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COMPARATIVE ANALYSIS OF CARBON ACCREDITATIONS AT AIRPORTS IN SOUTH AMERICA: FOCUS ON BRAZIL AND PROSPECTS FOR EXPANSION

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ABSTRACT

This article discusses the increasing need for innovative solutions to reduce the environmental impact of airports and promote sustainability in aviation. It focuses on the Airport Carbon Accreditation (ACA) program of Airports Council International (ACI). The research aims to comprehensively overview accredited airports in South America, particularly in Brazil. It discusses the results obtained and explores possible future scenarios. The methodology involved collecting data from the official ACA website, filtering to include South American airports and categorizing by accreditation level and country. The analysis revealed that Brazil leads the way regarding the number and diversity of accreditations and excels in carbon management practices. The comparative analysis identified trends and patterns that indicate a strong commitment to airport sustainability in Brazil, pointing to opportunities for growth in other countries in the region.

Keywords: Airport Carbon Accreditation (ACA), Carbon management, Airport Sustainability, Environmental practices in aviation.

1. INTRODUCTION

According to data from the International Energy Agency and the World Resources Institute, in 2019 the transportation sector was responsible for 14.3% (7.12 GtCO2e) of Carbon Dioxide Equivalent emissions from combustion, with the aviation sector accounting for 2.1%. In the same period, the transportation sector was responsible for 19% (201 MtCO2e) of emissions in Brazil. The following year, the sector was heavily impacted by the COVID-19 pandemic, which resulted in an abrupt drop in activities and, consequently, in emissions. Despite this, the gradual recovery of the sector highlights the emerging need for innovative solutions to mitigate the environmental impact of airports and promote sustainability in aviation.

The ICAO's report on Global Environmental Trends outlines the evolving data and forecasts regarding aviation emissions and their impact on climate change. First presented at the 37th Assembly Session, these trends have been regularly updated for each session to guide decision-making. The latest trends are based on the CAEP/12 air travel mid-demand forecast, using 2018 as the base year and projecting through 2050. The report includes various scenarios to account for the impacts of the COVID-19 pandemic on the aviation industry.

In the global context of reducing carbon emissions, Airports Council International's (ACI) Airport Carbon Accreditation (ACA) program has emerged as a crucial initiative to recognize and certify airports' efforts to reduce their carbon footprints. According to the Airport Carbon Accreditation Application Manual (Issue 14), the program was developed and launched in 2009 by ACI Europe and expanded over the years, until in 2014, with the inclusion of Latin America and the Caribbean in the program, it reached all of ACI's regions of operation. According to the Council, this program is the only voluntary, global carbon management program for airports. However, other bodies are engaged in discussing and promoting Sectoral Agreements or discussing Carbon Management initiatives and standards towards the Net Zero journey, such as IATA (Fly Net Zero), ICAO (Net Zero Tracker), and SBTi (Transport Science-Based Target Setting).

The ACA classifies airports into seven levels of accreditation, each representing a progressive stage of commitment to managing and reducing carbon emissions. Level 1: Mapping involves the initial measurement of the airport's carbon footprint. In Level 2: Reduction, the focus is on carbon management intending to effectively reduce the carbon footprint. Level 3: Optimization requires the engagement of third parties in reducing the carbon footprint. Level 3+: Neutrality achieves carbon neutrality for direct emissions through offsets. Level 4: Transformation involves transforming the operations of the airport and its business partners to achieve absolute emission reductions. At Level 4+: Transition, there is an offsetting of residual emissions with reliable offsets. Finally, Level 5 represents the highest level of the ACA program, highlighting the highest degree of commitment and effectiveness in managing carbon emissions.

This article aims to provide an overview of accredited airports in South America, particularly in Brazil, and to discuss the results obtained and possible future scenarios. The analysis will address the opportunities for increasing the representation of airports in programs aimed at decarbonizing the sector.

