S.C. 772(b), of the Federal Energy Administration Act of 1974 (FEA Act), Public Law 93 275 authorizes mandatory collection of energy supply and consumption data by the Administrator.
- b. Title 15 U.S.C. 764(a and b) establishes the Administrator's powers to plan, direct, and conduct mandatory and voluntary energy programs related to the production, conservation, use, control, distribution, rationing, and allocation of all forms of energy that are designed and implemented in a fair and efficient manner, including duties to collect, evaluate, assemble, and analyze energy information on reserves, production, demand, and related economic data and work with business, labor, consumer and other interests and obtain their cooperation.
- c. Title 15 U.S.C. 790(a) establishes a National Energy Information System that is the enclave containing energy information collected by EIA as required to provide a description of and facilitate analysis of energy supply and consumption within and affecting the US on the basis of such geographic areas and economic sectors to carry out the Administration's statistical and forecasting activities to meet the needs of DOE, Congress, and the States.

- d. Title [42 U.S.C. 7135](#) authorizes the Administrator to conduct and publish results from manufacturing, residential, and commercial energy consumption surveys, as well as from an annual survey of electricity production from domestic renewable energy resources.

A.2. Needs and Uses of Data

EIA conducts a series of data collections to describe the demand for energy within consuming units in the United States and the effect of that demand on the nation's social and economic needs. Each of these surveys is congressionally mandated to be conducted on a quadrennial basis through 42 U.S.C. § 7135. The three programs span end-use sectors that account for over 70 percent of the energy consumed in the United States. Not included in these surveys are the agriculture, mining, construction, and transportation sectors.

The RECS is the only program operated by EIA that collects energy characteristics data directly from housing units. Accordingly, it is the only program that permits the cross-tabulation of energy consumption by various descriptive variables to permit a full understanding of how energy is consumed in the household sector. These relationships between consumption and descriptive variables are the basis for the publication and analytic activities associated with the RECS data.

The RECS data are widely used throughout the public and the private sector to benchmark residential energy demand, produce projections for future demand, develop industry standards, and assess program and technology initiatives. Public utilities, interest groups, trade associations, federal agencies, state and local governments, equipment manufacturers, media, and the public are also major users of RECS data.

The following summarizes the key RECS stakeholders and how the RECS meets their needs:

- **National Energy Modeling System (NEMS) - Office of Energy Analysis, EIA:** NEMS is EIA's modeling system that meets a broad spectrum of agency needs and is used frequently to assess evaluation questions posed by the agency, other executive branch offices, and the Congress. NEMS is the modeling framework that supports EIA's Annual Energy Outlook. RECS data are tailored to meet the needs of this model and are used to characterize the U.S. residential sector in NEMS.
- **Short Term Energy Outlook - Office of Energy Analysis, EIA:** RECS consumption and cost data are used as benchmark input estimates for near-term energy demand forecasts within EIA. This includes the annual Winter Fuels Outlook, which forecasts heating fuel prices and expected household energy costs for November to March each year.
- **National Association of State Energy Officials (NASEO):** NASEO uses RECS data to support residential appliance standard recommendations. NASEO also uses RECS data for specific state initiatives where the data allow. They have also used RECS data for specific energy research topics, such as the availability of liquid fuels.
- **Low Income Home Energy Assistance Program (LIHEAP) - U.S. Department of Health and Human Services, Administration for Children and Families (HHS/ACF):** LIHEAP distributes energy assistance to low-income households to assist in meeting the costs of home heating and

cooling. Since 1981, HHS/ACF and EIA have partnered to use RECS data in support of analysis of LIHEAP and LIHEAP-eligible households.

