AIRPORTS COUNCIL INTERNATIONAL

ACERT

AIRPORT CARBON AND EMISSIONS REPORTING TOOL

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AIRPORTS COUNCIL INTERNATIONA

Introduction

WHAT is ACERT?

ACI's Airport Carbon and Emissions Reporting Tool (ACERT) is a self-contained Excel spreadsheet that enables an airport operator to calculate its own greenhouse gas (GHG) emissions inventory. The tool is available at no cost to airports and can be used without emissions or environmental expertise by inputting readily available operational data.

WHY do we need it?

In order to manage GHG emissions, an operator needs to understand the sources, quantities and ownership of emissions at the airport and along its value chain. An inventory can help the airport operator to set goals and target mitigation efforts.

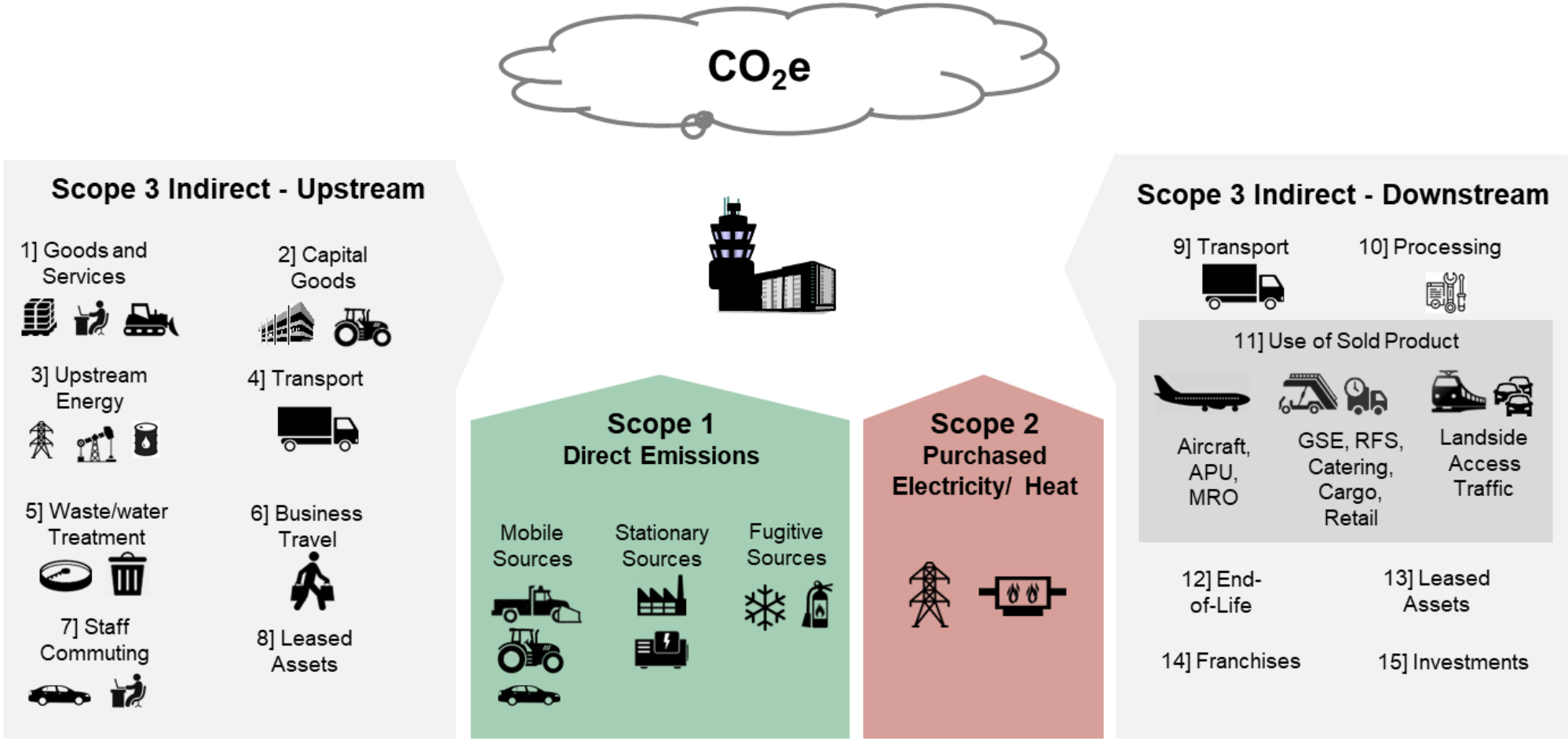
WHERE did ACERT come from?

