CARBON FOOTPRINT MANUAL - 2021

FRANJO TUĐMAN AIRPORT ZAGREB

airport carbon accredited
REDUCTION

LEED SILVER

SILVER

ISO 9001 - ISO 14001
BUREAU VERITAS
Certification

HRVATSKI SAVJET ZA ZELENU GRADNJU
CROATIA GREEN BUILDING COUNCIL

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PURPOSE OF THE DOCUMENT	Report in support of the International Zagreb Airport Level 3 application to the Airport Council International Airport Carbon Accreditation Scheme.
SCOPE OF APPLICATION	Zagreb International Airport

REFERENCE(S)		
	Manuals	➢ Airport Carbon Accreditation Application Manual Issue 12, November 2020
		➢ Airport Air Quality Manual, ICAO Doc 9889
		➢ The Stakeholder Engagement Manual Volume 2: The Practitioner's Handbook on Stakeholder Engagement
		➢ CC-IMS-MAN-10-1-ENG-Stakeholder Engagement Plan
	Procedures	➢ CC-IMS-PR-02-0 Internal Audit Management Procedure
	Forms	➢ CC-IMS-FO-04-1-Quality department Audit Plan.
	Records	➢ Airport carbon accreditation programme guidance – addendum: COVID-19 RESPONSE (6TH MAY 2020)
		➢ ACI Europe Resolution – European airports committing to net zero carbon emissions by 2050
		➢ MZLZ ACI ACA Calculation table
		➢ European Residual Mixes 2019

CONTENT OF THE DOCUMENT

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1. Definitions

TERM	DESCRIPTION
Aircraft Main engine	Main engines of aircraft within a specified operating perimeter (from start-up to shutdown)
Auxiliary power unit	A self-contained power unit on an aircraft providing electrical/pneumatic power to aircraft systems during ground operations
Ground support equipment	GSE necessary to handle the aircraft during the turnaround at the stand: ground power units, air climate units, aircraft tugs, conveyer belts, passenger stairs, forklifts, tractors, cargo loaders, etc.
Airside traffic	Service vehicle and machinery traffic (sweepers, trucks (catering, fuel, sewage) cars, vans, buses, etc.) within the airport perimeter fence (usually restricted area) that circulate on service roads.
Aircraft refueling	Evaporation through aircraft fuel tanks (vents) and from fuel trucks or pipeline systems during fueling operations.
Aircraft de-icing	Application of de-icing and anti-icing substances to aircraft during winter operations.
Power/heat generating plant	Facilities that produce energy for the airport's infrastructure: boiler house, heating/cooling plants, co-generators
Emergency power generator	Diesel generators for emergency operations (e.g. for buildings or for runway lights).
Aircraft maintenance	All activities and facilities for the maintenance of aircraft, i.e. washing, cleaning, paint shop, engine test beds.
Airport maintenance	All activities for the maintenance of airport facilities (cleaning agents, building maintenance, repairs, Greenland maintenance) and machinery (vehicle maintenance, paint shop).
Fuel	Storage, distribution and handling of fuel in fuel farms and vehicle fuel stations.
Construction activities	All construction activities associated with airport operation and development.
Fire training	Activities for fire training with different types of fuel (kerosene, butane, propane, wood).
Surface de-icing	Emissions of de-icing and anti-icing substance applied to aircraft moving areas and service and access roads.
Vehicle traffic	Motor bikes, cars, vans, trucks, buses and motor coaches associated with the airport on access roads, curb sides, drive-ups, and on-or off-site parking lots (including engine turn-off, start up and fuel tank evaporative emissions).
Aircraft main engines	Generally classified as turbojet, turboprop and piston engines
Time in mode (TIM)	The time period, usually measured in minutes, that the aircraft engines actually spend at an identified power setting, typically pertaining the one of the LTO operating modes of the operational flight cycle.
LTO cycle	ICAO has defined a specific reference LTO cycle below a height of 915 m (3000 ft).
TMA Efficiency	Terminal Control Area – a control area normally established at the confluence of ATS routes in the vicinity of one aerodrome.

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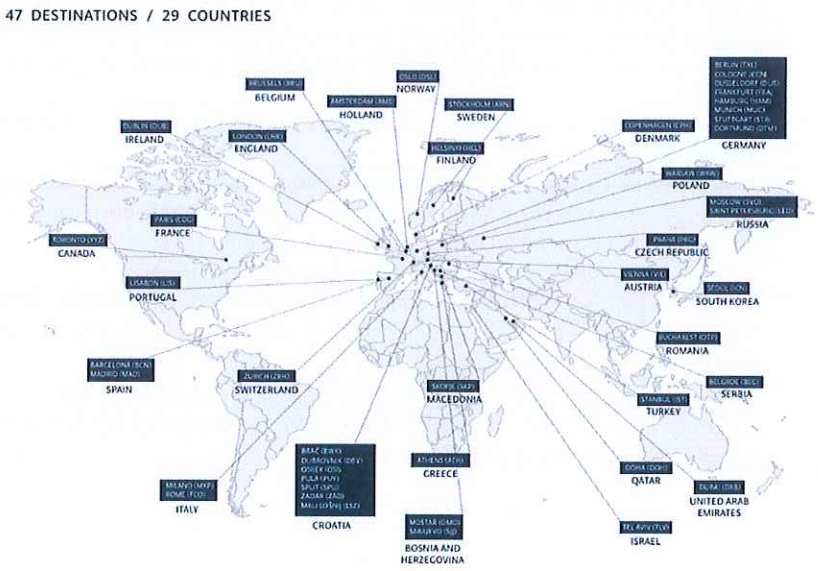
2. General Information about airport

International Zagreb Airport is the main international airport of Croatia and the base of the Croatian Air Force. Located 10 km South of Zagreb, in 2019:

- it served 3 435 531 passengers;
- MTOW 1 148 596;
- Number of flights: 45 061;
- Cargo: 12 684.

