

Sustainability indicators 2018

Thinking for the long term, acting responsibly,
creating transparency in communications:
Munich Airport prepares a report on its efforts in
the field of sustainability in accordance with the
highest standards.

Value generated/GRI standard 201-1

Group in € million	2018	2017	2016
Revenue	1,508.8	1,468.7	1,364.1
+ Other income	44.9	44.1	66.6
Total revenue	1,553.7	1,512.8	1,430.7
+ Income from investments	1.8	2.1	1.5
- Non-personnel expenses	-507.9	-510.7	-449.2
- Depreciation and amortization	-215.9	-217.6	-239.1
= Value generated	831.7	786.6	743.9

Value distributed/GRI standard 201-1

Group in € million	2018	2017	2016
Employees	507.7	482.1	452.5
Lenders (netted)	102.7	75.3	81.6
Public sector	72.6	70.4	58.2
Munich Airport Group	148.7	158.8	151.6
= Value generated	831.7	786.6	743.9

The value generated calculation represents the difference between the service provided by the company and the value of the advance services required.

✓ - External audit

The distribution statement shows the proportions distributed to those involved in the value creation process – employees, the public sector, and lenders. Payments provided by FMG to the public sector include taxes. The interest on the loans to shareholders is included under the «Lenders» recipient group. The income from investments includes income from companies valued using the equity method and income from the transfer of profit from non-consolidated entities. The non-personnel expenses include the cost of materials and other expenses.

Air traffic indicators / GRI A01, A02, A03 ✓

	2018	2017	2016
Total passenger volume	46,271,504	44,594,516	42,277,692
Total commercial traffic ¹⁾	46,253,623	44,577,241	42,261,309
Scheduled and charter traffic	46,231,009	44,556,053	42,241,902
Other commercial traffic ¹⁾	22,614	21,188	19,407
Non-commercial traffic ¹⁾	17,881	17,275	16,383
Total aircraft movements	413,469	404,505	394,430
Total commercial traffic ¹⁾	403,691	395,047	385,081
Scheduled and charter traffic	392,238	383,934	374,057
Other commercial traffic ¹⁾	11,453	11,113	11,024
General air traffic (non-commercial traffic) ¹⁾	9,778	9,458	9,349
Seating capacity utilization in %	77.5	76.5	75.1
Cargo throughput			
Cargo and airmail carried in t	368,377	378,803	353,650
Traffic units (TU) of commercial traffic	49,906,283	48,334,296	45,709,334

¹⁾ For term definitions see the Annual Statistics Report 2018, p. 28/29.

Passenger indicators (commercial traffic only) / GRI A01 ✓

	2018			2017			2016		
	Total	Domestic	International	Total	Domestic	International	Total	Domestic	International
Total commercial traffic	46,253,623	9,707,044	36,546,579	44,577,241	9,841,103	34,736,138	42,261,309	9,632,163	32,629,146
Arrivals	23,183,728	4,844,837	18,338,891	22,340,548	4,917,320	17,423,228	21,142,346	4,816,340	16,326,006
Departures	23,038,785	4,850,214	18,188,571	22,205,715	4,916,814	17,288,901	21,030,482	4,803,413	16,227,069
Transit passengers ¹⁾	31,110	11,993	19,117	30,978	6,969	24,009	88,481	12,410	76,071
Number of O&D passengers ²⁾ in millions	28.8	-	-	28.3	-	-	27.0	-	-
Number of transfer passengers in millions	17.4	-	-	16.2	-	-	15.2	-	-
Transfer passengers in % ³⁾	37	-	-	36	-	-	36	-	-

¹⁾ Transit passengers are passengers who fly into the airport and continue their trip on the same aircraft. Transit passengers are only counted on landing.

²⁾ Origin & Destination passengers are passengers who start or end their trip at the airport.

³⁾ The proportion of transfer passengers is based on departure passenger surveys.

Detailed information on night-time aircraft movements can be found in the monthly impact reports:

➔ munich-airport.com/impacts

Detailed information on the night-flight curfew can be found at:

➔ munich-airport.com/night-flight

Aircraft movements¹⁾ / GRI A02 ✓

	2018			2017			2016		
	Total	Arrivals	Departures	Total	Arrivals	Departures	Total	Arrivals	Departures
Passenger flights, scheduled/charter	388,431	194,073	194,358	380,119	189,996	190,123	369,561	184,699	184,862
Domestic	91,024	45,503	45,521	87,977	43,965	44,012	87,000	43,521	43,479
International	297,407	148,570	148,837	292,142	146,031	146,111	282,561	141,178	141,383
Cargo flights, scheduled/charter	3,576	1,758	1,818	3,619	1,795	1,824	4,047	2,014	2,033
Domestic	1,471	769	702	1,518	800	718	1,515	810	705
International	2,105	989	1,116	2,101	995	1,106	2,532	1,204	1,328
Airmail flights, scheduled/charter	231	114	117	196	98	98	449	225	224
Domestic	231	114	117	196	98	98	449	225	224
International	-	-	-	-	-	-	-	-	-
General air traffic	21,231	10,788	10,443	20,571	10,363	10,208	20,373	10,272	10,101
Domestic	8,833	4,589	4,244	8,454	4,355	4,099	8,413	4,338	4,075
International	12,398	6,199	6,199	12,117	6,008	6,109	11,960	5,934	6,026
Total	413,469	206,733	206,736	404,505	202,252	202,253	394,430	197,210	197,220

¹⁾ Military flights are not included.

