



Independent Statistics & Analysis

U.S. Energy Information
Administration

Supporting Statement for Residential Energy Consumption Survey (RECS)

Part A: Justification

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 consumption 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 2020 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 fifteenth 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* forms to collect energy consumption and cost data for the housing units in the sample. EIA uses data from the *Household Survey* and *Energy Supplier Surveys* to model and estimate consumption and expenditures for individual energy end-uses in the residential sector. For the 2015 RECS, EIA published energy end-use estimates for more than 25 household activities including space heating, air conditioning, water heating, appliances, electronics, and lighting.

The 2020 RECS design allows EIA to produce benchmark estimates of residential energy characteristics, consumption, and expenditures at the following geographic levels: national, Census region, Census division, and state.

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, and microdata data files which have been inoculated to protect the identity of individual households. RECS products and the microdata files from prior studies are available from EIA's website at <http://www.eia.gov/consumption/residential/>.

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 2020 RECS *Household Survey* will be administered to sampled housing units using a responsive-design¹ approach beginning in September 2020. 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 2021. EIA expects 18,000 completed Household Surveys after the first two phases. An additional sample will be held in reserve for an optional, third data collection phase. This optional Phase 3 will be used, as needed, to mitigate any coverage issues identified during the first two phases. Up to an additional 2,000 completes, for a total of 20,000 completes, may be targeted for this third data collection phase.

Form EIA-457A includes the following sections:

- i. Your Home: housing unit type, structural features, size, and age of the housing unit; electric vehicles
- ii. Appliances: presence and usage patterns of kitchen and laundry devices
- iii. Electronics: presence and usage patterns of televisions, computers, and small electronic devices
- iv. Space Heating: main and secondary equipment types and fuels used to heat the home, as well as usage indicators
- v. Air Conditioning: cooling equipment types and usage indicators
- vi. Water Heating: type and fuel used to heat water
- vii. Lighting: number and types of bulbs used inside and outside the home, as well as usage indicators
- viii. Energy Bills: how energy bills are paid and whether non-household costs are included in bills; presence of onsite solar
- ix. Household Characteristics: basic demographic information about the people living in the household
- x. Energy Assistance: challenges and coping mechanisms households may have faced paying energy bills or keep home at a comfortable temperature
- xi. Energy Suppliers: energy supplier names for each fuel used in the home, as well as wood usage

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

Data Collection Part 2: Energy Supplier Survey

During the second part of RECS, EIA conducts the *Energy Supplier Survey* (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 2020 RECS ESS will be conducted starting in June 2021 and continue through September 2021.

Questionnaire Updates for the 2020 RECS

Form EIA-457A is updated to reflect changes in the residential market, stakeholder feedback, cognitive interviews and other forms of respondent pretesting, and lessons learned from the 2015 RECS. Questions were added to collect the most relevant information necessary to characterize household energy use and to inform energy end-use estimation. Some revisions were made to questions to improve response quality or to adapt to changes in technologies used in residential dwellings.

The following changes apply to the Form EIA-457A *Household Survey*.

Question additions

- Add question to capture the source of the respondent's home square footage estimate (85% of respondents): Information on the source of the respondent's square footage estimate will help EIA evaluate response quality and produce valid estimates of residential conditioned space.
- Add question about whether at least half of the windows in the home are original to the home (100% of the home): More information about the condition of windows, and thus the air leakage in the home, will improve heating and cooling end-use estimation.
- Add series of questions to capture all-electric plug-in and hybrid plug-in vehicle charging infrastructure and charging behavior (approximately 2% of respondents): Plug-in electric vehicles are an emerging technology that can significantly impact a household's electricity consumption. Additional questions about charging behavior (e.g., how often and where the household charges) and the type of home charger used (e.g., Level 1 or Level 2) will improve EIA's analysis of the impact of electric vehicle charging on household energy use.
- Add questions to capture size of solar PV capacity and the year of installation (2% of respondents): The RECS Household Survey currently includes a question about presence of solar PV panels, but an additional question about the system capacity and year installed are needed to understand the portion of household consumption that is attributable to the on-site generation.
- Add question about variable-speed pool pumps (5% of respondents): Variable-speed pumps can significantly reduce the energy use attributable to pools. This question will improve our estimates of pool pump consumption, which can be a significant electric load for some households.
- Add question about wine chillers (100% of respondents): Wine chillers have become more common in homes and have separate energy standards than refrigerators.

