

# /Environmental Statement 2019 Executive Summary

The environment at Munich Airport

Living ideas – Connecting lives



# /Foreword



Andrea Gebbeken, Dr. Michael Kerkloh, Thomas Weyer (from left to right)

Dear Readers,

The CO<sub>2</sub>-neutral airport operation that we aim to achieve in Munich by 2030 at the latest is getting closer every year. In 2018 too we instigated a number of measures that enable us to run our airport in as environmentally friendly a manner as possible with conservation of resources.

One example is the issue of lighting: Switching to LED technology in the suburban railway tunnel and for street lighting in the Central Allee and the cargo area produced CO<sub>2</sub> savings of more than 150 tons in 2018, and there are plans for further modifications. The use of air curtains in Hall C-West and in Terminal 1 enabled CO<sub>2</sub> emissions to be reduced by over 1,200 tons. Progress is also being made regarding the use of renewables: the new photovoltaic system on the roof of parking lot P51 generates solar electricity, saving 423 tons of CO<sub>2</sub> annually. We are making increasing use of electric vehicles in our fleet: 85 cars and vans as well as 268 items of ground handling equipment have already been equipped in this way, and a further 44 electrically powered vehicles have been ordered.

For 14 years we have been operating an environmental management system in accordance with EMAS [the Eco-management and audit scheme], and from 2018 also in accordance with the updated and more stringent EN ISO 14001:2015 standard. In this way we systematically document, analyze and communicate the sustainable development of the airport to all stakeholders. This environmental statement offers you a brief insight into relevant environmental projects and provides information about the diverse environmental activities at Munich Airport. The key indicators published under EMAS Regulation 1221/2009 show the environmentally relevant consumption of sources of energy and resources in relation to traffic growth.

We welcome your interest in the 2019 environmental statement, in our company and in its environmental management.

**Dr. Michael Kerkloh**  
President and CEO, Personnel  
Industrial Relations Director

**Andrea Gebbeken**  
Chief Commercial  
and Security Officer

**Thomas Weyer**  
Chief Financial Officer,  
Chief Infrastructure Officer

# /Highlights

## Successful switch to ISO 14001:2015

In 2018, Munich Airport was inspected and successfully certified in accordance with the updated and more stringent international standard EN ISO 14001:2015. In the course of the inspection, environmental aspects, opportunities and risks were re-evaluated and additional environmental management objectives – such as increasing biodiversity – were incorporated. Taking a lifecycle approach also assumed greater importance. All employees have been asked to conserve resources. An environmental module in a course for ground service staff, for example, is aimed at reducing fuel consumption and at preventing or correctly collecting waste.



## eMobility

Within its climate protection program, Munich Airport uses alternative fuels made from renewable sources of energy for its fleet:

- 24 vehicles already run on biogas.
- 85 cars/vans and 268 items of ground handling equipment are electrically operated.
- A further 44 electrically powered vehicles have already been ordered.

The proportion of electric vehicles is growing enormously, and they will account for the majority of the fleet by 2030. In 2018, Munich Airport replaced a further 85 older gasoline or diesel vehicles. Electric cars now make up over 20 percent of the existing vehicle pool, and it has been possible to reduce local CO<sub>2</sub> emissions by some 76 tons compared to 2017.



