2023 MARKET DATA

Date: April 2024

German Bioethanol
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Overview

German Bioethanol production declined last year. In contrast, sales of bioethanol for blending with petrol increased by almost five percent year-on-year in Germany to 1.24 million tonnes during the same period. Consumption in excess of domestic production was covered by higher import levels. Last year´s fuel market recovery continued, petrol sales rose by over three percent to 17.4 million tonnes in 2023, blend levels of bioethanol for petrol grades Super E10, Super Plus and Super (E5) increased to 6.8 percent by volume (2022: 6.7 percent by volume). 2022's positive sales trend for Super E10 petrol also continued in 2023. Although its market share grew less significantly than in the previous year, at just under 26 percent it was over two percentage points higher than in 2022.

Bioethanol Production in 2023

A total of 670,585 tonnes of bioethanol were produced last year, a drop in production of over six percent compared to 2022.

619,985 tonnes (86.7 percent) of total production came from feed grain and around 50,600 tonnes (7.1 percent) from sugar beet pulp. In addition, a small percentage of bioethanol, not quantified in figures from the Federal Office for Agriculture and Food (BLE), is produced from waste and residues.

Bioethanol Production by Feedstocks (in tonnes)

Grains overall		2023	619,985	- 3.5 %
		2022	642,492	
Of which:	Maize	2023	109,035	- 22.7 %
		2022	141,022	
	Wheat	2023	359,082	+ 20.3 %
		2022	298,366	
	Other	2023	151,868	- 25.2 %
		2022	203,104	
Molasses/Sugar beet pulp		2023	50,600	- 30.7 %
		2022	72,987	
Waste and residues*		not specified	not specified	
Total*		2023	670,585	- 6.3 %
		2022	715,479	

*Total without waste and residues, not specified due to anti-trust provisions

Source: Federal Office for Agriculture and Food (BLE)

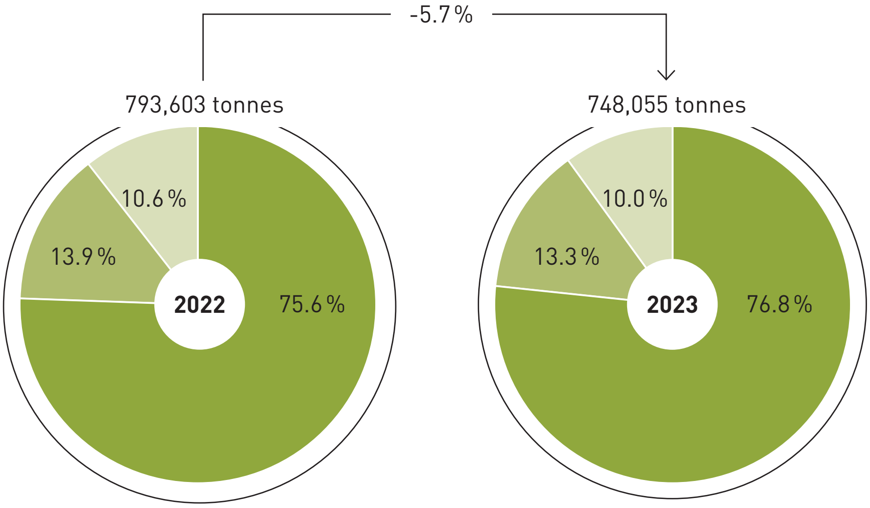
The figure of 50,600 tonnes of bioethanol from sugar beet pulp or molasses (- 30.7 percent compared to 2022) corresponds to a feedstock input of approximately 546,000 tonnes of sugar beet. That means that the volume of sugar beet processed for bioethanol fell by almost 240,000 tonnes last year compared with 2022 figures. The quantity handled corresponds to 1.7 percent of the 2023 German beet harvest.

Almost 620,000 tonnes of bioethanol were produced from feed grain last year (- 3.5 percent compared to 2022). Around 2.6 million tonnes of feed grain were used as a feedstock in this context. This figure corresponds to 6.1 percent of the German grain harvest, which in total amounted to almost 42.5 million tonnes in 2023. Processing of feed wheat has thus risen significantly, partly due to falling prices for wheat over the course of the year and pronounced growth in the quantities available.

In addition to bioethanol, the other plant-based components of the feedstocks that were processed supplied proteins, fibre, minerals and vitamins, which were used to make high-quality co-products. This generated valuable protein feed and other outputs for the food and feed industry, organic fertiliser and biogas, as well as biogenic CO2 for beverages and other applications.

Total volumes sold by German bioethanol producers fell by 5.7 percent year-on-year to around 748,000 tonnes (2022: 793,603 tonnes). Use of domestic bioethanol dropped compared to 2022 for all applications: in the chemical and pharmaceuticals industry by 11 percent, for the food and beverage industry by 9.8 percent and for transport-sector fuels by 4.3 percent.

Bioethanol Applications (in tonnes)



Transport-sector fuels	2023	574,397	- 4.3 %
	2022	599,942	
Foods and beverages	2023	99,200	– 9.8 %
	2022	109,955	
Industry	2023	74,457	– 11.0 %
	2022	83,706	
Total*	2023	748,055	- 5.7 %
	2022	793,603	

*including notifications from traders, importers

Source: Federal Office for Agriculture and Food (BLE)

2023 Bioethanol Consumption on the Fuel Market

The market for petrol continued to grow in 2023, with sales of over 17.4 million tonnes, 3.1 percent above the figure for the previous year (2022: 16.9 million tonnes); in this context, consumption of bioethanol, blended with the petrol grades Super E10, Super Plus and Super (E5) or used to produce ethyl *tert*-butyl ether (ETBE), also rose significantly by 4.8 percent to almost 1.25 million tonnes (2022: 1.19 million tonnes). Nearly 131,200 tonnes of bioethanol were utilised to produce ETBE, a 0.3 percent drop compared with 2022 (around 131,600 tonnes). Bioethanol's share in the petrol market rose slightly to 6.8 percent by volume (6.7 percent by volume in 2022) due to higher blending rates compared to the previous year.

