Published by
Federal Office for Agriculture and Food
Deichmanns Aue 29
53179 Bonn

Tel.: 0228 6845 – 2550
Fax: 030 1810 6845 – 3040

Email: nachhaltigkeit@ble.de
Internet: https://www.ble.de/EN/Topics/Climate-Energy/Sustainable-Biomass-Production/sustainable-biomass-production_node.html

Editorial Board
Federal Office for Agriculture and Food
Unit 523 – Sustainable Biomass

Design
Federal Office for Agriculture and Food

Photo/image credits
Federal Office for Agriculture and Food
Cover image: BLE

Editorial content as of: **December 2021**
Database excerpt as of: **September 2021**

List of tables

10. Background data

*Table 15: Biofuels in TJ – source materials**

Fuel type/ quota year / Source material	Bioethanol			Bio-LNG	Biomethane			Bio-metha-nol	BtL-FTD	FAME			HVO			CP-HVO		Vegetable oil		
	2018	2019	2020	2020	2018	2019	2020	2020	2018	2018	2019	2020	2018	2019	2020	2019	2020	2018	2019	2020
Wastes/residues	419	698	1,661	501	1,329	736	1,885	10	3	41,144	33,139	32,975	77	24	9,228		2			
Ethiopian mustard										52	98	73								
Cereal whole plant	1,326	424	1,034																	
Fodder beet							10													
Grass/arable grass							2													
Barley							10													
Maize	15,484	19,623	17,367																	
Palm oil										17,790	22,523	22,216	1,106	1,812	34,665	65	1,400	5	19	28
Rapeseed										25,105	29,600	28,274					10	19	18	26
Rye	1,439	1,148	2,111																	
Silage maize/whole plant					80	491	643			675										
Soy										1,898	1,215	1,994								
Sunflower											3,073	3,897					694			
Triticale	1,956	1,493	1,301																	
Wheat	8,622	5,394	3,562																	
Sugar cane	498	1,426	2,062																	
Sugar beet	1,042	603	429				27													
Total	**30,785**	**30,808**	**29,528**	**501**	**1,408**	**1,227**	**2,577**	**10**	**3**	**86,663**	**89,646**	**89,429**	**1,184**	**1,836**	**43,893**	**65**	**2,106**	**24**	**37**	**54**

* Differences in totals are due to rounding

*Table 16: Biofuels in kt – source materials , **

Fuel type/ quota year / Source material	Bioethanol			Bio-LNG	Biomethane			Bio-methanol	BtL-FTD	FAME			HVO			CP-HVO		Vegetable oil		
	2018	2019	2020	2020	2018	2019	2020	2020	2018	2018	2019	2020	2018	2019	2020	2019	2020	2018	2019	2020
Wastes/residues	16	26	63	0.02	27	15	38	0.5	0.1	1,101	887	882	2	1	212		0.6			
Ethiopian mustard										1	3	2								
Cereal whole plant	50	16	39																	
Fodder beet							0.2													
Grass/arable grass							0.04													
Barley							0.2													
Maize	585	741	656																	
Palm oil										476	603	594	25	42	795	1	32	0.1	1	0.8
Rapeseed										672	792	757					0.2	1	0.5	0.7
Rye	54	43	80																	
Silage maize/whole plant					2	10	13													
Soy										18	32	53								
Sunflower										51	82	104					16			
Triticale	74	56	49																	
Wheat	326	204	135																	
Sugar cane	19	54	78																	
Sugar beet	39	23	16				1													
Total	**1,163**	**1,164**	**1,116**	**0.02**	**29**	**25**	**52**	**0.5**	**0.1**	**2,319**	**2,399**	**2,393**	**27**	**42**	**1,007**	**1**	**48**	**1**	**1**	**1**

