Deliverable B.1.1

List of pilot stadiums to be involved in the governance and operational pilot tests

Version 2.0

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Document history

Version	Date	Description
1.0	30/04/2019	List of stadiums
2.0	07/02/2020	Modified list of stadiums with descriptions and main observations

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1. Introduction

The main objective of the LIFE TACKLE project is to increase the environmental awareness and to improve the current practices in environmental management during football games, including a whole range of different stakeholders. The project focuses on all phases of a football game's life cycle (i.e. conception, organisation, staging and closure) and targets necessary competences and organisational structures within the National Football Associations (NFAs) which are necessary or in charge of undertaking those activities in different phases of a football game. Moreover, the project promotes a continuous improvement of environmental management of football games even after the end of the project through benchmarking and setting targets, as well as via the peer influence of the NFAs committed to environmental sustainability.

One of the deliverables of the LIFE TACKLE project are the Guidelines, which were previously drafted through a desk research and on-site visits and interviews. These Guidelines contain nearly 100 existing good practices in organising sport events, including football matches. It serves as a compendium of good practices and an overview of what solutions exist already out there, their complexity when it comes to implementation and potential benefits. They cover a whole range of various aspects of environmental management – from mobility to energy, water, waste management and other operational aspects to governance.

This particular deliverable lists the 10 pilot stadiums and their characteristics, chosen for the project's purposes of in-situ testing of certain measures that are included in the Guidelines. The 10 stadiums that adhered to the project come from countries which are represented in the LIFE TACKLE project through a participating NFA as well as associated NFAs that are not directly involved in the project but do have a role in one or more project activities. This deliverable also describes each stadium's key environmental performances and characteristics as well as the identified local stakeholders who would play an important role in the pilot tests.

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2. Pilot stadiums, their characteristics and local stakeholders

The NFA participating in the project contributed with 7 stadiums, while 4 more stadiums adhered to the project through having their representatives on the Replicability Management Board[1] or simply football clubs simply expressing their interest in the project.

The stadiums are coming from different parts of Europe ensuring the project's geographical coverage which contributes to being able to assess various waste management performances influenced by local and national strategies and other local circumstances in general as well as behaviour of game goers from different cultures.

Another aspect which is covered by the choice of stadiums is the ownership. The list of pilot stadiums contains stadiums owned by local authorities, as well as NFAs and other private entities (such as football clubs or private companies). This allows the pilot tests to be undertaken in different circumstances with regards to a football game's life cycle – responsibilities, contractors etc.

The following Figure 1 shows an overview of the pilot stadiums and the project's geographical coverage.

[1] The role of the Replicability Management Board is the assessment and monitoring of the replicability potential of LIFE TACKLE activities, validating its outputs and deliverables under the replicability perspective. It is based on a strong involvement of UEFA and NFAs who signed the support letter.

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Figure 1. The pilot stadiums

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2.1 AVIVA Stadium (former Lansdowne road), Dublin

Aviva Stadium (previously known as Lansdowne Road is located in Dublin, with a capacity for 51.700 seats. It is built on the site of the former Lansdowne Road stadium, which was demolished in 2007, and replacing it as home to its chief tenants: the Irish rugby union team and the Republic of Ireland football team. Aviva Group Ireland signed a 10-year deal for the naming rights in 2009.

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The stadium, located adjacent to Lansdowne Road railway station, officially opened on 14 May 2010. The stadium is Ireland's first, and only, UEFA Category 4 Stadium and in 2011, it hosted the Europa League final. It also hosted the inaugural Nations Cup, as well as the regular home fixtures of the national rugby team, national football team and some home fixtures for Leinster Rugby from August 2010 onwards.

Unlike its predecessor, which was solely owned by the Irish Rugby Football Union (IRFU), the current stadium is controlled by the IRFU and the Football Association of Ireland (FAI) through a 50:50 joint venture known as the Lansdowne Road Stadium Development Company (LRSDC). The joint venture has a 60-year lease on the stadium; on expiry the stadium will return to the exclusive ownership of the IRFU.