Airlines operating during 2019 are:

Croatia Airlines, Lufthansa, Austrian Airlines, Eurowings Luftverkehrs, Qatar Airways, Turkish Airlines, LOT-Polskie Linie Lotnicze, Air Serbia, Air France, British Airways, K.L.M. Royal Dutch Airlines, Trade Air, Aeroflot, Emirates, Brussels Airlines, CSA Czech Airlines, Iberia, Swiss Intl Air Lines s.a., Aegean Airlines, EL AL Israel Airlines Ltd, Air Canada, Norwegian Air International, Vueling Airlines s.a., Korean Air, Air Transat, Flydubai, Silver Air, Swift Air.



It is the hub for the Croatian flag carrier Croatia Airlines.

In order to facilitate a substantive upgrade of the airport facilities at International Zagreb Airport, the Croatian Government initiated a new passenger terminal facility development project, for which a tender procedure, based on a Public Private Partnership, was implemented in February 2011.

The 30-year concession for the operation and maintenance of the current and future facilities and the construction of the New Passenger

1962 – Zagreb airport opens at Pleso a 2,500 m long runway, a1,000 m2 terminal and a 5,000 m2 apron.
1966 – Zagreb Airport gets a modern 5,000 m2 passenger terminal
1974 – The runway was extended to its current 3,252 m and the terminal expanded to 12,000 m2.
2004 – The airport installed a CAT-IIIb instrument landing system (ILS).
2008 – A VIP Terminal was added with extra amenities, restaurants and bars. The terminal was expanded to 15,500 m2.
2010 – A 3rd Floor Viewing platform and a bar were added in the Terminal.
2013 – The Terminal was expanded to 22,500 m2 to an increased capacity of 3.5 million passengers.
2017 - 21st March 2017 – official opening of the New Passenger Terminal.
28th March 2017 – New Passenger Terminal started with operations.

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Terminal was granted in 2012 to Međunarodna Zračna Luka Zagreb Jsc ("MZLZ"), a Croatian company whose main partners are Aéroports de Paris Management S.A, Bouygues Bâtiment International S.A., Marguerite, IFC, TAV and Viadukt d.d.

The handover of the airport between the previous Operator, Zračna Luka Zagreb (ZLZ) and the new Concessionaire, MZLZ, occurred on 5th December 2013.

Like its shareholders, MZLZ is fully committed in safety, security, customers' satisfaction and carbon footprint optimisation as part of the sustainable development.

FACTS & FIGURES:

5.000.000 Capacity of the passenger terminal
65.000 m² Passenger Terminal
2.000 m² Commercial area
1.100 Parking spaces
8 Passenger boarding bridges
34 Check-in counters
23 Passport control counters
3 km Baggage belts – modern automatic baggage handling system
10 Restaurants and bars
8 Shops

The impact of COVID-19 has caused unprecedented disruption in the global aviation sector. The airport industry's commitment to addressing carbon and climate issues remains an absolute priority. Airport Carbon Accreditation remains the only voluntary global carbon management standard for airports.

Last certificate issued in year 11 (Jun 2019 - Jun 2020) the expiry date was extended by one year.

It has been 8 years since International Zagreb Airport became accredited to Airport Council International's (ACI) Airport Carbon Accreditation (ACA), initially at Level 2 in 2013. International Zagreb Airport intend to submit an application to the Level 3 Optimisation in June 2021. This progression demonstrates remarkable progress. The requirements of Level 3 include:

- Fulfil all the requirements of Levels 1 and 2
- Expansion of the scope of the carbon footprint to include specific Scope 3 emission sources. Emission sources required to be included within the scope of the footprint for participation at Level 3 are:
  - The LTO cycle and all ground running operations including auxiliary power units (APU), fixed ground power and ground service equipment.
  - Surface (passenger and airport company staff) access
  - Airport company staff business travel
  - Other significant CO2 emission sources
  - Submission of a verified carbon footprint including Scope 3 emission sources.
- Evidence of activities to engage stakeholders.

Emissions data from 2020 is to be excluded from airports' carbon footprints.