- **Office of Energy Efficiency and Renewable Energy (EERE) Programs, DOE:** EERE's Appliances and Commercial Equipment Standards Program develops test procedures and minimum efficiency standards for residential appliances and commercial equipment. As an example, the program uses the RECS end-use consumption estimates to determine whether efficiency improvements have an adequate payback time for consumers. The Building Technologies Office also uses RECS to update Building Performance Standards and provide valuable inputs for their residential modeling software (ResStock).
- **U.S. Census Bureau:** EIA has provided extensive analysis of RECS data to the Census Bureau as part of an investigation into the use of consumption-based measures of poverty using expenditures and other indicators of material well-being. The U.S. Census Bureau also uses the RECS data to estimate electricity and gas costs by American Housing Survey respondents.
- **Lawrence Berkeley National Laboratory (LBNL):** RECS data are used by LBNL for analyzing impacts from possible energy efficiency standards for common household appliances, such as refrigerators and dishwashers, and emerging efficiency technologies in home electronics. LBNL relies on RECS for information about the age, size and usage of appliances and electronics.
- **National Renewable Energy Laboratory (NREL):** ResStock and TEMPO NREL use RECS data to understand the adoption rates and impact of the new technologies, building designs, and energy-efficient equipment they test and promote.
- **Pacific Northwest National Laboratory (PNNL):** PNNL uses RECS data for various appliance analysis, most specifically work on the water heater and advanced heat pump markets. PNNL also uses the RECS microdata for specific state analyses on various topics.
- **U.S. Bureau of Labor Statistics (BLS) - Consumer Price Index:** BLS uses RECS data in the preparation of the Consumer Price Index (CPI). BLS uses the RECS micro-data file to develop equations for imputing utility costs for renters whose utility costs are included in their rent.
- **American Council for an Energy-Efficient Economy (ACEEE):** ACEEE uses RECS data to help develop recommended appliance and other product standards. RECS data show the market saturation and age of various products and are used to develop the estimated savings from any new standard. ACEEE also uses RECS energy insecurity estimates in various reports on energy equity and justice.
- **Joint Center for Housing Studies and National Multifamily Housing Council:** Both organizations use RECS data to help develop a profile of rental housing. RECS is used to characterize the landscape of energy efficiency in apartments and to determine where energy efficiency improvements would be most effective.
- **U.S. Department of Housing and Urban Development (HUD):** HUD's Office of Community Planning and Development uses RECS data to evaluate its energy efficiency portfolio – from energy efficiency mortgages, to weatherization and retrofits, to utility incentive programs. The HUD Office of Housing uses RECS data to determine Utility Adjustment Factors for multifamily owners and agents.

- **U.S. Environmental Protection Agency (EPA):** EPA is looking to integrate RECS data into the EPA data fusion project which looks to produce small-area estimates using data from specific subject surveys and the American Community Survey.
- **U.S. Federal Housing Finance Agency (FHFA):** FHFA combines RECS data with several internal mortgage databases that they have in order to create better estimates of mortgage cost and burden for homeowners.
- **National Institute of Standards and Technology (NIST):** NIST is updating a listing of homes in order to determine ventilation and indoor air quality issues in U.S. housing. NIST uses RECS to update the data for multifamily homes.

A.3. Use of Technology

The 2024 RECS Household Survey protocols and self-administered design are similar to those used for the 2020 RECS Household Survey, which was informed by an extensive series of pilot tests prior to and concurrent with the previous RECS conducted in 2015. All sampled households for the 2024 RECS Household Survey will be offered the option to respond via a self-administered Web questionnaire. EIA expects that about 75% of household respondents will choose the Web option, with the remaining choosing to respond via a paper version of the form. These estimates of response by mode are based on the 2020 RECS, where 73% of Household Survey respondents used Web. The 2024 RECS Web form will be optimized for personal computer (desktop or laptop), tablet, and smart phone response. Using a Web form allows for more rapid data collection than paper forms and use of skip patterns so that respondents only see questions that are relevant to them. EIA is also embedding an experiment that includes QR codes on survey invitations.

The 2024 RECS ESS data collection will be organized electronically via an ESS website. EIA expects very few, if any, suppliers to submit non-electronic data.

A.4. Efforts to Identify Duplication

EIA has carefully searched for other surveys being conducted by DOE and other government agencies that might overlap with the RECS mandate. The following federal surveys collect data on energy characteristic, consumption, or expenditures in the residential sector, but none specifically about individual energy consumers at the level of detail or analysis value required for the RECS program:

- Form EIA-861 *Annual Electric Power Industry Report*
- Form EIA-176 *Annual Report of Natural and Supplemental Gas Supply and Disposition*
- Form AHS-2 *American Housing Survey* conducted by the U.S. Census Bureau
- Form ACS-1 *American Community Survey* conducted by the U.S. Census Bureau
- Form CE-302 *Consumer Expenditure Survey* conducted by the U.S. Census Bureau and sponsored by the U.S. Bureau of Labor Statistics
- *Household Pulse Survey* conducted by the U.S. Census Bureau