* Differences in totals are due to rounding

*Table17: Biofuels in TJ - source materials and their origin**

Region/ Quota year / Source material	Africa			Asia			Australia			Europe			Central America			North America			South America		
	2018	2019	2020	2018	2019	2020	2018	2019	2020	2018	2019	2020	2018	2019	2020	2018	2019	2020	2018	2019	2020
Wastes/residues	391	174	648	12,180	13,122	17,842	84	18	14	27,096	19,924	25,312	14	11	15	2,682	969	1,681	523	379	749
Ethiopian mustard																	9	27	52	89	46
Barley										1,326	424	1,034									
Cereal whole plant												10									
Fodder beet												2									
Grass/arable grass												10									
Maize	9									15,475	19,607	17,364					15	0			2
Palm oil				17,867	21,409	52,975							1,029	2,970	4,842				5	39	492
Rapeseed				17	71	110	3,104	5,014	4,214	22,002	24,533	22,160						1,827			
Rye										1,439	1,148	2,111									
Silage maize/whole plant										80	491	643									
Soy							10			19	27	70			2				646	1,188	1,922
Sunflower									2	1,898	3,073	4,589									
Triticale										1,956	1,493	1,301									
Wheat										8,622	5,394	3,562									
Sugar cane													247	350	688				251	1,076	1,375
Sugar beet										1,042	603	456									
Total	**400**	**174**	**648**	**30,065**	**34,603**	**70,927**	**3,198**	**5,031**	**4,229**	**80,954**	**76,716**	**78,626**	**1,290**	**3,331**	**5,547**	**2,682**	**993**	**3,535**	**1,477**	**2,771**	**4,586**

* Differences in totals are due to rounding

*Table18: Biofuels in kt – source materials and their origin**

Region/ Quota year / Source material	Africa			Asia			Australia			Europe			Central America			North America			South America		
	2018	2019	2020	2018	2019	2020	2018	2019	2020	2018	2019	2020	2018	2019	2020	2018	2019	2020	2018	2019	2020
Wastes/residues	10	5	17	326	351	451	2	0	0	721	536	665	0		0	72	26	41	14	10	20
Ethiopian mustard																	0	1	1	2	1
Barley										50	16	39									
Cereal whole plant												0.2									
Fodder beet												0.04									
Grass/arable grass												0.2									
Maize	0.3									585	741	656		79			1	0.01			0.1
Palm oil				474	566	1,285							28		125				0.1	1	13
Rapeseed				1	2	3	83	134	113	589	656	593						49			
Rye										54	43	80									
Silage maize/whole plant										2	10	13									
Soy							0.3			1	1	2			0.04				17	32	51
Sunflower									0.0	51	82	120									
Triticale										74	56	49									
Wheat										326	204	135		13							
Sugar cane													9		26				9	41	52
Sugar beet										39	23	17		93							
Total	**11**	**5**	**17**	**800**	**919**	**1,739**	**86**	**135**	**113**	**2,490**	**2,368**	**2,368**	**37**	**185**	**152**	**72**	**27**	**91**	**42**	**86**	**137**

* Differences in totals are due to rounding

Table 19: Biofuels per source material[*]

Source material	Year 2018 [TJ]	Year 2019 [TJ]	Year 2020 [TJ]	Year 2018 [kt]	Year 2019 [kt]	Year 2020 [kt]
Wastes/residues	42,971	34,598	46,262	1,145	928	1,195
Ethiopian mustard	52	98	73	1	3	2
Barley	1,326	424	1,034	50	16	39
Cereal whole plant			10			0.2
Fodder beet			2			0.04
Grass/arable grass			10			0.2
Maize	15,484	19,623	17,367	585	741	656
Palm oil	18,901	24,418	58,308	502	646	1,423
Rapeseed	25,124	29,618	28,310	672	793	757
Rye	1,439	1,148	2,111	54	43	80
Silage maize/whole plant	80	491	643	2	10	13
Soy	675	1,215	1,994	18	32	53
Sunflower	1,898	3,073	4,591	51	82	120
Triticale	1,956	1,493	1,301	74	56	49
Wheat	8,622	5,394	3,562	326	204	135
Sugar cane	498	1,426	2,062	19	54	78
Sugar beet	1,042	603	456	39	23	17
Total	**120,066**	**123,619**	**168,098**	**3,538**	**3,632**	**4,617**

[*] Differences in totals are due to rounding

*Table 20: Biofuels, the source materials of which originate in Germany [TJ]**

Fuel type/ quota year / Source material	Bioethanol			Biomethane			CP-HVO	FAME			Vegetable oil			Total		
	2018	2019	2020	2018	2019	2020	2020	2018	2019	2020	2018	2019	2020	2018	2019	2020
Wastes/residues	124	220	303	1,316	736	1,858		8,186	6,275	7,759				9,626	7,231	9,920
Barley	1,234	367	884											**1,234**	**367**	884
Cereal whole plant						10										10
Fodder beet						2										2
Grass/arable grass																
Maize	247	264	109											247	264	109
Rapeseed							4	12,187	13,812	11,396	19	18	26	12,206	13,830	11,426
Rye	432	470	537											432	470	537
Silage maize/whole plant				80	491	643								80	491	643
Sunflower								4						4		
Triticale	459	271	145											459	271	145
Wheat	1,519	392	117											1,519	392	117
Sugar beet	585	468	392			27								585	468	419
Total	**4,601**	**2,452**	**2,487**	**1,396**	**1,227**	**2,540**	**4**	**20,377**	**20,087**	**19,155**	**19**	**18**	**26**	**26,392**	**23,784**	**24,212**