Environmental issues and environmental governance in general are covered by the sustainability department which currently has 2 employees. The stadium has its own Sustainability Policy which is based on the mission "*to operate a first-class international stadium, on behalf of the IRFU and the FAI, providing an outstanding venue for matches, concerts, conferences and events, offering exceptional customer experience in a sustainable manner.*"

The key strategic commitments the stadium has are

- To continuously operate the venue in a sustainable manner.
- To continuously review how it operates in an effort to minimize the negative impacts and maximise the positive impacts its operation and events have on the environment, the economy, its stakeholders and society.
- To encourage event hosts using the stadium to engage in sustainable ventures.
- To comply with all applicable legislation and regulations.

Routine maintenance is performed by staff directly hired by Aviva stadium company for what concerns sweeping and cleaning services, gardeners for pitch maintenance. Plumbing services, together with electricians, are subcontracted to external companies. The table below gives the overview of environmental performance indicators.

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General data	2018
Capacity	51.700
Number of football matches	8
Attendance at football games	259.598
Average attendance per football game	32.448
Number of concerts	1
Number of attendees in concerts	39.365
Other events hosted: rugby games	12
Attendance at other events	513.671
Energy consumption	**2018**
Electricity (kWh)	6.754.299
Natural gas (KWh)	6.949.754
Fuel (l)	80.940
Water consumption	**2018**
Water from public water supply (m^3)	43.152
Waste production	**2018**
Total waste (kg)	296.520
Residual waste (kg)	*110.450*
Paper and cardboard (kg)	*7.080*
Bulky waste incl. C&I (kg)	*24.770*
Biowaste (kg)	*86.380*
Mixed packaging (kg)	*48.670*
Plastic packaging (kg)	*370*
WEEE (kg)	*310*

ACR+, the LIFE TACKLE project's technical partner who was assigned to be the reference point for AVIVA stadium as one of the external stadiums, identified together with FAI and the stadium management the following local stakeholders who would be involved in the project:

- AVIVA Stadium
- FAI
- Greenstar waste management company
- Dublin City Council
- Diagio

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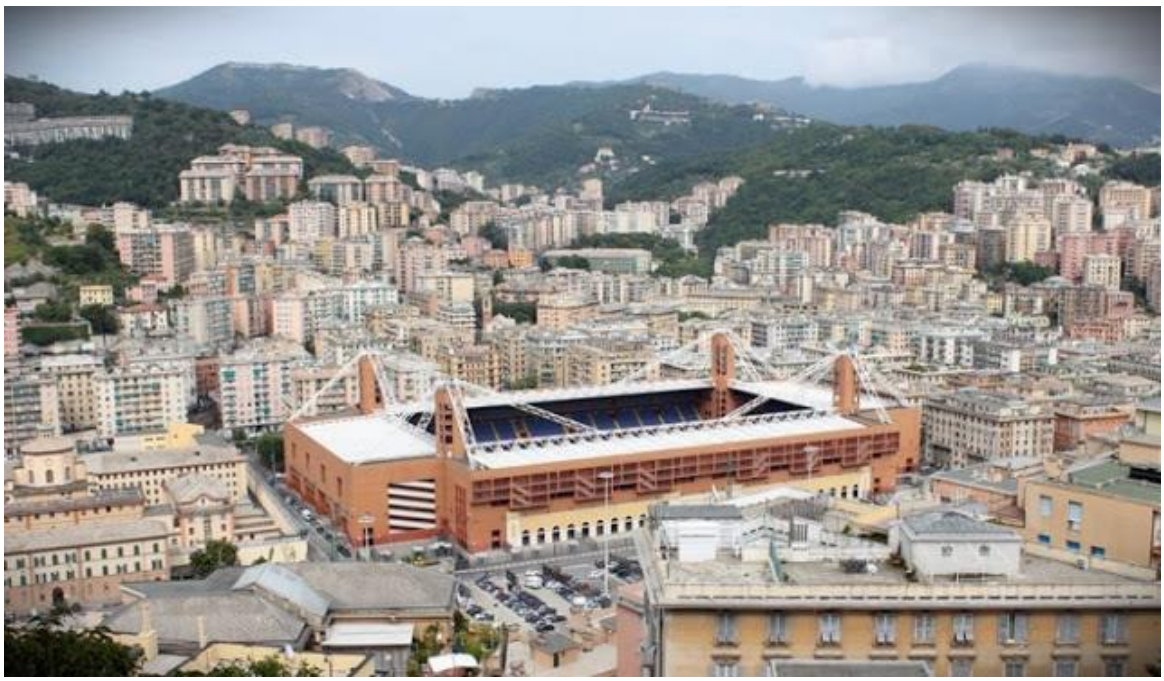
2.2 Luigi Ferraris Stadium, Genoa

The Stadio Comunale Luigi Ferraris, also known as the Marassi from the name of the neighbourhood where it is located, is a multi-use stadium in Genoa, Italy. The home of Genoa C.F.C. and U.C. Sampdoria football clubs, it opened in 1911 and is one of the oldest stadiums still in use for football and other sports in Italy. Aside from football, the stadium has hosted meetings of rugby in the Italian national team and, more rarely, some concerts.