After ACI World published the Greenhouse Gas Management Manual in 2010, airports asked for support and tools to develop GHG inventories. Transport Canada, coincidentally developing an air quality tool for smaller Canadian Airports supported ACI World in the advancement of its tool towards ACERT.

The first version of ACERT was released in 2012 and it has since been further developed, responding to evolving science, rising expectations and industry knowledge.

The Scope of ACERT

ACERT covers all Scope 1, 2, and 3 emission sources with focus on airports as described in the GHG Protocol.



ACERT Governance

- ACERT is owned and managed by ACI World in Montreal (Canada).
- Support is provided by member airports for the further development and Q&A.
- The tool is available for free from ACI World.
- The use of ACERT is subject to a Software License Agreement:
  - The tool may not be used at charge.
  - The tool may not be reverse engineered, copied or decomposed and ACI World retains the full IPR.
  - ACI World may not be held liable for any potential errors and omission.

ACERT and Airport Carbon Accreditation (ACA)

Background

- When ACERT was developed, ACA only existed in Europe (with virtually no demand for a tool like ACERT).
- With the rollout of ACA globally, expectations from airports emerged to have ACERT made suitable for ACA (inventory requirements for Levels 1, 2, 3 in 2016).
- ACERT featured elements that were simplifying airports' efforts to compile Scope 3 emissions (e.g. LTO).

The way towards a tool for ACA

- Between 2013 and 2015, more and more inquiries reached ACI World, if ACERT could also be used to compile emission inventories that were compliant with ACA requirements.
- In 2015, the new version 3.0 was thus designed to be suitable for ACA Levels up to 3/3+.
- Any following updates always reflected the development of ACA (Levels 4/4+, 5).
- ACERT has been determined by the Indonesian Government to be the required tool for airport GHG reporting in the country.
- By 2025, approximately 200 airports use ACERT for ACA purposes.

Applying ACERT

What's needed?

- Excel™ Version 2010 or higher
- Operational data, potentially procurement data.
- Individual contracts, certificates, etc.

