

ENVIRONMENTAL BULLETIN OF SANTORINI AIRPORT (JTR)

Reference year 2021

Fraport Regional Airports of Greece B S.A.

July 2021

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1. INTRODUCTION

1.1. Location

The airport of Santorini is located at the east part of the Cycladic island of Santorini, near the settlement Monolithos, at a distance of approximately 6km to the south-east of the town of Thira (Fira), the capital of the island.

1.2. Administration

The airport administratively belongs to the Municipal Unit of Thira of the Municipality of Thira of the homonym Regional Unit that belongs to the Region of South Aegean. The airport is within the limits of the Local Communities of Vothonas and Exo Gonia and of the Municipal Communities of Messaria, of the Municipal Unit of Thira.

1.3. Environmental licensing

Approved Environmental Terms	
E.T. Decision Reference number	Ref. No οικ. 51227/25.10.2016
E.T. Amendment Decision Reference Number	Ref. No οικ. 1758/23.01.2018

1.4. Airport Basic Data

Airport name IATA / ICAO	JTR / LGSR
Airport location – Airport Reference Point (ARP)	Latitude: 36° 23' 57" N Longitude: 25° 28' 45" E
Altitude	37.5m
Number of runways	1
Operation hours (summer)	00:01-24:00
Operation hours (winter)	Monday /Thursday /Sunday 10:30 – 19:30 Tuesday 10:45 – 18:00 Wednesday 10:30 – 18:00 Friday 14:00 – 18:00 Saturday 09:00 – 19:30

Runways	Length/Width					Code
Runway	2,125m x 30m					16L/34R
Full length of parallel taxiway	16R/34L - 2,122m					
Number of taxiways	5					
Apron capacity	A	B	C	D	E	
	-	-	4	1	-	
Employees	High season (31.08.2021)			Low season (30.11.2021)		
Fraport Greece (FG) employees	41			32		
Employees of other companies	689			421		

Terminal	
➤ Total area (m ²)	15.412

Other buildings and service/storage areas	
➤ RFF Station (m ²)	1.144

Parking Areas	
Car parking spaces	124
Bus parking spaces	18
Taxi parking spaces	22

1.5. Airport facilities

1.5.1. Fuel Handlers

Number of fuel handler companies	
Number of fuel handler companies operating at the Airport	2

Installations inside the airport	EKO	GISSCO	HAFCO
Environmental Management System (EMS)	YES	YES	Not operating at the airport

1.5.2. Ground Handlers

Number of ground handler companies	
Number of ground handler companies operating at the Airport	3

Installations inside the airport	SKYSERV	SWISSPORT	GOLDAIR
Environmental Management System (EMS)	YES	YES	YES

2. TRAFFIC DATA STATISTICS

2.1. Annual Traffic Data

Annual Traffic Data for the year 2021	
Overall Annual Air Traffic Movements ¹	16.063
Percent of increase or decrease in relation to the previous year	120,5 %
Annual passenger traffic	1.546.584
Percent of increase or decrease in relation to the previous year	169,9%
Annual cargo transferred (tn)	58
Percent of increase or decrease in relation to the previous year	-12,1 %

Aircraft types	
Prevailing aircraft types for domestic flights	
Aircraft type	No. of flights
AT75	1.068
A320	770
DH8D	765
AT72	712
B73H	614
A319	514
A20N	449
A321	412
AT76	354
A32A	321
Other	1.316
Prevailing aircraft types for international flights	
Aircraft type	No. of flights
A320	2.080
B73H	1.552
B738	896
A32A	833
A319	692
A20N	413
A321	409
A32B	258
7M8	187
A21N	176
Other	1.272

¹ Military and training flights not included.