# /Environmental objectives and measures

Subject area	Measure	Start	End	Status	Remarks
<b>Strategic objective: development of the environmental management system</b>					
<b>Operational objective: expansion of the environmental management system on the campus</b>					
	EMAS validation of Allresto GmbH	2007	Ongoing		Successful monitoring audit 9/2018
	EMAS validation of aerogate GmbH	2010	Ongoing		Successful renewed certification 3/2018
	EMAS validation of Cargogate GmbH	2010	Ongoing		Successful renewed certification 3/2018
	Introduction of an environmental management system in accordance with EMAS and ISO 14001 at AeroGround GmbH	2013	2019		Introduction planned by autumn 2019
	Introduction of an environmental management system in accordance with EMAS and ISO 14001 at eurotrade GmbH	2018	2020		Introduction planned by mid-2020
<b>Operational objective: IT tools for monitoring environmental data and information</b>					
Additional environmental objectives	Monitoring of drinking water and energy consumption	2011	2015/2020		Process water concept is being implemented
<b>Operational objective: increase in biodiversity</b>					
Species protection	Protection of rare moorland butterflies by enriching areas with important foraging plants for caterpillars and moorland butterflies	2016	2020		Further care over the coming years
	Protection of meadow-breeding birds in selected areas within the «Nördliches Erdinger Moos» bird sanctuary	2016	2020		Breeding success by suspending agricultural use and by erecting fencing in some areas. 2018: one fledgling curlew
<b>Strategic objective: resource efficiency and reduction of emissions and immissions</b>					
<b>Operational objective: protection of water</b>					
Resource of groundwater	Construction of a soil filter at the south-east runway	2016	2018		Put into operation in 2018
	Construction of a soil filter at the south-west runway	2018	2019		Planned measure to be put into operation in 2019
Resource of drinking water	Use of process water instead of drinking water for the energy center east	2015	Ongoing		Amount of drinking water saved in 2018: 279,881 m <sup>3</sup>
<b>Operational objective: reducing use of paper in offices</b>					
Resource of paper	Complete replacement of virgin fiber paper by recycled paper	2013	Ongoing		Since 2016 only recycled paper with «Blauer Engel» ecolabel
	Paperless workflow for time management, monthly journals, business trips and vocational training	2013	Ongoing		2018: 5,273 business trips, 2,244 external seminars, 124,320 applications processed digitally, saving around 250,000 sheets of paper.
<b>Operational objective: reducing energy for lighting</b>					
Lighting	Replacing lighting in the suburban railway tunnel by LED technology	2017	2018		Completed. Amount of CO <sub>2</sub> saved in 2018: 41 t
	Conversion of street lighting in the Central Allee and in the cargo area	2017	2018		Completed. Amount of CO <sub>2</sub> saved in 2018: 113 t
<b>Operational objective: reducing greenhouse gases in information technology (IT)</b>					
Green IT	Return of used toner cartridges by the manufacturer	2013	Ongoing		Recycling process successfully introduced
	Compensation of CO <sub>2</sub> emissions by sending letters with GoGreen	2011	Ongoing		Amount of CO <sub>2</sub> compensation in 2018: 6.5 t
<b>Operational objective: reducing greenhouse gases when generating power</b>					
Renewable energy	Construction of a new parking lot P51 with photovoltaic system	2017	2018		Amount of CO <sub>2</sub> saved in 2018: 423 t/a
<b>Operational objective: reducing greenhouse gases for aircraft</b>					
Greenhouse gases of aircraft	Use of 64 PCA (pre-conditioned air) systems at the terminals	2011	2016		PCA systems in operation since 9/2016. Amount of CO <sub>2</sub> saved in 2018: 18,364 t
<b>Operational objective: reducing greenhouse gases in buildings</b>					
Building	«Air curtain» project to reduce heat loss at doors in Terminal 1	2017	2019		Amount of CO <sub>2</sub> saved in 2018: 1,072 t
	Use of air curtains in Hall C-West	2017	2019		Amount of CO <sub>2</sub> saved in 2018: 197 t
<b>Operational objective: reducing fuel consumption of the aircraft fleet and use of alternative drive technologies</b>					
Vehicles	AdBlue technology for diesel vehicles	2013	Ongoing		2018: increased by 67% to 13,653 liters
	Expansion of eMobility	2016	2018		2018: 85 diesel-/ gasoline operated vehicles replaced by electric vehicles
	Pilot project: use of C.A.R.E diesel	2017	Ongoing		2018: 38,894 liters used

# /Environmental figures

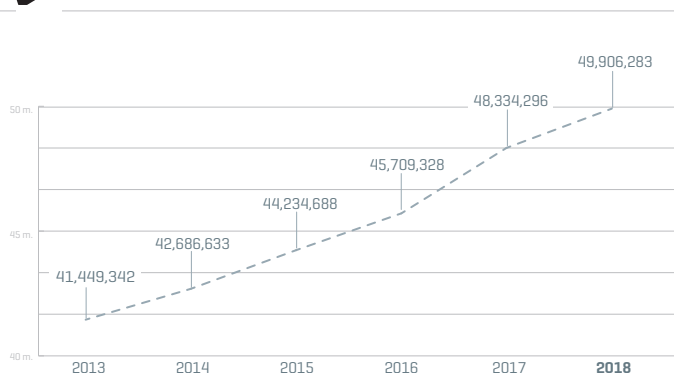
## Traffic data

In 2018, there were 413,469 commercial flights at Munich Airport, a rise of 2.2% over the previous year. The aircraft carried 46,271,504 passengers, an increase of 3.8%. When converted to traffic units [a traffic unit is one passenger or 100 kg of freight], there were 49,906,283 traffic units in 2018, a rise of 3.3% compared to 2017.