- Add questions to capture presence and use of induction cooktops (60% of respondents): Induction cooktops are an emerging technology, which require less energy to use than traditional electric or gas cooktops.
- Add questions to capture the emerging use of “smart speakers,” as well as a “mark all that apply” question to capture what devices the smart speakers can control (100% of respondents): A key topic in household energy use is the proliferation of internet-connected or “smart” devices in homes. Understanding the market penetration of these devices, individually and collectively, will improve EIA’s analysis and consumption estimates of household miscellaneous electric loads, or MELs.
- Add question to collect how the household primarily uses their televisions (95% of respondents): The use of televisions for viewing live programming, recorded content, streaming content, or playing video games requires differing amounts of energy. Capturing household behavior related to the usage of each television will improve EIA’s consumption estimates for televisions and related peripheral devices.
- Add questions to collect more information on teleworking and online education at home (85% of respondents): These new questions are added as teleworking and distance learning, either as permanent or regular situations, or due to COVID-19 stay-at-home orders, become more pervasive. Electricity consumption for computing equipment is likely increasing significantly for some households and these questions will facilitate analysis of those households, compared with those that are not using computing devices for teleworking and distance learning.
- Add questions for respondents in apartments about whether equipment for space heating, cooling, and/or water heating serves more than one unit (30% of respondents): These questions, which were included in RECS studies prior to 2015, are reinstated to better capture central or whole-building, equipment for key end uses.
- Add question to capture ground-source heat pumps (15% of respondents): Heat pump efficiencies vary by type, particularly between air-source and ground-source units. Knowing the type of heat pump system will improve EIA’s estimates of heating load.
- Add question to capture backup heat source for households using heat pumps as the primary heating equipment (15% of respondents): Most heat pumps require a backup heating source when the outdoor temperature is too cold for the heat pump to work efficiently. An additional question to determine if the backup source is electric-resistance or a natural gas-sourced component is necessary to ensure EIA can attribute the heating load in the home to the correct fuel and device type.
- Add question to capture extent of secondary heating equipment usage (35% of respondents): Household usage of backup or secondary heating sources, such as portable heaters and wood stoves, can vary significantly. An additional question to capture the relative use of these secondary sources is necessary to ensure EIA can attribute the heating load in the home to the correct fuel and device type.
- Add question to capture ceiling and floor fan usage (85% of respondents): Ceiling fans account for about 2% of household electricity consumption. An additional question to capture the relative use of ceiling and floor fans is necessary to capture the variability in usage of these devices across homes.

- Add question to capture heat pump water heaters (100% of respondents): Heat pump water heaters are an emerging, efficient technology in the residential sector. An additional question is necessary to measure the penetration of these devices, as well as to more accurately model water heating consumption.
- Add question to capture location of main water heating equipment (85% of respondents): Whether or not the main water heating equipment is located in a conditioned space affects the potential heat loss associated with the equipment and the overall energy profile for water heating. Collecting the equipment location (main living space, basement, garage, etc.) in combination with other household responses about their living space will improve the accuracy of modeled energy consumption for water heating.
- Add question to capture presence of water heater blankets (85% of respondents): Using water heater blankets for storage tank water heaters reduces heat loss and overall energy demand. This additional question will improve the accuracy of modeled energy consumption for water heating.
- Add questions to capture any loss of electricity service over 24 hours, as well as the reason (100% of respondents): The 2015 RECS Household Survey included questions to capture household electricity outages due to failure to pay bills, but data users indicate a need to capture electricity outages for any reason. These additional questions will improve analysis of the impacts of residential energy disruptions.
- Add questions to the lighting section to capture additional detail about indoor and outdoor lighting usage (100% of respondents): These questions have been added to gather more detail about how and when light bulbs are used. This information will be used to improve the quality of modeled estimates of residential lighting consumption.
- Add question requesting physical address for sampled households using a P.O. box as an “only way to get mail” (1% of respondents): A small portion of sampled units will not have physical address to mail to, but rather receive the survey invitation at a P.O. box at their local post office. In order to request energy billing records from energy suppliers, EIA must know the physical address of the sampled housing unit.

Question revisions

- Revise questions about how long the household has lived in the home and vacant periods to only capture move-in year and month for 2020 (100% of respondents): Questions about move in year and recent vacancy help explain gaps in customer billing data, including missing billing periods and bills with zero consumption. Approximately 6% of electricity cases and 9% of natural gas cases for the 2015 RECS contained an anomaly. These revised questions will allow us to better assess whether those anomalies are due to periods of vacancy for the sampled housing unit or are missing data outright that should be imputed, which will in turn improve average consumption and end-use estimation.
- Revise question about sliding glass doors to also cover French doors that open to the outside (100% of respondents): Better capturing any large glass openings to the outside of the home will improve heating and cooling end-use estimation.

- Revise range question response option for “dual fuel” (75% of respondents): Prior RECS Household Surveys only allowed for reporting of dual fuel ranges (i.e., gas cooktop and electric oven) as an “other/specify” write-in response. The updated questionnaire will contain an explicit “dual fuel” response option to better capture the proliferation of this type of range.