3. The International Zagreb Airport Inventory Boundary

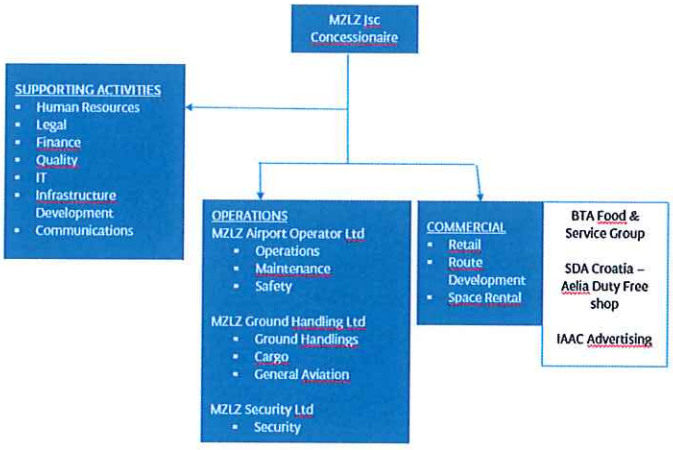
Inventory Boundary constitute of organizational and operational boundaries. These boundaries are required to properly account for and report emissions.

3.1 International Zagreb Airport Organizational Boundary

International Zagreb Airport Jsc. is a concessionaire of Zagreb – Franjo Tuđman Airport. The concession includes: financing, the design and construction of the new airport. Operating the entire airport for close to 30 years, including the runway, passenger terminal, cargo terminal, parking lots and future property developments.
Organizational Boundary is divided to 4 companies:

1. **MZLZ Jsc: Supporting activities:** Human Resources, Legal, Finance, Quality, IT, Infrastructure Development, Communications and Commercial activities: Retail, Route Development, Space Rental
2. **MZLZ Airport Operator Ltd.**: Operations, Maintenance, Safety
3. **MZLZ Ground Handling Ltd.**: Ground handling, Cargo, General Aviation
4. **MZLZ Security Ltd.**: Security

Commercial activities such as catering, duty free shop and advertising are under **external companies**.
On 25. September 2019. MZLZ Airport Operator and MZLZ Jsc. concluded with Resalta d.o.o. Operation and maintenance contract for heat energy production concession (boiler room).



3.2 International Zagreb Airport Operational Boundary

Operational boundary defines scope of direct and indirect emissions for operations based on company's established organizational boundary.
Sources of emissions (activities/facilities) are categorized as Scope 1, 2 or 3:

Scope 1: Direct GHG emissions that occur from sources that are owned and/or controlled by the airport, for example, emissions from combustion in owned or controlled boilers, furnaces, vehicles, etc.

Scope 2: Indirect GHG emissions from the generation of purchased electricity, steam, heat or cooling consumed by the airport. Scope 2 emissions physically occur at the facility where purchased electricity is generated.

Scope 3: All other indirect emissions, which are a consequence of the activities of the airport but occur from sources not owned and/or controlled by the company (e.g., aircraft movements, etc.). Such sources can be located within or outside the airport premises (geographical boundary).

	CONTROL Facilities, services, activities and equipment for which the airport company has ownership/control.	GUIDE Facilities, services, activities, and equipment owned / controlled by subcontractors, close partners and suppliers for which the airport company can provide guidance.	INFLUENCE Facilities, services, activities and equipment owned/controlled by loose partners, tenants, customers, government agencies, etc. which the airport company can only influence.	INTERNAL DEPARTMENT OR THIRD PARTY WITH RESPONSIBILITY FOR EMISSION SOURCE	CHANGES
Scope 1 Direct Emissions					
Mobile Sources	GSE & company cars			MZLZ Airport Operator Jsc: Airside operations Department, Electronics Maintenance Department, De-icing and Snow Removal Department, RFFS - Fire Department, Construction Maintenance Department, Biological protection, Electro-energetic maintenance, Airport Activities Coordinators, -Motor cars of MZLZ-Airport Operator Ltd., Motor cars of MZLZ – Security, MZLZ - Ground Handling	N/A
Stationary sources		Boilers		Resalta Jsc.	Outsourced from 25.9. 2019.
	Refrigerant leakage			MZLZ Airport Operator Jsc:	N/A

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				Maintenance Department	
	Emergency generators			MZLZ Airport Operator Jsc: Maintenance Department	N/A
Other	Firefighting exercise - Fire suppression CO2			MZLZ Airport Operator Jsc: RFFS - Fire Department	N/A
Scope 2 Indirect emissions					
Stationary		Purchased electricity		Distribution: HEP ODS Supply: Petrol	Petrol 2019
Scope 3 Other Indirect Emissions					
Mobile Sources			Surface access emissions	Staff travel in own vehicles and with bus. Business travel of airport company staff. Passenger travel in cars and bus.	N/A
		APU and engine testing		Airlines	N/A
			LTO cycle	Airlines	N/A

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4. Carbon Management policy

MZLZ commitment to reduce CO_2 emissions ■ our dedicated Policy

As a key player in Croatia, MZLZ strives to be exemplary and ambitious in respecting the environment. The implementation of an Environmental Management System according to ISO 14001 as part of the Integrated Management System, LEED passenger building certification and commitment to achieve net zero carbon emissions by 2050 clearly demonstrates our commitment to Sustainable Development.
MZLZ's Integrated Management System policy aims to:

- systematically incorporate the environment into its activities
- make it a responsible player
- prevent
- promote our values and pass on the best practice

We take the environmental aspect into consideration in our actions and perform activities with the utmost respect for the environment.