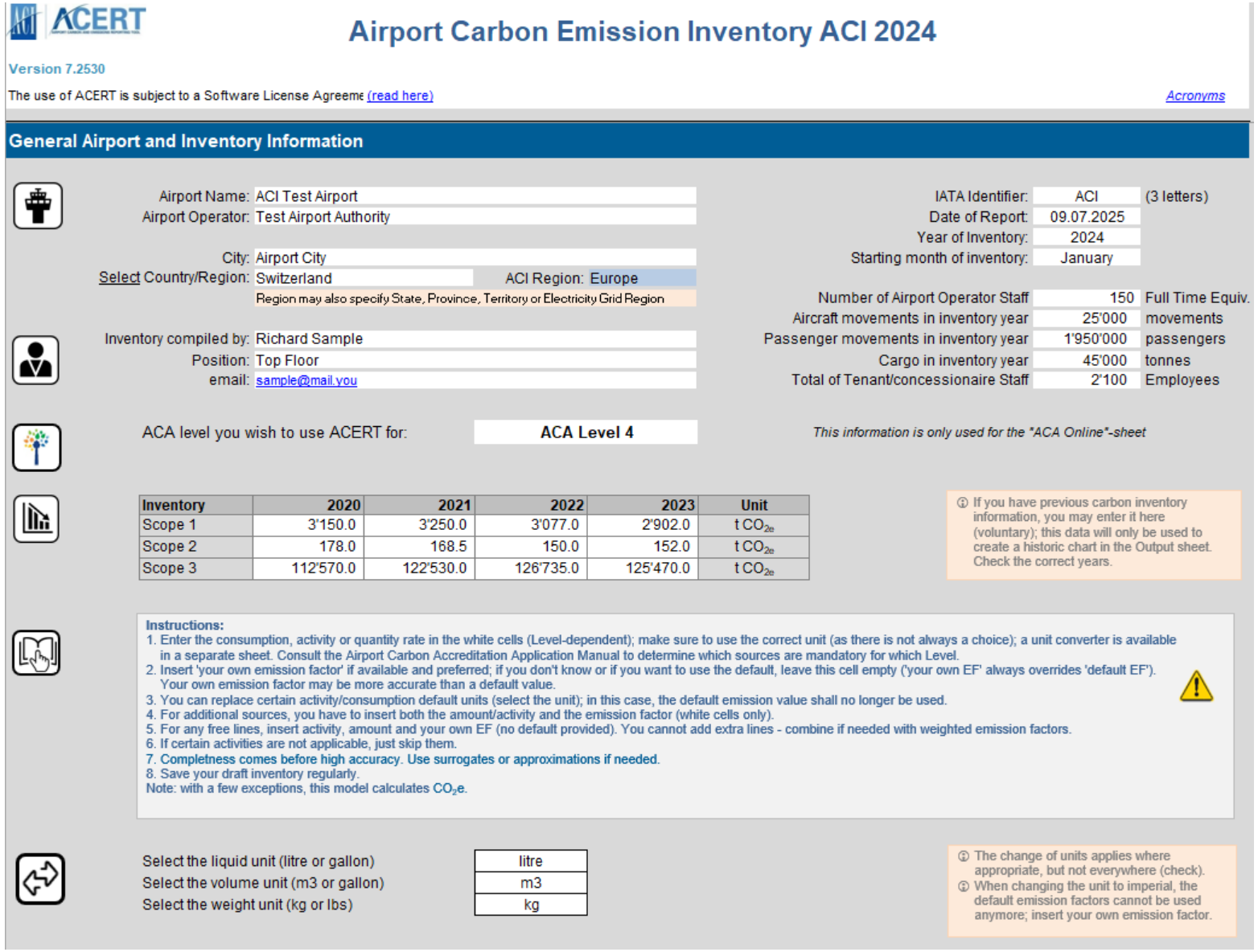
Working with ACERT

- If on a shared platform, many people can work at the same time on the inventory.
- For most emission sources, default emission factors are offered; for all sources, individual factors can be used.
- Some drop-down menus allow selection from a list.
- Additional space allows to add individual information.
- If inconsistencies occur (e.g. percentages don't add up to 100%), warnings are displayed (but not always).
- Data should be saved regularly.

How does it work?

Data are entered into a self-explanatory Excel spreadsheet. For the calendar year of the inventory, activity and consumables information is needed. This information is multiplied by either default or individual emission factors and compiled to produce a detailed inventory.

General Airport and Inventory Information



ACERT

Airport Carbon Emission Inventory ACI 2024

Version 7.2530

The use of ACERT is subject to a Software License Agreeme (read here) Acronyms

General Airport and Inventory Information

Airport Name: ACI Test Airport
Airport Operator: Test Airport Authority
City: Airport City
Select Country/Region: Switzerland ACI Region: Europe
Region may also specify State, Province, Territory or Electricity Grid Region

Inventory compiled by: Richard Sample
Position: Top Floor
email: sample@mail.you

IATA Identifier: ACI (3 letters)
Date of Report: 09.07.2025
Year of Inventory: 2024
Starting month of inventory: January

Number of Airport Operator Staff: 150 Full Time Equiv.
Aircraft movements in inventory year: 25'000 movements
Passenger movements in inventory year: 1'950'000 passengers
Cargo in inventory year: 45'000 tonnes
Total of Tenant/concessionaire Staff: 2'100 Employees

ACA level you wish to use ACERT for: **ACA Level 4**

This information is only used for the "ACA Online"-sheet

Inventory	2020	2021	2022	2023	Unit
Scope 1	3'150.0	3'250.0	3'077.0	2'902.0	t CO_{2e}
Scope 2	178.0	168.5	150.0	152.0	t CO_{2e}
Scope 3	112'570.0	122'530.0	126'735.0	125'470.0	t CO_{2e}

If you have previous carbon inventory information, you may enter it here (voluntary); this data will only be used to create a historic chart in the Output sheet. Check the correct years.