2. METHODS

A systematic methodology was adopted to carry out a comparative analysis of the airports accredited by the Airport Carbon Accreditation (ACA) program in South America. First, the complete list of accredited airports was obtained from the official website of the ACA Program. Next, the list was filtered to include only airports located in South America. The airports were then classified according to their accreditation levels: Level 1 (Mapping), Level 2 (Reduction), Level 3 (Optimization), Level 3+ (Neutrality), Level 4 (Transformation) and Level 4+ (Transition). Within

each accreditation level, the airports were organized by country, providing a clear visualization of the geographical distribution. Each airport was associated with its respective airport operator, identifying the companies responsible for managing and operating the accredited airports.

The information contained on the program's official website can be exported in .csv format and can be processed and analyzed using a variety of software. The analysis and interpretation of the data involved various aspects. The distribution and number of accredited airports were analyzed by region and country, highlighting the countries with the highest number of accredited airports and identifying trends and patterns. The performance of airport operators was assessed based on the number and level of accreditation of the airports under their management. Practices and results were compared to identify significant differences. Trends and patterns in the data were identified, such as regions with a higher number of advanced accreditations.

The results of the analysis were shown in tables, graphs, and combinations thereof. Of particular note is the choropleth map made possible by interaction with Microsoft's Bing Maps platform. This methodology provides a solid basis for detailed analysis of ACA accreditation data, allowing valuable insights into sustainability practices in the South American airport sector.

3. RESULTS AND DISCUSSION

Figure 1 shows the distribution and accreditation levels of the Airport Carbon Accreditation (ACA) program of Airports Council International (ACI) among airports in South America.

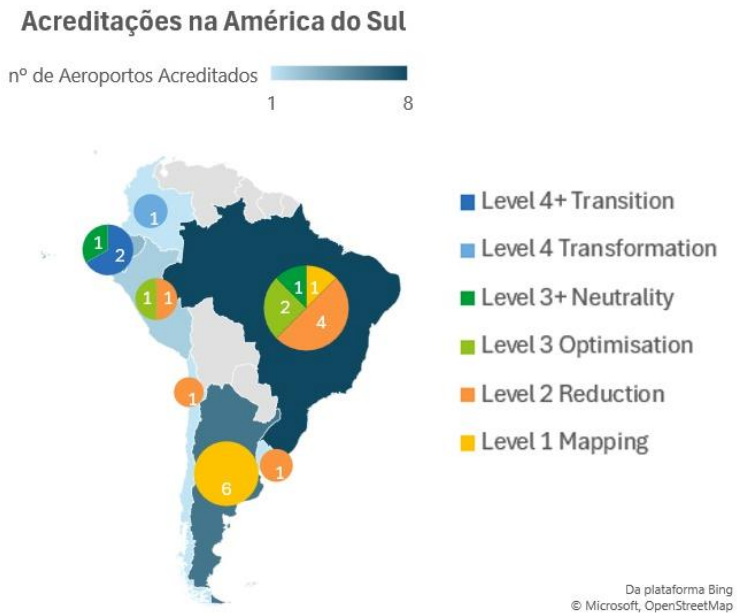


Figure 1 Accreditations in South America. Prepared by the author.

It was observed that Brazil leads both in terms of quantity and diversity of accreditation levels. The country has airports with varying levels of accreditation, while other countries in the region have mainly initial levels (Argentina, Chile, Uruguay, and Peru), and others have the highest levels in the region (Colombia and Ecuador). Table 1 lists the airport operators with accreditation in South America, and highlights those operating in Brazil. Operators such as Zurich Airport Brasil, BH Airport, Rio Galeão, Vinci, Infraero, and Corporación América S.A. stand out for their significant performance in carbon management practices. This analysis reveals Brazil's robust commitment to airport sustainability while pointing to opportunities for growth in other countries in the region. It also shows that Brazil's accreditation levels have room for improvement, given that there are 5 levels of the program, divided into 7 types of accreditation. Level 5 has no representative in the study area.

Table 1 Number of Accredited Airports per Airport Operator. Prepared by the author.