## Aircraft noise data

Aircraft noise is measured at 16 stationary and 3 mobile stations around Munich Airport. Individual measuring points are selected by way of example: the annual LEQ levels in dBA at the measuring points Achering [59], Attaching [57], Eitting [56], Hallbergmoos [59], Pulling [61] and Schwaig [61] remained unchanged compared to the previous year.


### Traffic units




## Consumption data

Field	Figure	Unit	Amount 2017	Amount 2018	2017/2018	Remarks
Energy	Natural gas [incl. customers]	MWh/Hi*	392,757	385,843	-1.8%	*Hi: lower calorific value
	Heating oil [cogeneration plant and boiler]	MWh/Hi	6,716	7,048	+4.9%	
	District heating	MWh	34,600	27,958	-19.2%	50% biomass proportion
	Electricity [only bought-in quantity]; the electricity generated by Munich Airport is included with natural gas	MWh	76,228	63,195	-17.1%	One tenant terminated its power supply
	Total energy requirements	MWh/Hi	510,301	484,011	-5.1%	
Automotive fuels	Premium grade gasoline	l	424,925	435,431	+2.5%	
	Diesel	l	4,442,160	5,095,965	+14.7%	
	Bioethanol E85	l	2,627	0		Discontinued
	Natural gas CNG	kg	15,765	15,964	+1.3%	
	AdBlue	l	8,180	13,653	+66.9%	
	C.A.R.E-Diesel	l	1,531	38,894	+2,349.7%	Introduced in 2017
Renewables as a percentage of total energy requirements:		%	2.9	5.4*		*The share of biomass from the district heating procured is included in the calculation for the first time as from 2018.
Water and waste-water	Drinking water from the Moosrain drinking water network	m <sup>3</sup>	1,016,708	986,580	-3.0%	
	Volume of wastewater to the sewage treatment plant	m <sup>3</sup>	2,336,313	2,404,292	+2.9%	
	Process water instead of drinking water	m <sup>3</sup>	225,549	279,881	+24.1%	Western and eastern energy centers
Waste	Total of all waste [not including aircraft waste]	t	17,028	13,765	+23.7%	Disposed of by FMG waste management


### Traffic light Status

 Measure stopped

### Traffic light Status

 Measure deferred

### Traffic light Status

 Measure in progress or completed

The actual effective start of the measure is more than 1 year later than the planned start

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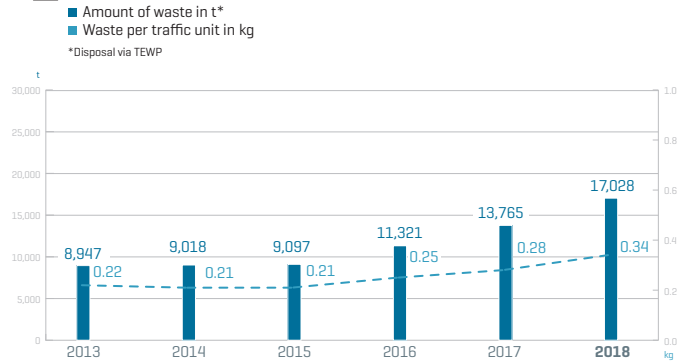
The actual effective start of the measure is the same or earlier than the planned start.

# /Key indicators

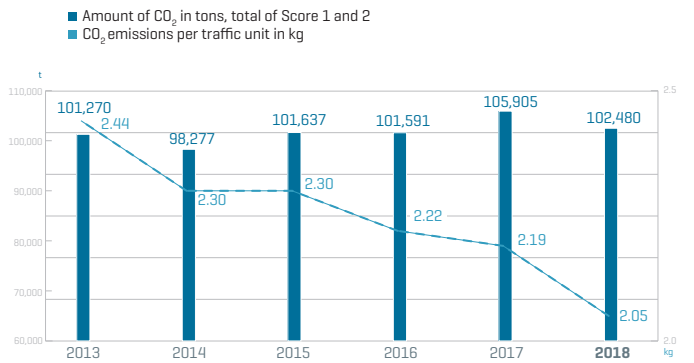
EMAS Regulation 1221/2009 requires the identification of so-called key indicators, i.e. important environmental figures which are relevant to the business activity. Consumption at the airport is caused by the handling process for passengers and cargo. For this reason, the following figures for specific consumption are determined on the basis of passengers arriving and departing and the volume of freight [a traffic unit is one passenger or 100 kg of freight].