Airport Carbon Management Strategic Plan 2019-2022

It is a goal of MZLZ, within the context of its strategic plan for the period 2019 – 2022, to become a benchmark in Europe for customer satisfaction, economic performance and sustainable development.
For this to happen, we set ourselves the ambitious target of reducing the internal CO_2 emissions with, at the same time, improving the level in quality of service and taking into account the growth in airport capacity.
Our 7-year plan includes:

- Electricity consumption reduction: lighting replacement from halogen to LED, installation of RWY guard lights, reconstruction of LV switchgear in TS-2, replacement of approach lights 22, reconstruction of flashers, replacement of RWY edge lights.
- Gas and oil consumption reduction: reconstruction of old boiler room and heat substations, replacement of old chillers, replacement of old hot water pipelines with pre insulated pipes, water consumption reduction through investment in pipeline/valves replacement and better consumption control through investments in additional water meters, investing in existing facilities improving building physics (doors, windows, façade insulation).
- Renewable energy: hot water production using sun collectors.
- Control of electricity, water, gas, oil consumption: improvement of HVAC management through management and control of BMS system.
- Implementation of the lifecycle plan: replacement of old equipment (winter service equipment, buses, firefighting vehicles).
- Training: employee/stakeholders' education and informing (through presentations/leaflets) in order to highlight importance of energy efficiency.

Our target is to reduce the Passenger Terminal CO_2 emissions by 15% between 2019 and 2022

■ Policy on energy

Background and stakes involved

As an employer, planner, and manager of infrastructures, MZLZ impacts the environment of its various sites. The business is committed to combating climate change and limiting the effects of its activities, especially in terms of greenhouse gas emissions.
In energy terms, MZLZ aims to bring consumption under control and to go-on experiencing the implementation of renewable energies facilities, all the while taking into the account the comfort and satisfaction of our customers.

The company's actions will be organized within a specific management system.
MZLZ coordinates the actions to be undertaken and annually updates the commitments it has made.

Commitments

In line with its Integrated Management System's policy and in order to limit its impact on the environment, MZLZ commits to:

1. Reduce the Passenger Terminal CO_2 emissions by 15% between 2019 and 2022
2. Reduce energy consumption by 20% (electricity, heating and cooling) per m^2 of the Terminal building between 2019 and 2022
3. Carry on with the use of solar panels
4. Offer tools for increasing employee awareness in order to modify behavior

■ Policy on transportation & air quality

Background and stakes involved

Airport activities and air traffic emit greenhouse gases and local pollutants. For the airport manager, internal emissions are linked in large part to energy consumption and vehicles. The main indirect emissions are linked to air traffic and airport access routes.

Commitments

In line with its Integrated Management System's policy and in order to limit its impact on the environment, MZLZ commits to:

1. Monitoring: implement regular Air Quality monitoring
2. Employee transportation: use soft mode of transport for employee and implement video-conferencing
3. Facilitating the reduction of aircraft emissions on the ground: contribute to limiting the use of APUs and GPUs through the provision of 400htz units on each Passenger Boarding bridge of the New Passenger Terminal
4. Reduce the ground vehicles emission: implement the vehicle lifecycle plan
5. Reporting: annually quantify our emissions of CO_2 and greenhouse gases
6. Managing: upgrade to level 3 certification under the *Airport Carbon Accreditation* scheme

5. Carbon management programmes – Action plan

International Zagreb airport has developed a Carbon Management Plan with purpose to demonstrate the meaningful efforts by the airport to reduce its emissions in line with the set target and policy statement. Plan covers Scope 1 and 2 emissions as they have been defined in the carbon footprint. This Plan will be updated at least every three years.

Action Plan (2019 – 2022)							
No	Type	Action	Location	In charge	Resources	Status	Annual CO2 reduction (tones)
INTERNAL EMISSIONS							
ELECTRICITY							
1	Lighting – Energy Saving	Lighting replacement from halogen to LED	Cargo Building	Maintenance Procurement	2019 - 57.0 kEUR	Done in 2019.	12.9
2	Lighting – Energy Saving	Reconstruction of RWY approach lights 22 (LED)	Airside	Maintenance Procurement	2020 – 70.0 kEUR 2021 – 800.0 kEUR	Plan was to do works on runway thresholds and ends in 2020 (70 kEUR). Planned investment in 2021 is 800 kEUR. (in 5years capex plan approved).	1.6
3	Lighting – Energy Saving	Reconstruction of Low voltage in TS2	Airside	Maintenance Procurement	2019 – 530 kEUR	Done in 2019.	2.58
4	Energy Saving	Photovoltaic plant installation on Passenger terminal car park (ESCO model)	Landside	Maintenance Procurement	2022 – 6,000.00 kEUR	Negotiation ongoing ESCO model 6.000 kEUR Installed power 3,6 MW. Possible realization 2022 or 2023.	543.9
5	Energy Saving	Offices refurbishment in Board building includes replacement of old fluo lights with LED (OPEX)	Landside	Maintenance Procurement	2019 – 20.0 kEUR	Around 56 offices was refurbished. Average light power before refurbishment was 216W (6x36W). With new LED panel average power is 80W per office with better illumination.	1.4

