



الهيئة العامة للإحصاء  
General Authority for Statistics

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## Methodology and Quality Report of Renewable Energy Statistics

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Version - 3.2

Quality Management



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## 1. Contact

1.1. Contact organization	General Authority for Statistics
1.2. Contact organization unit	Environment, Agriculture, and Energy Statistics
1.3. Contact person function	Director of Environment, Agriculture, and Energy Statistics Department
1.4. Contact mail address	P.O. Box: 3735 Riyadh, 11481 Kingdom of Saudi Arabia
1.5. Contact email address	<a href="mailto:info@stats.gov.sa">info@stats.gov.sa</a>
1.6. Contact phone number	199009

## 2. Methodology and Quality update

2.1. Methodology and Quality last update	23/10/2024
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## 3. Statistical Presentation

3.1. Data description
<p>The Renewable Energy Statistics Publication in the Kingdom of Saudi Arabia presents updated data on renewable energy projects that have been launched, along with targets for wind and solar energy projects. It includes information on the investment size, project capacity, the annual electricity generated by the project (production quantity), the project's impact on carbon dioxide emissions, the estimated number of residential units supplied with energy, renewable energy supplies, the total share of renewable energy in overall electricity</p>

production, the percentage of homes using solar energy, and the daily average of GHI, DHI, and DNI radiation, based on administrative regions.

**Renewable energy statistics are statistics based on record data collected on key characteristics as follows:**

- Operated renewable energy projects.
- Targets for renewable energy projects.
- Renewable energy supplies.
- The total share of renewable energy in the total electricity produced.
- Percentage of residences that use solar energy.
- Daily average radiation by region.

### 3.2. Classification system

Not applicable.

### 3.3. Sector coverage

Renewable energy statistics cover the renewable energy sector in the Kingdom of Saudi Arabia.

### 3.4. Statistical concepts and definitions

**Terms and concepts of renewable energy statistics:**

- Solar energy:

It is the utilization of solar radiation to generate electricity using solar panels, which convert the sunlight into electrical energy, or by using reflective systems to direct the solar radiation to a receiver that converts concentrated sunlight into thermal energy.

- Wind energy:

It is the energy generated from wind movement by converting kinetic energy into electrical energy, using wind turbines to produce electricity.

- Renewable energy supplies:

Refer to the sources used for generating energy that naturally replenishes and does not deplete with use. These supplies include solar energy and wind energy.



- Global Horizontal Irradiance (GHI):

Solar panels enable the direct conversion of Global Horizontal Irradiance (GHI) into electrical energy using an inverter, which converts the solar energy into alternating current (AC) that is compatible with the grid.

- Direct Normal Irradiance (DNI):

It involves the use of reflective systems to direct solar irradiance to a receiver typically located at the top of a solar tower, which converts concentrated sunlight into thermal energy.

- Diffuse Horizontal Irradiance: (DHI)

Solar panels allow the direct conversion of horizontal diffuse radiation (DHI) to electrical energy.

### 3.5. Statistical unit

Not Applicable.

### 3.6. Statistical population

Not Applicable.

### 3.7. Reference area

The Renewable Energy Statistics Pu covers all 13 administrative regions of the Kingdom.

### 3.8. Time coverage

Data is available from 2017 to 2023 on an annual basis.

### 3.9. Base period

Not applicable.

## 4. Unit of measure

- Most indicators are measured in megawatts (e.g., Project capacity).
- Some are measured in gigawatt-hours (e.g., Annually generated electrical energy from the project (Production quantity)).
- Some are measured in tons/year (e.g., Project impact on reducing carbon dioxide emissions).
- Some indicators are calculated as averages measured in units (watt-hours / m<sup>2</sup> / day) (e.g., daily average radiation GHI, DI, DNI).

## 5. Reference period

Renewable energy statistics data from administrative records are based on the last day of the year in each calendar 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 are displayed in appropriate tables to facilitate its summarization, comprehension, results extraction, comparison with other data and coming up with statistical connotations 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 the confidentiality of statistical data.



## 7. Release policy

### 7.1. Release calendar

Renewable energy statistics are included in the statistical calendar.

### 7.2. Release calendar access

Available on the: <https://www.stats.gov.sa/statistical-calendar-releases>

### 7.3. User access

One of GASTAT's objectives is to better meet its clients' needs, so it immediately provides them with the publication's results once the renewable 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 official website: [www.stats.gov.sa](http://www.stats.gov.sa)
- GASTAT official e-mail address: [info@stats.gov.sa](mailto:info@stats.gov.sa)
- Client support e-mail: [info@stats.gov.sa](mailto:info@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: (199009).

## 8. Frequency of dissemination

Annual.

## 9. Accessibility and clarity

### 9.1. News release

The announcements of 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 through the following link:

<https://www.stats.gov.sa/en/news>

### 9.2. Publications

GASTAT issues Renewable energy statistics Publications and Reports on a regular basis within a pre-prepared dissemination plan and are published on GASTAT's website. GASTAT is keen to publish its publications in a way that serves all users of different types, including publications in different formats that contain (publication tables, data graphs, indicators, Methodology and Quality Report) in both English and Arabic.