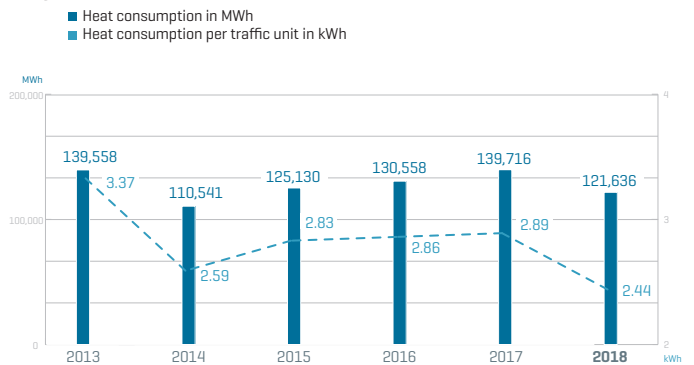
## Absolute and specific amount of waste



## Absolute and specific carbon dioxide emissions

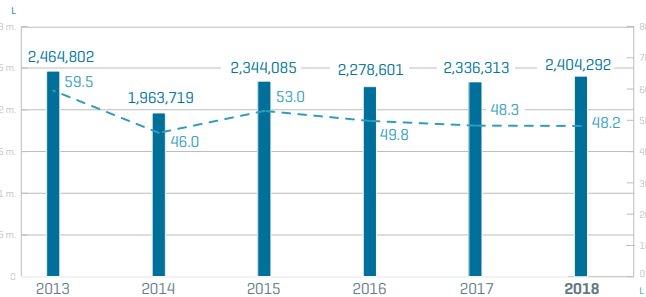


## Absolute and specific heat consumption



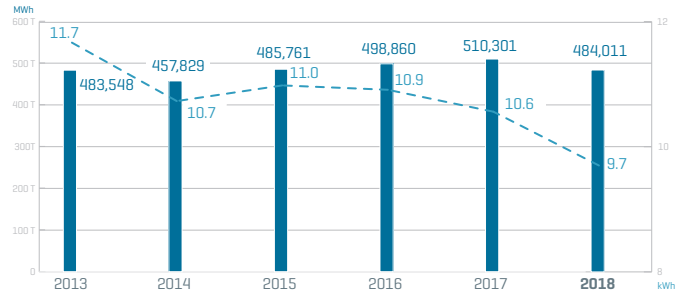
### Absolute and specific amount of wastewater

- Amount of wastewater per traffic unit in liters
- Amount of wastewater per passenger in liters Traffic units



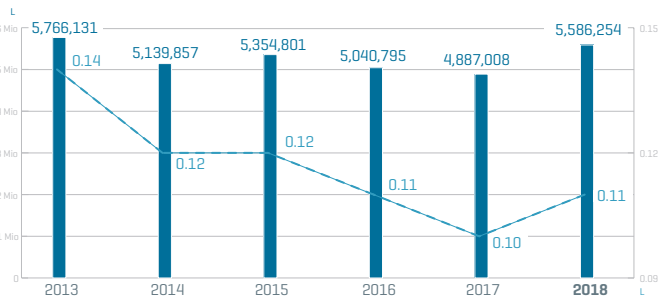
### Absolute and specific total energy consumption

- Total energy consumption in MWh
- Energy consumption per traffic unit in kWh



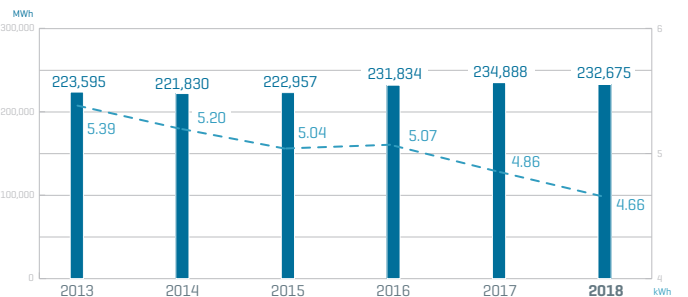
### Absolute and specific fuel consumption

- Amount of fuel in liters\*
  - Fuel per traffic unit in liters
- \*Premium gasoline, diesel, bioethanol, rapeseed oil, CARE diesel, CNG



