SUSTAINABILITY PARTNER FOR A BETTER FUTURE

env-isa

Your trusted partner for environment and sustainability in aviation and beyond, with 15+ years of experience.

www.env-isa.com

62 Rue de Montorgueil,
75002 Paris, France

Via Madre Cabrini 10,
20122 Milano, Italy

TABLE OF CONTENTS

1 Introduction

2 Mission and Purpose

3 Sustainability and Environment

4 Env-isa Solution: Carbon

5 Solution: Noise

6 Solution: Air

7 Circular Economy and Lifecycle Assessment

8 Env-isa Sustainability Training

9 References

INTRODUCTION

Sustainability is a paramount concern across various industries, and aviation stands out as one of the most important sectors when it comes to sustainability efforts. The rapid growth of aviation has raised concerns about its contribution to greenhouse gas emissions and environmental impact. Without proactive measures, projections indicate that aviation could be responsible for approximately 22% of global emissions by 2050.

Recognizing the urgency to reduce pollution and mitigate the environmental consequences of aviation activities, stakeholders within the industry have prioritized climate change, air pollution, and noise annoyance. The aviation sector understands its responsibilities and is committed to taking action to address these challenges.

env-isa, a pioneering company established in Paris in 2004, has been instrumental in providing innovative solutions not only to aviation stakeholders but also across industries such as tourism and education. With over 20 years of operational background and world-class expertise, ENV-ISA's team of international engineers, consultants and scientists collaborates closely with stakeholders to tackle environmental challenges and support the sustainability of our shared future.

In addition to their profound involvement in aviation, ENV-ISA has expanded its environmental and sustainability expertise to the tourism and construction sectorsby 2022. In tourism, ENV-ISA partners with hospitality providers, and tourism boards to develop and implement innovative solutions that reduce the industry's environmental impact. Their expertise spans noise reduction, air quality improvement, emissions reduction, circular economy initiatives, carbon management, and related subjects.

ENV-ISA's expertise covers sustainability reporting, environmental impact assessments, climate change adaptation, land use management, and biodiversity conservation.

ENV-ISA's partnerships extend not only across Europe but also encompass Africa, America, Asia and the Middle East, showcasing its intercontinental reach and international multitask capabilities. By actively engaging with stakeholders in these regions, ENV-ISA demonstrates its ability to operate globally and tackle environmental challenges on an international scale.

While aviation remains at the core of ENV-ISA's efforts, their commitment to environmental and sustainability expertise extends beyond this industry. By collaborating with stakeholders in aviation, tourism, and construction, ENV-ISA aims to tackle environmental challenges holistically, fostering sustainable practices and contributing to a more environmentally conscious future.

RATIONAL PARTNER

OUR MISSION

Established in Paris in 2004, ENV-ISA is a consulting company that works exclusively on developing solutions for the sustainable growth of aviation. ENV-ISA is one of the very few companies that focuses wholly on understanding the environmental impacts of aviation. It has been trusted by several major airports and European aviation institutions, such as EUROCONTROL, EASA, and the European Commission, to conduct strategic studies, develop tools and datasets, and generate performance indicators at both European and global levels

ENV-ISA's mission is to provide customised services and solutions for sustainable aviation and improve our clients' energy efficiency, strengthen their public image, and increase their profits in a sustainable way. As a World Business Partner of ACI Europe, our goal is to help airports and all aviation stakeholders find cost-effective solutions to managing and growing their businesses in an environmentally friendly way.

OUR PURPOSE

ENV-ISA's purposes revolve around evaluating and mitigating the environmental impacts of the aviation industry, including noise, air pollution, greenhouse gas emissions, waste management, wastewater, and biodiversity.

Their core expertise lies in conducting sustainability reviews, environmental impact assessments, and developing innovative methods and tools for enhanced efficiency. With a strong reputation and diverse references, ENV-ISA is recognized both nationally and internationally for their knowledge and competence in aviation-related issues.