Cargo tonnage (commercial handling) / GRI A03 ✓

In t	2018			2017			2016		
	Cargo handled	Incoming cargo	Outgoing cargo	Cargo handled	Incoming cargo	Outgoing cargo	Cargo handled	Incoming cargo	Outgoing cargo
Cargo-only flights	57,889	21,421	36,468	52,011	16,875	35,136	62,056	17,956	44,099
Bellyhold cargo on passenger flights	293,658	129,618	164,040	310,820	136,641	174,179	272,441	113,912	158,529
Total on all flights	351,547	151,039	200,508	362,831	153,516	209,315	334,497	131,868	202,628

Munich Airport received 79.1 complaints for every one million passengers handled in 2018. Given a 3.8 percent increase in passenger figures, the absolute number of complaints rose compared to 2017 from 2,467 to 3,660 (+48 percent).

The main driver for this change was the closure of T2 as a result of an incident at the security check area (+742 complaints) on July 28, 2018 and the consequences for passengers which continued into the following days.

Long waiting times, the frequent output of baggage on the wrong belt [Terminal 2], and a lack of contact persons in baggage reclaim were the reasons for an increase in complaints surrounding baggage collection of around 292 percent. Baggage reclaim is thus a topic that has given rise to increasing complaints from passengers over the years.

There was a slight increase of 31 passenger feedback responses (+37 percent) on the topic of parking, which was due primarily to the renovation works in parking structure 20, which is close to Terminal 2, and the ensuing inconvenience caused.

The complaints in relation to the airport facilities were down [-30 percent], due predominantly to Munich Airport's newly designed web presence, improved WiFi availability, and reduced delays thanks to the provision of passenger boarding bridges.

Dialog management / GRI standard 102-43, 102-44 ✓

Number of entries	2018	2017	2016
Total complaints	3,660	2,467	2,291
Number of complaints on key issues			
Airline	181	191	218
Airport facility	533	761	495
Baggage collection	678	232	188
Parking	113	82	197
Passport control	279	258	183
Security checks	1,092	350	318

Firefighting service deployments / GRI standard 417-1

	2018	2017	2016
Total alarms	3,717	3,555	3,487
False alarms	670	737	649
Number of deployments	3,047	2,818	2,838
Technical support jobs	1,903	1,846	1,978
Security monitoring jobs ¹⁾	864	833	740
Firefighting jobs	280	139	120
Rescue service deployments, total	1,701	1,474	1,592
First responder deployments ²⁾	123	164	155
Rescue vehicle deployments	1,578	1,310	1,437

¹⁾ On-call service where the Airport Rescue and Firefighting service attends certain situations with particularly high risk levels in order to provide immediate support should a risk occur.

²⁾ First aid until the arrival of the public rescue service.

Donations and sponsorship¹⁾ / GRI standard 413-1

Proportion of total budget in %	2018	2017	2016
Sport	42	39	35
Social welfare	29	30	31
Education	9	12	15
Culture	19	16	18
Environment	1	3	1

¹⁾ The annual sponsorship budget is linked to FMG's external sales.

[munich-airport.com/responsibility](https://www.munich-airport.com/responsibility)

Employees covered by collective bargaining agreements / GRI standard 102-41, 202-01 ✓

	2018		2017		2016	
	Group	FMG	Group	FMG	Group	FMG
Total number of employees covered by collective bargaining agreements	9,986	4,407	9,874	4,370	8,769	4,147
Proportion of total employees in % ¹⁾	95.95	96.67	95.93	96.94	94.23	93.55

¹⁾ All percentages are based on the total number of employees including apprentices, workers in minor employment, temporary workers, and interns.

Age structure of employees / GRI standard 405-1 ✓

Group	2018					2017		2016		
	Women	Pro-portion in % ²⁾	Men	Pro-portion in % ²⁾	Total	Pro-portion in % ²⁾	Total	Pro-portion in % ²⁾		
Age structure of employees¹⁾										
Under 30 years	632	6.57	900	9.35	1,532	15.92	1,516	16.11	1,401	16.48
30 to 50 years	1,762	18.30	3,260	33.87	5,022	52.17	5,013	53.26	4,510	53.05
Over 50 years	796	8.27	2,276	23.64	3,072	31.91	2,884	30.64	2,591	30.48
Total	3,190	33.14	6,436	66.86	9,626	100.00	9,413	100.00	8,502	100.00

FMG	2018					2017		2016		
	Women	Pro-portion in % ²⁾	Men	Pro-portion in % ²⁾	Total	Pro-portion in % ²⁾	Total	Pro-portion in % ²⁾		
Age structure of employees¹⁾										
Under 30 years	221	5.09	250	5.75	471	10.84	447	10.41	403	9.54
30 to 50 years	564	12.98	1,477	33.99	2,041	46.97	2,126	49.53	2,176	51.53
Over 50 years	236	5.43	1,597	36.75	1,833	42.19	1,719	40.05	1,644	38.93
Total	1,021	23.50	3,324	76.50	4,345	100.00	4,292	100.00	4,223	100.00

¹⁾ Reporting date: December 31: Figures exclude apprentices, workers in minor employment, temporary workers, and interns.

²⁾ All percentages are based on the total number of employees as per ¹⁾.