Revise coffee maker question to collect frequency of use and explicitly reference various types of machines (100%): Prior RECS Household Surveys only collected a yes/no for whether a coffee maker was used in the home. The question has been updated to collect detail about how frequently an electric coffee maker is used at home, and also to mention that this should include “drip coffee makers, single-serve machines, and espresso machines.” This question revision is part of EIA’s on-going efforts to further disaggregate the other or “miscellaneous” electric loads in homes. The ability to further disaggregate common devices and appliances from total residential sector consumption provides EIA and its stakeholders a better understanding of what contributes to changes in electricity use over time. Coffee makers are in widespread use within the residential sector (76 million households according to the 2015 RECS) and, if used consistently on a day-to-day basis and for several hours a day, will consume more energy than some common household appliances like dishwashers and clothes washers. In a 1997 report from Lawrence Berkley National Laboratory, coffee makers when used more than 3 hours per day were estimated to consume 126 kWh/year. There are no standards in effect for coffee makers and the energy efficiency for this kitchen appliance has not changed in the past 20 years. Because they constitute a significant portion of other or “miscellaneous” electric loads, coffee makers are explicitly modeled as part of EIA’s National Energy Modeling System (NEMS) residential demand module. In addition to coffee makers, NEMS also explicitly models these miscellaneous loads: ceiling fans, dehumidifiers, microwaves, pool and spa heaters, security systems, and wine chillers. Updated stock assessments of coffee makers within the household sector, particularly penetration among key sub-populations (e.g., by geography or housing type), as well as a nationally-representative consumption estimates derived from RECS, would improve EIA’s ability to project coffee maker consumption. Similar to other end-use models, the RECS team will rely on published research, as well as technology reports that support NEMS, for the coffee maker model parameters. For example, the following from a 2008 TIAX LLC report prepared for DOE may be incorporated as underlying assumptions:

- Active mode usage: 8 minutes per use at 1,100 watts
- Idle mode usage (device in warming mode): 38 minutes per use at 70 watts
- Inactive mode usage: remainder of time during the year at 0.4 watts

- Revise TV type questions to reflect current market terminology and trends (95% of respondents): The current TV market is almost exclusively LED (or OLED) models, with most plasma, older LCD, and CRT models no longer available. EIA will update response options to reflect this trend in the market.
- Revise question and response options about Internet access (100% of respondents): These changes more closely align RECS questions with those included on the American Community Survey.

- Revise questions about heating equipment and cooling equipment to separately capture central heat pumps and ductless mini-split heat pumps (95% of respondents): The use of ductless mini-split heat pumps has grown over time, and they are commonly used to replace or supplement equipment in older home without ducts. The order and placement of questions in the cooling section was revised to allow for reporting of this emerging technology.
- Revise humidifier and dehumidifier questions to capture whether units are portable or whole-home units and to improve usage indicators (100% of respondents): Humidifier and dehumidifier consumption can vary significantly based on whether the device is meant to impact all spaces in a home (whole-home) or only sections of the home (portable), and whether the device is used rarely or for most of the year.
- Revise space heating equipment questions to improve response quality and account for trends in the market (95% of respondents): In addition to adding ductless heat pumps, EIA has removed pipe-less furnace and fireplace as main heating equipment response options, which are rarely reported as main sources of heat. The main heating equipment response options will also include graphics to aid response.
- Revise the self-reported wood supply questions to improve data quality (10% of respondents): Unlike propane and fuel oil usage data, EIA relies solely on Household Survey respondents to report wood usage. Revising existing questions to include question aids (e.g., pictures) and consistently reference both of the main types of wood used in homes (logs and pellets) will improve response quality and estimates of household wood usage.
- Revised questions about number of adults and children in household (100% of respondents): Two, separate questions about number of adults and children have been combined into one question to instead ask number of household members in three age categories (0-17, 18-64, and 65 or older) to better capture the ranges of ages in the household.
- Revise income question response options to capture more granular levels (100% of respondents): Data users indicate that the level of detail for the 2015 RECS income question was not sufficient for many analysis needs, especially concerning low-income households. EIA will revise the income question to include more response options.
- Revise request for energy supplier information: For prior RECS studies, household respondents were asked by field interviewers to provide energy supplier names as part of the survey instrument, then asked to write in supplier names on a separate authorization form. Due to the change to self-administered Web and paper modes there is no longer a separate authorization form and EIA will now only collect the energy supplier names once. The change to self-administered modes also requires modification to the introduction to the request for supplier names. As part of the request, respondents will be informed that EIA will contact the suppliers for further information. EIA collects data from the energy suppliers under its mandatory authority, so authorization from the household is not required.