SUSTAINABILITY & ENVIRONMENT

ENV-ISA supports Airports in building their environmental capacity whilst ensuring sustainable operations by conducting sustainability assessments through these frameworks and tools. We offer various tools and services to integrate ESG factors into their operations, investment processes, and decision-making. We help to identify areas for improvement, implement effective strategies, and demonstrate their commitment to sustainable development with science-based KPIs.
ENV-ISA has extensive in-house experience ranging from Climate Change Mitigation, Environmental Impact studies, Carbon Management and Energy Management, Noise and LAQ Reduction Plans, and Innovative Dashboards to Training, Sustainable Roadmap Development, and the Circular Economy/LCA.

Environmental Capacity and Sustainable Growth

Airports need to conduct sustainability assessments by evaluating their environmental, social, and economic impacts. This is done through various frameworks, guidelines, and tools that help airports identify, measure, and manage their sustainability performance.

(SDG, ESG, KPI) the UN SDGs[1] is providing an instantly recognizable visionary framework for its wider community. The SDGs provide a common global language for Sustainability Initiatives with 17 indicators. The UN SDGs[2] cover broad challenges such as economic inclusion, diminishing natural resources, geopolitical instability, environmental degradation, and the impacts of climate change. All these elements have a significant impact on the aviation sector and Airports in particular due to their unique Business Models and vulnerability to investments, pandemics, and public opinion fuelled by social media.

In addition in Europe, there are Sustainability Strategy Guidelines: ACI Europe has developed guidelines to help airports develop their sustainability strategy by providing a framework for setting sustainability goals, identifying key performance indicators (KPIs), implementing best practices, and monitoring progress.
Other frameworks and guidelines (CEM, ACA, EMS, GRI, etc..) can also be used in specific areas of environmental improvement.

Environmental and Sustainability Road Maps

We design and develop pragmatic and measurable Roadmap towards more sustainable practices. These roadmaps provide a structured approach to identify, prioritize, and implement actions that will improve environmental and social performance while also considering their economic objectives.

We start by conducting a thorough assessment of the current environmental and social performance, including their existing policies, practices, and impacts. We gather input from all relevant stakeholders and ensure that their concerns and expectations are considered in the road map. We then establish clear and measurable sustainability goals and targets, which may be aligned with international standards or frameworks (i.e. SDGs).

For the action plan including monitoring and reporting; we provide customized dashboards and reporting tools that can measure the improved environmental performance of the client. This will help to develop a prioritized list of actions to achieve their sustainability goals and monitor their progress and report on their performance to stakeholders as a robust communication material.

Environmental and Sustainability Roadmaps are dynamic documents that need to be periodically reviewed and updated to reflect new developments, challenges, or opportunities.

We support our clients in adapting their roadmaps as needed and ensuring continuous improvement in their sustainability performance.

[1] In 2015, 193 member states of the United Nations adopted 17 global Sustainable Development Goals (SDGs) with the aim of ending poverty, fighting inequality and injustice, and tackling climate change by 2030. Business, academia, and non-profit organizations globally played a part in their development

[2] https://www.undp.org/sustainable-development-goals?

