General Authority for Statistics

Metadata Report of Household Energy Statistics

Table of Contents

1. Contact

1.1.	Contact organization	General Authority of Statistics
1.2.	Contact organization unit	Department of Environment Agriculture and Energy Statistics
1.3.	Contact person function	Director of Environment Agriculture and Energy Statistics
1.4.	Contact mail address	P.O. Box: 3735 Riyadh, 11481 Kingdom of Saudi Arabia
1.5.	Contact email address	info@stats.gov.sa
1.6.	Contact phone number	920020081

2. Metadata Update

2.1.	Metadata last update	

3. Statistical Presentation

3.1.	Data description

The Household Energy Statistics present the data on the Uses of electricity sources Household energy statistics and data on the uses of electricity sources, fuel uses, consumption rates of different forms of energy in the dwelling, as well as identifying the means of rationalization, the extent of the household's desire to use photovoltaic energy (solar), the uses of biomass, in the dwelling in Saudi Arabia.

Household energy statistics are statistics on energy consumption in the household sector, data is collected through the Household Energy Survey, and these statistics aim to:

1. Obtain realistic estimates of energy consumption of various kinds in the domestic sector.
2. Provide data on household uses of fuel of all kinds.
3. Identify the patterns and forms of energy consumption used in the household sector.
4. Identify the impact of economic, social and geographical variables on energy consumption.
5. Identify the behavior of society in energy consumption according to its type and source.
6. Provide data that contributes to the knowledge of energy efficiency in the domestic sector.
7. Building a statistical database that includes indicators on energy consumption in the domestic sector at the level of the Kingdom's regions.
8. Identify the extent of the desire of families in Saudi Arabia to use photovoltaic energy (solar) in the dwelling.

3.2. Classification system

The following classifications are applied in Household Energy Statistics

- **National Code of Countries and Nationalities (3166 ISO – codes Country):**
  A statistical classification based on the international standard (ISO 3166_Country codes), which is a standard issued by the International Organization for Standardization (ISO of the UN), and this classification gives numeric and literal codes for the world's (248) countries, based on the classification of countries. The classification is used in the Household Energy Statistics to classify Saudi or non-Saudi individuals.

The classifications are available on the GASTAT's website: www.stats.gov.sa

3.3. Sector coverage

Not applicable.

3.4. Statistical concepts and definitions

Terminologies and concepts of Household Energy statistics:

- **Household energy consumption:** The energy consumed by the population for domestic purposes only (water heating, warming, air-conditioning, lighting, cooking, etc.) It includes the energy

consumption of the residential, industrial, commercial and service sectors that contain households.

- **Fuel**: It refers to any type of material used to produce energy through a thermo-chemical or nuclear reaction.

- **Diesel (fuel oil):** A liquid hydrocarbon fuel produced by distilling crude oil. It is heavy oil that is distilled between 200 - 380 ℃. Its flash point is permanently higher than 50 ℃, and its specific weight is higher than 82 ℃.

- **Kerosene**: A medium-viscosity oil distilled between 150 - 300 ℃. Its specific weight is approximately 8.0, and its flash point is higher than 38 ℃.

- **Liquefied petroleum gas (LPG):** LPG consists of a mixture of gases and is extracted from natural gas or from crude oil fractionation. It mainly consists of Propane and Butane or a mixture thereof. It is used as a fuel for heating and household cooking, and as a fuel for some types of engines. It is additionally used as a raw material in some chemical industries. LPG is often available in the form of metal cylindrical canisters, or in the form of surface or underground tanks.

- **Electrical energy:** The work required to move an electric charge through a conductor in a given time, and its unit is kilowatt-hours.

- **Photovoltaic energy :** Photovoltaic cells are made up of solar panels designed to convert the Global Horizontal Irradiance (GHI) directly into electric energy. These panels can be combined into fields that are directly connected to the national grid using inverters that convert the solar power into a grid-compatible alternating current. The foremost aim is to have installed sufficient photovoltaic capacity to be able to generate power.

- **Firewood:** all types of firewood used as fuel.

- **Charcoal :** A solid material the main component of which is carbon. It is produced through destructive distillation of firewood while being secluded from air.