Each of the EIA-sponsored energy data collections identified above (Forms EIA-861 and EIA-176) were established to collect aggregate data from energy suppliers for specific macroeconomic analyses of the residential sector. Those results describe supply and demand chains to and within the residential sector and other sectors as a whole. RECS is different in that it links energy characteristics data from the

Household Survey with energy consumption data from their suppliers. As a result, only RECS supports microeconomic analyses of groups of energy consumers within the residential sector. RECS produces consumption and expenditure estimates of energy demand about residential energy consumers at national and subnational levels. These estimates would not be possible using only the total energy supplied that is collected by these supply-side data collection programs.

While the American Housing Survey, American Community Survey, and Consumer Expenditure Survey are all national household-level data collections, none of them cover the broad range of energy-related housing unit characteristics and household behaviors collected in the RECS, nor do they include the collection of energy consumption and expenditures from suppliers.

- *Form EIA-861 Annual Electric Power Industry Report*: This is a census of electric utilities and provides information on the sale of electric energy and other financial data. Aggregate data are collected on electric sales (revenue and megawatt hours) to consumers by class of consumer, sales for resale, other revenue, depreciation, and net income. No information is collected on the characteristics of household consumers, which is a major focus of the RECS. Moreover, the definition of the consuming sectors may vary from supplier to supplier. For example, some suppliers classify apartment buildings as "commercial" while others classify them as "residential." RECS uniformly classifies such units as residential.
- *Form EIA-176 Annual Report of Natural and Supplemental Gas Supply and Disposition*: This is a census of natural gas distributors and collects aggregate data on the volume and cost of natural gas delivered to residential, commercial, and industrial consumers. Data are not collected on the characteristics of the household consumers.
- *Form EIA-821 Annual Fuel Oil and Kerosene Sales Report*: This statistical sample survey provides aggregate data by state on the annual sales of distillate and residual fuel oil, and kerosene to end-use sectors. Like the electricity and natural gas surveys above, no data are collected on characteristics of consumers, and the definition of end-use sectors varies between EIA-821 and the RECS.
- *Form AHS-2 American Housing Survey*: AHS provides limited heating and cooling equipment, appliances, and self-reported energy cost data for a large sample of households. AHS respondents are asked to provide expenditures for a few specific months, which allows for modeling energy costs estimates as a share of the total cost of housing. That approach is sufficient for the AHS but because respondents are poor informants on their energy costs and the AHS collects no consumption data, that approach is inadequate for the RECS program. RECS requires the accuracy and detail of monthly energy consumption and expenditures provided by energy suppliers for estimating current and future energy demand. As noted above, the AHS uses RECS data to correct for data quality errors of self-reported energy cost data.
- *Form ACS-1 American Community Survey*: ACS collects information on annual expenditures for gas, electricity, and other fuels that are paid by the household directly to the suppliers of those fuels. Because these data are self-reported, they suffer from the same reporting biases in the American Housing Survey. However, because they are available at the census block level, ACS data on main space heating fuels and type of housing unit are critical inputs in designing the RECS sample.

- *Form CE-302 Consumer Expenditures Survey*: A part of this survey collects data on the uses of fuels in the home, expenditures for these fuels, and the amounts used. The data on expenditures and amounts used, are taken from the households' bills when available, but most of the data are self-reported and subject to similar biases in the AHS and ACS. These data are not published but used only for editing expenditure data as a component of total household expenditures.
- *Household Pulse Survey*: This data collection effort initiated by the U.S. Census Bureau in response to the COVID-19 pandemic includes a series of household energy insecurity questions derived from the RECS *Household Survey* and requested by EIA. Results derived from these questions allow for tracking energy insecurity during and after the pandemic. These results, however, are experimental and based on a data collection with low response rates relative to RECS.