2.2. High season traffic data

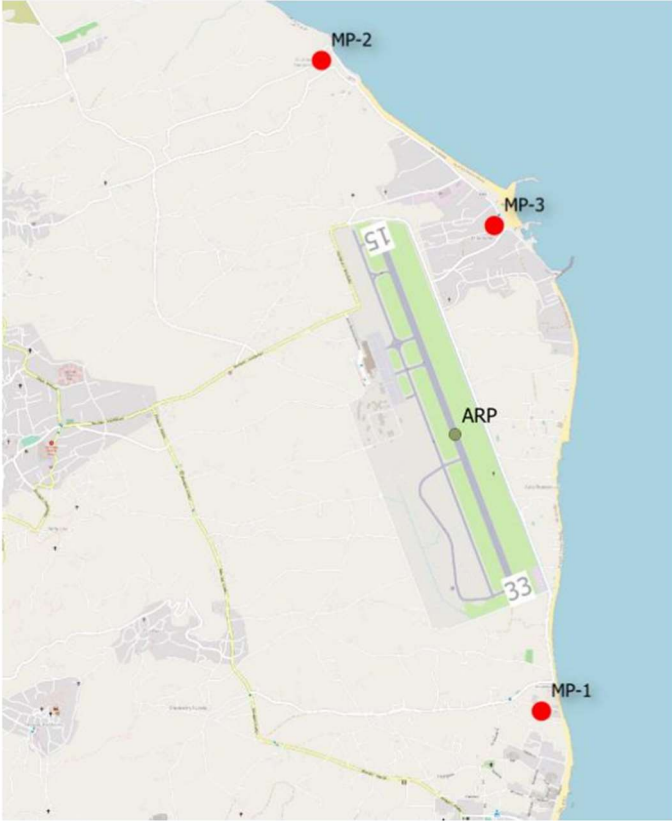
High season traffic data (June-September)	
Highest traffic month	August
Air traffic movements during the month with highest traffic	3.804
Air traffic movements daily average number during the month with highest traffic	123

2.3. Low season traffic data

Low season traffic data (October-May)	
Lowest traffic month	February
Air traffic movements during the month with lowest traffic	136
Air traffic movements daily average number during the month with lowest traffic	5

3. AIRCRAFT NOISE


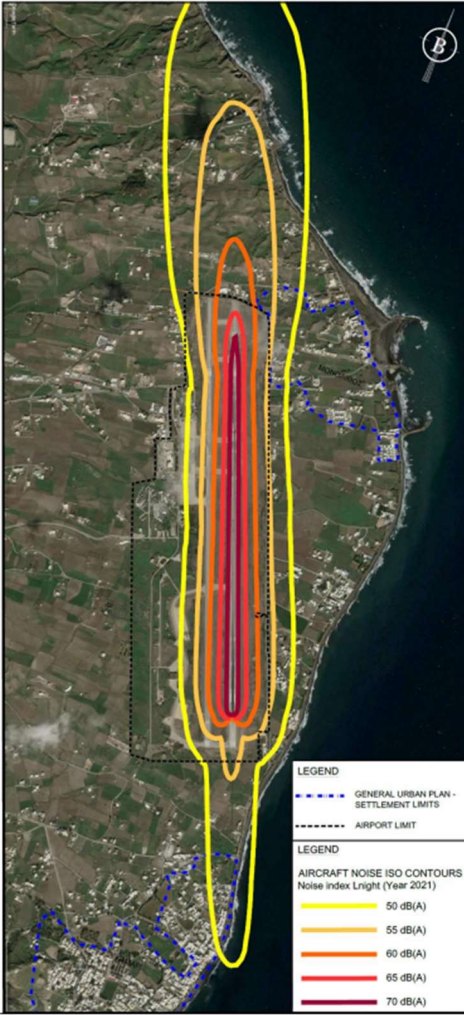
3.1. Noise measurements during the reference year

Have noise measurements at the airport's surrounding area been performed during the reference year?		YES
Measurement points		
		
Measurement points coordinates	Measurement points description	
Θέση 1: 36° 23' 00" N 25° 29' 07" E	Kamari area, south of the runway on a hotel roof. Affected by arrivals RWY 34R and departures RWY 16L.	
Θέση 2: 36° 25' 14" N 25° 28' 11" E	North of the runway on a hotel roof. Affected by arrivals RWY 16L and departures RWY 34R.	
Θέση 3: 36° 24' 40" N 25° 28' 55" E	Monolithos area, east of the runway in the garden of a hotel. Affected by all flights to and from all directions	
Measurement period	20.07.2021 – 21.07.2021	
Noise indicators	L _{den} , L _{night}	

Summary of measurement results:

Noise levels are monitored according to the airport's monitoring program.
No exceedance of noise indicators levels L_{den}=70 dB(A) and L_{night}=60 dB(A) was observed.