The stadium Luigi Ferraris is owned by the municipality of Genova and is managed by the company Luigi Ferraris, which is owned 50% by the football team Sampdoria and 50% by the football team Genoa.



One of the main reasons for the lack of environmental standards within the management of the stadium is the fact that the arena is old (it was first inaugurated in 1911, enlarged for

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the championships in 1934, and finally brought to its actual shape in 1990) and therefore most of the efforts are focused on keeping the building functional under an infrastructural point of view. The incompatible mixing of residential functions with stadium and prison functions in a confined area hampers certain security measures and the adoption of measures to improve sustainable mobility and waste management.

The stadium mainly produces plastic and paper/cardboard waste. However, there are currently no bins within the stadium's perimeter for the differentiated collection of waste (organic, paper, plastic). The stadium produces large quantities food waste (uneaten food) and of organic waste (food discards). All organic waste and food waste end up in unsorted bins. The table below gives the overview of environmental performance indicators:

General data	2018
Capacity	35.000
Number of football matches	48
Attendance at football games	864.000
Average attendance per football game	18.000
Number of concerts	n/a
Number of attendees in concerts	n/a
Other events hosted	n/a
Attendance at other events	n/a
Energy consumption	**2018**
Electricity (kWh)	800.000
Natural gas (KWh)	n/a
Fuel (l)	32.950
Water consumption	**2018**
Water from public water supply (m^3)	14.000
Waste production	**2018**
Total waste (kg)	68.663

Amiu, the LIFE TACKLE project's technical partner who was assigned to be the reference point for Marassi stadium, identified together with the stadium management the following local stakeholders who would be involved in the project:

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- Luigi Ferraris Stadium
- Catering Business Beltrame
- Amiu Genova S.p.A.
- Association Ricibo

2.3 Anghel Iordănescu, Voluntari

Stadionul Anghel Iordănescu is a multi-use stadium in Voluntari, Ilfov county, Romania. It is used mostly for football matches and is the home ground of FC Voluntari. The stadium holds 4,500 people.

Founded on 26 July 2010, they have been playing since the 2015–16 season in the Liga I, the first tier of the Romanian football league system. They claimed their first major honour in 2017, after defeating Astra Giurgiu in the Romanian Cup final in penalty shootouts, and went on to win the Romanian Supercup in the same year.

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Nine years later, the club relies a lot on its local community which counts approximately 40.000 people living in the municipality the club got its name after. The club decided to provide a shuttle service to the stadium for those interested in going to games, since the stadium lies on a tiny peninsula, surrounded by water, making it difficult for the locals who live on the other side of the peninsula to access the stadium, which is 7 km away. By doing so, the club has made sure not to clog the access roads by cars and have the game goers arriving by the shuttle buses. This is only an example how the local football club tried to reach out to the local community.

The stadium, already represents an example of a reclaimed land, as it lies on a former landfill, now closed and turned into a sport complex. Given the fact that the stadium is rather young and new, it was decided to include it in the LIFE TACKLE project and test few measures there, too. The table below shows an overview of environmental performance indicators:

General data	2018
Capacity	4.600
Number of football matches	40
Attendance at football games	35.000
Average attendance per football game	n/a
Number of concerts	n/a
Number of attendees in concerts	n/a
Other events hosted	n/a
Attendance at other events	n/a
Energy consumption	**2018**
Electricity (kWh)	442.000
Natural gas (KWh)	30.000
Fuel (l)	200
Water consumption	**2018**
Water from public water supply (m^3)	2.100
Water consumption from wells (m^3)	15.000
Waste production	**2018**
Total waste (kg)	50.000

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The Romanian FA, SSSA and ACR+, who work closely on the project with the stadium management, identified the following local stakeholders to be involved in the project:

- Voluntary FC
- Ecovol

2.4 Stadio Olimpico, Rome

The Stadio Olimpico is the main and largest sports facility of Rome, Italy. It is located within the Foro Italico sports complex, north of the city. The structure is owned by the Italian National Olympic Committee (CONI) and it is used primarily for football games. The Stadio Olimpico is the home stadium of SS Lazio and AS Roma and also hosts the Coppa Italia final. It was rebuilt for the 1990 FIFA World Cup and it hosted the tournament final.