Instructions:
1. Enter the consumption, activity or quantity rate in the white cells (Level-dependent); make sure to use the correct unit (as there is not always a choice); a unit converter is available in a separate sheet. Consult the Airport Carbon Accreditation Application Manual to determine which sources are mandatory for which Level.
2. Insert 'your own emission factor' if available and preferred; if you don't know or if you want to use the default, leave this cell empty ('your own EF' always overrides 'default EF'). Your own emission factor may be more accurate than a default value.
3. You can replace certain activity/consumption default units (select the unit); in this case, the default emission value shall no longer be used.
4. For additional sources, you have to insert both the amount/activity and the emission factor (white cells only).
5. For any free lines, insert activity, amount and your own EF (no default provided). You cannot add extra lines - combine if needed with weighted emission factors.
6. If certain activities are not applicable, just skip them.
7. Completness comes before high accuracy. Use surrogates or approximations if needed.
8. Save your draft inventory regularly.

Note: with a few exceptions, this model calculates CO_2e.

Select the liquid unit (litre or gallon): litre
Select the volume unit (m3 or gallon): m3
Select the weight unit (kg or lbs): kg

The change of units applies where appropriate, but not everywhere (check).
When changing the unit to imperial, the default emission factors cannot be used anymore; insert your own emission factor.

- While the Excel is in English, the instructions and the light orange information boxes are available in the Instruction Manual in Spanish and French as well.
- Only entry cells are available for input or selection, all other cells are not accessible.

Example of Scope 1

SCOPE 1: Process Sources of the Airport Operator → only complete applicable sources

1.4.A Fuel used for fire training (if service rendered by Airport Operator)

	Burnable	Annual Consumption	Unit	Your own emission factor (voluntary)	Default emission factor	Emission factor unit
	Kerosene	500.0	litre		2.5308	kg CO2e/litre
	Butane		kg		3.0500	kg CO2e/kg
	Propane	3'000.0	kg		3.0891	kg CO2e/kg
	Diesel	1'000.0	litre		2.6141	kg CO2e/litre
	Gasoline		litre		2.2890	kg CO2e/litre
	LPG		litre		1.6120	kg CO2e/litre
	Jet A		litre		2.5308	kg CO2e/litre
	Jet B		litre		2.5308	kg CO2e/litre
	Wood	4'000.0	kg		-	kg CO2e/kg
Other fuels:	AF8		unit			kg CO2e/unit

- Fuels for fire vehicles are included in section 1.1
- The fuel unit (l or kg or any other) must match the EF unit used.

1.4.B CO_2-extinguisher used for training or fire fighting systems

CO_2-ext.	25.0	kg		1.0000	kg CO2e/kg

Your own notes:

1.5 Refrigerants used by Airport Operator

	Refrigerant (select from list)	Annaul Usage	Unit	Your own GWP factor (voluntary)	Default GWP factor	Emission factor unit
Select	HCFC-123	35.00	kg		90	kg CO2e/kg
Select	HFC-143	112.00	kg		364	kg CO2e/kg
Select	R-449A		kg		1'396	kg CO2e/kg
Select	R-410A		kg		2'088	kg CO2e/kg
Select	CFC-112		kg		4'620	kg CO2e/kg
Select	CFC-115		kg		9'600	kg CO2e/kg
	Own Refrigerant		kg			kg CO2e/kg
	Own Refrigerant		kg			kg CO2e/kg
	Own Refrigerant		kg			kg CO2e/kg

- Refrigerants can be from chillers, air handling units, fire suppression systems. Enter the use (new, disposal, leakage) of refrigerant chosen from list for lines 1-3 or enter your own in line 4.
- Do not use your installed stock, but only refills and exchanges.
- GWP = Greenhouse Warming Potential

Your own notes:

Example of Scope 2

SCOPE 2: Energy purchased by Airport Operator from External Supplier ⇨ Consult chart in "EF Grid" for further guidance

2.1 Electricity Purchased from 3rd Party (external supplier, can be on-site/off-site)

Electricity	Annual Amount	Unit	Your own EF (PA, GO, CO)	Default emission factor	Emission factor unit
Directly from external supplier	12'000'000	kWh			
resold from airport to 3rd parties	4'900'000	kWh			
Net electricity from external	7'100'000	kWh			
Your location based emission factor (country/grid):				34.8427	g CO_2e/kWh
Your market-based emission factor (purchase agreement, GO, etc)			21.0		g CO_2e/kWh

- Select after which method you want to report (in the inventory): Market-based EF

Share of renewable electricity	0.0%	%	*Hydro, Solar, Wind, Biomass*

Your own notes:

- Data should be available from electricity bills. If you buy energy attributes, you have to report by the market-based method. This includes any self produced renewable electricity if looped back through the grid.
- Tenant usage should be metered and usually invoiced. If so, emissions become Scope 3, if not, they remain Scope 2.
- If you purchase renewable energy offsets (or credits) enter them in Annex 1 below (even if the cells are greyed out).
- The Emissions Factor (EF) is used to calculate CO2 from off-site electricity production. Check with your power company.
- The hierarchy in the use of the electricity EF is: "your own emission factor" and select whether this is "Market-based" or "Location-based". If not available (=leave blank) then "Default" is taken. This country/area default is used in any case for electric train emissions.
- PA=Purchase Agreement, GO=Guarantee of Origin, CO=Certificate of Origin.