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HEAT ENERGY, WATER, GAS, OIL CONSUMPTION REDUCTION							
6	Energy Saving	New passenger terminal boiler room flue gas waste heat recovery system	Landside	Maintenance	N/A	Done in 2017.	40.5
7	Energy Saving	Reconstruction of thermal plant (ESCO model)	Landside	Maintenance	2019 - 1000 kEUR	Done in 2019.	241.2
8	Energy Saving	Renewal of hot water pipelines-OPEX	Landside Airside	Maintenance	2019 – 164.0 kEUR 2020 – 67.0 kEUR 2021 . 150.0 kEUR 2022 – 175.0 kEUR	2017 - 225 meters-completed 2019- 550 meters-completed 2020 -200 meters-planned 2021 -470 meters-planned 2022 -500 meters-planned	9.0
9	Energy Saving	Reconstruction and modernization of heating/cooling substation in Administrative building	Landside	Maintenance	2021 – 150.0 kEUR	Detailed project completed. Tender completed.	12.2
RENEWABLE ENERGY							
10	Energy Saving	Hot water production using sun collectors	Landside Airside	Maintenance	Existing facilities, calculation time for maintenance department	On-going	N/A
CONTROL OF ELECTRICITY, WATER, GAS, OIL CONSUMPTION							
11	Energy Saving	Improvement of HVAC management through management and control of BMS system	Landside Airside	Maintenance	Regular maintenance of the system	On-going	N/A
VEHICLES							
12	Implementation of the lifecycle plan	Replacement of old equipment (winter service eqpt., buses, firefighting vehicles)	Landside Airside	Operations	Winter service vehicles – sweepers 930.000 Eur	N/A	N/A
TRAINING							
13	Educational campaigns	Employee/stakeholders education and informing (through presentation/leaflets etc.) in order to highlight importance of energy efficiency and CO2 reduction.	Landside	Quality	Quality department time	On-going through all year	N/A

6. Details on the responsibilities regarding the carbon footprint process

The Board of Directors is responsible for the climate change matters and related decisions.
This field of activity is fully included in MZLZ's Integrated Management System.
The IMS includes:

- ISO 9001, ISO 14001, ISO 10002
- Airport Carbon Accreditation Program of ACI
- EASA and national regulations related to the Aeronautical Safety
- Airport related Security regulations

The IMS is composed of the two companies of the Group, MZLZ Concessionaire and MZLZ – Airport Operator, that manage and operate the full scope and boundaries of the airport.

The Quality (IMS) Manager, as the Management Representative, reports to the Board and accompany the company's employees in the implementation of the System and more particularly of the Carbon Emission Reduction project.

The Airport Operator, and more specifically its Maintenance Director, is in charge of the energy management activities (power supply, electricity production, lighting and monitoring). Development manager is in charge for development of airport infrastructure and related projects.

The Quality (IMS) Department is in charge of coordinating the Carbon Emission Reduction project activities and training the companies' staff.

All needed documentation is accessible on the Intranet.

7. Results

7.1 Emissions target setting and selection of base year

Baseline year is 2019. International Zagreb Airport has set a challenging and realistic target for emission in **absolute terms** demonstrate annual improvement in Scope 1 and 2 emissions against a three-year rolling average. For scope 3 it's also used absolute terms. It's visible in MZLZ ACI ACA Calculation table.

7.2 Data used for calculating the carbon footprint

As a part of carbon footprint calculation methodology, International Zagreb Airport used following data for calculation of the carbon footprint:

- Energy consumption data
- Fuel consumption data
- kWh of electricity produced
- LTO cycle information
- Flight information (e.g. aircraft type, flight distance)
- Other data (private vehicles, public transportation, surface access, travel, de-icing, APUs)

7.3 Procedure for the collection, documentation and processing emissions data

Source	Company / Department	Source of emission data	Collected by:
Boilers	Resalta Jsc.	External certified company – report on stationary gases.	Quality Department
Emergency generators	MZLZ Airport Operator Ltd.: Electronic department	Report on - side measurement	
Firefighting exercise	MZLZ Airport Operator Ltd.: RFF Department	Report on quantities	
GSE & company cars	MZLZ Ground Handling MZLZ Airport Operator Ltd MZLZ Security MZLZ Jsc.	Report on fuel quantities	
Refrigerant leakage	MZLZ Airport Operator Ltd.: Maintenance division	Report on refrigerant leakage	
Electricity purchases	Airport Operator Ltd.: Maintenance division	Monthly maintenance report	
LTO cycle	Quality department	Source: © 2021 EMS Bruel & Kjaer – Airport Noise Monitoring and Management – ANOMS	
APU and engine testing	Quality department	Business development department	
Surface access emissions	MZLZ Jsc.; HR department	surface access - staff; 2019_Transport_Tool_v2_6 surface access - passenger; 2019_Transport_Tool_v2_6	
Airport company staff business travel	MZLZ Jsc.; Finance department	2019_Transport_Tool_v2_6	

7.4 Emission factors, formulas and their justification

For scope 1 and 2 International Zagreb Airport calculated market based and location-based carbon footprint. For market based International Zagreb Airport used country residual mix published in European Residual Mixes 2019.