Airport Operators	Qty Accredited Airports
Aeropuertos Argentina 2000	6
Zurich Airport Brasil	**3**
Corporación América S.A.	**2**
Aeropuertos del Perú S.A.	1
Aeropuertos Uruguay	1
BH Airport S.A.[1]	1
Corporación Quiport S.A.	1
Infraero Aeroportos	1
Lima Airport Partners	**1**
Nuevo Pudahuel[2]	1
OPAIN S.A. Concesionario Aeropuerto Internacional El Dorado	1
RIOgaleão – Aeroporto Internacional Tom Jobim[3]	1
Terminal Aeroportuaria de Guayaquil S.A.	**1**
VINCI SA	1

[1]Special Purpose Company formed by CCR Group, Zurich Airport and Infraero

[2]Involvement of Vinci, ADPM, and Astaldi Concessions

[3]Constituted by Changi Airports International and Infraero

Table 2 Categorization of airports by passenger demand. Prepared by the author.

Airport/Country	Categorization by demand (mi.pax/year)
Argentina	
Aeropuerto Internacional de Córdoba “Ingeniero Aeronáutico Ambrosio Taravella”	< 5
Comodoro Rivadavia Airport	< 1
Ezeiza International Airport	> 5
Iguazu Cataratas Airport	< 5
Jorge Newbery Airfield Buenos Aires	> 5
Mendoza El Plumerillo Airport	< 5
Brazil	
Aeroporto de Macaé – Joaquim de Azevedo Mancebo	< 1
Aeroporto Internacional de Florianópolis Hercílio Luz	< 5
Belo Horizonte International Airport	> 5
Brasilia International Airport	> 5
Rio de Janeiro/Galeão International Airport	> 5
Salvador Bahia International Airport	> 5
Santos Dumont Airport	> 5
Vitoria International Airport	< 5
Chile	
Santiago Arturo Merino Benitez Airport	> 5
Colombia	
El Dorado International Airport	> 5
Ecuador	
Galapagos Ecological Airport	< 1
José Joaquín de Olmedo International Airport	< 5
Quito International Airport	< 5
Peru	
Jorge Chávez International Airport	< 5
Pisco Airport	< 1
Uruguay	
Carrasco International Airport	< 5

Table 2 shows that of the twenty-two accredited airports in South America, nine handle more than 5 million passengers a year, nine are less than 5 million, and four are less than 1 million. It can be seen that there is a higher rate of accreditation for the main airports in each country.

According to ANAC, Brazil has 504 public aerodromes, of which sixty-three are operationally certified and twenty-nine are in the process of being certified, making a total of ninety-two airports. This demonstrates the opportunity to increase Brazil's representation in carbon management and accreditation.

Brazil has experienced a transformation from public to private administration through concessions and re-bidding. Important players are expanding their contracts and operations in the country. As a result, there may be a greater demand for accreditation, given these companies' policies and global strategies. Although Table 1 does not have an extensive list of operators, they are concerned with accrediting a large part of their operations.

4. CONCLUSIONS

The analysis of airports accredited by the Airport Carbon Accreditation (ACA) program in South America revealed a significant lead for Brazil in terms of the number and diversity of accreditation levels. This predominance indicates the country's strong commitment to airport sustainability. It was observed that the main Brazilian airports are distributed at almost all levels of accreditation, in contrast to other countries in the region, where accreditations are mainly at the initial levels.

From the data, it is possible to conclude that airport operators such as Zurich Airport Brasil, BH Airport, Rio Galeão, Vinci, Infraero, and Corporación América S.A. play a crucial role in promoting carbon management practices in Brazil. Together, these operators manage a significant portion of the accredited airports, reflecting a corporate policy that is aligned with global decarbonization goals.

Furthermore, the analysis suggests that there is a correlation between passenger volume and level of accreditation, with the top airports in terms of passenger movements tending to seek more advanced accreditations. However, there is substantial potential to increase the number of accredited airports in Brazil, considering the total number of public aerodromes and the recent trend of concessions and re-bidding which may favor the adoption of sustainable practices.