A.5. Provisions for Reducing Burden on Small Businesses

EIA has designed RECS so that small businesses are not unduly burdened. Some of the energy suppliers required to respond to Forms EIA-457 D-G are small businesses. These forms request respondents to produce customer billing information, which is information that they already maintain. The sampling approach to data collection minimizes the burden on the industry as a whole, because only a portion of all energy suppliers are contacted. Furthermore, the number of customer records requested from each of the suppliers contacted is a small fraction of their customer base. Additionally, EIA offers flexibility in how respondents report in the EIA-457 D-G, either by a Web form or Excel templates.

A.6. Consequences of Less-Frequent Reporting

The quadrennial cycle is based on Congressional mandate to ensure that long-term shifts in energy markets are effectively monitored by examining energy demand. Major shifts in energy demand need to be measured to account for changes in energy uses and efficiencies by households. If RECS was conducted less frequently, Federal, State, and Local governments; product manufacturers; energy suppliers; and researchers would lack information to effectively design and monitor energy programs, sufficiently, inform markets for energy-consuming products, and plan for future energy needs. It would also impair EIA's ability to measure the adequacy of the nation's energy supply and to effectively forecast residential sector energy demand.

A.7. Compliance with 5 CFR 1320.5

There are no special circumstances that would require the 2024 RECS to be conducted in a manner inconsistent with the guidelines in 5 CFR 1320.5.

A.8. Summary of Consultations Outside of the Agency

EIA published a 60-day Federal Register Notice at 88 Fed. Reg. 209 (October 31, 2023) and received the following responses.

- On October 31, 2023, EIA received an email from a representative from the American Economic Association and Industry Studies Association requesting a copy of the updated questionnaire content and supporting documents for the ICR.

- On December 6, 2023, EIA received a letter of support for RECS from the Bureau of Economic Analysis (BEA).
- On December 22, 2023, EIA received a letter from the Zero Emissions Transportation Association (ZETA) requesting EIA add two electric vehicle-related questions to RECS.

EIA also conducts informational and outreach efforts to communicate RECS results and solicit feedback on improvements to the RECS program. RECS staff also maintain consistent communications channels with key stakeholders, periodically receiving feedback on their uses of RECS and how RECS might better serve needs in the future. The following summarizes some of these interactions.

- In August 2022, EIA hosted a formal poster-display session and an informal session at the American Council for an Energy-Efficient Economy (ACEEE) Summer Study on Buildings in Pacific Grove, CA to provide an update on RECS and gather feedback on uses of RECS data and its coverage of topics and questions valued by the buildings and efficiency communities.
- In October 2022, EIA presented RECS results and discussed RECS methods with the National Energy Assistance Directors Association (NEADA).
- In September 2022, EIA hosted a stakeholder and data user webinar, which was attended by more than 200 representatives from federal, state, and local governments; utilities; energy consultants and analysts; research centers; advocacy and policy groups; and product manufacturers and retailers. RECS staff presented 2020 RECS Household Characteristics results, discussed Household Survey methods and basic design features, and conducted a “Q&A” session. During the “Q&A” and subsequent to the event, EIA received extensive feedback on the RECS estimates and methods, as well as suggestions for updating future RECS questionnaires.
- In August 2023, EIA hosted a second 2020 RECS-results webinar that was attended by more than 150 stakeholders and data users. This webinar focused on 2020 RECS consumption, expenditures, and end-use estimation results and methods. Similar to the initial webinar event, we received feedback on results, suggestions for updating the next RECS projects, and suggestions for extending the utility of the RECS program.
- EIA staff attend American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE) Subcommittee TC7: Monitoring Energy Performance meetings to discuss RECS methods and results.
- In periodic meetings throughout 2022 and 2023, discussed NREL’s use of RECS end-use estimates for the End-Use Load Profile project and received feedback and suggestions on updating RECS questionnaire content and end-use estimation methods.
- During 2022 and 2023, EIA employees served on various energy equity, energy justice, and related working groups. This includes participating in OMB’s interagency Technical Working Group on Race and Ethnicity Standards.

A.9. Payments or Gifts to Respondents

EIA has used monetary incentives for the Household Survey since the 2005 RECS study. The decision to use incentives over this time period has drawn on best practices and strategies developed for other

federal surveys, and substantive testing and application in the RECS production environment. For the 2024 RECS Household Survey, EIA proposes continued use of monetary incentives.