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Rated an UEFA category four stadium, it has also hosted four European Cup finals, the most recent being the 2009 UEFA Champions League Final. Outside football, the stadium is used by the Italian national rugby union team and it is Italy's national athletics stadium. Occasionally, it hosts concerts and events.

The stadium manager directly oversees the stadium operations (energy consumption, turf management, waste disposal) and the contracting activities (merchandise, waste, security, procurement). For what concerns aspects of Governance, direct responsibilities for CSR aspects belongs to the Marketing and Development Department, which is also responsible for the stadium energy management. Indeed, there is a specific role of Energy Manager, while no responsibilities in the field of Environmental Management are present in the organizational chart of CONI. For some years, the stadium used to be certified with the ISO 20120, related to event sustainability management systems. CONI decided to no longer adopt the certification because it was perceived as fruitless for the organization and the stadium.

CONI, as stadium owner, is in charge of waste management, which is tracked during all the process phases, from waste collection to waste disposal. CONI is not using any kind of KPI even if they gather data on volume of waste collected for each match. Concerning the separate waste collection, 7/8 sectors of the stadium are equipped with different bins for plastic, paper and residual waste, nevertheless the stadium manager emphasizes the necessity of sensitize people at preventing wastefulness and incentivizing recycling.

CONI is collecting data about water and energy consumption of the Stadio Olimpico, even if they have implemented few performance indicators of such environmental aspects. They are well-focused at monitoring the stadium energy performance, thanks to their energy manager. CONI published the Sustainability Report of 2017 which does not address specifically aspects related to the Stadio Olimpico but all the activities, events and services that are managed by CONI.

The table below displays the environmental performance indicators identified at the Olimpico Stadium:

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General Data	2018
Capacity	72.698
Number of football matches	n/a
Attendance at football games	n/a
Average attendance per football game	n/a
Number of concerts	n/a
Number of attendees in concerts	n/a
Other events hosted	n/a
Attendance at other events	n/a
Energy consumption	**2018**
Electricity (kWh)	7.472.647
Natural gas (KWh)	339.206
Fuel (l)	14.300
Water consumption	**2018**
Water from public water supply (m^3)	124.484
Waste production	**2018**
Total waste (kg)	482.484

SSSA who is working with the stadium, together with FGIC recognised the following local stakeholders to involve in the project:

- Competitions – FIGC
- Special Projects Department - Coni Servizi Spa
- Stadium Manager and Manager of Parco del Foro Italico
- SSSA

2.5 National Arena, Bucharest

The National Arena (Arena Națională) is a retractable roof football stadium in Bucharest, Romania, which opened in 2011, on the site of the original Stadionul Național, which was demolished from 2007 to 2008. The stadium hosts major football matches including home

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matches of the Romania national football team, and the Romanian Cup Final. The stadium is also the home of Liga I football clubs FCSB and Dinamo București.

With 55.634 seats, it is the largest football stadium in Romania. The stadium has a retractable roof.

A UEFA category four stadium, Arena Națională hosted the 2012 UEFA Europa League Final, and will host four games at UEFA Euro 2020 (including the quarter-finals). The stadium also hosts music concerts.

Since being completed in 2011, this stadium has already seen some major football games, such as the UEFA Europa League final in 2012 and the 2014 FIFA European Qualifiers game between Romania and the Netherlands both attracting more than 50.000 visitors. The stadium also hosted some major concerts such as Ed Sheeran, Metallica, Depeche Mode and Red Hot Chili Peppers. In a less than a year's time, the UEFA Euro Cup will be coming to Bucharest, one of the 12 host cities bringing three games.

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Although equipped with the latest technology and facilities which offer a remarkable experience to the game and concert goers, the stadium is continuously improving its environmental performances. The management of the stadium is responsible for mobility and other environmental performances such as waste and energy management.