Question removal

- Remove question about clothes washer rinse cycle (85% of respondents): Clothes washer rinse cycles almost always use cold water, so this question has become antiquated and of little analytical value.
- Remove question about count of total light bulbs in the home (100% of respondents): 2015 RECS respondent estimates of total light bulbs were generally lower than estimates derived from various, lighting-specific studies where on-site auditors counted light bulbs. To better gauge the total number of light bulbs *used* by the household, EIA has instead added two light bulb usage questions.
- Remove questions about indoor and outdoor lighting controls (100% of respondents): EIA determined that the questions about lighting timers, dimmers, and sensors were of minimal analytical value without detailed information about actual usage of these devices.
- Remove all Energy Star questions (100% of respondents): EIA comparisons of 2009 and 2015 RECS Energy Star responses with Energy Star appliance shipment data show that RECS respondents have difficulty identifying whether their appliances are Energy Star certified. These data quality issues, as well as data availability via alternative sources, warrants removal of these items from the RECS Household Survey.
- Remove all efficiency program participation questions (100% of respondents): Data users indicate that the lack of specificity associated with respondent reports of energy program participation (e.g., light bulb rebate programs) significantly decreases the usability of these RECS Household Survey items. Data users also note that these data can often be obtained from alternative data sources, including individual government or utility program offices.
- Remove the self-reported propane and fuel oil supply and cost questions (15% of respondents): The RECS Household Survey has included self-reported propane and fuel oil delivery and cost questions for many survey cycles. This information, however, is no longer used extensively as EIA now relies almost exclusively on data reported on the ESS.

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

Question revision

- Change the number of customer (household) billing and delivery months requested from 20 to 24 months: The additional four months of data will facilitate EIA's analysis of consumption patterns before and during COVID-19. For example, EIA plans to compare energy bills during the summer of 2020 (during COVID-19) to those from the same housing unit during the summer of 2019 (pre-COVID-19.)

A.1. Legal Justification

15 U.S.C. § 772(b) states:

- i. "All persons owning or operating facilities or business premises who are engaged in any phase of energy supply or major energy consumption shall make available to the Administrator such information and periodic reports, records, documents, and other

data, relating to the purposes of this Act, including full identification of all data and projections as to source, time and methodology of development; as the Administrator may prescribe by regulation or order as necessary or appropriate for the proper exercise of functions under this chapter."

15 U.S.C. § 764(b) states that to the extent authorized by subsection (a), the Administrator shall:

- i. advise the President and the Congress with respect to the establishment of a comprehensive national energy policy in relation to the energy matters for which the Administration has responsibility, and, in coordination with the Secretary of State, the integration of domestic and foreign policies relating to energy resource management;
- ii. assess the adequacy of energy resources to meet demands in the immediate and longer range future for all sectors of the economy and for the general public;
- iii. [intentionally deleted]
- iv. [intentionally deleted]
- v. assure that energy programs are designed and implemented in a fair and efficient manner so as to minimize hardship and inequity while assuring that the priority needs of the Nation are met;
- vi. develop and oversee the implementation of equitable voluntary and mandatory energy conservation programs and promote efficiencies in the use of energy resources;
- vii. [intentionally deleted]
- viii. [intentionally deleted]
- ix. work with business, labor, consumer and other interests and obtain their cooperation;
- x. [intentionally deleted]
- xi. perform such other functions as may be prescribed by law."

As the authority for invoking subsection (b), above, 15 U.S.C. § 764(a) states:

- i. "Subject to the provisions and procedures set forth in this Act, the [Secretary] shall be responsible for such actions as are taken to assure that adequate provision is made to meet the energy needs of the Nation. To that end, he shall make such plans and direct and conduct such programs related to the production, conservation, use, control, distribution, rationing, and allocation of all forms of energy as are appropriate in connection with only those authorities or functions-
- ii. specifically transferred to or vested in him by or pursuant to this chapter;
- iii. delegated to him by the President pursuant to specific authority vested in the President by law; and
- iv. otherwise specifically vested in the Administrator by the Congress."

Additional authority for this information collection is provided by 15 U.S.C. § 790(a) which states;

- i. "It shall be the duty of the Director to establish a National Energy Information System... [which] shall contain such information as is required to provide a description of and facilitate analysis of energy supply and consumption within and affecting the United States on the basis of such geographic areas and economic sectors as may be appropriate... to meet adequately the needs of..."
- ii. the Department of Energy in carrying out its lawful functions;
- iii. the Congress;

- iv. other officers and employees of the United States in whom have been vested, or to whom have been delegated energy-related policy decision-making responsibilities;
- v. the States to the extent required by the Natural Gas Act [15 U.S.C. § 717 et seq.] and the Federal Power Act [16 U.S.C. § 791a et seq.].
- vi. "At a minimum, the System shall contain such energy information as is necessary to carry out the Administration's statistical and forecasting activities, and shall include... such energy information as is required to define and permit analysis of;
- vii. the institutional structure of the energy supply system including patterns of ownership and control of mineral fuel and non-mineral energy resources and the production, distribution, and marketing of mineral fuels and electricity;
- viii. the consumption of mineral fuels, non-mineral energy resources, and electricity by such classes, sectors, and regions as may be appropriate for the purposes of this chapter;
- ix. the sensitivity of energy resource reserves, exploration, development, production, transportation, and consumption to economic factors, environmental constraints, technological improvements, and suitability of alternate energy sources;
- x. the comparability of energy information and statistics that are supplied by different sources;
- xi. [Intentionally deleted]
- xii. [Intentionally deleted]
- xiii. [Intentionally deleted]

Authority for conducting RECS is specified by 42 U.S.C. § 7135 where EIA is to carry out;

- i. "central, comprehensive, and unified energy data and information program which will collect, evaluate, assemble, analyze, and disseminate data and information which is relevant to energy resource reserves, energy production, demand, and technology, and related economic and statistical information, or which is relevant to the adequacy of energy resources to meet demands in the near and longer term future for the Nation's economic and social needs."

