

Calculation of the carbon footprint of Aena S.M.E., S.A. and Aena Sociedad Concesionaria Aeropuerto Internacional de la Región de Murcia

Index

1. Purpose and Scope.....	3
2. Reference documentation.....	3
3. General information.....	3
3.1 Definitions and terms.....	3
4. Calculation of corporate carbon footprint.....	5

1. Purpose and Scope

The purpose of this procedure is to explain the methodology for calculating the carbon footprint of Aena S.M.E., S.A. and Aena Sociedad Concesionaria del aeropuerto Internacional de la Región de Murcia (SCAIRM), hereinafter collectively referred to as Aena, in accordance with the Greenhouse Gas Protocol ("GHG Protocol").

This procedure applies to the calculation of the carbon footprint for all activities and airport network covering airports, heliports and facilities throughout Spain, including Murcia International Airport and Headquarters. The scope therefore includes the calculation of all CO₂ emissions resulting from the direct and indirect impacts of Aena's operations in Spain, as well as the calculation of the company's carbon footprint, which includes Scopes 1, 2 and 3.

2. Reference documentation

- GHG Protocol of the *World Resources Institute (WRI)* and *World Business Council for Sustainable Development (WBCSD)*.
 - Corporate Standard.
 - Scope 2 Guidance.
 - Corporate Value Chain (Scope 3) Standard.

3. General information

3.1 Definitions and terms

The following terms have the following meaning in the context of this procedure:

Scope: concept that defines the operational limits in relation to direct and indirect GHG emissions.

Scope 1: direct greenhouse gas (GHG) emissions. For example, emissions from combustion in boilers, vehicles, etc., which are owned or controlled by the entity in question. It also includes fugitive emissions (e.g. air conditioning leaks, etc.).

Scope 2: indirect GHG emissions associated with the generation of electricity purchased and consumed by the organization.

Scope 3: other indirect emissions from third parties. Examples of Scope 3 activities include the extraction and production of materials procured by the organization, business travel, the transportation of raw materials, fuels and products by third parties (such as logistics activities) and the use of products or services provided by external companies.

Auxiliary Power Unit (APU): provide electrical power to the aircraft once the aircraft's engines are shut down. These are generally small turbines with similar characteristics to the rest of the aircraft engines.

Landing and Take-off cycle (LTO): LTO cycle is initiated when the aircraft crosses into the mixing zone (approximately 3,000 ft or 915 m) as it approaches the airport on its descent from cruising altitude, lands and rolls to the parking stand. The cycle continues as the aircraft taxis to the runway for takeoff and ascends until it exits the mixing zone to return to cruising altitude. One aircraft LTO is equivalent to two aircraft operations (one landing and one take-off). The four modes of operation specific to the LTO cycle are: takeoff, ascend, approach and taxi on the ground.

CNAE: National Code of Economic Activity.

DEFRA: Department for Environment, Food and Rural Affairs of United Kingdom.

Carbon dioxide equivalent (CO₂e): universal unit of measurement that indicates the global warming potential (GWP) of each of the six greenhouse gases, expressed in terms of the GWP of one unit of carbon dioxide. It is used to evaluate the emission of different greenhouse gases against a common denominator.

Greenhouse gas emissions (GHG): gases present in the atmosphere that give rise to the greenhouse effect, the main ones being carbon dioxide, methane and nitrous oxide.

Direct GHG emissions: emissions from sources owned or controlled by the Aena unit or center. They correspond to Scope 1.

Indirect GHG emissions: those emissions that are a consequence of the operations of the Aena unit or center, but which occur from sources that are owned or controlled by other companies. They correspond to Scope 2 and 3.

FAA-AEE AEDT: Aviation Environmental Design Tool.

GHG emission factor: factor that allows estimating GHG emissions from available activity data (such as tons of fuel consumed) and total GHG emissions.

Greenhouse gases (GHG): for the purposes of this procedure, GHGs are the six gases listed in the Kyoto Protocol: carbon dioxide (CO₂); methane (CH₄); nitrous oxide (N₂O); hydrofluorocarbons (HFCs); perfluorocarbons (PFCs); and sulfur hexafluoride (SF₆).

Uncertainty: for the purposes of the GHG inventory, "uncertainty" refers to the lack of certainty in emissions data due to various causal factors, such as the use of unrepresentative factors or methodologies, incomplete information on sources and sinks, lack of transparency, and so on.

GHG inventory: list of GHG emissions quantification and emission sources corresponding to the Aena unit or center.