The stadium serves as the home ground not only for the national team, which only plays 5-8 home games every year, but also for several clubs such as FCSB and Dinamo Bucharest.

The current practice of serving drinks in single use plastic cups generates large amounts of such waste. The concert of the American rock band Metallica served as the very first event where reusable cups were tested as a scheme. The table below presents the environmental performance indicators recognized by the National Arena:

General Data	2018
Capacity	55.634
Number of football matches	23
Attendance at football games	22500
Average attendance per football game	n/a
Number of concerts	n/a
Number of attendees in concerts	n/a
Other events hosted	n/a
Attendance at other events	n/a
Energy consumption	**2018**
Electricity (kWh)	4.400.000
Natural gas (KWh)	165.636
Fuel (l)	4.000
Water consumption	**2018**
Water from public water supply (m^3)	124.484
Waste production	**2018**
Total waste (kg)	330.960

The Romanian FA, SSSA and ACR+, identified together with the stadium management the following local stakeholders who would be involved in the project:

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- Municipality of Bucharest
- FA's Secretary-General
- Bucharest Romanian Football Association

2.6 Roi Baudouin/Koning Boudewijn stadium, Brussels

The King Baudouin Stadium (French: *Stade Roi Baudouin*, Dutch: *Koning Boudewijnstadion*) is a sports ground in north-west Brussels, Belgium. It was inaugurated on 23 August 1930. Crown Prince Leopold attended the opening ceremony. Located in the Heysel section of the Brussels municipality, it was built to embellish the Heysel plateau in view of the 1935 Brussels International Exposition. The stadium hosted 70,000 at the time. A wooden track for cycling races was later added around the pitch.

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As the stadium is a property of the City of Brussels (not the region) the management is a shared responsibility between several departments, such as the sports department and the department for cleanliness and waste management.

The city has also founded a separate body, Prosport, which is responsible for all the non-sportive events (e.g. concerts). The stadium has nearly 0 permanent infrastructure and equipment for different events making it very polyvalent in terms of different events it hosts. When it comes to football, the stadium hosts games of the Belgian national football team, Belgium Cup final and games of football clubs who are unable to play at their home stadium (due to reconstructions or other reasons), as it was the case with Union St. Gilloise during 2 seasons.

As the stadium is public, certain competences are shared between several departments of the city of Brussels. The stadium doesn't have any environmental standards or certificates in place. The Roi Baudouin stadium is currently lacking in several fields of environmental management, including governance, waste management and mobility and the monitoring of performances in this field in general. This could open doors to pilot tests which would have significant achievement compared to the baseline scenario.

As the stadium's waste management performance is rather basic, with no separate collection but only general waste collection and litter collection in the stands and around the stadium, both the stadium and the Royal Belgian Football Association (RBFA) identified this field as a potential one for improvements. The general waste composition mainly features single use plastic cups. There is barely any food waste, as food consumption is not allowed inside the stadium (only outside the stadium, except for VIP guests).

The table below shows the environmental performance indicators recognized by the Roi Baudouin stadium:

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General Data	2018
Capacity	50.093
Number of football matches	8
Attendance at football games	278.664
Average attendance per football game	n/a
Number of concerts	n/a
Number of attendees in concerts	n/a
Other events hosted	n/a
Attendance at other events	n/a
Energy consumption	**2018**
Electricity (kWh)	n/a
Natural gas (KWh)	n/a
Fuel (l)	n/a
Water consumption	**2018**
Water from public water supply (m^3)	n/a
Waste production	**2018**
Total waste (kg)	11.040
Residual waste (kg)	*6.348*
Paper and cardboard (kg)	*1.738,8*
Bulky waste incl. C&I (kg)	*n/a*
Biowaste (kg)	*1.622,88*
Mixed packaging (kg)	*1.153,68*
Glass (kg)	*138*
WEEE (kg)	*n/a*

ACR+, the project's technical partner who was assigned to be in charge of this stadium identified the following local stakeholders who would be involved in the project:

- RBFA
- City of Brussels
- Propsport
- Coca-Cola
- AB InBev
- Fostplus
- Bruxelles Proprete
- Bevers & Bevers
- Brussels Environment
- Suez

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2.7 Friends Arena, Stockholm

Friends Arena, also known as Nationalarenan, is a retractable roof multi-purpose stadium in Stockholm, Sweden. Located next to the lake Råstasjön in Solna, just north of the City Centre, it is the biggest stadium in Scandinavia. Since its opening, the venue has served as Sweden's national stadium for men's football, hence its name. The main tenants of the stadium are Sweden's men's national football team and Allsvenskan football club AIK; both relocated from their previous home at the Råsunda Stadium. The venue has a total capacity of 65,000 at concerts and 50,000 seated at football matches, but the stadium can be scaled down to provide for smaller events with approximately 20,000 guests.