- **Agricultural residues :** Solid residues from trees and fruits, such as residues squeezed olives. The benefits of such residues are many: they can be used for generating energy for bread-baking in traditional tabun ovens. They may also be used as fertilizers for trees or fodder for animals.

3.5.   Statistical unit

The statistical unit in Household Energy Statistics is the household.

3.6.   Statistical population

The statistical populations of household energy statistics are all households (Saudi and non-Saudi) who normally reside in Saudi Arabia.

3.7. Reference area
The survey sample is a representative sample for Saudi Arabia's 13 administrative regions that are scientifically selected to be representative of the region's households from the General Population and Housing Census 2022 framework.

3.8. Time coverage
Household Energy Statistics data covers the years from 2017 to 2022

3.9. Base period
Not applicable.

4. Unit of measure

Most of the results are calculated in percentage, such as the percentage of dwellings connected to the public electricity grid. Some results are measured in numbers, such as: the value of electrical energy consumption - in Saudi riyals.

5. Reference period

References period to the variables or dataset as following:
    1. Household energy statistics data in terms of dwelling data, household information and their characteristics are based on the history of contact with the household.
    2. Household energy statistics data in terms of fuel use, electricity uses, and biomass use (firewood, charcoal, agricultural waste) shall be assigned to the reference year.

6. Confidentiality

6.1. Confidentiality - policy

According to the Royal Decree No. 23 dated 07-12-1397, data must always be kept confidential, and must be used by GASTAT only for statistical purposes. Therefore, the data are protected in the data servers of the Authority.

6.2. Confidentiality - data treatment

Data were displayed in appropriate tables to facilitate its summarization, comprehension, and results extraction. Also, to compare data with other data and extract statistical meanings for the study community. It is also easier to check tables without the need to see the original questionnaire, which usually include data like names and addresses of individuals, names of data providers, which violates data confidentiality of statistical data.

"Anonymity of data" is one of the most important procedures. To keep data confidential, GASTAT removed information on individual persons, households, or business entities such a way that the respondent cannot be identified either directly (by name, address, contact number, identity number etc.) or indirectly (by combining different - especially rare - characteristics of respondents: age, occupation, education etc.).

7. Release policy

7.1. Release calendar

The date of the Household Energy Statistics publication was included in the statistical calendar on the official website of GASTAT, where the publication of the statistics results was set on 18/07/2023.

7.2. Release calendar access

Available on the: https://www.stats.gov.sa/en/future-releases

7.3. User access

One of GASTAT's objectives is to meet better its clients' needs, so it immediately provides them with the publication's results once the Household Energy Statistics publication is published. It also receives questions and inquiries of the clients about the publication and its results through various communication channels, such as:
- GASTAT's official website www.stats.gov.sa
- GASTAT's official e-mail address info@stats.gov.sa
- Client Support's e-mail address cs@stats.gov.sa
- Official visits to GASTAT's official head office in Riyadh or one of its branches in Saudi Arabia.
- Official letters.
- Statistical telephone (92002008).

8. Frequency of dissemination

Annual.

9. Accessibility and clarity

9.1. News release

The announcements for each publication are available on release calendar as mentioned in 7.2. Release calendar access. The news release can be viewed on the website of GASTAT in the link https://www.stats.gov.sa/en/news.

10.2. Publications

GASTAT issues Household Energy Statistics publications and reports on a regular basis within a pre-prepared publishing plan and installed on the GASTAT's website. GASTAT is keen to publish its publications in a manner that serves all users of different types, including publications in different formats that contain (publication tables, data graphs, indicators, metadata, methodology, and used questionnaires) in both English and Arabic.

The Household Energy Statistics publications are available on the

11.1. On-line database

Some data on household energy statistics are published in the statistical database GASTAT (stats.gov.sa).

12.1. Micro-data access

Microdata are unit-level data obtained from sample surveys, censuses, and administrative systems. They provide information about characteristics of individual people or entities such as households, business enterprises, facilities, farms, or even geographical areas such as villages or towns.

The different types of microdata files to meet different information needs:

- Public use: It consists sets of records containing information on individual persons, households, or business entities anonymized in such a way that the respondent cannot be identified either directly (by name, address, contact number, identity number etc.) or indirectly (by combining different - especially rare - characteristics of respondents: age, occupation, education etc.).