Managers / GRI standard 405-1 ✓

Group	2018		2017		2016	
	Proportion in %	Proportion in %	Proportion in %	Proportion in %	Proportion in %	Proportion in %
Total managers	732	7.60¹⁾	744	7.90¹⁾	676	7.92¹⁾
Women	174	1.81 ¹⁾	190	2.02 ¹⁾	170	1.99 ¹⁾
Men	558	5.80 ¹⁾	554	5.89 ¹⁾	506	5.93 ¹⁾
Age structure of managers						
Under 30 years	31	4.23 ²⁾	42	5.65 ²⁾	19	2.81 ²⁾
30 to 50 years	373	50.96 ²⁾	408	54.84 ²⁾	370	54.98 ²⁾
Over 50 years	328	44.81 ²⁾	294	39.52 ²⁾	282	41.72 ²⁾

FMG	2018		2017		2016	
	Proportion in %	Proportion in %	Proportion in %	Proportion in %	Proportion in %	Proportion in %
Total managers	412	9.48¹⁾	406	9.46¹⁾	394	9.33¹⁾
Women	61	1.40 ¹⁾	62	1.44 ¹⁾	58	1.37 ¹⁾
Men	351	8.08 ¹⁾	344	8.01 ¹⁾	336	7.96 ¹⁾
Age structure of managers						
Under 30 years	5	1.21 ²⁾	5	1.23 ²⁾	5	1.27 ²⁾
30 to 50 years	161	39.08 ²⁾	187	46.05 ²⁾	191	48.48 ²⁾
Over 50 years	246	59.71 ²⁾	214	52.71 ²⁾	198	50.25 ²⁾

¹⁾ Reporting date: December 31: Proportion of managers relative to the total number of employees.

²⁾ Proportion of managers relative to the total number of managers.

Parental leave taken¹⁾ / GRI Standard 401-3 ✓

Group	2018			2017	2016	FMG	2018			2017	2016
	Women	Men	Total	Total ²⁾	Total		Women	Men	Total	Total	Total
Parental leave taken	113	175	288	243	176	Parental leave taken	45	78	123	138	115
Part-time parental leave taken	27	3	30	44	45	Part-time parental leave taken	19	1	20	36	36

¹⁾ Number of employees who have taken parental leave in the year under review. Figures exclude apprentices, workers in minor employment, temporary workers, and interns.

²⁾ Without HSD.

Due to the significant expense of evaluating the various parental leave models manually (duration of parental leave, split of parental leave), the number of individuals returning from parental leave, along with the number of resignations following parental leave, have not been recorded.

Employee turnover: starters and leavers¹⁾ / GRI standard 401-1 ✓

Group	2018				2017		2016		FMG	2018				2017		2016	
	Starters	Pro-portion in % ²⁾	Leavers	Pro-portion in % ²⁾	Starters	Leavers	Starters	Leavers		Starters	Pro-portion in % ²⁾	Leavers	Pro-portion in % ²⁾	Starters	Leavers	Starters	Leavers
Starters and leavers by age group																	
Under 30 years	664	43.66	473	39.58	861	513	727	502	Under 30 years	129	50.99	36	21.56	133	41	103	33
30 to 50 years	673	44.25	494	41.34	1,077	515	574	346	30 to 50 years	96	37.94	53	31.74	122	90	125	48
Over 50 years	184	12.10	228	19.08	267	240	113	154	Over 50 years	28	11.07	78	46.71	13	89	14	66
Total	1,521	100.00	1,195	100.00	2,205	1,268	1,414	1,002	Total	253	100.00	167	100.00	268	220	242	147
Starters and leavers by gender																	
Male	1,020	67.06	729	61.00	1,384	779	863	565	Male	163	64.43	123	73.65	163	158	157	112
Female	501	32.94	466	39.00	821	489	551	437	Female	90	35.57	44	26.35	105	62	85	35

¹⁾ Including apprentices, excluding workers in minor employment, temporary workers, and interns.

²⁾ All percentages are based on the total number of starters/leavers among the employees as per ¹⁾.

Turnover rate¹⁾ / GRI standard 401-1 ✓

In %	2018		2017		2016	
	Group	FMG	Group	FMG	Group	FMG
Turnover rate	12.32	3.77	13.37	5.01	11.41	3.42

¹⁾ The turnover rate reflects the ratio of leavers to the number of employees (as an annual average including apprentices and excluding workers in minor employment, temporary workers, and interns).

Average hours of training¹⁾ / GRI standard 404-1 ✓

Average hours of training per employee	2018		2017		2016	
	Group ²⁾	FMG	Group ³⁾	FMG	Group ⁴⁾	FMG
Average hours of training per employee	15.9	9.2	18.91	13.35	15.76	12.65
Per male employee	16.6	9.6	20.43	14.51	16.91	13.96
Per female employee	14.3	7.9	15.95	9.41	12.55	7.95
Per manager ³⁾	16.1	12.6	17.37	13.12	23.92	12.67
Per employee (without managerial responsibilities)	15.9	8.9	21.00	16.95	15.16	12.54

¹⁾ Average number of hours spent on professional development, training, and seminars that are recorded in a time management system (excluding aviation security courses) per employee (excluding apprentices, employees in minor employment, temporary workers, and interns) as at the reporting date, December 31.

²⁾ Excluding LabCampus, MUCreal, FM Bau, and Infogate.

³⁾ First- to fourth-tier managers excluding the Executive Board of FMG.

⁴⁾ Excluding Terminal 2 oHG.

⁵⁾ Excluding HSD, InfoGate, and FM Bau.

Occupational health and safety / GRI standard 403-9 ✓

Group ¹⁾	2018	2017	2016
Accident statistics²⁾			
Reportable occupational accidents	231	225	195
Number of resulting days of absence ³⁾	5,820	5,761	4,331
Fatal occupational accidents ⁷⁾	0	0	0
Rate per 1,000 workers ⁴⁾	26.55	26.63	24.50
FMG¹⁾			
Accident statistics²⁾			
Reportable occupational accidents	84	76	71
Number of resulting days of absence ³⁾	2,464	1,985	2,106
Fatal occupational accidents	0	0	0
Rate per 1,000 workers ⁴⁾	20.95	19.02	18.17

¹⁾ Including apprentices, workers in minor employment, temporary workers, and interns.

²⁾ Injuries requiring first aid are recorded when employees attend Munich Airport's medical center.