**The results of the Renewable energy statistics are available at:**

<https://www.stats.gov.sa/en/statistics>

### 9.3. On-line database

Not available.

### 9.4. Micro-data access

Not available.

### 9.5. Other

Not available.

## 9.6. Documentation on methodology

### Renewable Energy Statistics Framework:

The General Authority for Statistics conducts all its statistical activities according to a unified methodology that aligns with the nature of each statistical product. It relies on a Statistical Business Procedures Manual that is consistent with the work procedures adopted by international organizations, in coordination with the relevant authorities.

**For more details, you can refer to the attachment:**

[Generic Statistical Business Process Model \(GSBPM\)](#)

## 9.7. 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

## 10.1. 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.

## 10.2. 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

### 11.1. User needs

#### **GASTAT's internal users of the data (Renewable Energy Statistics):**

- International indicators department.
- General Department of Strategic Communication and Client Support

#### **Some several external users and beneficiaries greatly benefit from Renewable Energy Statistics, including:**

- Government entities.
- Regional and international organizations.
- Research institutions.
- Media.
- Individuals.

#### **The disseminated key variables that used by external users:**

International Energy Agency (IEA)	Renewable energy data from: Renewable energy projects commissioned, production, impact of projects on CO2 emission reductions, number of residential units estimated to be powered, renewable energy supply, share of renewable energy in total energy produced, percentage of residences using solar energy, and daily average radiation (GHI, DHI, DNI) by administrative regions.
The Statistical Centre for the Cooperation Council for the Arab Countries of the Gulf (GCC-Stat)	
International Renewable Energy Agency IRENA	
The United Nations Statistics Division	
Private sector	

### 11.2. User satisfaction

Not available.

### 11.3. Completeness

Renewable energy statistics data are based on administrative records data from renewable energy-related entities, in order to provide a comprehensive and integrated picture of the renewable energy sector in Saudi Arabia and the status of the data is complete.

## 12. Accuracy and reliability

### 12.1. Overall accuracy

- 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

### 13.1. Timeliness

The General Authority for Statistics is committed to applying internationally recognized standards regarding the announcement, clarification of the time of publishing statistics on its official website, as outlined in the statistical calendar, as well as adhering to the announced time of publication. In the event of any delay, updates will be provided accordingly.

### 13.2. Punctuality

The publication takes place according to the published release dates on the statistical calendar for Renewable energy statistics on the website of the General Authority for Statistics. The data are available at the expected time, as scheduled in the statistical release calendar, If the publication is delayed, reasons shall be provided.

## 14. Coherence and comparability

14.1. Comparability - geographical
Data is fully comparable.
14.2. Comparability - over time
Data is fully comparable.
14.3. Coherence- cross domain
Not applicable.
14.3.1. Coherence - sub annual and annual statistics
Not applicable.
14.3.2. Coherence- National Accounts
Not applicable.
14.4. Coherence - internal
Renewable energy statistics data have complete internal consistency.

## 15. Data revision

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

## 15.2. Data revision - practice

Not applicable, only final results will be published.

# 16. Statistical processing

## 16.1. Source data

The main and only source of data for Renewable energy statistics is register based data

**Data is collected from the following government agencies:**

- Ministry of Energy.
- Renewable Energy Projects Development Office.
- King Abdullah City for Atomic and Renewable Energy.
- General Authority for Statistics.

**Main variables of administrative data are:**

- Operated renewable energy projects.
- Targets of renewable energy projects.
- Coordinates of solar and wind energy stations.
- Daily average radiations GHI, DHI, DNI)) by administrative regions.

## 16.2. Frequency of data collection

Annual.

## 16.3. Data collection

**Data collection from administrative records:**

The data are collected from the administrative records in coordination with the departments of the Authority related to the management and collection of the records data, and the data of the renewable energy statistics publi is obtained from the Ministry of Energy , which includes the production and consumption data of renewable energy, the volume of investment, solar and wind energy data, and the most important renewable energy projects and targets.

The data is stored in the authority's databases after undergoing auditing and review processes following approved statistical methods and recognized quality standards. If errors or discrepancies are discovered, the data is cross-referenced with the data source for correction or clarification.

#### 16.4. 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 energy statistics through modern technologies and software designed for this purpose.

#### 16.5. Data compilation

##### **Data editing:**

Specialists of the Energy Statistics team have processed and analyzed data in this stage, and this step was based on the following measures:

- Sorting and arranging data in groups or different categories in a serial order.
- Summarizing detailed data into key points or data.
- Combining many data segments and ensuring their interconnection.
- Converting data into statistically significant data.
- Arranging, presenting and interpreting data.

##### **The applied statistical equations:**

GASTAT has relied on the formulas approved by the international standards in calculating the key indicators for Renewable energy statistics as follows:

- Renewable Energy Share = (Total Renewable Energy Supply / Total Energy Produced) \*100





## 16.6. Adjustment

Not applicable, only final results will be published.

## 17. Comment

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