Operational boundaries: boundaries that determine the direct and indirect emissions associated with operations owned or controlled by the inventory and reporting organization. This concept enables an organization to identify the activities and sources that cause direct or indirect emissions. It helps to determine which indirect emission sources resulting from its activities should be included in the inventory.

Organizational boundaries: boundaries that determine the operations that are owned or controlled by the reporting organization, depending on the consolidation approach assumed (ownership interest or control).

OCCC: Office of Climate Change of Catalonia

Global Warming Potential (GWP): factor describing the impact of the radiative forcing (degree of damage to the atmosphere) of one unit of a given GHG relative to one unit of CO₂.

Third parties: third parties operating within Aena's operational boundaries.

WBCSD: World Business Council for Sustainable Development.

WRI: World Resources Institute.

4. Calculation of corporate carbon footprint

(A) Planning the calculation of the corporate carbon footprint

The calculation of the corporate carbon footprint will generally be performed on an annual basis.

(B) Determination of the company's organizational boundaries

The methodology for consolidating Aena's GHG emissions should follow the operational control approach in accordance with this procedure. This means that the emissions calculations should focus on the facilities in Spain where Aena has the authority to implement and enforce company policies. That is, all GHG emissions quantified in the centers identified in section 1 *should be taken into account. Purpose and Scope* of this procedure.

(C) Determination of operational scope

The emissions associated with Aena's activities and centers in Spain are quantified considering the following scopes:

- Scope 1: direct emissions at Aena come from sources under the ownership or control of the airport manager:
 - Stationary combustion: generators and continuity groups, boilers, cogeneration plants owned or controlled by the airport operator, fire extinguishing service practices, etc.
 - Mobile combustion: light and heavy vehicles belonging to the Aena fleet.
- Scope 2: indirect GHG emissions from off-site electricity generation and off-site heating or cooling purchased and consumed by the airport operator's facilities and centers.
- Scope 3: indirect GHG emissions from activities related to Aena and generated by sources that are neither owned nor controlled by the airport manager due to:
 - Purchased goods and services: includes all emissions that arise in advance in the production of goods or services that Aena has acquired in the reporting year and that are necessary for the performance of its activities.
 - Capital goods: includes all upstream emissions from the production of capital goods purchased or acquired by Aena.
 - Fuel and energy-related activities not included in Scope 1 or Scope 2: includes emissions related to the production of energy or fuels purchased and consumed by Aena during the reporting period. These emissions differ from those included in Scope 1 (direct emissions) and Scope 2 (indirect emissions from purchased electricity and heat).
 - Waste generated in operations: includes emissions from the deposit and treatment of waste generated by Aena in its operations in the reporting year.
 - Business travel: includes emissions from employee business travel in vehicles owned and/or operated by third parties such as airplanes, trains, buses, etc.
 - Employee commuting: includes emissions due to commuting between their homes and the workplace.
 - Upstream Leased Assets: includes emissions from the operation of assets that are leased by Aena and that have not already been included in Scope 1 and 2.
 - Downstream transportation and distribution: includes all emissions from downstream transport, i.e., the movement of passengers to or from Aena airports as well as the distribution of goods to the nearest transport node.

- Use of Sold Products: includes emissions due to the use or consumption of goods or services sold. Aena's customers are considered to be airlines, handling agents and passengers. The use of services by passengers is included in Aena's Scope 1 and 2 emissions, since it is the use of the facilities themselves. However, in the case of airlines and handling agents, emissions derived from the LTO cycle, as well as APUs and emissions caused by the activity of handling agents, should be accounted for in this category.
- Investments: includes issues associated with income related to Aena's investees based on their percentage of ownership.

These emissions are determined on the basis of the fifteen categories defined in the *Corporate Value Chain (Scope 3) Standard* of the GHG Protocol that apply to Aena.

(D) Definition of GHG emissions quantification methodology

The calculation methodology is based on the GHG Protocol published by WRI and WBCSD. From the data available in the internal systems, all of them are consolidated in a spreadsheet.

In relation to emission factors, we conduct regular reviews of our data sources to ensure that the most current versions of these factors are utilized in our calculations.

The calculation of GHG emissions is conducted by considering the various emission sources corresponding to each of the scopes:

- Scope 1:
 - For stationary combustion and mobile combustion, quantitative indicators of each source's activity are used along with their corresponding emission factors. To do so:
 - The activity data from each of the sources is carefully selected and collected in a manner consistent with the requirements of the selected scope. These values are then included in Aena's carbon footprint inventory. The primary activity data required to calculate Scope 1 of the corporate carbon footprint corresponds to Aena's energy and fuel consumption data.