Research has shown that the use of monetary incentives for survey respondents can increase survey response rates. Higher response rates lead to improvements in data quality through the reduced risk of nonresponse bias. In addition, incentives have been shown to increase survey saliency leading to greater response reliability and validity.^{2, 3}

EIA's incentive structure for the 2024 RECS is informed by and resembles the incentive structure used for the 2020 RECS, as well as the series of self-administered Web and paper pilot tests conducted prior to the 2020 RECS. EIA and its contractor have tested and evaluated monetary incentive levels and sequencing necessary for successful completion of self-administered RECS Household Surveys. The RECS incentive approach includes the use of both unconditional incentives (when the incentive is sent with the initial mailing, without knowing whether the household will respond) and promised incentives (when the incentive is given after the survey is completed).

All sampled households for the 2024 RECS will receive a \$5 unconditional, cash incentive mailed with the initial invitation letter. Respondents to the initial mailing or the first follow-up reminder will receive a \$10 promised, cash incentive. The initial invitation letter and first reminder offer only a Web-response option. The second invitation letter introduces a paper-response option, and the second reminder and third invitation all offer Web and paper options. Beginning with the second invitation letter, respondents using the Web option will receive the \$10 incentive plus a bonus \$10 incentive (for a total of \$20 incentive). Paper respondents will receive the \$10 incentive. This "Choice+" protocol was tested during pilot studies and used exclusively for the 2020 RECS Household Survey. As demonstrated for the RECS pilot tests, the Choice+ protocol results in higher response rates than Web-only or traditional Choice protocols. The Choice+ protocol also incentivizes Web response and results in lower per-complete cost compared to the traditional Choice protocol.

Table A1 shows the standard (i.e., control group) protocol for the 2024 RECS Household Survey mailings and incentive levels for Phase 1. As discussed in Supplement Statement Part B, EIA will experiment with removing the prenotification postcard and adding an additional reminder for Phase 1 of data collection. Incentive levels will remain the same for Phase 2, regardless of the treatment protocol used for Phase 2.

Table A1. 2024 RECS Household Survey Mailing Protocol and Incentives

Day	Mailing	Incentive
1	Prenotification Postcard	
4	Survey Invite 1 (web only, USPS)	\$5 prepaid \$10 promised
11	Reminder Postcard 1	\$10 promised
23	Survey Invite 2	\$10 promised (paper)

² Singer, Eleanor, and C. Ye. 2013. "The Use and Effects of Incentives in Surveys." *Annals of the American Academy of Political and Social Science*, No. 645(1) (January 2013), p. 112-141.

³ Groves, R. et. al. (2006). "Experiments in Producing Nonresponse Bias," *The Public Opinion Quarterly*, No. 70(5), p. 720-736.

	(web/paper, USPS)	\$10 + \$10 bonus promised (web)
26	Reminder Postcard 2	\$10 promised (paper) \$10 + \$10 bonus promised (web)
45	Survey Invite 3 (web/paper, UPS Mail Innovations)	\$10 promised (paper) \$10 + \$10 bonus promised (web)

Incentives have not been used and are not proposed for the 2024 RECS ESS administration.

A.10. Provisions for Protection of Information

Data for the 2024 RECS will be collected under the Confidential Information Protection and Statistical Efficiency Act of 2018 (CIPSEA, Title 5, Subtitle A, P.L. 107-347) and the Privacy Act of 1974. Each respondent will be provided the following statement:

The information you provide will be used for statistical purposes only and is confidential by law. In accordance with the Confidential Information Protection and Statistical Efficiency Act of 2018, your responses will not be disclosed in identifiable form without your consent. EIA employees, as well as their agents, are subject to a jail term, a fine, or both if they willfully disclose any identifiable information that you report.

All EIA staff and contractor employees having access to respondent information will complete EIA's CIPSEA training program. This program describes CIPSEA as well as the responsibilities of staff that have access to respondent data. The training also describes the requirements governing the use and access to respondent data and the penalties for violation of CIPSEA rules.

EIA contractors are also required to submit detailed Data Security and Confidentiality Plans, which include methods for establishing physical and electronic barriers to protect RECS data from unauthorized users, descriptions of electronic security systems, and procedures for securing information.

A.11. Justification for Sensitive Questions

No sensitive questions are proposed for the 2024 RECS.