³⁾ These are calendar days and are counted from the day following the occupational accident.

⁴⁾ Reportable occupational accidents x 1,000/annual average actual employee capacity [EC].

⁵⁾ Ground handling employees working for FMG and employees and temporary workers at AeroGround.

⁶⁾ 2017 without HSD.

⁷⁾ In 2018, a fatal work accident occurred at Munich Airport. As the person in question was an employee of a third company, the accident is not included in these statistics.

Sick leave¹⁾ / GRI standard 403-10 ✓

Group	2018			2017	2016
	Women	Men	Total ³⁾	Total ⁴⁾	Total
In %					
Illness rate ²⁾	7.48	8.74	7.98	7.88	7.9
FMG					
2018					
In %					
Illness rate ²⁾	5.1	8.9	7.3	7.94	8.14

¹⁾ Including apprentices, excluding workers in minor employment, temporary workers, and interns.

²⁾ Hours off sick in relation to planned working hours, including rehabilitation, therapy programs, treatment, and so on. Relates to the total number of employees as per.¹⁾

³⁾ Excluding InfoGate, LabCampus, MAI, and MUCreal.

⁴⁾ Excluding InfoGate, HSD, and FM Bau.

Workers in ground handling in Munich ⁵⁾	2018	2017	2016
Accident statistics²⁾			
Reportable occupational accidents	101	112	89
Number of resulting days of absence ³⁾	2,900	2,964	2,304
Fatal occupational accidents	0	0	0
Rate per 1,000 workers ⁴⁾	49.49	56.60	46.32
Workers in ground handling in Berlin			
2018			
Accident statistics²⁾			
Reportable occupational accidents	26	29	
Number of resulting days of absence ³⁾	741	820	
Fatal occupational accidents	0	0	
Rate per 1,000 workers ⁴⁾	55.13	66.87	

Aircraft handling on the ground is a critical area for occupational health and safety measures at Munich Airport. This is why FMG publishes additional accident statistics for employees who work in aircraft handling.

Occupational illnesses¹⁾ / GRI standard 403-10 ✓

In %	2018		2017 ⁴⁾		2016	
	Group ²⁾	FMG	Group ³⁾	FMG	Group	FMG
Reported occupational illnesses	4	4	2	2	6	4

¹⁾ Including apprentices, excluding workers in minor employment, temporary workers, and interns.

²⁾ Excluding eurotrade.

³⁾ Excluding HSD.

⁴⁾ Errors identified whilst our data was being audited have been corrected.

Employees with disabilities / GRI standard 405-1 ✓

Group	2018	2017	2016	FMG	2018	2017	2016
Number of employees with limiting disabilities ¹⁾	698	677	645		488	484	487
Employees with severe disabilities in % ²⁾	6.99	7.25	7.11		10.94	10.95	12.28

¹⁾ Degree of disability of at least 30 within the meaning of equality under Book IX of the Social Security Code.

²⁾ Proportion of employees with disabilities as per ¹⁾ based on the average total employees, including apprentices and workers in minor employment and excluding temporary workers and interns. 2017 without HSD. From 2018 excluding MAI, InfoGate, LabCampus, and MUCreal.

Nationalities¹⁾ / GRI standard 405-1 ✓

Group	2018				2017		2016		FMG	2018				2017		2016	
	Women	Men	Total	Proportion in % ²⁾	Total	Proportion in % ²⁾	Total	Proportion in % ²⁾		Women	Men	Total	Proportion in % ²⁾	Total	Proportion in % ²⁾	Total	Proportion in % ²⁾
Employee nationalities, overall picture	3,331	6,572	9,903		9,688		8,776		Employee nationalities, overall picture	1,090	3,409	4,499		4,446		4,367	
German nationals	2,633	4,880	7,513	75.87	7,491	77.32	6,920	78.85	German nationals	1,036	2,994	4,030	89.58	3,974	89.38	3,898	89.26
Foreign nationals	698	1,692	2,390	24.13	2,197	22.68	1,856	21.15	Foreign nationals	54	415	469	10.42	472	10.62	469	10.74
Most represented groups of foreign nationals									Most represented groups of foreign nationals								
Turkey	62	485	547	5.52	528	5.45	460	5.24	Turkey	1	267	268	5.96	272	6.12	268	6.14
Hungary	20	178	198	2.00	183	1.89	178	2.03	Hungary	1	2	3	0.07	2	0.04	33	0.76
Italy	30	109	139	1.40	132	1.36	118	1.34	Italy	6	20	26	0.58	28	0.63	28	0.64
Romania	67	103	170	1.72	126	1.30	50	0.95	Austria [additional as of 2018]	11	24	35	0.78	-	-	-	-
Croatia	38	168	206	2.08	117	1.21	-	-	Croatia	1	6	7	0.16	6	0.13	14	0.32
Greece	34	60	94	0.95	93	0.96	29	0.95	Greece	3	17	20	0.44	18	0.40	19	0.44

¹⁾ Reporting date: December 31: Total workforce including apprentices, excluding workers in minor employment, temporary workers, and interns.

²⁾ All percentages are based on the total number of employees as per ¹⁾.

Employees' areas of residence¹⁾ / GRI standard 102-8, 401-1 ✓

Administrative districts	Group				FMG			
	2018	Proportion in % ²⁾	2017	2016	2018	Proportion in % ²⁾	2017	2016
Freising	2,484	25.08	2,376	2,295	915	20.34	903	876
Erding	1,920	19.39	1,880	1,862	1,067	23.72	1,065	1,066
Munich	1,940	19.59	1,866	1,820	790	17.56	776	753
Landshut	1,312	13.25	1,257	1,221	715	15.89	696	670
Pfaffenhofen	170	1.72	147	155	97	2.16	92	92
Ebersberg	186	1.88	156		109	2.42	104	
Berlin and surrounding area ³⁾	106	1.07			2	0.04		
Other districts	1,785	18.02	2,006	1,423	804	17.87	810	910
Total	9,903	100.00	9,688	8,776	4,499	100.00	4,446	4,367

¹⁾ Total workforce including apprentices, excluding workers in minor employment, temporary workers, and interns, who lived in each administrative district as at the reporting date of December 31.