For location based International Zagreb Airport used GHG protocol 2019 Purchased_Electricity_Tool_Version_4_9_0.

International Zagreb Airport submitted carbon footprint data using the worksheets provided by the GHG Protocol.

7.5 Adjustments for new assets or asset divestment

International Zagreb Airport had one terminal (T1) for many years. For 2019 the calculation of the three-year rolling average for T1 has emissions data for 2018, 2017 and 2016. The same is true for the calculations for 2015, 2014 and 2013.
In March 2017 it opens terminal 2 (T2), while T1 remains open. In 2017 it has emissions from T1 and partially from T2. Therefore for 2017, when demonstrating improvements, International Zagreb Airport reports T1 emissions versus the three-year rolling average for T1 only (2016, 2015 and 2014). For 2018 again compares the emissions of T1 versus the average performance of T1 only (2017, 2016, 2015) because it has no full historical data for T2.

However, for its footprint in 2019, International Zagreb Airport includes the emissions associated with T1 and T2 as two full years of comparable data is available. In order to adjust for investment in new assets, International Zagreb Airport used Method B as following:

- For 2019 compare the performance of T1 and T2 versus the sum of the three-year-rolling average of T1 emissions in 2018, 2017 and 2016 and T2 emissions in 2018.
- For 2021 (as 2020 is excluded) International Zagreb Airport will compare the performance of T1 and T2 versus the sum of the three-year-rolling average of T1 emissions in 2019, 2018 and 2017, and the rolling average of T2 emissions in 2019 and 2018.
- From 2022 International Zagreb Airport will be able to compare its performance of T1 and T2 versus the full three-year-rolling average for both assets (2018, 2019, 2021). According to ACI ACA Manual Issue 12, under the Chapter 6.2.3 Adjusting the three-year rolling average for investment or divestment, 6.2.3.3 Example of Adjustment with New Assets: There is no need to separate the calculations of the average historical emissions for both assets anymore.

7.6 Quality control procedure (audits, comparisons, recalculations)

To establish systematic method of reviewing and assessing the performance of the IMS and ACI ACA requirements and to check its efficiency International Zagreb Airport has Internal Management Procedure, Ref: CC-IMS-PR-02-0. and yearly Audit Plan. Internal audit is at least once a year.

7.7 Graphic Data presentation

Table 1: Location based method B (Scope 1 and Scope 2) and Scope 3

scope	source	t CO2							
		2013	2014	2015	2016 T1	2017 T1	2018 T1	2019 T1+T2	2018 T2
SCOPE 1	boilers	2,786.80	3,122.12	2,440.24	2,740.10	1,695.43	2,222.05	2,753.28	529.01
	emergency generators	0.57	3.10	0.36	1.97	0.12	2.91	5.25	0.00
	firefighting exercise	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	GSE & company cars	1,192.08	1,095.71	1,139.28	1,167.96	1,285.89	1,035.36	1,181.99	0.00
	refrigerant leakage	15.39	63.45	15.48	0.00	0.00	0.00	0.00	0.00
SCOPE 2	electricity purchases	2,590.87	2,669.00	3,014.60	2,648.86	1,695.43	1,499.65	5,027.33	3,536.12
SCOPE 3	LTO cycle					52,127.40	55,662.30	56,075.70	55,662.30
	APU and engine testing					5,106.84	5,415.35	6,691.55	5,415.35
	surface access emissions					8,950.07	8,344.03	9,801.11	8,344.03
	airport company staff business travel					4.19	3.36	18.51	3.36
total (scope 1 + scope 2)		6,585.70	6,953.38	6,609.96	6,558.88	4,676.86	4,759.98	8,967.85	4,065.13
3 - year average (scope 1 + scope 2):		2011-2013	2012-2014	2013-2015	2014-2016	2015-2017	2016-2018	2016-2018 + 2018 T2	
				6,716.34	6,707.41	5,948.57	5,331.91	9,397.04	
year vs 3 - year av. (scope 1 + scope 2)					-2.34%	-30.27%	-19.98%	-4.57%	
total (scope 1 + scope 2 + scope 3)						70,865.37	74,185.03	81,554.72	

Table 1 shows International Zagreb Airport carbon footprint from each year in period 2013.-2019 in tones of CO2. For calculation of CO2 emissions for Scope 1 and Scope 2, location based approach is used. Carbon footprint is also shown in Graph 1. The reduction in CO2 emissions in 2019. compared to arithmetic mean emissions from last three years (2016.-2018.) is 4,57%.

