FAOSTAT Domain Bioenergy. Methodological note, release June 2024

Dataset Information:	
Title	**Bioenergy**
Abstract	The FAOSTAT domain *Bioenergy* contains data on bioenergy consumption and bioenergy production, covering the following items: i) animal waste; ii) bagasse; iii) bio jet kerosene; iv) biodiesel; v) biogases; vi) biogasoline; vii) black liquor; viii) charcoal; ix) fuelwood; x) other liquid biofuels; xi) other vegetal material and residues. Data are available by country and regional groups with global coverage, for the period of 1990 – 2022, with annual updates.
Supplemental	The FAOSTAT domain *Bioenergy* disseminates data on energy final consumption and production in terajoules (TJ) of several bioenergy fuels. Energy data are sourced from the United Nations Statistics Division (UNSD) Energy Statistics database. The biofuels covered are also disseminated as aggregates: i) Total Bioenergy; ii) Solid biofuels; iii) Liquid biofuels; and 4) Gaseous biofuels.
Creation Date	2024
Last Update	2024
Data Type	Bioenergy consumption and bioenergy production (TJ) by country and by biofuel.
Category	Environment
Time Period	1990 - 2022
Periodicity	Annual
Geographical Coverage	Global. The database provides information for 193 countries and 22 territories. Coverage varies over the period 1990-2022 depending on the scope of underlying activity data.
Spatial Unit	Country
Language	Multilingual (EN, FR, ES)

Methodology and Quality Information:	
Methods and processing	***Overview*** The domain contains data on bioenergy final consumption and bioenergy production, covering the following items: i) animal waste; ii) bagasse; iii) bio jet kerosene; iv) biodiesel; v) biogases; vi) biogasoline; vii) black liquor; viii) charcoal; ix) fuelwood; x) other liquid biofuels; xi) other vegetal material and residues. Fuelwood includes wood residues and by-products, such as wood pellets and briquettes. The renewable fraction of municipal waste is excluded from this list. The energy production and consumption data originate from the UNSD Energy Statistics database, where they are expressed, depending on the specific bioenergy fuel, in joules, cubic meters or tonnes. The detailed description of the biofuels covered is in UNSD (2011). All data are then converted to joules by applying the heating value conversion factors of UNSD. In addition, data are gap-filled and some missing data imputed.

Table 1. Conversion factors applied to convert original data to energy

Item Code (FAO)	Item Name(FAO)	UNSD ProdCode		Original unit	Conversion factor applied [TJ]
6519	**Animal waste**	5130	AW	TJ	1.0
170	**Bagasse**	5120	BS	t	7.7
6523	**Bio jet kerosene**	5230	BJ	t	40.0
6521	**Biodiesel**	5220	BD	t	36.8
6522	**Biogases**	5300	BI	TJ	1.0
6520	**Biogasoline**	5210	AL	t	26.8
6531	**Black liquor**	5140	PU	TJ	1.0
6524	**Charcoal**	5160	CH	t	29.5
6525	**Fuelwood**	5110	FW	m^3	7.8 – 12.5
6526	**Other liquid biofuels**	5290	OL	t	27.4
6532	**Other vegetal material and residues**	5150	VW	TJ	1.0

Data imputation

To address missing data in each fuel type's time-series, a two-step methodology was employed: 1) linear interpolation is applied to estimate values between existing data points within the UNSD dataset ; 2) any missing data in the period 2018-2022 is linear projected forward on the basis of the last 5 available years, and backwards to 0 from the first available data, for 5 years back.

Aggregates

The aggregates are calculated as follows.

Table 2. Calculation of aggregate items

Item code	Item name	Items inside	
6527	Total bioenergy	6519	Animal waste
		170	Bagasse
		6523	Bio jet kerosene
		6521	Biodiesel
		6522	Biogases
		6520	Biogasoline
		6531	Black liquor
		6524	Charcoal
		6525	Fuelwood
		6526	Other liquid biofuels
		6532	Other vegetal material and

			residues
6529	Solid biofuels	6519	Animal waste
		170	Bagasse
		6531	Black liquor
		6524	Charcoal
		6525	Fuelwood
		6532	Other vegetal material and residues
6528	Liquid biofuels	6523	Bio jet kerosene
		6521	Biodiesel
		6520	Biogasoline
		6526	Other liquid biofuels
6530	Gaseous biofuels	6522	Biogases

It should be noted that, since the item "fuelwood" as per UNSD definition includes the fraction of wood used for the production of charcoal and the item "charcoal" is a secondary product, charcoal is excluded from "Energy production" results of "Bioenergy total" and "Solid biofuels" in order to avoid double-counting. However charcoal is included in "Energy consumption", because the amount of fuelwood used to produce charcoal is not consumed as fuelwood, but rather as charcoal, thus not creating any double counting.

References

UNSD, 2011. *International Recommendations for Energy Statistics (IRES*). Prepared by the United Nations Statistics Division, New York, USA. Available at:

https://unstats.un.org/unsd/energystats/methodology/ires/

UNSD, 2023. *Energy statistics database*, New York, United States. Available at: http://data.un.org/Explorer.aspx

Data Collection Method	Computed
Links	http://www.fao.org/faostat/en/#data/BE http://data.un.org/ https://unstats.un.org/unsd/energystats/data/

Distribution Information:

Owner	FAO
Provider	FAO
Source	FAO

Copyright Policy	FAOSTAT is part of FAO corporate statistical databases in scope of the FAO Open Data Licensing Policy. Terms of use are available at: http://www.fao.org/contact-us/terms/db-terms-of-use/en
Citation	FAO 2024. FAOSTAT Bioenergy, FAO, Rome, Italy. Available at: http://www.fao.org/faostat/en/#data/BE
Acknowledgments	The FAOSTAT Bioenergy database is developed and maintained by FAO Statistics Division (ESS).

Statistical Database Terms of Use