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The stadium has a retractable roof, enabling events to take place during the winter season and to host indoor entertainment shows. The facade of the arena can be lit up in 17 million different colour schemes. For example, the stadium is lit up in blue and yellow when Sweden's national team is playing matches. Friends Arena is a UEFA Category 4 stadium.

A private company owns the stadium (75% real estate company) with the football associations owning the other 25%. In the organisational chart of the company no specific roles and responsibilities in the field of Environmental Management and CSR are established. The main focus is on energy, grass and media consumption.

For what concerns waste management aspects, only paper, organic waste and special waste are separated, while the rest of the waste is unsorted due to the municipal incinerator. This municipal plant also produces energy for the heating system of the stadium. The grass used is natural, except for the sides of the pitch.

No specific indicators are used for monitoring environmental aspects. The table below gives the overview of data collected:

General data	2018
Capacity	50.000-65.000
Number of football matches	25
Attendance at football games	583.177
Average attendance per football game	n/a
Number of concerts	16
Number of attendees in concerts	328.326
Other events hosted: rugby games	n/a
Attendance at other events	n/a
Energy consumption	**2018**
Electricity (kWh)	6.874.579
Natural gas (KWh)	n/a
Fuel (l)	600
Water consumption	**2018**
Water from public water supply (m^3)	n/a
Water from wells (m^3)	14.435
Waste production	**2018**
Total waste (kg)	n/a

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The stakeholders identified to be involved in the project were:

- Swedish Football Association
- Stockholm Live
- Friends Arena

2.8 Stadium Benito Villamarìn, Sevilla

Estadio Benito Villamarín is a stadium in Seville, Spain, and the home of Real Betis since its completion in 1929. With a capacity of 60,720, it is the 4th-largest stadium in Spain and the largest in Andalusia. In 1997, the stadium was renamed after then club president Manuel Ruiz

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de Lopera. However, in 2010, Real Betis fans voted to change the name of the stadium back to Benito Villamarín.

In 2016, the southern stand of the stadium was demolished for expansion. After the most recent redevelopments, the total capacity of the stadium was increased from 52,000 to 60,720. The expansion work was completed in August 2017 in time for the 2017–18 La Liga season.

Regarding the governance and organisational aspects, environmental issues are planned and managed by the business area, which includes also the marketing department. There are meetings every month (one per month) in which the progress of single projects and milestones achieved are discussed. (e.g. carbon neutrality is an important issue for the club).

The main reasons which stimulate the sports club to adopt environmental criteria and convert to a green management, are linked to the importance of football as a communication channel, which could be the mean for awareness raising on environmental issues. The management stresses the need for introducing specific environmental policies that would reward clubs themselves on the basis of their environmental practices and not only on their financial resources. In the past, the club has concluded some agreements with Ecoembes, which is the local wasting company, in order to make supporters more aware of recycling actions.

Regarding the waste management aspects, the stadium is equipped all around with different separated bins for plastic, paper and organic waste. Some of them are transparent in order to make people aware that the club is doing separated collection. The waste management is in charge of the club (special waste included) and it is transported to an ecological isle called Punto Olympia owned by the city hall.

Real Betis is not using any kind of KPI in order to monitor the different environmental aspects. Invoices are the only method to verify their consumptions. the approach toward sustainability of Real Betis and possible improvement actions to be implemented in Life TACKLE.