Graph 1: Location based method B (Scope 1 and Scope 2) - Total Carbon footprint

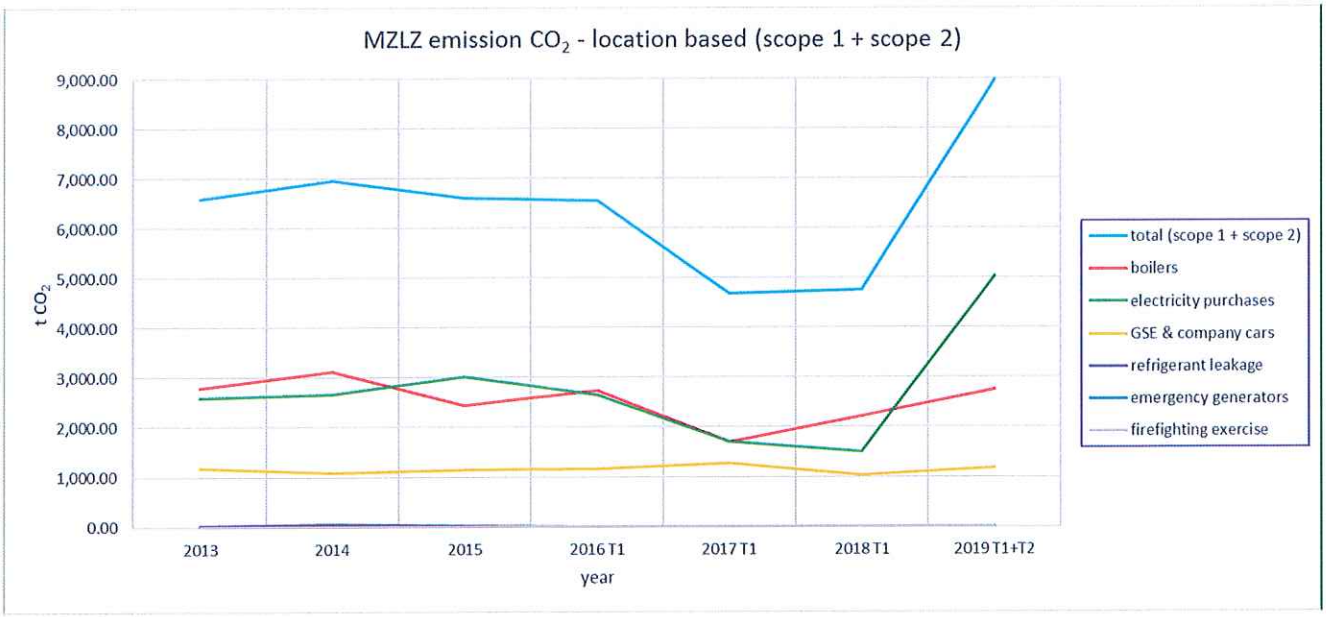

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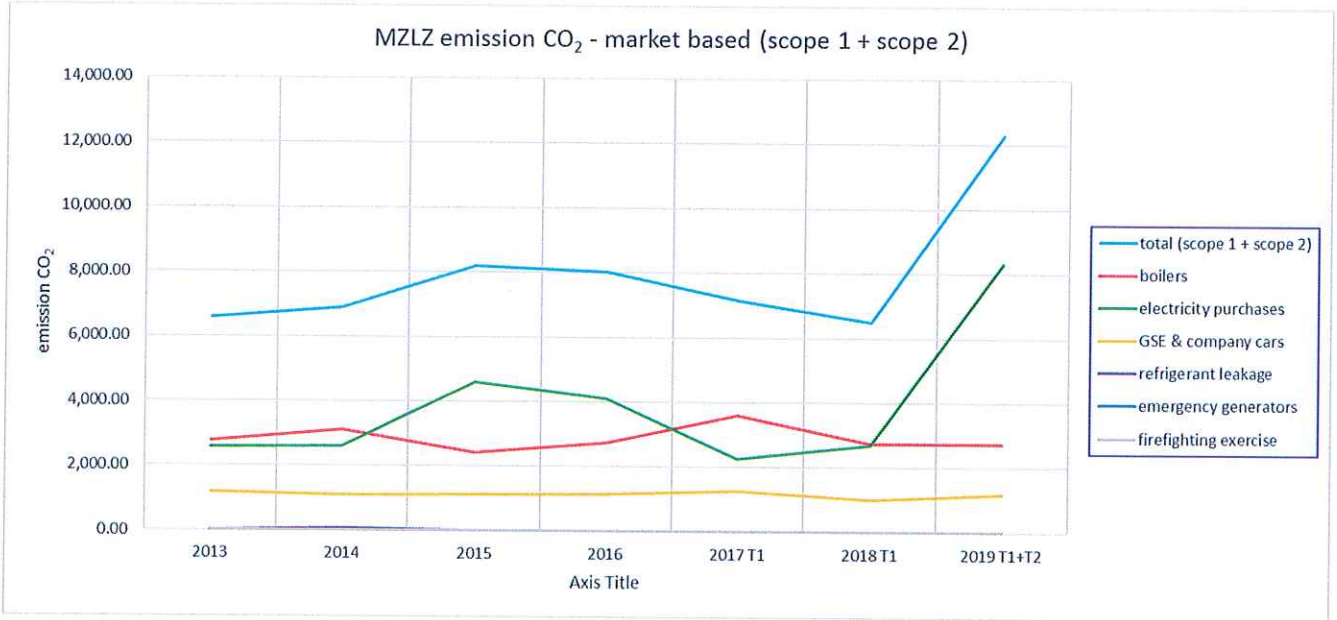
Table 2: Market based method B (Scope 1 and Scope 2) and Scope 3