2.2 Heat (or steam) purchased from 3rd party (external supplier, can be on-site/off-site)

Heat/Steam	Airport Operator	Unit (select)	Your own emission factor (PA, GO, CO)	Default emission factor	Emission factor unit
Directly from external supplier		kWh			
resold from airport to 3rd parties		kWh			
Net heat/steam from external	0	kWh	145.000		kg CO2e/kWh
Share of renewable heat/steam		%	*Biogas, wood, synthetic fuels*		

OR Fuels used by external supplier (by %):

	Fuel Share	EF (unweighted)	EF unit
Coal		0.515	kg CO2e/kWh
Fuel Oil		0.322	kg CO2e/kWh
Natural Gas		0.229	kg CO2e/kWh
Nuclear		0	kg CO2e/kWh
Renewable		0	kg CO2e/kWh
Total	0%		

Your own notes:

- Data should be available from heating bills. Fuel purchased by the airport operator to produce heat itself is contained in Step 3 (do not include here).
- If the airport purchases heat from an on-site tenant, then that counts as "external supplier".
- Else ask off-site heat provider for composition and use defaults.

Example of Scope 3

3.11.1A Aircraft full flight emissions

Option 1: Aircraft main engines and APU based on fuel uplift

Fuel Tpye	Total fuel	Unit	Your own emission factor	Default emission factor (TTW)	Emission factor unit
Aviation Gasoline	200	m^3		3.3395	kg CO2e/kg
Jet-A1 / Kerosene	45'000	m^3		3.1628	kg CO2e/kg
SAF 1, specify: HEFA	30	m^3			kg CO2e/kg
SAF 2, specify:		m^3			kg CO2e/kg
Enter discount for tankering	-3%	%			

- If aircraft are tankering (uploading more fuel than they actually burn on average, e.g. for return flights), specify a percentage here that will be subtracted from uplift (hence a negative value). Will be universally applied to all fuel types.
- Any APU usage (ECS, MES) is automatically included, as aircraft use onboard fuel for APU.

Option 2: Separately calculated flight emissions

Full flight emissions	Amount	Unit	APU included?
CO_2 emissions from full outbound flights		t CO_2e	No

select

- Apply the one-way or the 50:50 route split and enter directly the CO2e emissions.
- Default = leave empty (then Option 1 is used).
- Indicate, whether APU is also included in full flight or only the flight itself.

3.11.1B Aircraft APU (only in conjunction with Option 2 above)

Complete this section.

Aircraft Group	Number of LTO cycles	APU use percentage	APU operating time (min/LTO)	Default fuel factor	Factor unit
General/Business Aviation Aircraft				1.78	kg Fuel/min
NB, Small-Med. Aircraft				1.78	kg Fuel/min
WB, Large Aircraft				4.00	kg Fuel/min

- If only part of the aircraft use APU and others not, determine overall weighted average. Include time at gate and taxiing (if needed).
- Check if fixed ground power/GPU or PCA is

Your own notes:

3.11.1C Aircraft Maintenance

Is MRO fuel included in any aircraft flight option? No select

Complete this section.