The table below shows some of the available data regarding the stadium:

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General data	2018
Capacity	60.720
Number of football matches	n/a
Attendance at football games	n/a
Average attendance per football game	n/a
Number of concerts	n/a
Number of attendees in concerts	n/a
Other events hosted: rugby games	n/a
Attendance at other events	n/a
Energy consumption	**2018**
Electricity (kWh)	508.438
Natural gas (KWh)	n/a
Fuel (l)	n/a
Water consumption	**2018**
Water from public water supply (l)	110.000
Water from wells (m^3)	n/a
Waste production	**2018**
Total waste (kg)	n/a

The stakeholders identified to be involved in the project were:

- Real Betis Balompié
- Real Betis Balompié Foundation
- ARAMARK catering
- Seville food bank

2.9 Stadium Dragão, Porto

The Estádio do Dragão (Dragon Stadium) is an all-seater football stadium located in Porto, Portugal. It is the current home stadium of FC Porto with a capacity of 50.033. Designed by Portuguese architect Manuel Salgado, the infrastructure was constructed to replace Porto's previous stadium, the Estádio das Antas. A UEFA category four stadium, it has held several

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international club competition and national team matches, receiving some of the Euro 2004 matches and the 2019 UEFA Nations League Final.

Estádio do Dragão held the opening match of Euro 2004, opposing Portugal and Greece, and was the stage of an incredible blue and white journey towards European victory, in season 2003/2004. In 2019, it hosted the very first edition of UEFA's Nations League tournament. It was also selected to host the upcoming 2020 UEFA Super Cup.

The improvement of environmental performance has accompanied the entire life of FC Porto stadium. Environmental aspects such as water, energy, waste, noise and gas emissions have been adequately monitored in order to minimise the environmental impacts of infrastructure.

FC Porto stadium has ISO 9001 and 14001 certifications that is, quality and environmental management which has been the sustainability approach and the GREENLIGHT certification.

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Below, the main data collected on environmental performance indicators identified at the Dragão Stadium:

General data	2018
Capacity	50.033
Number of football matches	27
Attendance at football games	1.072.204
Average attendance per football game	n/a
Number of concerts	n/a
Number of attendees in concerts	n/a
Other events hosted: rugby games	n/a
Attendance at other events	342
Energy consumption	**2018**
Electricity (kWh)	4.066.000
Natural gas (KWh)	219.666
Fuel (l)	n/a
Water consumption	**2018**
Water from public water supply (m^3)	13.459
Water from wells (m^3)	6.942
Waste production	**2018**
Total waste (kg)	207.848
Residual waste (kg)	*142.174*
Paper and cardboard (kg)	*18.980*
Bulky waste incl. C&I (kg)	*n/a*
Biowaste (kg)	*23.705*
Mixed packaging (kg)	*n/a*
Glass waste (kg)	*13.640*
Plastic packaging (kg)	*7.140*
WEEE (kg)	*1.669*

The stakeholders identified to be involved in the project were:

- F.C. Porto
- Porto Ambiente (Municipal Environment Company of Port)
- Porto Municipality
- LIPOR (Intermunicipal Waste Management of Greater Porto)

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2.10 Renzo Barbera Stadium, Palermo

Stadio Renzo Barbera (previously and still commonly known as Stadio La Favorita) is a football stadium in Palermo, Italy. It is currently home of S.S.D. Palermo football team. The stadium was inaugurated on 24 January 1932, and was named Stadio Littorio in homage to the Fascism. The opening match was Palermo vs Atalanta, with Palermo winning 5–1. In 1936, the stadium was renamed Stadio Michele Marrone, in memory of a soldier killed during the Spanish Civil War. The name was changed again at the end of World War II to Stadio La Favorita, from the name of the nearby ancient game preserve of Frederick II, Holy Roman Emperor in the 13th century.

In 1984, the main redevelopment took place, involving the addition of a second tier to the stadium which increased capacity to 50.000 spectators. This higher capacity was, however, completely covered in only twice, respectively in a Serie C1 league match against Messina and a friendly match against Juventus. A third redevelopment ended in 1990, the last main one to which the venue was subjected and was undertaken due to city of Palermo having been chosen to host a number of the 1990 FIFA World Cup First Round matches. Due to this redevelopment, the capacity of the stadium was lowered to its current 37.619 seats.

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On 18 September 2002, the stadium was renamed as Renzo Barbera, past chairman of Palermo in the club's last Serie A tenure, as well as the two Coppa Italia finals throughout the 1960s and the 1970s, who had died that same year on 19 May. In the Serie A 2004-05 campaign, which marked the first Palermo appearance in the top division in over 30 years, all seats in the stadium were already assigned in the summer to season-ticket holders. The surface of the stadium is in grass, with a field size of 105 x 68 m. The owner is the Municipality of Palermo.