3.2. Noise levels calculation based on noise simulation software

<p>Aircraft noise levels calculation based on noise simulation software</p>	<p>YES</p>
<p>Software used: IMMI Noise Prediction Software (evaluation method CNOSSOS-EU according to Directive 2015/996/EYU)</p>	
<p>Noise indicators and respective contours calculation: L_{den}, L_{night}</p>	
<p>Noise contours:</p>	
 <p style="text-align: center;">L_{den}</p>	 <p style="text-align: center;">L_{night}</p>

Summary of results:

For the year 2021 no populations or buildings inside official settlement boundaries were found to be exposed to noise levels higher than the limits $L_{den}=70$ dB(A) and $L_{night}=60$ dB(A).

4. AIR QUALITY

4.1. Air quality measurements during the reference year

Have air quality measurements at the airport's surrounding area been performed during the reference year?		YES
Measurement points		
		
Measurement points	Measurement points description	
Position 1	Approximately 1 km from the runway end at the parking area of Alexandra hotel.	
Position 2	Near the airport boundary at the parking area of Moto Prekas car repair f	
Measurement period:	08.04.2021 – 26.04.2021	
Pollutants measured:	PM ₁₀ , PM _{2,5} , NO ₂ , SO ₂ , C ₆ H ₆ , O ₃	

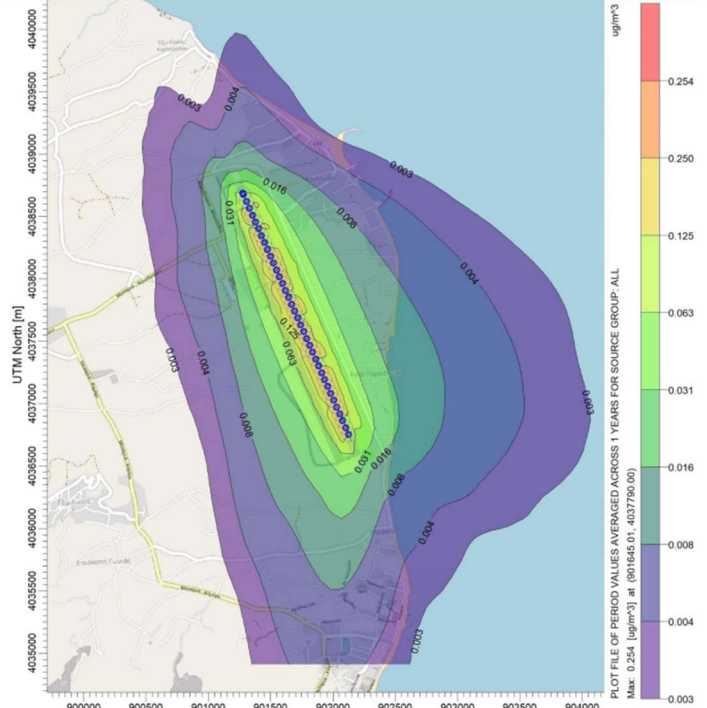
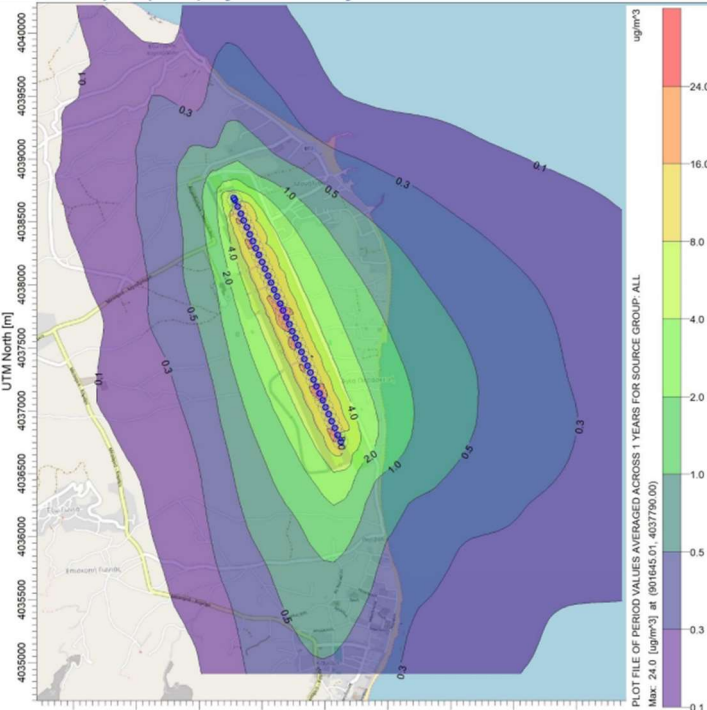
Summary of measurement results:

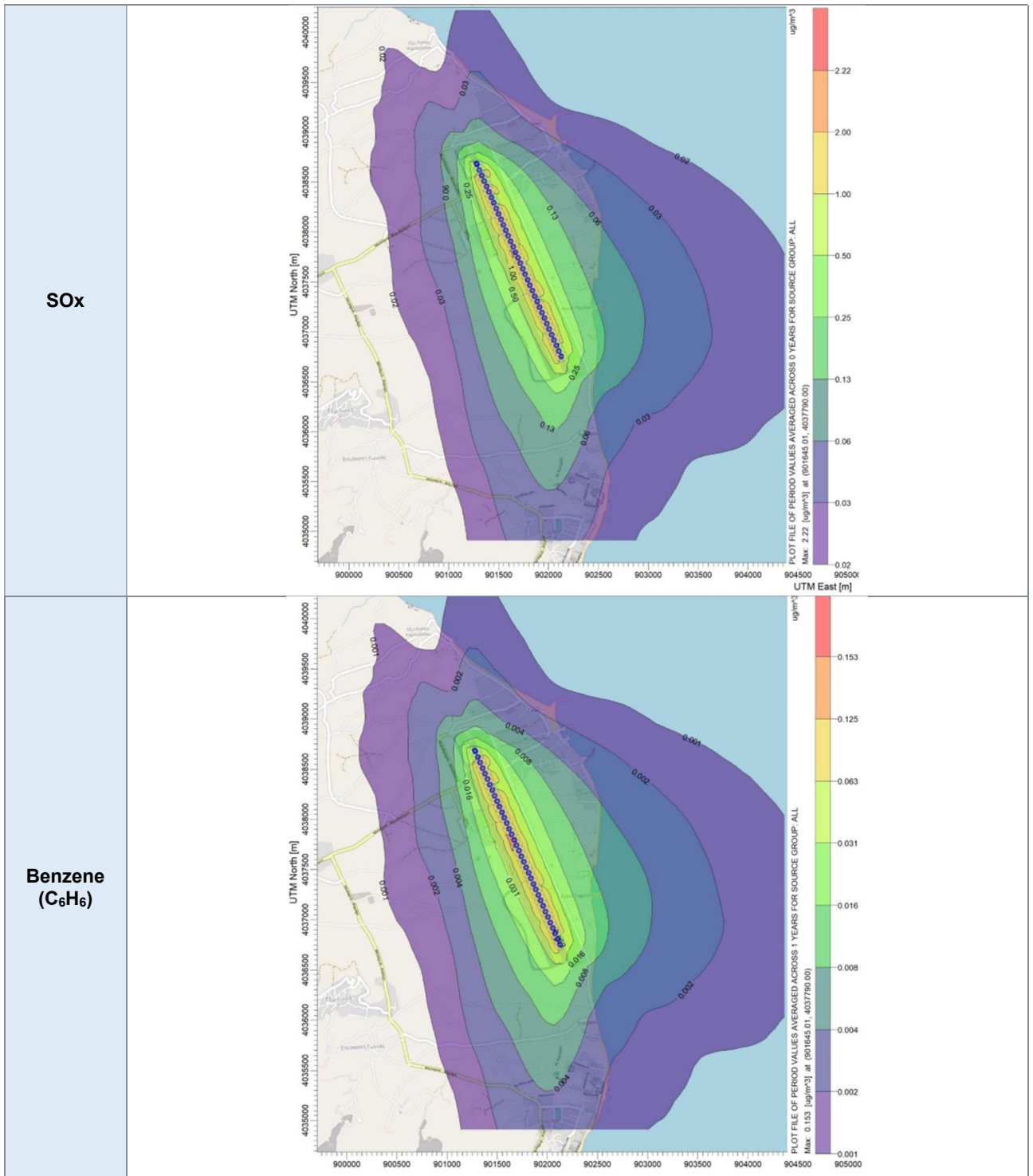
Air quality is monitored according to the airport's monitoring program.