For the collection of this data, sources ensuring the highest possible quality are chosen to minimize the uncertainty associated with the calculation. The source of the primary data is, whenever possible, the invoice of the corresponding supply.
 - Emission factors are values from recognized and updated sources, such as MITERD and GHG Protocol.

The final calculation of emissions is made by multiplying the GHG activity data by the selected emission factors.

Exceptions to the calculation of Scope 1 emissions are justified due to their minor significance compared to the total footprint (A1+A2+A3). These include cases such as the leakage of fluorinated greenhouse gasses from Aena's air conditioning systems.

- Scope 2:
 - Indirect GHG emissions from off-site electricity generation, purchased and consumed by the airport operator.

These emissions are calculated using the market-based method.

Quantitative indicators of electricity consumption from external suppliers and their respective emission factors are used to calculate emissions. To do so:

- Electricity consumption data from external suppliers corresponds to the kWh reflected in the electricity bills.

- The emission factors are those attributable to the electricity purchased under the supply contract with the retailer for the period of calculation of the company's carbon footprint.

The final calculation of emissions is made by multiplying the electricity consumption data by the corresponding emission factors.

- Indirect GHG emissions from off-site heating or cooling generation purchased and consumed by the airport operator.

To calculate emissions, quantitative indicators are utilized to determine the total emissions from the external supplier, and the portion attributable to the heating and cooling consumed by Aena is then computed.

- Scope 3:

- Purchased Goods and Services: purchases are assessed based on units of measurement of the most significant materials and resources in terms of purchasing volume. They are calculated according to the type of good or service as described below:
 - For paper purchased by the organization: the paper consumption is multiplied by the emission factor obtained from recognized sources. Specifically, the DEFRA database should be used, which was developed by the British government and is recognized and recommended by the GHG Protocol.
 - For water purchased by the organization: the water consumption is multiplied by the emission factor from recognized sources. In particular, the guide prepared by the Climate Change Office of the Generalitat de Catalunya is used, as it is an official source that minimizes geographical uncertainties.
 - For all other goods and services purchased by the organization: they are calculated through an economic input/output analysis using economic data on the goods and services purchased during the calculation period of the organization's carbon footprint, and relevant emission factors from a recognized database are applied. Specifically, the CNAE activity code (equivalent) is assigned to each expense corresponding to the accounting accounts to be taken into account, and the total emission factor published by the INE for this CNAE is applied.
- Capital goods: emissions are calculated through an economic input/output analysis using the economic data on capital goods from the calculation period of the company's carbon footprint. Then, the corresponding emission factors from a recognized database are applied. Specifically, each fixed asset acquisition concept corresponding to the accounting accounts to be considered is assigned the corresponding CNAE activity code, and the total emission factor published by the INE for that CNAE is applied.
- Fuel and energy-related activities not included in scope 1 or scope 2: involve the use of primary data on energy purchased by Aena in various forms. This includes data on fuel purchases for stationary combustion, electricity consumption, and consumption for heating/cooling purposes. Relevant emission factors obtained from a recognized database should be applied to these consumptions. Specifically, the DEFRA database should be used, which was developed by the British government and is recognized and recommended by the GHG Protocol.
- Waste generated in operations: involves using primary data on the amount of waste generated at Aena's facilities in Spain and the treatment undergone by this waste, categorized by type. Relevant emission factors obtained from a recognized database shall be applied to these values. Specifically, the emission factors included in the DEFRA and OCCC databases should be used. The selection criterion is based on prioritizing the OCCC factors with the least geographic uncertainty. If the factor does not exist for a specific waste, the ones established by DEFRA should be used.