Option 1: Fuel used (preferred)	Total fuel	Unit	Your own emission	Default emission	Emission factor unit
Aviation Gasoline		tonnes		3.3395	kg CO2e/kg
Jet-A1 / Kerosene		tonnes		3.1628	kg CO2e/kg
SAF-Type 1		tonnes			kg CO2e/kg
SAF-Type 2		tonnes			kg CO2e/kg

OR, alternatively: Estimated number of annual engine run-ups (Caution: any potential SAF use will not be considered)

Option 2: Aircraft Group (Example Aircraft)	# of Run-ups	Default fuel (kg/runup)	Default emission	Factor unit
Piston, Turboprop (Cessna 182): Av. Gasoline	360	1.5	3.33949	kg CO2e/kg
Single-Aisle Jet (e.b. B737, A320): Jet-A1, kerosen	600	392.4	3.16279	kg CO2e/kg
Double-Aisle Jet (e.g. A330, B777): Jet-A1, keroser	200	907.2	3.16279	kg CO2e/kg

Example of Result Table

ACI Test Airport Greenhouse Gas Emissions Inventory 2024

ACERT Version 7.2530

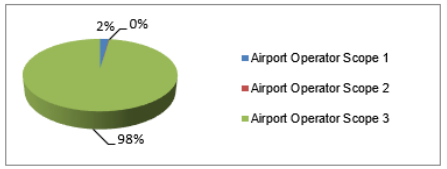
by: Richard Sample, Top Floor (Mail: sample@mail.you)

Identifier	ACI
Airport	ACI Test Airport
Airport Operator	Test Airport Authority
Country	Switzerland
ACI Region	Europe
Report Date	9.7.2025
ACA-Level	ACA Level 4

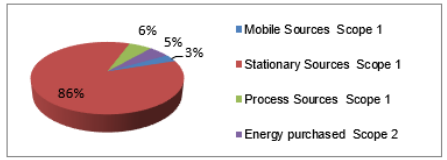
Operational Data		2024
Passenger Movements		1'950'000
Aircraft Movements		25'000
Cargo (t)		45'000
Traffic Units (or WLU)		2'400'000
Airport Operator Staff (FTE)		150
Approximate total ground access	pers-km/a	55'828'093

Greenhouse Gas Emissions 2024

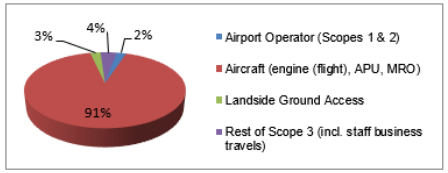
Scope Break Down:		
Airport Operator Scope 1	(t CO2e)	2'712.4
Airport Operator Scope 2	(t CO2e)	149.1
Airport Operator Scope 3	(t CO2e)	120'594.3
Total Gross Emissions	(t CO2e)	123'455.7
minus Removals and Offsets	(t CO2e)	-
Total Net Airport Emissions	(t CO2e)	123'455.7



Airport Operator Source Break Down:			
Mobile Sources	Scope 1	(t CO2e)	93.2
Stationary Sources	Scope 1	(t CO2e)	2'453.5
Process Sources	Scope 1	(t CO2e)	165.6
Energy purchased	Scope 2	(t CO2e)	149.1
Gross Total Scopes 1+2		**(t CO2e)**	**2'861.5**



Source Group Break Down:		
Airport Operator (Scopes 1 & 2)	(t CO2e)	2'861.5
Aircraft (engine (flight), APU, MRO)	(t CO2e)	112'803.1
Landside Ground Access	(t CO2e)	3'078.7
Rest of Scope 3 (incl. staff business travels)	(t CO2e)	4'712.5



Airport Carbon Neutrality or Net Zero Path		
Total required offsets (Scopes 1&2, Bus. Travel)	(t CO2e)	2'863.6
Airport Operator Carbon Offsets purchased	(t CO2e)	-
Neutrality achieved	%	0.0%
Total required removals (Scopes 1&2)	(t CO2e)	2'861.5
Airport Operator Carbon Removals purchased	(t CO2e)	-
Net Zero (Scopes 1&2) achieved	%	No

Key Performance Indicators 2024

Airport Operator Carbon Intensity	(t CO2e/FTE)	19.1	(Scopes 1 and 2)
Airport Operator Carbon Intensity 2	(kg CO2e/pax)	1.47	(Scopes 1 and 2)
Airport Operator Carbon Intensity 3	(kg CO2e/TU)	1.19	(Scopes 1 and 2)
Airport Carbon Intensity (Scopes 1-3)	(kg CO2e/TU)	51.44	(Scopes 1, 2, 3)
Aircraft Traffic Carbon Intensity	(kg CO2e/TU)	46.45	(Aircraft engine & APU)
Share of Airport Operator on total Emissions	%	2.3%	(Scopes 1+2 on Total, before any off-setting)
Airport Intermodality Carbon Intensity	(kg CO2e/TU)	2.56	(airport emissions without landside access and air traffic, per TU)