scope	source	t CO2							
		2013	2014	2015	2016	2017 T1	2018 T1	2019 T1+T2	2018 T2
SCOPE 1	boilers	2,786.80	3,122.12	2,440.24	2,740.10	3,125.53	2,222.05	2,753.28	529.01
	emergency generators	0.57	3.10	0.36	1.97	0.12	2.91	5.25	0.00
	firefighting exercise	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	GSE & company cars	1,192.08	1,095.71	1,139.28	1,167.96	1,285.89	1,035.36	1,193.47	0.00
	refrigerant leakage	15.39	63.45	15.48	0.00	0.00	0.00	0.00	0.00
SCOPE 2	electricity purchases	2,578.85	2,597.42	4,599.57	4,092.04	2,252.39	2,692.98	8,309.58	6,349.96
SCOPE 3	LTO cycle					52,127.40	55,662.30	56,075.70	
	APU and engine testing					5,106.84	5,415.35	6,691.55	
	surface access emissions					8,950.07	8,344.03	9,294.99	
	airport company staff business travel					4.19	3.36	18.51	
total (scope 1 + scope 2)		6,573.68	6,881.79	8,194.93	8,002.07	6,663.93	5,953.31	12,261.58	6,878.98
3 - year average (scope 1 + scope 2):		2011-2013	2012-2014	2013-2015	2014-2016	2015-2017	2016-2018	2016-2019 + 2018 T2	
				7,216.80	7,692.93	7,620.31	6,873.10	13,752.08	
year vs 3 - year av. (scope 1 + scope 2)					10.88%	-13.38%	-21.88%	-10.84%	
total (scope 1 + scope 2 + scope 3)						72,852.44	75,378.36	84,342.33	

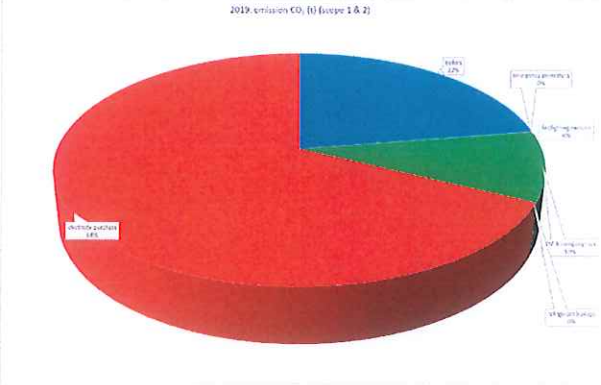
Table 2 shows International Zagreb Airport carbon footprint from each year in period 2013.-2019. in tones of CO2. For calculation of CO2 emissions for Scope 1 and Scope 2, market based approach is used. Carbon footprint is also shown in Graph 2. The reduction in CO2 emissions in 2019. compared to arithmetic mean emissions from last three years (2016.-2018.) is 10,84 %.

Graph 2: Market based method B (Scope 1 and Scope 2) - Total Carbon footprint

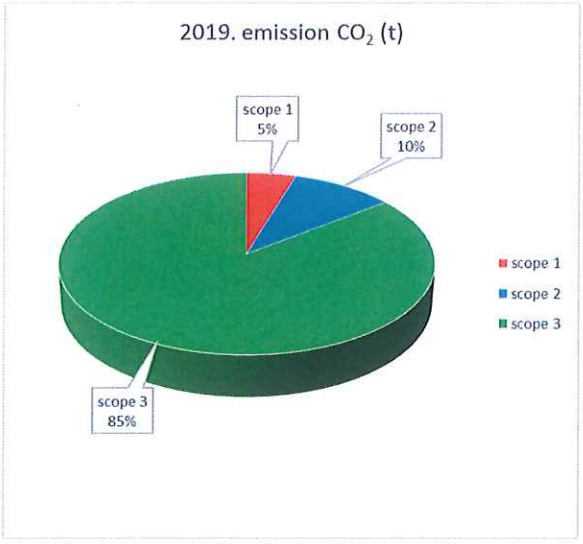


MANUAL
CARBON FOOTPRINT 2021

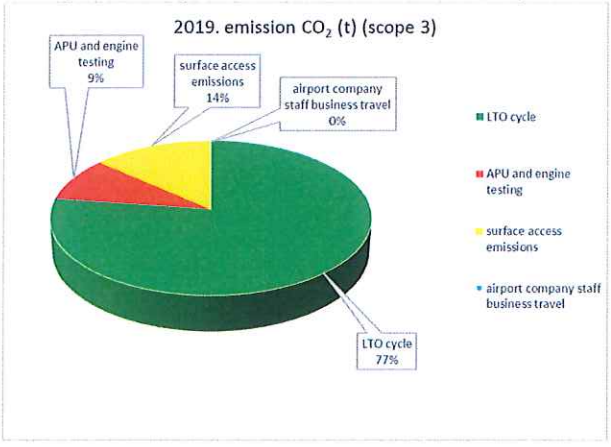
Pie 1: Market based Scope 1 and 2 Comparison of Total carbon footprints in 2019



Pie 2: Market based Scope 1, 2 and 3 Comparison of Total carbon footprints in 2019



Pie 3: Market based Scope 3 Comparison of Total carbon footprints in 2019 with details



8. Contact person responsible for the carbon footprint and the report

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