No exceedance of the air quality limits was observed at measurement position 1. In position 2 there was a an exceedance of the quality limit for PM₁₀ (dust), which is most likely not attributed to airport operations, rather than the on-going construction works (e.g. earthworks) near the measurement point. The remaining pollutants at position 2 were within limits.

It is noted that some individual exceedances for the O₃ pollutant mean values were recorded. As a result of its dependency on the solar radiation, ozone does not show a homogenous trend during the year. Increased ozone concentrations are recorded usually at the end of spring and beginning of summer, especially during the days with high sunlight. Therefore, these momentary exceedances are considered to be individual occurrences not related to the airport's operation.

4.2. Air pollutants emission and dispersion modelling

Calculation of air pollutants concentrations based on an emission and dispersion modelling software		YES
Software used: Aviation Environmental Design Tool (AEDT) - US Federal Aviation Administration & US Environmental Protection Agency AERMOD		
Pollutants concentrations and respective contours calculation: PM ₁₀ , NO _x , SO _x , C ₆ H ₆		
PM₁₀		
NO_x		



Summary of results:

Air quality is monitored according to the airport's monitoring program.
 No exceedance of the air quality limits was observed.

5. WASTE MANAGEMENT

Waste	Collection	Management/Disposal
Recyclables (paper, plastic, metals, glass)	Separate collection by the Municipality of Thira	Disposal at material recovery facility or transshipment for recycling
Residues (Mixed Waste) and Bulky Waste	Collection by the Municipality of Thira (landside) and licensed private company (airside)	Disposal in Santorini landfill

Notes:

1. Regarding the different categories of the MSW (recyclables, mixed waste, bulky waste), the Airport Users handle their waste together with Fraport Greece B (central management).
2. Regarding the "alternative management" waste categories (Waste lubricant oil WLO, WEEE, etc.):
 - i. Waste Lubricant Oil (WLO): Collection and management by authorized collector "CYTOP S.A."
 - ii. Waste Electrical & Electronic Equipment (WEEE): Collection and management by alternative management system "Appliances Recycling S.A."
 - iii. Accumulators: Collection and management by alternative management system "Re-Battery S.A."
 - iv. Small batteries: Collection and management by alternative management system "AFIS S.A."
 - v. Used tires: Collection and management by alternative management system "ECOELASTIKA S.A."
3. The total quantities of the hazardous waste further to the above-mentioned and produced at the airport, are managed by licensed private companies which have a contract with Fraport Greece B, according to the provisions of the legislation in force.
4. The total quantities of the produced waste by category resulting from all activities of the airport, the collectors and final recipients, are recorded by Fraport Greece B and submitted in the Electronic Waste Registry of the Ministry for Environment and Energy via the Annual Waste Producer Report according to the provisions of the legislation in force.

6. ECOSYSTEM AROUND THE AIRPORT

6.1. Flora-Fauna

Flora	
Are there protected zones of vegetation/habitats in the broader airport area?	NO
<i>(if YES)</i> Short description:	
Fauna	
Are there protected species of fauna/birds in the broader airport area?	YES
<i>(if YES)</i> Short description: The protected bird species that have been observed at Santorini airport since April 2017 are presented below:	
<p><i>Collared pratincole (Glareola pratincola), Eurasian spoonbill (Platalea leucorodia), Eurasian stone-curlew (Burhinus oedicephalus), Eurasian skylark (Alauda arvensis), European turtle-dove (Streptopelia turtur), Great egret (Casmerodius albus), Long-legged buzzard (Buteo rufinus), Marsh harrier (Circus aeruginosus), Montagu's harrier (Circus pygargus), Pallid harrier (Circus macrourus), White stork (Ciconia ciconia)</i></p>	

6.2. Ecologically fragile areas

The airport is located outside the limits of the protected areas included in the National Protected Areas Network. The NATURA 2000 network area that is closest to the airport is the area called "Santorini: New and Old Kameni – Profitis Ilias" (GR4220003) at a horizontal distance of approximately 1km to the south of the airport.