A.12. Estimate of Respondent Burden Hours and Cost

Respondent burden hours

The annual respondent burden for the 2024 RECS is estimated at 3,909 hours. The burden estimates are annualized over the four-year RECS project cycle. Table A2 shows an annualized estimated burden for each of the survey forms.

The burden estimate per response for Form 457-A (0.53 hours) is based on timing data collected on the 2020 RECS and is the same as the burden estimate per response requested for the 2020 ICR. To estimate net burden impact after considering question additions and deletions, EIA uses an industry-standard formula of approximately six questions per minute, or 0.17 minutes per question.

The burden estimates per response for Forms 457-D, E, F and G are based on discussions with a sample of likely ESS respondents. Based on pretesting interviews conducted with nine energy suppliers prior to the onset of data collection for the 2018 CBECS Energy Supplier Surveys, which is a companion survey to the RECS and conducted in a similar manner as the RECS ESS. EIA plans to conduct ESS respondent debriefing interviews after the 2024 RECS to assess if an update of respondent burden is necessary for future rounds of RECS.

Table A2 shows the number of respondents and annual burden hours for each form in this ICR, as well as burden for respondent debriefings. The burden estimates in Table A2 for Forms D, E, F, and G forms reflect that each energy supplier in those surveys will be asked to report energy-bill information for as few as one or as many as several hundred households. The per-response burden estimates reflect the average burden for each form across all suppliers. From the 20,000 households in the target completed sample for Form-457A, EIA expects 17,600 Electricity Usage forms to be filed. Each of those forms takes an average of 0.17 hours to complete. EIA expects 1,100 electricity suppliers to complete the 17,600 Electricity Usage forms, for an average burden of 2.72 hours per supplier. The same method of calculation of burden hours per respondent continues with the rest of the energy supplier forms. From the 20,000 Household Survey sample, EIA expects 560 propane suppliers to complete 1,100 Form EIA-457D Propane Usage. The burden per form is an average of 0.17 hours, or a total average burden of 0.33 hours per propane supplier. For the same RECS sample, EIA expects 350 natural gas suppliers to complete Form EIA-457F Natural Gas Usage. These natural gas suppliers will file a combined total of 9,600 reports. Each report takes an average of 0.17 hours to complete with an average burden per natural gas supplier of 4.66 hours. EIA expects 450 suppliers of fuel oil or kerosene to complete 750 reports. The average burden for a single Form EIA-457G is 0.17 hours. The 750 reports filed by 450 kerosene and fuel oil suppliers results in an average burden of 0.27 hours per supplier.

Table A2. Estimated Burden: Per-Respondent Basis⁴

⁴ Differences between detail and totals are due to rounding.

EIA Form Number/Title	Annual Reporting Frequency	Number of Respondents	Annual Number of Respondents	Burden Hours Per Respondent	Annual Burden Hours
EIA Form 457-A Household Survey	0.25	20,000	5,000	0.53	2,650
EIA Form 457-D Household Propane Usage	0.25	560	140	0.33	47
EIA Form 457-E Household Electricity Usage	0.25	1,100	275	2.72	748
EIA Form 457-F Household Natural Gas Usage	0.25	350	88	4.66	408
EIA Form 457-G Household Fuel Oil or Kerosene Usage	0.25	450	113	0.27	31
Pretesting	0.25	100	25	1.00	25
TOTAL		22,560	5,641		3,909

Respondent cost

Based on the estimated rate of \$91.16 per hour for respondents who would complete these forms, the total annual respondent cost for all forms is estimated to be:

$$\$91.16/\text{hour} \times 3,909 \text{ hours/year} = \$356,344/\text{year}$$

Cost to respondents is annualized over the four-year RECS project cycle. An average cost per hour of \$91.16 is used because that is the average loaded cost (salary plus benefits) for an EIA employee assigned to data survey work. EIA assumes that the survey respondent workforce completing surveys for EIA is comparable with EIA workforce.

A.13. Annual Cost to the Federal Government

The annual cost of operating RECS is estimated at \$3,079,658 and includes contractor costs and federal staff time for survey-related activities. Costs to the federal government are annualized over the four-year RECS project cycle. The survey related activities include frame maintenance, collection, processing, and dissemination. EIA anticipates no additional respondent costs for generating, maintaining, and providing the information required in this Information Collection Request.