- Scientific use: These files established based on specific methodology asked by data requester to extract the datasets with specific characteristics used for strategic studies and decision making as well scientific research purposes on individuals, households and enterprises with no direct identifiers, which have been subject to control methods to protect confidentiality.

Eligible users can access microdata sets through secure interface built-in by GASTAT called "Etaha" with specific documentary requirements.

13.1. Other

Not available.

13.2. Documentation on methodology

The Household Energy Statistics Framework: Concepts, Definitions, Issues and Classifications are based on the international Energy Statistics manual standards, carried out by the International Energy Agency (IEA) in cooperation with Eurostat, contributes to a better understanding of definitions.

1. Quality documentation
Quality documentation covers documentation on methods and standards for assessing, measuring, and monitoring the quality of statistical process and output. It is based on standard quality criteria such as relevance, accuracy and reliability, timeliness and punctuality, accessibility and clarity, comparability, and coherence.

10. Quality management

14.2. Quality assurance
GASTAT declares that it considers the following principles: impartiality, user orientated, quality of processes and output, effectiveness of statistical processes, reducing the workload for respondents. Quality controls and validation of data are actions carried out throughout the process in different stages such as the data input and data collection and other final controls.
14.3. Quality assessment
GASTAT performs all statistical activities according to a national model (Generic Statistical Business Process Model - GSBPM). According to the GSBPM, the final phase of statistical activities is overall evaluation using information gathered in each phase or sub-process. This information is used to prepare the evaluation report which outlines all the quality issues related to the specific statistical activity and serves as input for improvement actions.

11. Relevance

14.3. User needs
Internal GASTAT's users, which make use of Household Energy Statistics data, include: • International Indicators. • Strategic Communication and Client Support. • Population, Gender and Diversity Statistics.

- External users who make significant use of Household Energy Statistics data include, but is not limited to:
1. Governmental entities.
2. Regional and International Organizations.
3. Research institutions.
4. Media.
5. Individuals.

The main variables that external users benefit from:

• Amount of electrical energy consumption in the household sector.
• value of electricity consumption in the household sector.
• Percentage of electricity sources in the household sector.
• Percentage of fuel used for cooking in the household sector.
• Percentage of households want to use photovoltaic (solar) energy.
• Percentage of households interested in rationalizing the consumption of electrical energy in the dwelling.

1. User satisfaction

Not available.

a. Completeness

Household Energy Statistics data are based on completed household data where all data is published in the form of statistical indicators.

12. Accuracy and reliability

14.4. Overall accuracy

The data collected is improved through the researchers, that have been selected according to a set of practical and objective criteria and training program related to the field of work.

The electronic data collection form of the Household energy statistics questionnaire includes Alert, prevention rules and correction rules during the data collection process in order to improve data quality.

Overall, the data is checked with previous years to identify any significant changes in the data. The internal consistency of the data is checked before it is finalized. The links between variables are checked and coherence between different data series is confirmed.

13. Timeliness and punctuality

16.1. Timeliness

GASTAT uses the Special Data Dissemination Standard (SDDS) issued by the International Monetary Fund. According to this Standard, all statistics agencies are required to publish data on annually basis, and with a delay of not more than (180 days) after the end of the reference period. If the data are from different source, they may be published in a different frequency.

16.2. Punctuality

Publication takes place in accordance with published release dates for Household energy statistics in the GASTAT webpage. The data are available at the expected time, as scheduled the release calendar, If the publication delayed the reasons would be provided.

14. Coherence and comparability

17.1. Comparability - geographical

Data are fully comparable between administrative regions of Saudi Arabia.

17.4. Comparability - over time

The survey started in 2017 as annual survey, Major changes in recent years:
- 2020: Data were estimated due to the population census and the COVID-19 pandemic.
- 2021: Moved to computer assisted telephone interviews (CATI) due to COVID-19 pandemic
- 2022: The method of computer-assisted online interviews (CAWI) was added, and the framework of the General Population and Housing Census 2022 was used.

17.5. Coherence- cross domain

Not applicable.

14.3.2. Coherence - sub annual and annual statistics

Not applicable.

14.3.2. Coherence- National Accounts

Not applicable.