²⁾ All percentages are based on the total number of employees as per ¹⁾.

³⁾ Survey as of 2018.

➔ munich-airport.com/efm

De-icers used¹⁾ / GRI standard 301-1, 301-2, GRI A06 ✓

	2017/2018	2016/2017	2015/2016
Apron de-icer in t ²⁾	4,699	3,502	2,041
Aircraft de-icer [Safewing Type I] in m ³	5,139	4,071	3,233
Aircraft de-icer [Safewing Type IV] in m ³	879	787	783
Recycling rate of Type I de-icer used in %	64.9	61.4	63.9
Number of days of winter operations	58	65	47

¹⁾ Seasonal database/fluctuations in year-on-year comparisons are linked to winter weather conditions.

²⁾ Liquid potassium formate and sodium formate granules.

Sustainability indicators

The company responsible for de-icing operations at Munich Airport, Gesellschaft für Enteisung und Flugzeugschleppen am Flughafen München mbH (EFM), uses glycol-based de-icer that is sprayed onto aircraft by de-icing vehicles. The low-viscosity Type I de-icer is mixed with water in a ratio 55:45, heated, and applied to the aircraft at a temperature of 85 degrees Celsius. Type IV de-icer contains thickeners, making it viscous. It is sprayed on cold and undiluted.

Energy consumption and emissions¹⁾ / GRI standard 301-1, 302-1, 302-2, 302-4, 302-5, 305-1, 305-2, 305-5 ✓

	2018			2017			2016		
	GJ	MWh	CO ₂ [t]	GJ	MWh	CO ₂ [t]	GJ	MWh	CO ₂ [t]
Scope 1: Direct energy consumption/emissions									
Natural gas gas/diesel generating sets CHPP	0	0	0	414	115	23	8,193	2,276	455
Natural gas gas/gasoline generating sets CHPP	1,289,542	358,206	71,570	1,322,438	367,344	73,395	1,273,319	353,700	70,644
Natural gas boiler plant	18,252	5,070	1,013	18,261	5,073	1,014	10,564	2,934	586
Fuel oil gas/diesel gensets	24,228	6,730	1,795	19,080	5,300	1,414	16,943	4,707	1,256
Fuel oil boiler plant	1,937	538	144	5,855	1,626	434	950	264	70
LPG	1,121	311	73	1,912	531	124	4,046	1,124	262
Fuel oil emergency gensets	1,721	478	127	1,584	440	117	1,526	424	113
Natural gas consumption EFM ²⁾	10,037	2,788	557	6,681	1,856	371	7,855	2,182	436
Diesel and gasoline	164,269	45,630	12,063	159,103	44,195	11,777	154,001	42,778	11,441
Total scope 1	1,511,107	419,752	87,341	1,535,329	426,480	88,668	1,477,396	410,388	85,262
Scope 2: Indirect energy consumption/emissions³⁾									
Purchased power ⁴⁾	223,259	62,016	33,303	268,075	74,465	43,190	278,606	77,391	45,428
Purchased district heat ⁵⁾	100,649	27,958	2,978	124,560	34,600	3,685	126,972	35,270	3,756
Purchased natural gas ⁶⁾	64,238	17,844	3,565	60,323	16,756	3,348	65,449	18,180	3,631
Power supplied to outside companies ⁷⁾	-200,393	-55,665	-29,892	-185,775	-51,604	-29,930	-191,987	-53,330	-31,305
Heat supplied to outside companies	-86,515	-24,032	-4,576	-102,056	-28,349	-5,340	-131,419	-36,505	-6,799
Cooling supplied to outside companies	-3,870	-1,075	-115	-15,540	-4,317	-501	-18,742	-5,206	-609
Natural gas supplied to outside companies	-64,238	-17,844	-3,565	-60,323	-16,756	-3,348	-65,449	-18,180	-3,631
Purchased power transmitted ⁸⁾	89,476	24,854	13,347	38,063	10,573	6,132	35,923	9,979	5,857
Total scope 2¹³⁾	9)	9)	15,045	9)	9)	17,237	9)	9)	16,329
Scope 3: Other indirect energy consumption/emissions (by third parties)	10)	10)		10)	10)		10)	10)	
Electrical energy purchases of outside companies	-	-	29,892	-	-	29,930	-	-	31,305
Heat purchases of outside companies	-	-	4,576	-	-	5,340	-	-	6,799
Cooling purchases of outside companies	-	-	115	-	-	501	-	-	609
Natural gas purchases of outside companies	-	-	3,565	-	-	3,348	-	-	3,631
Fuel for outside companies	-	-	9,571	-	-	7,036	-	-	6,680
Subtotal	9)	9)	47,719	9)	9)	46,154	9)	9)	49,024
Total annual CO₂ emissions open to influence¹¹⁾			150,105			152,059			150,614
Air traffic (LTO cycle) ¹²⁾	-	-		-	-		-	-	
Take-off	-	-	56,306	-	-	55,792	-	-	55,337
Climb out	-	-	97,381	-	-	94,765	-	-	93,711
Idle (taxiing on the apron)	-	-	174,565	-	-	165,488	-	-	162,115
Approach	-	-	116,348	-	-	114,575	-	-	113,731
APU (PCA taken into account) ¹⁴⁾	-	-	25,532	-	-	32,359	-	-	39,803
Engine test runs	-	-	456	-	-	793	-	-	715
Feeder traffic ¹⁵⁾	-	-	37,992	-	-	36,661	-	-	39,439
Total scope 3			556,299			546,588			553,874

¹⁾ Data collected and reported according to the GHG protocol WRI/WBCSD Greenhouse Gas Protocol Corporate Accounting and Reporting Standard. Principle of operational control applied. To the extent that they are subject to emissions trading, conversion parameters, such as heat values and emission factors in particular, are determined according to the provisions of the German Emissions Trading Authority (DEHSt). Other conversion parameters are based on the latest publications from the German Federal Environment Agency (UBA).