SOLUTION CARBON

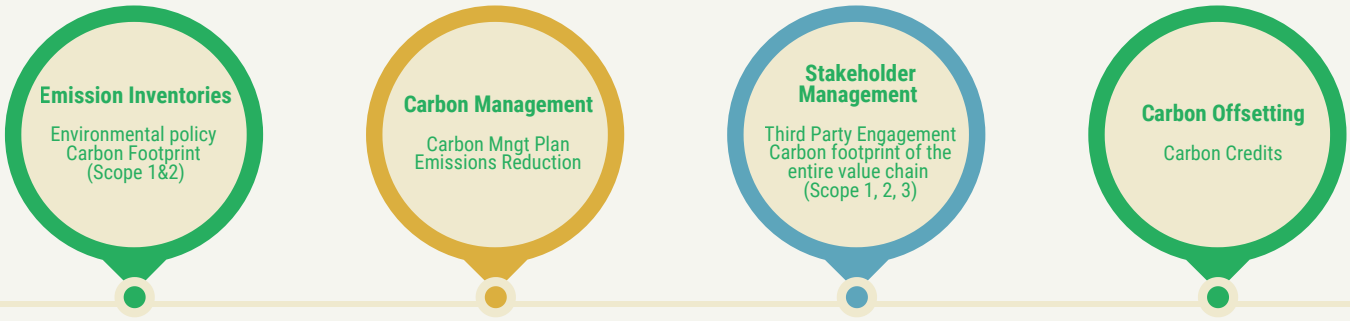
Airport Carbon Accreditation

Following the Paris Agreement in 2015 and the International Civil Aviation Organisation's (ICAO) deal to curb aviation emissions, it is imperative that airports confirm their commitment and take concrete action to improve their energy management and reduce emissions.

In this context, Airports Council International (ACI) Europe decided to adopt a resolution on climate change to mark the airport members' commitment to reducing carbon emissions, with the ultimate goal of becoming carbon neutral. In 2009, ACI Europe launched the Airport Carbon Accreditation (ACA) programme, aiming to highlight airports' efforts to manage and reduce their GHG emissions.

In this entirely voluntary approach, airports gain recognition from their peers and the public for their commitment to reduce CO2 emissions. The popularity of ACA stems from its success in improving carbon and energy management performance and thus increasing the profitability of airports. As of this day, over 460 airports have been accredited worldwide.

This graphic illustrates the main highlights the ACA programme includes:



ENV-ISA relies on highly experienced, multidisciplinary environmental consultants and project managers who have been working in the aviation industry for several years. Our experts are proficient in carbon accounting methodologies used to evaluate, report and verify greenhouse gas (GHG) emissions, such as the United Nations Framework Convention on Climate Change (UNFCCC) guidelines, the GHG Protocol, ACI's Airport Carbon Accreditation, carbon footprint, etc.

SOLUTION NOISE

Aircraft noise is the foremost concern of local communities located close to airports. The management of noise annoyance issues is one of the most important tasks for an airport when it comes to communicating the impacts of mitigating actions to allow for future growth.

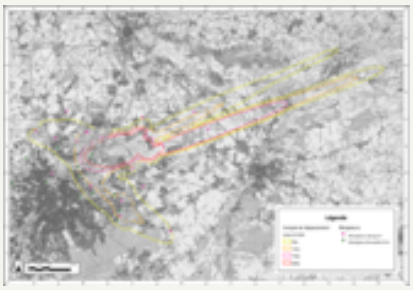
The public and local authorities expect airports to take measures to reduce and mitigate noise impacts around the airport and increasingly along the flight paths around it.

To answer these concerns, ENV-ISA provides solutions to help airports manage their noise annoyance issues by evaluating the current noise impacts, elaborating noise reduction plans, and communicating on noise issues with local communities and public authorities.

Our core expertise lies in:

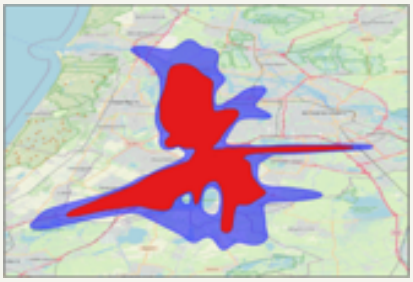
Environmental impact assessments

- Calculation of noise contours for different metrics (exposure, maximum level, number of events above a certain level)
- Production of maps and counting of impacted population
- Statistical analyses (number of overflights per area)



Evaluations of future scenarios

- Forecasts (2030, 2040,…etc) including future aircraft types that are modeled following ICAO guidelines
- Runway extensions
- Changes in runway usage (number of departures/rivals on each runway)



Noise reduction options

- New trajectories
- Implementation of noise abatement procedures
- Modification of runway thresholds
- Other, operational improvements (continuous descent, increased descent angle…etc)

SOLUTION
LOCAL AIR QUALITY

Emissions modeling and dispersion

Faced with the growing concerns of the public related to pollutant emissions and linked health issues, the aviation sector, and in particular airports, must adopt an effective strategy to address this matter. Indeed, emissions from aircraft and other emission sources at an airport have an effect on the local air quality (LAQ): in particular, emissions of nitrogen oxides (NOx), volatile organic compounds (VOCs), carbon monoxide (CO) and particulate matter (PM) are among the most important contributors on LAQ concerns.

