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Life Cycle Assessment of a Football Match



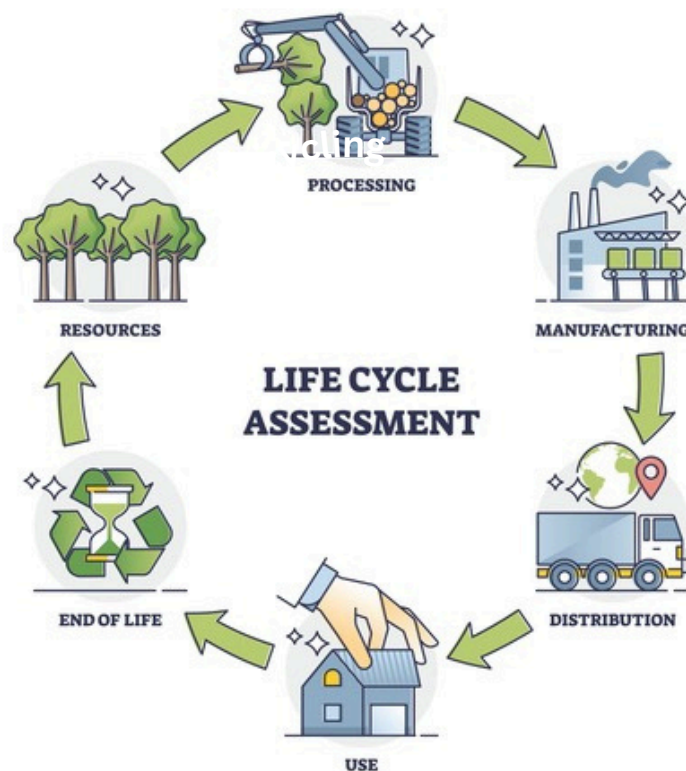
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What is a Life Cycle Assessment (LCA)?

Life cycle assessment (LCA) is a methodology to assess the overall environmental burden associated to the whole life cycle of a product or service.

Being quantitative, standardized and scientific, this methodology allows the production of reliable information about the environmental performance of a product and it overcomes some issues that might arise while focusing on a single life cycle phase, typically the production one.



What is an LCA? (cont.)

It is generally considered the most reliable tool to assess properly the sustainability of a product.

LCA is an iterative process, which consists of 4 main phases:

1. Goal and scope definition.
2. Inventory analysis (Life Cycle Inventory - LCI)
3. Impact assessment (Life Cycle Impact Assessment - LCIA)
4. Interpretation of the results

Today, LCA is defined in two ISO standards:

- ISO 14040:2021 - Environmental management -- Life cycle assessment -- Principles and framework
- ISO 14044:2021 - Environmental management -- Life cycle assessment -- Requirements and guidelines





Goal and Scope

To identify the environmental footprint of a professional football match in a specific season (2018-19).

The unit of analysis of the study is one football match played at the Estadio Benito Villamarín.

During the 2018-19 season, a total of 27 matches were played at Estadio Benito Villamarín.

Did You Know?

An environmental footprint, isn't just about carbon emissions. For example, it can include:

- Climate change
- Ozone depletion
- Ionising radiation
- Photochemical ozone formation
- Particulate matter
- Human toxicity (cancer and non-cancer)
- Acidification
- Eutrophication (marine, freshwater, terrestrial)
- Ecotoxicity – freshwater
- Land use
- Water use
- Resource use, fossils, minerals and metals



Inventory Analysis

The scope of the study is to assess the environmental footprint of a football match, considering the following system boundaries:

- energy, water consumption and refrigerant gas refills associated to the football match processes (with reference to the stadium and facilities)
- production and end of life of the sport apparel and equipment merchandised (t-shirt, shorts, balls, sport bags and scarfs) and used by the team (e.g. shoes, t-shirt, shorts, balls, etc.)
- production and end of life of waste materials associated to the football match, and related production of the corresponding materials (paper, plastic, glass, metal)
- production and end of life of food and beverages associated to the football match (bar and kiosk and catering including the menus served at the stadium), including packaging
- production of the chemicals and materials used for cleaning operations and for the pitch maintenance (i.e., fertilizers, cleaning product, turf, etc.)
- transport of the public attending the football match (home team and away team)
- transport of the Real Betis Balompié Staff to the football pitch (away matches)
- transport of the Real Betis Balompié talent scouts throughout the whole season;
- material used for choreographies by home supporters



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Impact Assessment

For Real Betis Balompié, the main environmental impacts of a professional football match are:

- Climate change 30.89%
- Resource use, fossils 20.53%
- Resource use, minerals and metals 10.11%
- Particulate matter 6.97%
- Photochemical ozone formation 5.86%
- Acidification 5.51%

Most Impactful Activities



77.2% - Mobility is the key contributor to the overall footprint



10.2% - Followed by energy consumed at the stadium and training facility



5.0% - The third largest contributor was food and beverages served at bars, kiosks and catering



Smaller contributions include energy consumed at the training centre, water consumption at the stadium and sports & apparel equipment



Interpretation Of Results and Recommendations

Mobility, energy consumed at the stadium and food and beverages served at bars, kiosks and catering are the three most relevant contributors to the overall footprint.

These top 3 processes together represent more than 90% of the overall environmental footprint.

Read on for recommendations on these areas.



Transport

Home supporters' mobility is the largest contributor to Real Betis Balompié's overall footprint.

Though mobility is seldom under direct control of the professional football organisation, to lower the total environmental footprint, it is necessary to reduce the use of cars for home supporters as well as flights for guest supporters.

A further boost in the use of public transport could contribute to reducing the impact of home supporters' mobility.

The promotion of increased use of public transport by home supporters could lead to an annual saving of roughly 740 ton of CO₂ equivalent emissions.



Energy



The second largest contributor was energy consumed at the stadium.

Real Betis Balompié can reduce energy consumption through the installation of solar panels to produce energy.



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Food



Food and beverages served at bars, kiosks and catering is the third largest impact.

Since this is an area where the professional football organisation might have direct influence, the composition of the menu and the inclusion of more environmentally friendly type of food and beverages could be a target for potential improvement actions.



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Limitations of the Study & Possible Improvements

- **Mobility:** most but not all club activities were considered, but using some proxy;
- **Merchandising:** consider only shirts, shorts and balls were considered
- **Sport apparel** and equipments: data referred only to first male team was used
- **Energy consumption:** “digital spectators” were not considered



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Date published: February 2024

Study carried out by the institute of Management of S. Anna School of Advanced Studies. The results are based on the data provided by the club and elaborated with SimaPro software and ecoinvent database version 3.9.1

Funded by the European Union. Views and opinions expressed are however those of the author(s) only and do not necessarily reflect those of the European Union or the European Education and Culture Executive Agency (EACEA). Neither the European Union nor EACEA can be held responsible for them.



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