42 U.S.C. § 7135(k) provides specific statutory authority and justification for RECS. This section states:

- i. conduct surveys of residential and commercial energy use at least once every four years, and make such information available to the public;
- ii. when surveying electric utilities, collect information on demand-side management programs conducted by such utilities, including information regarding the types of demand-side management programs being operated, the quantity of measures installed, expenditures on demand-side management programs, estimates of energy savings resulting from such programs, and whether the savings estimates were verified; and
- iii. in carrying out this subsection, take into account reporting burdens and the protection of proprietary information as required by law."

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 general 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. RECS state-level estimates, including characteristics of housing units and detailed energy use estimates, will be incorporated into 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 October 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. The extensive list of RECS characteristics (stocks and usage indicators), consumption, and cost estimates are used as

benchmark estimates for these standards programs. They represent the only national, subnational, and subpopulation estimates available. New and revised questions, as well as state-level estimation for the 2020 RECS Household Survey will expand the list of benchmark results and improve existing ones. These updates will better inform analysis and discussions for EERE and other stakeholders considering new or updated standards. For example, the new question about wine chillers will result in national and subnational, representative estimates of the portion of homes with this appliance, as well estimates of average consumption and cost, and metrics relative to other devices in homes.

- **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 adjust the reporting of 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):** NREL uses RECS data to understand the adoption rates and impact of the new technologies, building designs, and energy-efficient equipment they test and promote. The laboratory reports it needs much larger RECS sample sizes to perform necessary multivariate analyses.
- **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 data to influence recommendations for work on national and state building codes.
- **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):** HUDs 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.

A.3. Use of Technology

All sampled households for the 2020 RECS Household Survey will be offered the option to respond via a self-administered Web questionnaire. EIA expects that at least two-thirds of household respondents will choose the Web option, with the remaining one-third choosing to respond via a paper version of the form. These estimates of response by mode were informed by a series of pilot tests, as described below.

The 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.

The 2020 RECS Household Survey protocols and self-administered design using a Web-response option were informed by an extensive series of pilot tests prior to and concurrent with the previous RECS conducted in 2015. For every RECS prior to 2015, EIA used interviewer-administered modes (most recently computer-assisted personal interviewing). A Committee on National Statistics report released in 2013 urged EIA to explore alternative data collection modes to: improve timeliness in collecting and disseminating data, reduce per-interview costs, and as a means to improve the flexibility and expand the scope of the RECS program. EIA conducted three pilot tests of a multimode, Web and paper RECS Household Survey to explore the viability of these alternative modes. The cumulative results of these tests, which included a nationwide test in late 2015 (the RECS National Pilot), showed that despite lower response rates than an interviewer-administered design, a self-administered RECS Household Survey will produce comparable coverage and representativeness of key energy-use metrics as an interviewer-administered design.

The 2020 RECS Energy Supplier Survey 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. These searches, along with the knowledge of personnel in the EIA office sponsoring RECS, resulted in the identification of six federal surveys that collect data on energy use 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 EIA-821 *Annual Fuel Oil and Kerosene Sales Report*
- 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.

Each of the EIA-sponsored energy data collections identified above (Forms EIA-861, EIA-176, EIA-821) 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 as part of the broader purpose to describe housing unit and living conditions in the U.S. With a specific focus on household energy demand, RECS requires much more detailed information than is available in AHS. AHS respondents are also 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 energy characteristics and 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 basic housing unit and household information and there are similar questions on the RECS Household Survey. EIA has only included questions where there is an exact (e.g., Internet usage) or similar overlap (e.g., number of household members) with ACS when there is a specific and significant energy demand or statistical need for RECS. For the Internet usage question there is a specific relationship with household energy demand due to the presence of energy-consuming devices associated with broadband access. Routers are an always-on energy load and a device that we specifically disaggregate when present. This question is also used to evaluate response patterns and is potentially a nonresponse weighting adjustment factor. Income, number of household members, housing type, and household characteristics questions are included to allow EIA to

produce critical sub-population estimates of household energy demand, as well as potential nonresponse weighting adjustment factors.

ACS also 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.

- 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.

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 small percentage 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 2020 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 conducted an extensive outreach effort with RECS stakeholders to seek input on the 2020 RECS objectives and form content. EIA met with various groups, solicited and received written comments, and published a 60 Day Federal Register Notice at 84 Fed. Reg. 224 (November 20, 2019). Further details about these outreach efforts are outlined below.

- On August 13, 2018, EIA hosted a formal poster-display session and an informal session at the 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.