However, the airport is not the only source of emissions. Usually, airports are surrounded by road networks and supplied by power stations and other industrial facilities. The airport is therefore not the only, and often not even the major, responsible for all the air pollution measured in the area. The pragmatic solution to understanding the contribution of an airport to the measured air quality at any point around it is through modeling.

Our core expertise lies in:

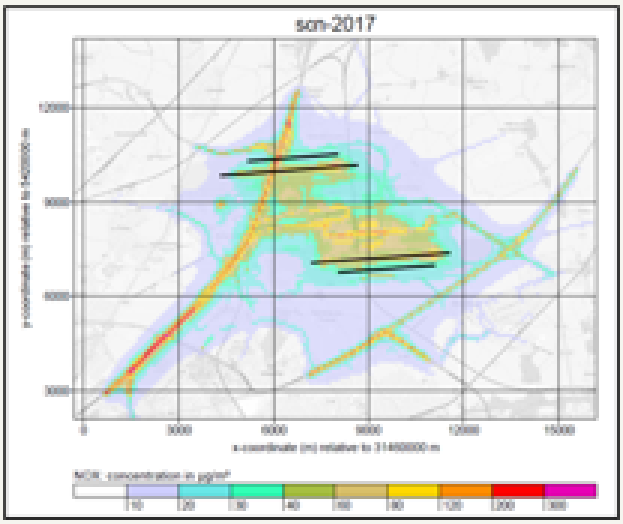
Emissions evaluation (Inventory)

- Aircraft (LTO, APU, engine tests)
- Airside and landside motor traffic emissions (Traffic, parking)
- Other sources (De-icing, fuel refueling, and stockage, GSE, GPU…etc)

Air quality modeling (Emissions dispersion)

- Gas (CO, NOx, SOx, HC)
- PM (UFP, PM10, PM2.5, PM1)

Inclusion of modern technologies, innovations into emissions and dispersion modeling



Monitoring Equipment & Sensors

Along with our partners, Oizom, we provide solutions to monitor all critical air pollution parameters.

Oizom offers a wide range of state of art monitoring solutions that are designed for scalable data acquisition for pollutants such as Particulates, Toxic Gases, Odours, and also for Radiation, Traffic, Noise, Light, Weather, etc. Its modern, sleek, and compact design allows it to be easily integrated into the smart-city infrastructure. All of Oizom's hardware solutions are conceptualized on the Internet of Things (IoT) approach to collect continuous environment data from the field.

We also offer visualization solutions (dashboards) to display and analyze the monitored data.

CIRCULAR ECONOMY
LIFECYCLE ASSESSMENT

An important concept to be considered when addressing sustainability is circular economy, which tries to achieve improved resource management throughout the lifecycle of systems, and which is characterized by closed loops of material flows, promoting maintenance, reuse, remanufacturing, and recycling.
Sustainability and the achievement of sustainable development have become major goals at international and EU levels. Aviation has a crucial role to play to contribute to the overall sustainability of our society and has its own related challenges.

Aircraft End-of-life

While, undoubtedly, emissions generated by fuel burn caused by far the largest impact on environmental sustainability in an aircraft's life, design, maintenance, and production phases also have an important role to play in the sustainability of the aviation sector, since they are by themselves influencing environmental, social, and economic impacts, as well as the end-of-life (EoL) phase, which is strongly connected with the circular economy in aviation.

Therefore, aircraft EoL is a crucial element among the aviation sustainability challenges, which has not been studied in depth in the past.

ENV-ISA has experience in the analysis of aircraft End-Of-Life activities, finding measures to increase the performance of these actions, and contributing to a sustainable execution of these activities.