- Business travel: involves using origin-destination data by means of transportation, processed in a mileage spreadsheet developed internally from the data of the corporate travel application CONCUR. The relevant emission factors obtained from a recognized database will be applied to these data. However, for the calculation of emissions due to air travel, the ICAO and IATA calculators should be used as the most accurate method of calculation available.¹² For all other means of transport, emission factors from the DEFRA database, as it is developed by the UK government and recognized and recommended by the GHG Protocol, should be utilized.
- Employee commuting: data from employee surveys on available home-work-home commuting patterns should be used. An internal spreadsheet should be utilized to extrapolate the amount of CO₂ corresponding to employees' home-to-work and work-to-home commuting from the workplaces for which information is available, based on employee surveys of existing mobility plans. For emission factors, we primarily rely on the guide prepared by the Climate Change Office of the Government of Catalonia, as it is an official source that minimizes geographical uncertainty, provided it has published emission factors for the means of transport considered. Alternatively, DEFRA database is used, as it is developed by the UK government and recognized and recommended by the GHG Protocol.
- Upstream Leased Assets: these are calculated by performing an economic input/output analysis using the economic data relating to assets leased by Aena in the corporate carbon footprint calculation period and applying the relevant emission factors obtained from a recognized database. Specifically, the CNAE activity code (equivalent) is assigned to each expense corresponding to the accounting accounts to be taken into account, and the total emission factor published by the INE for this CNAE is applied.
- Downstream transportation and distribution: to be included:
 - For passenger ground access emissions to airports, primary data is used on passenger numbers by airport along with access mode percentages (e.g., taxi, train, bus, etc.), and distance data in kilometers for each access mode and airport. For car trips, the distribution of the vehicle fleet by province and environmental label published by the Dirección General de Tráfico are taken into account. Relevant emission factors obtained from recognized sources shall be applied to these data. Specifically, we refer to the guide prepared by the Climate Change Office of the Government of Catalonia, as it is an official source that minimizes geographical uncertainty, provided it contains published emission factors for the considered means of transport. Alternatively, DEFRA database may be used, as it is developed by the UK government and recognized and recommended by the GHG Protocol.
 - For emissions due to ground transportation of goods to the nearest ground access node, we utilize primary data on the distance from airports to the nearest ground access nodes and the total weight of goods transported per airport. Relevant emission factors obtained from recognized sources shall be applied to these data. In particular, the guide prepared by the Climate Change Office of the Government of Catalonia is used, as it is an official source that minimizes geographical uncertainties.
- Use of Sold Products: shall include:
 - Emissions associated with airline activity, due to:
 - Landing and Take Off Processes (LTO cycle): the available primary data on emissions recorded by airport from the National Emissions Inventory prepared by MITERD is used.
 - For the use of APUs, emissions are modeled for each airport based on the operations data of each aircraft model, which will then be correlated to an APU according to recognized databases. Relevant emission factors obtained from

¹ [ICAO Carbon Emissions Calculator: https://applications.icao.int/icec](https://applications.icao.int/icec)

² [IATA - IATA CO₂ Connect: https://www.iata.org/en/services/statistics/intelligence/co2-connect/](https://www.iata.org/en/services/statistics/intelligence/co2-connect/)

recognized sources shall be applied to these data. Specifically, the emission factors published by FAA-AEE AEDT are used.

- Emissions associated with the activity of handling agents are calculated based on fuel consumption data provided by the main handling agents.
- Investments: are calculated using economic data related to the gross profits of Aena's subsidiary companies and the percentage of participation in the calculation period of the corporate carbon footprint. Relevant emission factors obtained from a recognized database are then applied. Specifically, the equivalent CNAE activity code are assigned to each investment amount to be considered and the total emission factor published by the INE for that CNAE is applied.

The unit of measurement for GHG emissions will in any case be the ton of CO₂e.

(E) Re-calculation of historical series.

The GHG inventory of previous years are recalculated in the event of significant variations that are important to consider in the historical series. These variations may be due to an increase in the scope of the inventory, the incorporation of assets or a change in the calculation methodology, among other causes.

For the recalculation of previous years due to changes in operational limits, ownership and control of GHG sources, changes in quantification methodologies, etc., the methodology described in this procedure and in the GHG Protocol are to be followed.

(F) Evaluation and reduction of uncertainty.

The quantification of GHGs is subject to inherent uncertainty due to the incomplete scientific knowledge used to determine the emission factors and values needed to calculate the emissions of the different greenhouse gases. However, Aena has the following elements to reduce this uncertainty:

- All the processes in which the different emission sources are framed are within the scope of Aena's Quality and Environment System. This system is certified in accordance with ISO 9001:2000 and ISO 14001:2004 standards. The implementation of the aforementioned quality systems minimizes the uncertainty of the information used to calculate the GHG inventory.
- The information on activity data associated with Scope 1 and 2 emission sources will come whenever possible from invoices, which are commercial records based on meter measurements that comply with the standards set forth in current legislation.

If all the invoices corresponding to the energy consumed in the footprint calculation period are not available, the corresponding consumption may be determined by using Aena's own meters, averaging the consumption of the remaining months (non-seasonal consumption), or assimilating the consumption in the same months of previous years (seasonal consumption). In all cases, the chosen method and its rigor will be duly justified.

- Scope 1 and 2 emission factors are derived from recognized national and international databases prepared by official agencies, with known and controlled uncertainty.
- The information on the input data associated with the emission sources of the different Scope 3 categories shall be derived, as appropriate, from invoices, company accounting records, public statistics performed by the company and public information from official sources ensuring the validity of the data in the data collection process.
- The emission factor databases and calculation tools used to calculate Scope 3 emissions are of recognized prestige.