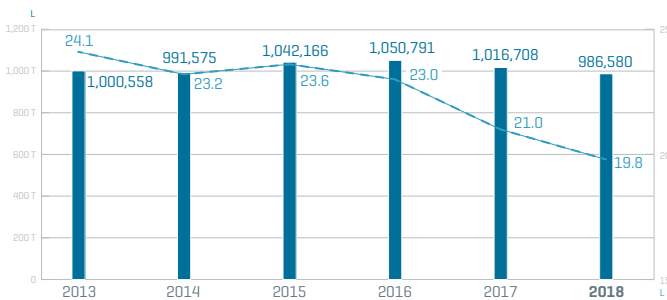
### Absolute and specific electricity consumption

- Electricity consumption in MWh, own-generated and bought-in electricity, incl. for transit
- Electricity consumption per traffic unit in kWh



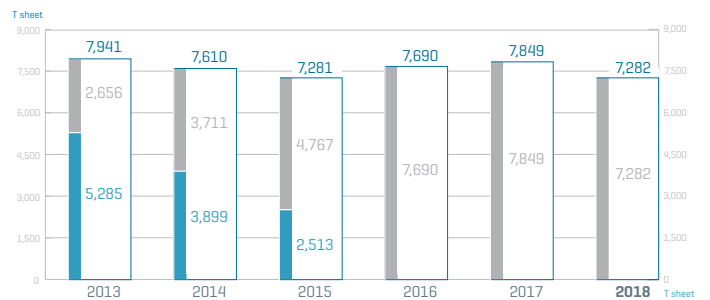
### Absolute and specific water consumption

- Amount of water in liters
- Water volume per traffic unit in liters



### Paper consumption, switch to recycled paper

- Total consumption in thousands of sheets of paper
- Virgin paper in thousands of sheets of paper
- Recycled paper in thousands of sheets of paper



# /Greenhouse gases

## Carbon dioxide (CO<sub>2</sub>) emissions

All emissions from the direct consumption of the Munich Airport Group are summarized (in accordance with the Greenhouse Gas Protocol) under Scope 1:

	Unit	2013	2014	2015	2016	2017	2018
Gas/diesel engines	t	39,665	39,168	33,351	455	23	0
Gas/Otto engines	t	24,346	25,899	26,859	23,095	24,813	0
New gas/Otto engines*	t	-	-	6,885	47,549	48,583	71,570
Gas boiler system	t	470	613	633	586	1,014	1,013
Heating oil gas/diesel engines	t	5,811	5,620	4,601	1,256	1,414	1,795
Heating oil boiler system	t	8	8	11	70	434	144
Liquid gas	t	261	262	256	262	124	73
Heating oil emergency generators	t	101	117	145	113	117	127
EFM natural gas consumption	t	798	205	552	436	371	557
Fuel consumption	t	11,864	10,446	11,503	11,441	11,777	12,063
Emissions from other Kyoto gases	t	378	456	784	**	**	**
<b>Total Scope 1</b>	<b>t</b>	<b>83,731</b>	<b>82,794</b>	<b>85,610</b>	<b>85,263</b>	<b>88,670</b>	<b>87,341</b>

\* Put into operation in autumn 2015

\*\* Figures were not yet available at the time of going to press

**Scope 2** summarizes all emissions created by the use of bought-in energy. This data therefore takes the entire consumption of external energy supplies into account. The data is based on the annual reviews of the total supplies of external electricity, district heating and natural gas.

	Unit	2013	2014	2015	2016	2017	2018
External electricity supply	t	53,388	49,517	49,468	45,428	43,190	33,303
External electricity supply for transit	t	3,964	6,349	6,406	5,857	6,132	13,347
District heating supply	t	3,843	2,558	3,802	3,756	3,685	2,978
Natural gas supply	t	469	337	1,895	3,631	3,348	3,565
Electricity supplied to external companies	t	-35,779	-34,586	-35,086	-31,305	-29,930	-29,797
Heating supplied to external companies	t	-8,232	-7,311	-7,054	-6,799	-5,340	-4,576
Cooling energy supplied to external companies	t	-362	-589	-725	-609	-501	-115
Natural gas supplied to external companies	t	-469	-337	-1,895	-3,631	-3,348	-3,565
<b>Total Scope 2</b>	<b>t</b>	<b>17,539</b>	<b>15,938</b>	<b>16,811</b>	<b>16,329</b>	<b>17,236</b>	<b>15,136</b>

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You can find the detailed version of our environmental statement as well as much more information on the subject of «environment and aviation» online at: <https://www.munich-airport.com/environmental-protection-264103>

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