* Differences in totals are due to rounding

*Table 21: Biofuels from wastes and residues [TJ]**

Biofuels from wastes and residues -advanced in accordance with 38th BImSchV Annex 1 No.	2018	2019	2020
2 (Biomass proportion of mixed municipal waste)			0.1
3 (Biowaste from private households)	191	106	94
4 (proportion of biomass in industrial waste)	53	476	1,112
5 (straw)			129
6 (animal manure and sewage sludge)			184
7 (palm oil mill effluent and empty palm fruit bunches)	51	1	3,290
9 (crude glycerine)	0.3	36	47
11 (grape pomace and wine sediment)	1	0.3	0.1
15 (Biomass proportions of waste and residues from forestry)			1,433
16 (other non-food materials containing cellulose)	53	129	
Subtotal for advanced biofuels	**350**	**748**	**6,288**

Biofuels from wastes and residues -non-advanced in accordance with 38th BImSchV	2018	2019	2020
Used cooking oils	35,192	27,181	29,286
Other	7,429	6,668	10,688
Subtotal of non-advanced biofuels	**42,621**	**33,849**	**39,974**

Total waste and residues	42,971	34,598	46,262

* Differences in totals are due to rounding

*Table 22: Emissions and emission savings of biofuels**

Biofuel type	Emissions 2018 [t CO_2eq/TJ]	Emissions 2019 [t CO_2eq/TJ]	Emissions 2020 [t CO_2eq/TJ]	Savings 2018 [%]	Savings 2019 [%]	Savings 2020 [%]
Bioethanol	12.69	11.04	7.44	86.40	88.16	92.02
Bio-LNG			13.70			85.44
Biomethane	9.19	10.12	8.94	90.23	89.24	90.50
Biomethanol			33.50			64.09
BtL-FTD	8.30			91.27		
FAME	16.26	18.37	17.97	82.90	80.68	81.11
HVO	21.93	19.45	19.82	76.94	79.55	79.15
CP-HVO		20.43	17.69		78.52	81.40
Vegetable oil	30.18	25.90	31.60	68.26	72.77	66.78
Weighted average of all biofuels	**15.32**	**16.48**	**16.46**	**83.81**	**82.59**	**82.63**

* Differences in totals are due to rounding

*Table 23: Biofuel types [TJ]**

Type of bioliquid	2018	2019	2020
From pulp industry	25,700	27,597	24,955
Bionaphtha			1
FAME	1,256	1,069	1,276
HVO			26
Vegetable oil	3,432	4,259	4,415
Total **Figure 40, p.** Fehler! Textmarke nicht definiert.	**30,388**	**32,925**	**30,673**

*Table 24: Bioliquid in vegetable oil – source materials [TJ**

Source material	2018	2019	2020
Palm oil	2,448	2,971	3,237
Rapeseed	824	1,142	1,169
Shea	159	146	9
Total	**3,432**	**4,259**	**4,415**

*Table 25: Bioliquid vegetable oils from palm oil – origin [TJ]**

Origin	2018	2019	2020
Guatemala		15	165
Honduras	249	782	254
Indonesia	267	804	1,198
Colombia	419	192	99
Malaysia	1,512	1,178	1,521
Total	**2,448**	**2,971**	**3,237**

* Differences in totals are due to rounding

*Table 26: Emissions and emission savings of bioliquids**

Type of bioliquid	Emissions 2018 [t CO_2eq/TJ]	Emissions 2019 [t CO_2eq/TJ]	Savings 2020 [%]	Savings 2018 [%]	Savings 2019 [%]	Savings 2020 [%]
From pulp industry	1.86	1.72	2.43	97.95	98.11	97.33
Bionaphtha			9.57			89.49
FAME	34.65	34.80	33.81	61.93	61.76	62.85
HVO			8.48			90.68
Vegetable oil	31.99	29.83	31.07	64.85	67.22	65.86
Weighted average of all bioliquids	**6.62**	**6.43**	**7.86**	**92.73**	**92.94**	**91.36**

* Differences in totals are due to rounding