- On July 11, 2019, EIA hosted a stakeholder and data user webinar, which was attended by more than 100 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 discussed 2020 RECS objectives and basic design features, as well as hosted a “Q&A” session. Subsequent to the webinar, EIA received numerous comments on the 2020 RECS and suggestions for questionnaire updates.
- On August 12, 2019, EIA staff met with building energy and utility program experts from ACEEE to discuss 2020 RECS plans and potential updates to the questionnaires.
- On August 26 and 27, EIA staff met with data users from government agencies, academia, and nongovernmental organizations to discuss 2020 RECS plans and RECS coverage of low-income household and energy insecurity issues.
- On September 11 and 13, 2019, EIA staff met with DOE EERE and DOE laboratory staff to discuss 2020 RECS plans and RECS coverage of miscellaneous electric loads, electrification, and plug-in electric vehicles.
- On September 15 and 16, 2019, EIA staff attended the NASEO Annual Meeting to announce the planned expansion of RECS state-level estimates and to discuss state interest in EIA’s residential data program.
- On September 26, 2019, EIA staff briefed the Department of Energy State and Local Community of Practice group on 2020 RECS objectives and key design elements.
- On November 8, 2019, EIA staff met with EPA Energy Star staff to discuss 2020 RECS objectives and key design elements and to discuss removing Energy Star appliances questions from the 2020 RECS Household Survey form.
- On January 6, 2020, EIA received a letter of support for RECS from the Bureau of Economic Analysis (BEA).
- On January 20, 2020, EIA received comments from the Entertainment Software Association on the content and wording of questions pertaining to video gaming systems.

A.9. Payments or Gifts to Respondents

EIA has used monetary incentives 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 2020 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}A recent example of incentive strategies used in federal surveys similar to those proposed for the 2020 RECS is the National Postsecondary Student Aid Survey (NPSAS), sponsored by the National Center for Education Statistics.

EIA's incentive structure for the 2020 RECS is also informed by the series of self-administered Web and paper pilot tests. During these pilot tests, EIA and its contractor conducted experiments to evaluate monetary incentive levels 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 conditional incentives (when the incentive is given after the survey is submitted).

In an initial pilot test of a self-administered household energy use survey, all sampled households (single-family homes only) received a \$2 unconditional incentive and respondents received a \$5 conditional incentive. The overall response rate for this initial test was 20%. In the second pilot test, sampled households (this time both single and multifamily homes) received a \$5 unconditional incentive, and respondents received a \$10 conditional incentive. The response rate for this pilot study, which was conducted in five U.S. cities, was 38%.

Building on results from the first and second pilots, EIA conducted two incentive experiments for the third pilot test, the RECS National Pilot⁴: one focused on the level of conditional incentive (a lower incentive of \$10 vs. a higher incentive of \$20), and a second to determine if respondents could be incentivized to respond via the Web, rather than by mail. For the second experiment, EIA offered an additional \$10 conditional incentive for a Web response. Among the respondents that were offered this additional Web incentive, there was no significant difference in overall response between the low and high incentive levels. However, the additional incentive significantly increased the share of Web responses: 64% of respondents who were offered this additional incentive responded by Web, with 36% responding by mail. Overall data quality for Web responses was higher due to lower item nonresponse than the mailed surveys. The additional Web incentive also motivated faster overall response, resulting in reduced nonresponse follow-up and processing costs. Despite the cost of this additional Web incentive, overall data collection costs were lower compared to the group that was not offered the extra incentive. The overall response rate for the RECS National Pilot across all experimental treatment groups was 40%.

The results from those experiments demonstrated that a \$10 incentive was effective for overall participation, and that an additional incentive was effective in encouraging respondents to respond via Web. As such, EIA proposes the following incentive structure for Phase 1 of data collection for the 2020 RECS Household Survey, which includes an experiment on the amount of the incentive given for participants who respond via Web:

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.

⁴ Biemer, P. et. Al, "Using Bonus Monetary Incentives to Encourage Web Response in Mixed-Mode Household Surveys," *Journal of Survey Statistics and Methodology*, No. 6(2) (June 2018), p. 240-261,

	Group 1 (Control) <i>n</i> = 4,860	Group 2 <i>n</i> = 4,860
Prepaid unconditional incentive	\$5	\$5
Promised conditional incentive for paper respondents	\$10	\$10
Promised conditional incentive for Web respondents	\$20	\$30

Sampled households will be randomly assigned to either Group 1 or Group 2. The \$5 unconditional incentive will be delivered in the form of cash, accompanying the initial mailing of materials. The promised conditional cash incentive (if earned) will be delivered to the participant by mail, following completion of the survey.

EIA and its contractor will closely monitor the impacts of the experiment on incentivizing Web response. After Phase 1, EIA will determine how effective the incentives were in promoting Web response and make a determination on the best incentive strategy to employ for Phase 2.

Incentives have not been used and are not proposed for Energy Supplier Survey (ESS) administration.

A.10. Provisions for Protection of Information

Data for the 2020 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 in written form:

The information you provide on Form EIA-457 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 and other applicable Federal laws, your responses will not be disclosed in identifiable form without your consent. Per the Federal Cybersecurity Enhancement Act of 2015, Federal information systems are protected from malicious activities through cybersecurity screening of transmitted data. Every EIA employee, as well as every agent, is subject to a jail term, a fine, or both if he or she makes public any identifiable information you reported.