Some of the tasks we cover are:

- The identification of environmental hotspots in the aircraft's End-Of-Life steps
- The proposal of sustainability-related measures to be implemented based on the previous point
- The creation of KPIs to monitor the implementation of the sustainability measures

Life Cycle Assessments (LCA)

LCA is a method for analyzing the impacts of a product or service over the course of its lifecycle. This type of assessment allows the obtention of full life cycle impacts arising from the different phases of a product or service: design, construction or manufacturing, operation, maintenance, and end-of-life. Moreover, LCAs provide an estimation of the impacts from many different environmental categories, such as climate change potential, ozone depletion, acidification, eutrophication, water use, land use, etc.

ENV-ISA has over 10 years of experience accrediting Worldwide Airports. Moreover, ENV-ISA has carried out LCAs for aeronautic products (electrical aircraft and drones).

In these studies, the complete lifecycle was included, dividing it into the following steps:

- Upstream phase, which included the obtention of the raw materials, their transportation and manufacturing.
- Core phase, which is constituted by the electricity consumption and waste generation during the assembling.
- Use phase, including the electricity consumption of these vehicles during their lifetime operations.
- End-Of-Life phases were included.

Moreover, sensitivity analyses were performed to understand the influence of the different energy grids in the LCA results.

AFRA End-Of-Life KPIs
LCAs for electric aircraft and drones
Analysis of the sustainability of the aircraft lifecycle, with a focus on End-Of-Life

DATA SCIENCE

Data science has become an essential asset in the field of sustainable aviation. The analysis of aviation data can help to find solutions to reduce the environmental impact of the industry. For example, it can be used to find optimal trajectories to reduce the fuel consumption, or to reduce taxi times at congested airports. Data science can also be used to improve the estimation of noise and emissions derived from aircraft operations, and to communicate results more precisely.

ENV-ISA has extensive knowledge and experience in data science applied to aviation and the environment. Our Data Science team is working in projects that can help to better estimate the environmental impact of aviation and to propose solution to mitigate it. The two areas of focus are highlighted below and can help to provide valuable insights for regulators and policy-makers, helping them to develop effective strategies and regulations to achieve environmental goals, as well as to increase public awareness

IT tools development

ENV-ISA Data Science team has worked on the development of different IT tools. These include:

- Data pre-processing for different noise and emissions models (IMPACT, AEDT, LASPORT, COPERT etc.)
- Post-processing tools to analyse the results of the models (eg. count population impacted by certain noise levels)
- Development of aircraft performance models, following international guidelines
- Preparation of dashboards to help clients to better communicate their environmental performances
- Production of automated periodic reports, for example analysing emissions or noise monitoring stations and inform regarding the performance of the last reporting period
- Use of flight simulators to simulate different scenarios and to generate real-world data

Artificial Intelligence

Recently ENV-ISA has started to work in the field of artificial intelligence applied to aviation & environment. Projects, where we are working on, include:

- E**nhanced Data Analysis**: AI can process vast amounts of data, such as flight routes, aircraft types, fuel consumption and weather conditions, to provide an accurate estimation of aviation environmental impact.

- **Predictive modeling:** AI models can be trained to predict future environmental impact trends based on historical data, industry growth, and technological advancements.

- F**uel efficiency optimization:** AI algorithms can be used to optimize flight routes, aircraft performance, and operational procedures for greater fuel efficiency, thus reducing environmental impacts.

AFRA End-Of-Life KPIs
LCAs for electric aircraft and drones
Analysis of the sustainability of the aircraft lifecycle, with a focus on End-Of-Life

SUSTAINABILITY TRAINING

Aviation sustainability training is crucial for addressing environmental challenges, promoting sustainable practices, and reducing the industry's impact. It equips professionals with the knowledge and skills to implement carbon reduction, energy efficiency, waste management, and biodiversity conservation measures. Additionally, it enhances environmental responsibility, meets traveler expectations, and fosters a competitive edge in the market.