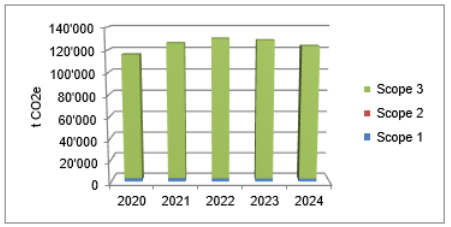
Electricity Reporting 2024

Airport Operator Electricity Use (incl renewables)	MWh	7'100
Airport Tenant Electricity Use (incl renewables)	MWh	4'900
Total Airport Electricity Consumption	MWh	12'000
Total Airport Renewable Electricity	%	1.2%

Location-based electricity emissions	t CO2e	247.4
Market-based electricity emissions	t CO2e	149.1

Historic Data

$t CO_{2e}$	2020	2021	2022	2023
Scope 1	3'150	3'250	3'077	2'902
Scope 2	178	169	150	152
Scope 3	112'570	122'530	126'735	125'470
Total	**115'898**	**125'949**	**129'962**	**128'524**



Example of ACA Online Output

ACERT Version 7.2530

Airport Carbon Accreditation

airport carbon accreditation

This report provides information for the ACA Online Application for the "year 0" only. It does not contain information on the historic average of the years "-1" to "-3". It also does not account for investements/divestements.

Part 2 GHG Emission Section

Standard Inventory Reporting

Scope 1 emissions for the year	2024	2'712	t CO_2e	
Scope 2 emissions for the year	2024	149	t CO_2e	Market-based
Total emissions of airport operator	2024	2'861	t CO_2e	non-adjusted
Scope 3 emissions for the year	2024	120'594	t CO_2e	

Additionally required (location-based) Reporting

Scope 1 emissions for the year	2024	2'712	t CO_2e	
Scope 2 emissions for the year	2024	247	t CO_2e	Location based
Total emissions of airport operator	2024	2'960	t CO_2e	non-adjusted

Emission Source Breakdown for Dashboard (uncorrected)

Mobile Sources	Scope 1	93	t CO_2e	⇨ ACA Online
Stationary Sources	Scope 1	2'454	t CO_2e	⇨ ACA Online
Process Sources	Scope 1	166	t CO_2e	⇨ ACA Online
Electricity	Scope 2	149	t CO_2e	⇨ ACA Online
Heat (Air Conditioning)	Scope 2	-	t CO_2e	⇨ ACA Online

Part 3 Emission Reduction Section

Climate Adjustments: this section is not mandatory under Airport Carbon Accreditation (=optional section)

	Do you claim climate adjustment?		Select →	Heat and Cool degree days	
A)	Heat degree days for the year	2024		3'025	HDD
	Heat degree days for reference year			3'000	HDD
	Scope 1 & 2 emissions to be corrected for heat degree days			2'521	t CO_2e
	Scope 3 emissions to be corrected for heat degree days			171	t CO_2e
B)	Cool degree days for the year	2024		2'900	CDD
	Cool degree days for reference year			2'500	CDD
	Scope 1 & 2 emissions to be corrected for cool degree days			2'521	t CO2e
	Scope 3 emissions to be corrected for cool degree days			171	t CO2e

- Check all your sources from the output page and add up as needed.
- Scopes 1&2: usually 1.2, 2.1 and 2.2.
- Scope 3: usually 3.11.2.B and 3.13.
- Overwrite values if needed.

Scope 1 & 2 climate adjusted,	Market-based	2'493	t CO_2e	⇨ ACA Online
Scope 3 climate adjusted,	Market-based	120'569	t CO_2e	⇨ ACA Online

Absolute or Relative Benchmark

Do you use a relative benchmark?		Select →	Traffic Units	⇨ ACA Online
Your denominator value for the year	2024		2'400'000	⇨ ACA Online

Scope 1 & 2 adjusted, relative, TU	Market-based	1.039	kg CO2e/Traffic Units	⇨ ACA Online
Scope 3 adjusted, relative, TU	Market-based	50.237	kg CO2e/Traffic Units	⇨ ACA Online

Part 4 Carbon Offset Reductions

Annex

What is the current version?
The current version is 7.2532 of August 2025.

Where can I get it?
ACERT is available free of charge on our website.