²⁾ EFM: Gesellschaft für Enteisung und Flugzeugschleppen am Flughafen München (company responsible for de-icing at Munich Airport); associated company.

³⁾ Scope 2 emissions reported using the GHG Protocol Scope 2 Guidance (2015) in accordance with the «location-based» method based on emission factors for domestic consumption in Germany, electricity mix, and district heating mix. Net scope 2 emissions with specific emission factors are 0.537 kg/kWh for electricity and 0.213 kg/kWh for district heat from fossil fuels. The total purchased district heat consists of 50% district heat from fossil fuels and 50% district heat from biomass with a specific emission factor of 0 kg/kWh.

⁴⁾ 45.84% electricity from renewable energy sources [as of 2017 according to Section 42 of the German Energy Act (EnWG)].

⁵⁾ 50% of district heat is purchased directly from the biomass thermal power plant in Zolling.

⁶⁾ Solely natural gas purchased (baseline year 2018); no renewable energy sources.

⁷⁾ Including the quantity transmitted to outside companies.

⁸⁾ Total power transmitted to outside companies and subsidiaries. The specific emission factor used for purchased power was also used here.

⁹⁾ For physical reasons it is not practical to add heat, cooling energy, and electricity in energy units. The sum can only be used to draw very limited conclusions.

¹⁰⁾ No information as values cannot be specified for all items.

¹¹⁾ Sum of scope 1, scope 2, and the subtotal of scope 3a; this is the comparative value for the reference value taken from the baseline year of 2005 at 162,046 tonnes. The CO₂ reference value must not be exceeded in spite of expansion plans and the expected growth.

¹²⁾ Emissions calculated using the LASPORT model for classifying flight operations in accordance with the LTO cycle.

¹³⁾ Scope 2 emissions calculated using the GHG Protocol Scope 2 Guidance (2015) in accordance with the «market-based» method results in a figure of 9,311 t of CO₂. This is based on an emission factor of 0.352 kg/kWh for the Munich Airport network. The other emission factors stated in footnote 3 remain unchanged.

¹⁴⁾ Calculated from aircraft movements using the LASPORT model, subsequently taking into account the APU emissions avoided by using PCA systems.

¹⁵⁾ Feeder traffic includes the road traffic caused by passengers, visitors, and employees around the airport.

Generated and purchased power / GRI standard 305-1, 305-2, 305-5

Munich Airport produces around 80 percent of its annual heat energy requirements in the Group's own block heat and power plant. Aside from a tiny amount that is generated in peak load boilers, the airport meets the remainder of its heating needs by purchasing district heat from a public utility company in Freising. Since early 2011, 50 percent of this purchased district heat – roughly 18 gigawatt hours (GWh) – has been generated by a biomass thermal power plant in Zolling. This procurement is secured by a long-term supply option for the coming years. This district heat obtained from biomass is renewable and climate neutral, and cuts carbon emissions by around 3,000 t per year.

→ Glossary

→ Glossary

Energy intensity coefficient¹⁾ / GRI standard 302-3 ✓

In kWh/passenger	2018	2017	2016
Power consumption	5.02	5.24	5.51

¹⁾ Power consumption is responsible for more than 2/3 of the total CO₂ emissions produced by energy-induced processes in the airport (excluding emissions generated by airlines). Furthermore, it is only very slightly linked to weather conditions. For this reason, the power consumption per passenger is the most useful indicator for energy consumption at Munich Airport.

The power consumption is made up of total power consumption of all buildings and installations on the campus, including hosted electricity. It includes power consumption by FMG and its subsidiaries, consumption by external companies, and all losses at the low-voltage level.

Greenhouse gas emissions intensity¹⁾ / GRI standard 305-4 ✓

In kg/passenger	2018	2017	2016
CO ₂ emissions	3.24	3.41	3.56

¹⁾ The calculation of CO₂ emissions per passenger enables the physically meaningful addition of the various forms of primary and secondary energy used at the airport in relation to passenger figures.

The CO₂ emissions from scope 1 and 2 are added, as well as power, heat, cooling energy, natural gas, and fuel consumption by external companies. The figure therefore includes all emissions that must not exceed the targets for carbon-neutral growth.

Other greenhouse gas emissions / GRI standard 305-3, 305-5, 305-6 ✓

CH ₄ , N ₂ O and greenhouse gases containing fluorine in CO ₂ equivalent ¹⁾ [t]	2018	2017	2016
LTO cycle	4,483	4,342	4,285
Feeder traffic ²⁾	328	323	348
APU ³⁾	370	327	402
Engine test run ⁴⁾	5	8	7
Small appliances in buildings and central cooling plants	685	656	476
Mobile systems (vehicles)	174	271	184

¹⁾ Conversion of emissions into CO₂ equivalents in accordance with the IPCC Fourth Assessment Report.

²⁾ Feeder traffic includes the traffic caused by passengers, visitors, and commuters in the area around the airport.