ENV-ISA and Airports Council International - ACI Africa have joined forces to establish the Sustainable Aviation Academy (SAA), an innovative online platform developed in collaboration with ACI Africa. This groundbreaking initiative is designed to equip airport environmental specialists with the necessary knowledge and tools to effectively manage carbon emissions within African airports. By leveraging the SAA, participants can gain insights and expertise that enable them to meet the requirements for different accreditation levels of the globally recognized Airport Carbon Accreditation (ACA) program. Together, ENV-ISA and ACI Africa drive sustainable practices and foster environmental stewardship in the African aviation industry through this transformative educational platform.

200+
REFERENCES

100+
PARTNERS

200+
PROJECTS

MORE&LESS

REIVON

BeCoM

ECATS International Association

LGA
hOListic Green Airport

AIRBUS

Aéroport de Lille

Arora GROUP

BELGRADE AIRPORT

brussels airport

QUEEN ALIA INTERNATIONAL AIRPORT

مطار الملك خالد الدولي
king khalid int'l airport

VINCI CONCESSIONS

EASA

European Commission

dgac

Honeywell

SAFRAN

Bartin

Rolls-Royce

DLR

VERIFAVIA

nlr

bahrain airport company

KIX

ITM

ADL

AEROPORTURI BUCUREȘTI

AÉROPORT

Brest Bretagne

egis

ACA CERTIFIED AIRPORTS WITH ENV-ISA

ENV-ISA's ACA references include the following airports:

Tarbes-Lourdes-Pyrénées Airport, France (ACA2), Maya-Maya International Airport, Brazzaville, Congo (ACA2), Perpignan South of France Airport, France (ACA2), Carcassonne South of France Airport, France (ACA2), Lille-Lesquin Airport, France (ACA2), Brest Bretagne Airport, France (ACA2), Quimper Bretagne Airport, France (ACA2), Pays d'Ancenis Airport, France (ACA2), King Khalid International Airport (Riyadh), Saudi Arabia (ACA2), Grand Nancy Tomblaine Aerodrome, France (ACA2), Aurillac-Tronquières Airport, France (ACA2), Puy-en-Velay Loudes Airport, France (ACA2), Limoges Airport, France (ACA2), Pau Pyrénées Airport, France (ACA2), La Rochelle-Île de Ré Airport, France (ACA2), Angoulême Cognac Airport, France (ACA2), Caen Carpiquet Airport, France (ACA2), Deauville-Normandy Airport, France (ACA2), Le Havre-Louis Blériot Airport, France (ACA2), Cluj-Napoca Airport, Romania (ACA2), Belgrade Nikola Tesla Airport, Serbia (ACA2), Rouen Airport, France (ACA2), Moi International Airport, Kenya (ACA2), Jomo Kenyatta International Airport, Kenya (ACA2), Eldoret International Airport, Kenya (ACA2), Kisumu International Airport, Kenya (ACA2), Nantes Atlantique Airport, France (ACA3), Saint-Nazaire Montoir Airport, France (ACA3), Grenoble Alpes Isère Airport, France (ACA3), Rennes Bretagne Airport, France (ACA3), Narita International Airport, Japan (ACA3), Monaco Heliport, Monaco (ACA3), Chambéry Savoie Mont Blanc Airport, France (ACA3), Clermont-Ferrand Auvergne Airport, France (ACA3), Toulon Hyères Airport, France (ACA3), Luxembourg Airport, Luxembourg (ACA3+), Libreville Airport, Gabon (ACA3+), Kansai Airport, Japan (ACA4), Kobe Airport, Japan (ACA4), Osaka Airport, Japan (ACA4), Chūbu Centrair International Airport, Japan (ACA4), Lyon-Saint Exupéry Airport, France (ACA4+), Lyon Bron Airport, France (ACA4+), Pau Pyrénées Airport, France (ACA4+), Luxembourg Airport, Luxembourg (ACA4+), Adelaide Airport, Australia (ACA4+), Toulon Hyères Airport, France (ACA5), Brazzaville Airport (ACA2R 2023), Le Havre Airport (ACA2R 2023), Limoges Airport (ACA2R 2023), Cambodia (ACA2R), ONDA Maroc (2023), Ravinala Airports (ACA2 + 3), SPLAR, Angoulême Airport (ACA2R), and Cluj Airport (ACA2).