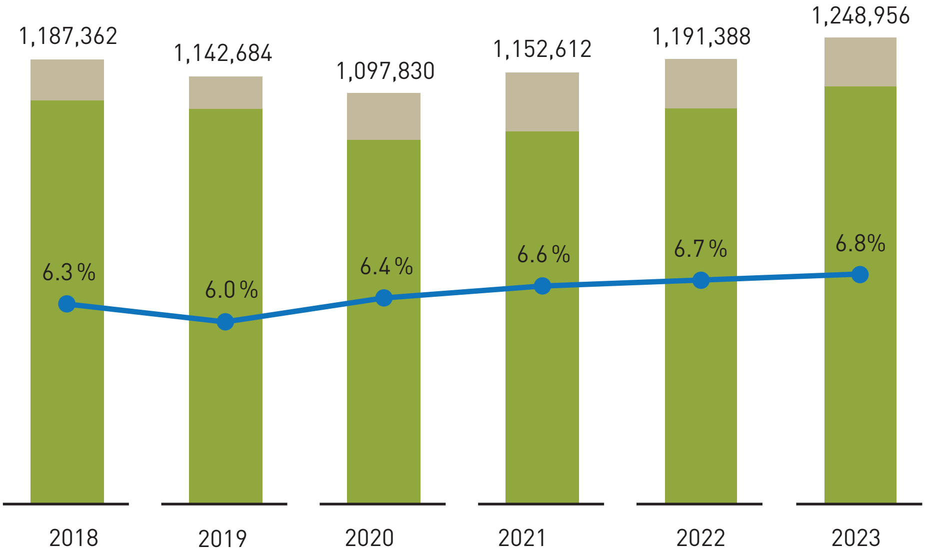
Bioethanol Utilisation in Transport-Sector Fuels (in tonnes)

Total bioethanol consumption		2023	1,248,956	+ 4.8 %
		2022	1,191,388	
Of which:	Bioethanol for blending	2023	1,117,785	+ 5.5 %
		2022	1,059,835	
	Bioethanol for ETBE*	2023	131,171	- 0.3 %
		2022	131,553	
Petrol fuels (incl. bioethanol)		2023	17,438,666	+ 3.1 %
		2022	16,915,031	
Share of bioethanol in petrol fuels [vol.-%]		2023	6.8 %	
		2022	6.7 %	

*ETBE: ethyl *tert*-butyl ether, additive produced from bioethanol

Source: Federal Office for Economic Affairs and Export Control

Blending of Bioethanol with Petrol (in tonnes)



Blended with petrol

As ETBE* As bioethanol Proportion of bioethanol in petrol [% by volume]

*ETBE: ethyl *tert*-butyl ether, additive produced from bioethanol

Source: Federal Office for Economic Affairs and Export Control

The market share of Super E10 also increased in 2023: from 23.7 percent of total petrol sales in 2022 to almost 26 percent. The sales volume was over 4.5 million tonnes (+ 12.6 percent). In the previous year, it was just over 4.0 million tonnes. Super (E5) achieved a market share of 69 percent with over 12.0 million tonnes in 2023. In the previous year, Super (E5) notched up sales of 12.1 million tonnes, attaining a market share of almost 72 percent.

The market share of Super Plus, also including up to 5 percent bioethanol in its blend, was 5.0 percent in 2023, slightly above the figure for the previous year (2022: 4.5 percent). At just under 880,000 tonnes, almost 16 percent more Super Plus was consumed compared to the year before (2022: just under 759,000 tonnes).

2022 and 2023 Sales of Petrol Grades (in tonnes)

			Change	Market share
Super Plus	2023	879,257	+ 15.9 %	5.0 %
	2022	758,919		4.5 %
Super (E5)	2023	12,040,325	− 0.8 %	69.0 %
	2022	12,141,609		71.8 %
Super E10	2023	4,519,084	+ 12.6 %	25.9 %
	2022	4,014,503		23.7 %
Total	2023	17,438,666	+ 3.1 %	
	2022	16,915,031		

Source: Federal Office for Economic Affairs and Export Control

Outlook for 2024

Super E10's upward sales trend continued at the start of the year. This is probably due in part to the price differential for Super E10 and Super (E5), which has to date remained stable at around 5 to 6 cents/litre nationwide. Further factors include overall increases in fuel prices and greater environmental awareness among motorists. Super E10 is now available in 19 EU Member States and the UK. Poland introduced Super E10 across the country in early 2024.

In Germany, the greenhouse gas reduction quota (GHG quota), scheduled to increase gradually until 2030, has been set at 9.25 percent since early 2024 and will rise to 10.5 percent from 2025; this will in all likelihood ensure that sales of renewable fuel components and therefore also of bioethanol will remain stable. In addition, it is likely that the GHG quota for 2024 and subsequent years will be raised with retroactive effect, as a statutory adjustment mechanism stipulated in the Federal Immission Control Act will be triggered. The provision in question states that the Federal Government must increase the GHG quota if more electricity as expected is utilised in the transport sector. The Federal Ministry for the Environment only introduced the relevant provisions on raising the GHG quote in late February. Formal adoption by the German government is scheduled for May.