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 2020 RECS.

A.12. Estimate of Respondent Burden Hours and Cost

Respondent burden hours

The annual respondent burden for the 2020 RECS is estimated at 3,951 hours. The burden estimates are annualized over the *four year project cycle*. Table A1 shows an annualized estimated burden for each of the survey forms. The total annualized burden for this information collection is 3,951 hours.

The burden estimate per response for Form 457-A Household Survey (.53 hours) is based on timing data collected on 2,340 Web submissions for the RECS pilot tests conducted in 2015. Paradata time stamps collected for each of these responses showed that the median response time for the pilot tests was 30 minutes (.50 hours). Response times ranged from 19 minutes for the 10th percentile to 54 minutes for the 90th percentile. For this pilot test, respondents answered an average of 170 questions. Skip patterns built into the question allowed respondents to bypass questions that were not applicable to them and thus reduced the per-response burden. The 2020 RECS Household Survey is built directly from the Household Survey used for the pilot test, including similar content, format, wording, and overall presentation. Because of a small net increase in the number of questions, EIA expects the 2020 Household Survey to be approximately 32 minutes (.53 hours). To estimate net burden impact after considering question additions and deletions, EIA uses an industry-standard formula of approximately six questions per minute, or .17 minutes per question.

The burden estimates per response for Forms 457-D, E, F and G Energy Supplier Surveys 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, EIA decreased the burden per response from 15 minutes (.25 hours) to 10 minutes (.17 hours). The burden estimates per respondent for the Energy Supplier Surveys is adjusted because of the per-response estimates change.

Table A1 shows the number of respondents and annual burden hours for each form in this ICR. Table A1 calculates the burden for Forms D, E, F, and G (the Energy Supplier Survey forms) using a per form basis to calculate the average burden per response. From the 20,000 households in the sample for Form-457A, EIA expects 19,000 Electricity Usage forms to be filed. Each of those forms takes an average of 0.17 hours to complete. EIA expects to contact 950 electricity suppliers to complete the 19,000 Electricity Usage forms, for an average burden of 3.40 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 to contact 600 propane suppliers to complete 1200 Form EIA-457D *Propane Usage*. The burden per form is an average of 0.17 hours, or a total average burden of 0.34 hours per propane supplier. For the same RECS sample, EIA expects to contact 430 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 3.8 hours. EIA expects to contact 530 suppliers of kerosene and fuel oil who will file 800 reports. The average burden for a single Form EIA-457G is 0.17 hours. The 800 reports filed by 530 kerosene and fuel oil suppliers results in an average burden of 0.26 hours per supplier.

Table A1 Estimated Burden

EIA Form Number/Title	Annual Reporting Frequency	Number of Respondents	Annual Number of Respondents	Burden Hours Per Respondent	Annual Burden Hours
EIA Form 457A Household Survey	0.25	20,000	5,000	0.53	2,650
EIA Form 457D Household Propane Usage	0.25	600	150	0.34	51
EIA Form 457E Household Electricity Usage	0.25	950	238	3.40	808
EIA Form 457F Household Natural Gas Usage	0.25	430	108	3.80	409
EIA Form 457G Household Fuel Oil or Kerosene Usage	0.25	530	133	0.26	34
TOTAL		22,510	5,628		3,951

Respondent cost

Based on the estimated rate of \$80.14 per hour for respondents who would complete these forms, the total annual respondent cost for all forms is estimated to be:

$$\$80.14/\text{hour} \times 3,951 \text{ hours/year} = \$316,633/\text{year}$$

An average cost per hour of \$80.14 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. Table A2 shows how EIA calculates the average hourly loaded cost per labor hour.

Table A2: Average Hourly Loaded Cost of an EIA Employee, Fiscal year 2020

As of 1/21/2020	Number of Employees	Average Annual Salary	Average Benefit Percentage	Average Benefit Costs	Total Average Salary and Benefits	Average Hourly Loaded Cost
Administrative/ Professional (GS)	305	\$128,221	26.33%	\$33,761	\$161,982	\$77.88
Executive (EJ,ES,EX,SL)	22	\$183,610	26.33%	\$48,344	\$231,954	\$111.52
All EIA Employees	327	\$131,947	26.33%	\$34,742	\$166,689	\$80.14

A.13. Annual Cost to the Federal Government

The annual cost of operating RECS is estimated at \$2,707,370 and includes contractor costs and federal staff time for survey related activities. 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. Annual Cost to the Federal Government

Activity	Labor Hours	Hourly Rate	Cost
Survey design, sampling, preparation	10,135	\$ 80.14	\$ 812,219.00
Data collection and processing	20,270	\$ 80.14	\$1,624,438.00
Dissemination	3,378	\$ 80.14	\$ 270,713.00
TOTAL	33,783		\$2,707,370.00

A.14. Changes in Burden

Table A4, shows the changes in burden from the prior RECS. The changes reflect a decrease in the burden per response, as well as an increase in the sample size for the 2020 RECS.