³⁾ Calculated from aircraft movements using the LASPORT model, taking into account the remaining APU period when using PCA.

⁴⁾ Estimates.

Measured pollutant concentrations¹⁾ / GRI standard 305-7, GRI A05

In µg/m ³	Current legal annual limit value	2018	2017	2016
NO ₂ concentration [nitrogen dioxide]	40	18	22	20
SO ₂ concentration [sulfur dioxide] ²⁾	20	2	2	2
PM ₁₀ concentration [particulate matter]	40	14	16	12
PM _{2,5} concentration	25	11	11	9

¹⁾ As part of the publication of the integrated report, NO₂, SO₂, PM₁₀ and PM_{2,5} are recorded. Other pollutant concentrations can be found in the monthly impact reports: munich-airport.com/impact

²⁾ Statutory threshold to protect vegetation, only strictly applicable away from urban centers and transport facilities, but complied with here as well as the immission value specified by the administrative regulation TA Luft for protecting human health [50 µg/m³].

Air pollutant emissions / GRI standard 305-7, GRI A05 ✓

In t	2018	2017	2016
NO _x – air traffic (LTO cycle)	1,676.8	1,556.9	1,509.2
NO _x – feeder traffic ¹⁾	82.4	83.8	81.1
SO _x – air traffic (LTO cycle)	112.7	109.2	107.8
SO _x – feeder traffic ¹⁾	0.2	0.2	0.2
PM ₁₀ – air traffic (LTO cycle)	13.4	13.1	12.3
PM _{2,5} – feeder traffic ¹⁾	1.1	1.2	1.5

¹⁾ Feeder traffic includes the traffic caused by passengers, visitors, and commuters in the area around the airport.

➔ munich-airport.com/air-quality-measurements

Total drinking water consumption^{1), 2)} / GRI standard 303-3, 303-5

1 m ³ corresponds to 0.001 mega liters	2018	2017	2016
Water purchased from utility in m ³	986,580	1,016,708	1,050,791
Water consumption per 1,000 traffic units in m ³	19.8	21.0	23.0

¹⁾ Includes all companies on the campus.

²⁾ Values are derived as follows: Water metering in m³ measured at the drinking water feed points (transfer points at water metering shafts 1 through 4) from the Moosrain water utility company to Munich Airport.

Water sources / GRI standard 303-1, 303-3

Munich Airport sources its drinking water from the Moosrain water utility company, which extracts it from the tertiary strata via seven water wells at depths of between 94 and 160 meters. The water wells are located in water protection areas at «Obere Point» [surface area 33 ha] and «Oberdingermoos» [surface area 36 ha] in the Oberding municipality.

➔ moosrain.de/verband/daten-fakten

Total process water extraction for cooling in the power centers, west and east / GRI standard 303-1, 303-3, 303-5

1 m ³ corresponds to 0.001 mega liters	2018	2017	2016
Quantity of the quaternary groundwater extracted in m ³	279,881	225,549	240,491

Water samples / GRI standard 303-1, 303-2, GRI A04

Under the provisions of the planning approval notice Munich Airport is required to test the water surrounding the airport. Securing evidence regarding the quantity (water level) and quality (water quality) of groundwater is particularly important. FMG measures the water levels of more than 300 groundwater and 17 surface water measurement points on an ongoing basis. Water quality is determined at 18 groundwater and eleven surface water measurement points. All implemented measures are summarized in a report, evaluated, and presented to the water authorities.

➔ azv-em.de

Total wastewater discharged^{1), 2)} / GRI standard 303-2, 303-4, 306-1

1 m ³ corresponds to 0.001 mega liters	2018	2017	2016
Total wastewater discharged from Munich Airport to the sewage plant of the Erdinger Moos wastewater utility company in m ³	2,404,292	2,336,314	2,278,602
Wastewater consumption per 1,000 traffic units in m ³	48.2	48.3	49.8

¹⁾ Includes all companies on the campus.

²⁾ The wastewater discharged to the sewage plant consists of domestic wastewater, industrial wastewater, mixed water, and de-icing waste.

Hazardous goods: checks and training courses / GRI standard 306-4

Operations at Munich Airport involve a number of substances that are harmful to the environment and water; these must be declared as hazardous goods and transported off site. The vehicles used for transporting hazardous goods were inspected to verify that they are in proper condition and are roadworthy and safe to operate. Employee training on the handling of hazardous goods is held at regular intervals in accordance with legal regulations. In the year under review, 2018, a total of 251 tonnes of waste (previous year: 199 tonnes) declared as hazardous goods were transported away for disposal.

Waste¹⁾ / GRI standard 306-2, 306-4

In t	2018	2017	2016	Point of disposal and reuse
Recycling				
Paper, cardboard, and cartons from aircraft ²⁾	-	-	-	Sorting facilities, paper factory in Munich/Schrobenhausen (wastepaper recycling)
Paper, cardboard, and cartons from buildings	1,508	1,574	1,654	
Mixed reclaimed materials/waste for recycling from buildings	3,037	3,026	3,038	
Top soil [humus-rich excavation material] ³⁾	2,766	-	-	
Mixed glass	248	176	178	Sorting facilities, recycling firms in Eitting, Schwaig, Moosburg, and Munich
Wood	495	357	355	
Bulk waste	852	764	634	
Scrap metal containing electronic waste	626	630	378	
Other recyclables ⁴⁾	204	212	180	
Total recycling	9,736	6,739	6,417	
Other forms of utilization				
Material utilization				
Building site waste [waste from dismantling, conversion, renovation, and maintenance measures]	3,207	3,127	2,247	Recycling/disposal firms [material recycling/pit filling]
Hazardous waste [FMG fraction only, excluding mineral wool]	321	257	219	Recycling/disposal firms [material recycling] or hazardous waste specialists in Munich and Ebenhausen [secondary fuels]
Of which are subject to ADR [hazardous goods] rules ⁵⁾	251	199	180	
Other waste ⁶⁾	1,032	1,259	313	
Energy recovery				
Food waste ⁷⁾	1,228	1,123	1,024	Biogas plant [energy recovery]
Waste from cleaning of aircraft cabins ⁸⁾	-	-	-	
Waste for disposal/prohibited liquids [terminal areas]	201	195	196	Munich North power plant [energy recovery]
Waste for disposal from buildings	706	633	596	
Total utilization	6,695	6,594	4,595	
Landfill waste				
Insulators [mineral wool] ⁹⁾	597	432	309	Spitzberg, Landshut landfill
Total landfill	597	432	309	
Total amount	17,028	13,765	11,321	