Table A3. Annualized Cost to the Federal Government

Activity	Labor Hours	Hourly Rate	Cost
Survey design, sampling, preparation	10,135	\$91.16	\$923,907
Data collection and processing	20,270	\$91.16	\$1,847,813
Dissemination	3,378	\$91.16	\$307,938
TOTAL	33,783		\$3,079,658

A.14. Changes in Burden

Table A4 shows the changes in burden from the prior RECS. Burden estimates are annualized over the four-year RECS project cycle.

Table A4. Changes in Burden⁵

EIA Form Number/Title	Annual Reporting Frequency	Number of Respondents (Previously Approved)	Number of Respondents (Requested)	Annual Number of Respondents (Previously Approved)	Annual Number of Respondents (Requested)	Burden Hours Per Respondent (Previously Approved)	Burden Hours Per Respondent (Requested)	Annual Burden Hours (Previously Approved)	Annual Burden Hours (Requested)	Annual Number of Respondents			Annual Burden Hours		
										Change Due to Agency Discretion	Change Due to Adjustment in Agency Estimate	Adjustment	Change Due to Agency Discretion	Change Due to Adjustment in Agency Estimate	Adjustment
EIA Form 457-A Household Survey	0.25	20,000	20,000	5,000	5,000	0.53	0.53	2,650	2,650	0	0	0	0	0	0
EIA Form 457-D Household Propane Usage	0.25	600	560	150	140	0.34	0.33	51	47	0	-10	-10	0	-4	-4
EIA Form 457-E Household Electricity Usage	0.25	950	1,100	238	275	3.40	2.72	808	748	0	37	37	0	-60	-60
EIA Form 457-F Household Natural Gas Usage	0.25	430	350	108	88	3.80	4.66	409	408	0	-20	-20	0	-1	-1
EIA Form 457-G Household Fuel Oil or Kerosene Usage	0.25	530	450	133	113	0.26	0.27	34	31	0	-20	-20	0	-3	-3
Pretesting	0.25	0	100	0	25	0.00	1.00	0	25	25	0	25	25	0	25
TOTAL		22,510	22,560	5,628	5,641			3,952	3,909	25	-13	12	25	-68	-43

⁵ Differences between detail and totals are due to rounding.

A.15. Reasons for Changes in Burden

The following is a summary of the burden estimate changes for each form.

The completed sample size, estimated burden per response, and final burden estimate for Form EIA 457-A are unchanged.

The burden estimates for Forms EIA 457-D, E, F, and G are updated based on the number of individual forms and number of suppliers responding to the 2020 RECS. For Form EIA 457-E Household Electricity Usage, for example, we collected fewer forms from more suppliers than EIA anticipated collecting at the outset of data collection. Therefore, the overall burden per response is lower (from 3.40 to 2.72 hours per response), but the annual burden hour estimate is changed only slightly (-60 hours).

The change in burden for the 2024 RECS also reflects additional burden for pretesting interviews, in the form of respondent debriefings, which were not included in the 2020 RECS burden estimate.

A.16. Collection, Tabulation, and Publication Plans

As previously discussed in this document, EIA plans to begin data collection in September 2024. The goal for the 2024 RECS is to begin releasing results in December 2025. The timeline for data collection and distribution activities is summarized below:

- Begin Household Survey Data Collection Phase 1: September 2024
- Begin Household Survey Data Collection Phase 2: January 2025
- End Household Survey Data Collection: March 2025
- Begin Energy Supplier Survey Data Collection: July 2025
- Complete Energy Supplier Survey Data Collection: December 2025
- Release Housing Characteristics Results: December 2025
- Release Consumption and Expenditures Results: December 2026

2024 RECS results will be published by EIA at <https://www.eia.gov/recs/>. All data will be prepared in accordance with EIA publication standards. Detailed tables will contain energy characteristics, consumption, and expenditures for electricity, natural gas, fuel oil, propane, and wood by numerous energy-related housing characteristics. Public use data that have been masked to maintain confidentiality will also be available on the EIA Website.

A.17. OMB Number and Expiration Date

The expiration date will be displayed on the form.

A.18. Certification Statement

There will be no exceptions to the Certification for Paperwork Reduction Act Submissions of OMB Form 83-I.