Table A4. Changes in Burden

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	4,000	20,000	1,000	5,000	0.83	0.53	833	2,650	4,000		4,000	2,117	-300	1,816.67
EIA Form 457-C Rental Agent Survey (discontinued)	0.25	550	0	138	0	0.50		69		-138		-138	-69		-69.00
EIA Form 457-D Household Propane Usage	0.25	165	600	41	150	1.00	0.34	41	51	109		109	37	-27	9.75
EIA Form 457-E Household Electricity Usage	0.25	360	950	90	238	5.00	3.40	450	808	148		148	502	-144	357.50
EIA Form 457-F Household Natural Gas Usage	0.25	165	430	41	108	6.37	3.80	263	409	66		66	251	-105	145.74
EIA Form 457-G Household Fuel Oil or Kerosene Usage	0.25	165	530	41	133	1.00	0.26	41	35	91		91	24	-30	-6.25
TOTAL		5,405	22,510	1,351	5,627.50			1,697	3,952	4,276	0	4,276	2,860	-606	2,254.40

A.15. Reasons for Changes in Burden

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

There is a reduction in burden of 69 hours from deleting EIA Form 457-C *Rental Agent Survey* from this ICR.

The sample size of Form EIA 457-A increased from 4,000 to 20,000 resulting in an increase of 1,817 burden hours, annualized. The increased sample size is necessary to produce state-level estimates, a key priority identified by stakeholders and data users, and thus a primary objective for the 2020 RECS. The increased sample size will also allow for more precise estimates of other key subpopulations (e.g., mobile homes and low-income households), as well as for EIA to estimate trends in emerging technologies (e.g., ground-source heat pumps and electric-vehicle charging.) This change in burden is shown in Table A4 by a decrease of 300 burden hours for a decrease in the burden per response from 0.83 hours to 0.53 hours (shown under agency estimate) and a corresponding increase of 2117 burden hours as a result of the increase in sample size (shown under agency discretion). The change in burden per response from 0.83 to 0.53 hours for Form EIA- 457A is due to a change from an interviewer-administered mode in the 2015 RECS Household Survey to self-administered (Web and paper) modes for the 2020 RECS Household Survey. The skip-logic design of the web form reduces the amount of applicable questions a respondent will answer. The 32-minute (.53 hour) self-administered response duration is based on documented timing paradata from the RECS National Pilot study. The National Pilot study consisted of 2,340 completions of the Web survey. The change in burden per response for Form EIA-457A results in a decrease of 303 hours which is shown under agency estimate.

Forms EIA 457-D, E, F, and G: Energy Supplier Survey (ESS) responses are based on the estimated number of energy suppliers reported on Form EIA-457A by the household respondents. Therefore, the overall burden for these forms is expected to increase due to the significant increase in the *Household Survey* responses. This increase is shown under *Agency Discretion* in Table A4. EIA estimates an increase from 660 to 1200 completed EIA-457D *Household Propane Usage*; 7,200 to 19,000 for EIA-457E *Household Electricity Usage*; from 4,200 to 9,600 for EIA-457F *Household Natural Gas Usage*; and 660 to 800 for EIA-457G *Household Fuel Oil or Kerosene Usage*. These changes also account for changes in household fuel usage trends. The number of households using Fuel Oil, for example, has been in decline for several years. The burden per response for each energy supplier form decreased as shown under *Agency Estimate* in Table A4. The reason for the decrease in the burden per response for the energy supplier forms is discussed in detail in section A12, *Estimate of Respondent Burden Hours and Cost*.

Table A5. ICR Summary of Burden

	Requested	Program Change Due to Agency Discretion	Change Due to Adjustment in Agency Estimate	Previously Approved
Annual Number of Responses	5,627	4,276	-	1,351
Annual Time Burden (Hr)	3,952	2,860	(606)	1,697

A.16. Collection, Tabulation, and Publication Plans

EIA will mail out the Brochure simultaneously with the *Introductory Letter* to the household respondents and the energy suppliers. The results of the RECS will be published by EIA at <http://www.eia.gov/consumption/residential/> 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.

As previously discussed in this document, EIA plans to begin data collection in September 2020. The goal for the 2020 RECS is to begin releasing results in October 2021. The timeline for data collection and distribution activities is summarized below:

The estimated time schedule for data collection and related publication activities is shown here.

- Begin Household Survey Data Collection Phase 1: September 2020
- Begin Household Survey Data Collection Phase 2: January 2021
- Begin Household Survey Data Collection Phase 3 (if necessary): March 2021
- End Household Survey Data Collection: April 2021
- Begin Energy Supplier Survey Data Collection: June 2021
- Complete Energy Supplier Survey Data Collection: September 2021
- Release Housing Characteristics Results: October 2021
- Release Consumption and Expenditures Results: June 2022

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.