¹⁾ All quantities refer exclusively to the disposal processes organized by FMG waste management. This refers to the total figure reported [2018: 17,029 t].

²⁾ Disposal is no longer conducted by FMG waste management. Disposal and transport services were outsourced to a disposal company in April 2011.

³⁾ In 2018, the «disposal» [= recycling] of the «Top soil fraction» was handled by FMG waste management for the first time. The topsoil comes from construction projects [in 2018 from the renovation work on the district heating pipeline].

⁴⁾ For example foil, lightweight packaging.

⁵⁾ ADR [Accord européen relatif au transport international des marchandises dangereuses par route]: European Agreement concerning the International Carriage of Dangerous Goods by Road

⁶⁾ For example runway wear, refuse, old tires, rubber waste

⁷⁾ Food waste disposal from the Allresto catering area in Terminal 2 only.

⁸⁾ Waste from the cleaning of aircraft cabins and catering waste is processed by a disposal firm at the Munich North waste incineration plant/ at the power plant in accordance with EC Regulation 1069/2009. Disposal is no longer FMG's responsibility and has been conducted by a specialist contractor working on behalf of the Erding animal carcass disposal association since January 2011.

⁹⁾ Insulators that are collected at a disposal specialist contracted on behalf of the district of Freising and sent away for proper disposal [landfill]. Figure has increased in 2018 due to renovation/roof repair work [mineral wool].

Measured noise¹⁾ / GRI A07 ✓

In dB(A)	2018		2017		2016	
	Night ²⁾	Day	Night ²⁾	Day	Night ²⁾	Day
Measurement point (nearest municipality)						
Brandstadi (municipality of Hallbergmoos)	50	58	51	59	52	59
Pallhausen (town of Freising)	48	54	46	56	46	56
Reisen (municipality of Eitting)	49	56	48	55	48	55
Viehlaßmoos (municipality of Berglern)	47	54	44	52	44	54

¹⁾ Leq3 continuous sound level in dB(A) for the six busiest months at four aircraft noise measuring stations situated on each of the main flight paths.

²⁾ Hours from 10 p.m. to 6 a.m.

Distribution of operations directions between west and east

	Westward		Eastward	
	Take-offs	Landings	Take-offs	Landings
Total 2018				
Total aircraft movements¹⁾, absolute	220,326		190,101	
Total aircraft movements¹⁾, in %	54		46	
North runway	49,071	61,330	47,153	49,080
South runway	61,137	48,788	47,856	46,012

¹⁾ Excluding helicopters.

Source: Impact reports from January to December 2018.

The distribution of operations directions, in other words the decision as to whether the aircraft take-off and land to the east or west, depends on the wind. Aircraft always take off and land in the opposite direction to the prevailing wind. Furthermore, FMG also tries to ensure that the north and south runways are used equally when organizing the runway system.

Noise complaints / GRI standard 102-44 ✓

	2018 ¹⁾	2017	2016
Noise complaints received via telephone	185	248	277
Complainants	116	142	189
Complaints received in writing	161	-	-
Complainants	66	-	-

¹⁾ The increase in written complaints is due to the fact that since 2018 the DFLD (Deutscher Fluglärm-dienst e.V.; German aircraft noise service) has listed the e-mail address info@munich-airport.de on its website as the address to which complaints should be directed. These complaints were previously received by the government of Upper Bavaria and were not included in our statistics.

Population growth in neighboring communities¹⁾ / GRI A07 ✓

Number of residents	2017	2016	2015
Freising (District of Freising)	48,318	47,848	46,963
Marzling (District of Freising)	3,231	3,233	3,179
Oberding (District of Erding)	6,325	6,187	6,151
Hallbergmoos (District of Freising)	10,946	10,835	10,524

¹⁾ The reporting date is December 31 in each case.

Source: Bayerisches Landesamt für Statistik und Datenverarbeitung (Bavarian State Office for Statistics and Data Processing) – Statistikatlas Bayern (statistical atlas of Bavaria). Figures for 2018 were not available at the time of going to press.

«Green spaces»¹⁾ belonging to the airport but outside the airport fence / GRI standard 102-7, 304-3 ✓

In ha	2018	2017	2016
«Green spaces» in total	824	751	746
Compensatory mitigation areas, zone III ²⁾	450	375	374
Airport periphery, zone II	250	250	250
Ecological land reserve for future expansion measures	124	126	122

¹⁾ Green areas in zone II and III that Flughafen München GmbH is developing or maintains as natural conservation areas (in contrast to rented farmland or other real estate).

²⁾ From 2017 to 2018, approx. 73 ha of compensation and replacement zones were created as nature protection compensation for construction measures and 2 ha were removed from the ecological land reserve. As a result there was an increase in zone III of 75 ha.

➔ Noise measurement points

➔ [munich-airport.com/noise-protection](https://www.munich-airport.com/noise-protection)