7. WILDLIFE HAZARD MANAGEMENT

Wildlife strikes and wildlife hazard management measures	
Wildlife species that suffered a strike	Strikes (%)
Common kestrel (<i>Falco tinnincolus</i>)	43%
Pigeon (<i>Columba livia</i>)	14%
Yellow-legged gull (<i>Larus michahellis</i>)	14%
Barn swallow (<i>Hirundo rustica</i>)	7%
Common house martin (<i>Delichon urbicum</i>)	7%
Crested lark (<i>Galerida cristata</i>)	7%
Golden plover (<i>Pluvialis apricaria</i>)	7%
Wildlife strike risk mitigation measures:	
<ul style="list-style-type: none"> • Inspections of the manoeuvring area for wildlife monitoring and control at regular intervals • Drainage ditches are regularly monitored and when necessary cleaned, to ensure efficient water run-off and, thus, reducing the attractiveness of the airside to the wildlife • Regular grass cutting at the airside. Santorini airport is equipped with lawn mower • Fence maintenance • Systematic monitoring of bird species populations and their habitat on and off-airport (at a distance of 13km from the airport) • Holding of the wildlife strike committee meeting, to raise awareness across the airport users and local authorities about the risk of the wildlife strikes on aircraft and the measures applied to mitigate such a risk 	
Reference year summary results:	
<p>Hellenic Civil Aviation Authority (Safety and occurrence management division) receives annual reports referring to the risk assessment of the wildlife hazard as well as to the wildlife hazard management at the 12 regional airports operating by Fraport Greece. Aktion Airport and Chania Airport “Ioannis Daskalogiannis” are excluded, in accordance with the Concession Agreement, Annex 20, paragraph 6.3.3 & 6.3.4.</p>	

8. CULTURAL HERITAGE

Have new cultural heritage properties been discovered during the reporting period?	NO
<i>(if YES)</i> Details provided in the table below:	

Location	Date of discovery	Type of discovery	Additional protection measures taken

9. RESOURCES CONSUMPTION

9.1. Energy consumption

Energy consumption (monthly electric energy consumption, in Kwh)	
Total annual electric energy consumption (in Kwh)	2.822.430

9.2. Fuel consumption

Fuel consumption		
Number of FG vehicles at the airport	6	
Number of firefighting vehicles at the airport	4	
Total annual fuel consumption	Diesel (lt)	12.516,48
	Unleaded gasoline (lt)	19.526

9.3. Heating oil or natural gas consumption

Heating oil or natural gas consumption	
Total annual heating oil consumption (lt)	-*
Total annual heating natural gas consumption (m ³)	N/A

*Heating and air conditioning is performed via heat pumps

9.4. Fuel consumption for generator

Fuel consumption	
Total annual consumption (lt)	3.176

9.5. Water consumption

Water consumption	
Total annual consumption (m ³)	14.808

10. GREENHOUSE GAS EMISSIONS & CARBON FOOTPRINT

Greenhouse gas emissions that were included in the carbon footprint calculation are the CO₂ emissions included in scope 1 & 2 of the GHG protocol:

- Scope 1: Direct GHG emissions that occur from sources that are owned and/or controlled by the airport,
- Scope 2: Indirect GHG emissions from the generation of purchased electricity, steam, heat or cooling consumed by the airport.