17.3. Coherence - internal
Household Energy Statistics estimates have full internal coherence, as they are all based on the same corpus of microdata, and they are calculated using the same estimation methods.

15. Resources used

Description	Total
Total staff (GASTAT's staff, researchers)	114
Number of surveyed households	45,520
Total days of data collection period (end date – start date)	30 working days
Average conducted interviewer per day (during data collection)	-

16. Data revision

17.6. Data revision - policy
Not applicable, only final results will be published.

11.3. Data revision - practice
Not applicable, only final results will be published.

17. Statistical processing

14.3. Source data
The main and only source of household energy statistics is the household energy survey by a representative sample of households, and the sample size for 2022 is estimated at 45,520 households. **The main variables of the survey data are:** 1. Percentage of households interested in rationalizing the consumption of electrical energy in the dwelling. 2. Percentage of households that apply energy saving instructions in the use of electrical appliances.

3. Percentage of households that wish to use photovoltaic (solar) energy at home.
4. Percentage of dwellings that use a separate electric meter in the dwelling.
5. Percentage of dwellings that use an electric meter shared with several dwellings.
6. Percentage of households that use electricity for cooking.
7. Percentage of households that use biomass products (firewood, coal and agricultural waste).

o   Frequency of data collection

Annual.

o   Data collection

Data collection from survey:
The Household Energy Statistics data collection is carried out through Computer-assisted telephone interviewing (CATI), Computer-assisted web interviewing (CAWI).

9.7.   Data validation

Data are reviewed and matched to ensure their accuracy and precision in a way that suits their nature with the aim of giving the presented statistics quality and accuracy.

The data of the publication's current year are compared with the data of the previous year to ensure their integrity and consistency in preparation for processing data and extracting and reviewing results.

In addition to the data processing and tabulation to check their accuracy, all the outputs are stored and uploaded to the database after being calculated by GASTAT to be reviewed and processed by specialists in the energy statistics team through modern technologies and software designed for this purpose.

11.2.   Data compilation

Data Coding
In the Household energy statistics, interviewers collect from respondents, a detailed description of each field. This information is then coded in-house by an automated process, which is reviewed by a small-dedicated team of coding experts using a series of consistency checks.

Data Editing
Specialists of energy statistics team have processed and analyzed data in this stage, and this step was based on the following measures:
- Sort and arrange data in groups or different categories in a serial order.
- Summarize detailed data into main points or main data.
- Linking between many parts of data and make them connected.
- Process incomplete or missing data.
- Process illogical data.

- Converting data into statistically significant data.
- Organize, display and interpret data.

Imputation (for Non-Response or Incomplete Data Sets)
- **Non-Response:**

The response is analyzed at the level of the completed sample, then a weight is estimated for each sampling unit to be generalized to the entire population.
- **Incomplete data sets:**

GASTAT uses statistical methods to estimate outliers and some missing data within the sections of the Household Energy Statistics questionnaire.
For example: using measures of central tendency at the level of the target classes.

Extrapolation and weighting
After processing the data collected from the responding Households, survey weights were generated to produce indicator tables by following two main steps in creating survey weights:
- Adjustment of non-response
- Calibration weight

Applied statistical estimation
GASTAT has relied on the formulas approved by the international standards in calculating Household energy statistics indicators, as follows:

- Percentage of households interested in rationalizing the use of electric energy in their homes = (number of households interested in reducing and rationalizing the use of electric energy in their homes / total households) * 100

- Percentage of households that apply energy saving advice in the use of electrical appliances = (number of households that apply energy saving advice in the use of electrical appliances in their homes / total households) * 100

- Percentage of households wishing to use photovoltaic (solar) energy in their homes = (number of households wishing to use solar energy in their homes / total households) * 100

- Percentage of dwellings that use an independent electric meter in the dwelling = (number of dwellings that use an independent meter / total dwellings) * 100

- Percentage of dwellings that use a shared electric meter with several dwellings = (number of dwellings that use a shared meter in their dwellings / total dwellings) * 100

- Percentage of households that use electricity for cooking = (number of households that use the electricity source as fuel for cooking / total households) * 100

- Percentage of households that use biomass products (firewood, coal and agricultural waste) = (number of households that use biomass in their homes / total households) * 100

a. Adjustment

Not applicable, only final results will be published.

18. Comment