It would be interesting to expand the study to include the other countries of Latin America and the Caribbean, covering the entire ACI/LAC area. Participation as a member of organizations and the search for accreditations results in an important exchange of experience between airports and councils, which is favorable for the development of the entire sector.

In conclusion, Brazil has shown remarkable progress in joining the ACA program, but there is still room for progress, especially in reaching the highest levels of accreditation. The expansion of accreditations can serve as an example for other countries in the region and contribute to more sustainable aviation in South America.

5. REFERENCES

AEROPORTO DE BRASÍLIA (Brasil). Dados operacionais: estatísticas. Estatísticas. 2024. Available online: https://www.bsb.aero/institucional/dados-operacionais. Accessed on July 19, 2024.

AFEN, Sena., HADI, Prayitno., PUTRA, Wicaksono. (2024). Airport Carbon Emission Accreditation as a Policy Approach towards Net Zero Carbon 2050. DOI: 10.61306/icaneat.v1i1.196

AGÊNCIA NACIONAL DE AVIAÇÃO CIVIL (ANAC). (org.). Operador de Aeródromo de Uso Público. 2024. Available online: https://app.powerbi.com/view?r=eyJrIjoiNWZlZDU5OWEtOWM1OC00ZTMyLWI2MTEtN

2Q4OTM2YTk5MTBiIiwidCI6ImI1NzQ4ZjZlLWI0YTQtNGIyYi1hYjJhLWVmOTUyMjM2ODM2NiIsImMiOjR9. Accessed on July 21, 2024.

AIRPORT CARBON ACCREDITATION (org.). Accredited Airports: accredited airports across the world. Available online: https://www.airportcarbonaccreditation.org/accredited-airports/. Accessed on July 12, 2024.

AIRPORT COUNCIL INTERNATIONAL (org.). Airport Carbon Accreditation Application Manual (Issue 14). 2023. Available online: https://www.airportcarbonaccreditation.org/wp-content/uploads/2023/12/Airport-Carbon-Accreditation-Application-Manual-14-FINAL-01112023.pdf. Accessed on July 12, 2024.

Airport of Guayaquil, José Joaquín de Olmedo. Disponível em: <https://www.tagsa.aero/en_aeropuertojjo.html>. Acesso em: 5 ago. 2024.

ICAO. Trends in Emissions that affect Climate Change. Available online: https://www.icao.int/environmental-protection/Pages/ClimateChange_Trends.aspx. Accessed on July 21, 2024.

INDRA (org.). GESTIÓN INTEGRAL DEL TRÁFICO AÉREO EN AEROPUERTO EL DORADO: modernización del aeropuerto internacional el dorado. MODERNIZACIÓN DEL AEROPUERTO INTERNACIONAL EL DORADO. CASO DE ÉXITO. Available online: https://www.indracompany.com/sites/default/files/indra_atm_colombia_e-1.pdf. Accessed on July 19, 2024.

ORSNA. INFORME DE IMPACTO SOCIOECONÓMICO Y TERRITORIAL. 2022. Available online: https://www.argentina.gob.ar/sites/default/files/2023/09/iset_crd_2022_0.pdf. Accessed on July 19, 2024.

VINCI S.A (Brasil). Dados Operacionais: movimentação de aeronaves e passageiros. Movimentação de aeronaves e passageiros. 2024. Available online: https://hstvoos.salvador-airport.com.br/PBI/IndexSSA. Accessed on July 19, 2024.

WORLD RESOURCES INSTITUTE (org.). 4 Charts Explain Greenhouse Gas Emissions by Countries and Sectors**.** 2020. By Mengpin Ge, Johannes Friedrich and Leandro Vigna. Available online: https://www.wri.org/insights/4-charts-explain-greenhouse-gas-emissions-countries-and-sectors. Accessed on August 04, 2024.