Source Flows	Total CO ₂ Emissions (t)
	2021
Direct emissions form heating fuel (scope 1)	0,0
Direct emissions from fuel used for fleet vehicles (scope 1)	72,7
Direct emissions from fuel used for firefighting vehicles (scope 1)	9,6
Direct emissions from fuel used for generators (scope 1)	8,5
Indirect emissions from refrigerants (scope 1)	0,0
Indirect emissions from electricity consumption (scope 2)	1.701,1
Total (t)	1.791,9
Kg CO₂ /passenger	1,16

Notes:

Fraport Greece B is committed to the monitoring, management and reduction of its airports carbon footprint. In order for this target to be achieved:

- Direct and indirect carbon emissions from all the emission sources in the airports' boundaries are calculated and reported, based on the GHG Protocol (scope 1 & 2)
- The airport was certified during the reference year according to ISO 14064 regarding greenhouse gas emission by an independent certification body

11. HUMAN COMSUMPTION WATER MONITORING PROGRAM

Human consumption water quality	
Water supply (public water network or airport's boreholes)	Airport boreholes
Is sampling of the airport's water network performed?	YES
(if YES) Sampling frequency:	Quarterly
<p>Summary of results: The results of the chemical analyses show that the water supplied from the boreholes of the airport is not potable due to the existence of high concentrations of Sodium and Chlorine (brackish water) and Arsenic (due to volcanic rocks). The rest of the results of the microbiological and chemical analyses show that the parameters analysed as regards the airport's water network are within the legislative limits defined by the Ministerial Decision Γ1 (δ)/ΓΠ οικ. 67322/ GG 3282 B/19-9-2017 regarding the quality of human consumption water.</p>	

12. RAINWATER

RAINWATER (collection, treatment disposal and recipient)		
Area	Collection/treatment/disposal	[YES/NO]
Apron and manoeuvring area	Collected in drainage ditches leading to the sea	YES
Other runoffs (runway etc.)	Collected in drainage ditches leading to the sea	YES
Treatment of rainwater by oil-separator		YES

Rainwater quality	
Is sampling of the airport's rainwater performed?	YES
(if YES) Sampling frequency:	Yearly
Parameters analyzed: pH, conductivity, TSS, DO, NO ₃ , NO ₂ , Oil & grease, BOD, COD, Total Petroleum Hydrocarbons (TPH), PAHs, BTEX, Heavy metals, PCBs, Detergents	
Summary of results:	
Surface rainwater quality is monitored according to the airport's monitoring program. Due to the absence of designated recipients and relevant national quality limits for surface rainwater, the Environmental Health & Safety Guidelines of the International Finance Corporation (IFC) are adopted. According to FG's analyses results and based on the abovementioned specifications, the airport's rainwater environmental condition is adequate and no further treatment measure is necessary, with the exception of two points where TSS exceedances occurred which is probably due to the fact that the trenches are not lined and that due to the wind the volcanic materials are highly dispersed.	

13. GROUNDWATER AND/OR SOIL AND/OR SOIL GAS MONITORING

Groundwater and/or soil and/or soil gas quality	
Is sampling of the airport's groundwater and/or soil and/or soil gas performed?	YES
<i>(if YES)</i> Sampling frequency:	According to the Environmental Terms
Parameters analyzed: Volatile hydrocarbons, aliphatic, aromatic and chlorinated (soil gas)	
Summary of results:	
<p>Groundwater quality is monitored according to the airport's monitoring program. The results of the analyses from the airport's boreholes indicate that no pollution is present. Due to the high depth of the aquifer it was not possible to take water samples from the fuel handler's monitoring boreholes. According to the fuel handler's environmental monitoring reports and based on the limits set in various European countries in the absence of legislative EU limits and relevant national specifications/limits, the environmental condition of soil-gas is adequate and no remediation measures are necessary. Regarding soil gas the Directive of the Munich Environmental Protection Department in force by 10.02.1998, which is the most widely accepted, is adopted as a basis for comparison</p>	

14. SEWAGE TREATMENT AND DISPOSAL

Sewage	
Sewage network to the municipal waste water treatment plant (WWTP)	YES
Autonomous airport's waste water treatment plant (WWTP)	NO

Blue water
Collection and disposal: Collection in watertight tank and disposal to the municipal sewage network.

Waste water treatment plant description (where applicable) <i>Description of characteristics and condition of the airport's WWTP including possible problems. Type and frequency of the effluent quality measurements.</i>	
Degree of treatment of airport's WWTP	N/A
Treatment method	N/A
Disposal of treated wastewater	N/A
Sludge disposal	N/A
Sampling frequency of WWTP effluent	N/A
Parameters analyzed	N/A
Summary of quality of WWTP effluent	N/A