Waste is under the responsibility of the cleaning service. No data available.

Below is the main data collected on environmental performance indicators identified at the Renzo Barbera Stadium:

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General data	2018
Capacity	36,365
Number of football matches	24
Attendance at football games	15.000
Average attendance per football game	n/a
Number of concerts	n/a
Number of attendees in concerts	n/a
Other events hosted: rugby games	n/a
Attendance at other events	n/a
Energy consumption	**2018**
Electricity (kWh)	40.000
Natural gas (KWh)	n/a
Fuel (l)	17.000
Water consumption	**2018**
Water from public water supply (m^3)	3.500
Water from wells (m^3)	n/a
Waste production	**2018**
Total waste (kg)	*n/a*
Residual waste (kg)	*n/a*
Paper and cardboard (kg)	*n/a*
Bulky waste incl. C&I (kg)	*n/a*
Biowaste (kg)	*n/a*
Mixed packaging (kg)	*n/a*
Glass waste (kg)	*n/a*
Plastic packaging (kg)	*n/a*
WEEE (kg)	*n/a*

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2.11 Stadium S.P.A.L, Ferrara

Stadio S.P.A.L Paolo Mazza (formerly Stadio Comunale) is a multi-use stadium in Ferrara, Italy, owned by the Municipality of Ferrara. It is currently used mostly for football matches and is the home ground of SPAL.

Located in the Rione Giardino, west of Ferrara within the city walls, it was built in the immediate vicinity of the area where the former playground of SPAL, Campo di Piazza d'Armi, stood since 1919. The municipal stadium of Ferrara is the fifth oldest Italian ground still in operation.

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It was opened in September 1928 as Stadio Comunale, initially it had a capacity of 4000. It assumed its current name in February 1982, to honour the former president of the club Paolo Mazza, who died two months earlier.

In concomitance with the access of SPAL to Serie A, in 1951 it was subjected to a heavy restructuring that brought capacity to 25000. From 2005 to 2016 the capacity was limited to 7500 seats due to safety reasons and cost containment. In 2016–17, in conjunction with the club's promotion to Serie B and then to Serie A, the stadium was restructured again to match the modern needs of comfort and safety. In the summer 2018 a further remodelling took place, in order to bring the stadium capacity from 13.135 seats to 16.134. The structure is rectangular and the surface is in grass. The table below gives the key baseline data for the stadium.

General data	**2018**
Capacity	16.134
Number of football matches	22
Attendance at football games	262.000
Average attendance per football game	11.909
Number of concerts	0
Number of attendees in concerts	n/a
Other events hosted: sponsor events	50
Attendance at other events	100
Energy consumption	**2018**
Electricity (kWh)	477.502
Natural gas (KWh)	700
Fuel (l)	9.900
Water consumption	**2018**
Water from public water supply (l)	2.900
Water from wells (l)	2.000
Waste production	**2018**
Total waste (kg)	25.000 kg
Residual waste (kg)	*n/a*
Paper and cardboard (kg)	*n/a*
Bulky waste incl. C&I (kg)	*n/a*
Biowaste (kg)	*n/a*

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Mixed packaging (kg)	*n/a*
Glass waste (kg)	*n/a*
Plastic packaging (kg)	*n/a*
WEEE (kg)	*n/a*

2.12 Tele2 Arena, Stockholm

Tele2 Arena is a retractable roof multi-purpose stadium in Stockholm Globe City, Johanneshov, just south of Stockholm City Centre, Sweden. It is used mostly for concerts and football matches, hosting the home matches of Allsvenskan teams Djurgårdens IF and Hammarby IF. The owner is the City of Stockholm via SGA Fastigheter.

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The arena has a capacity of 30000 to 35000 spectators for football matches, depending on the number of people standing, and its facilities fulfil the requirements of FIFA and UEFA for hosting international games and tournaments. When configured for concerts, the arena has a capacity of 45000. The surface is made of artificial turf.

The arena is able to host concerts, equestrian, motor sport, ice sports, banquettes, exhibitions, company events and shareholder meetings, in addition to football.

The arena was planned to host the opening game of the ice hockey World Championship 2013, but the construction was delayed and the arena was not finished until July 2013, two months after the tournament.

The stakeholders identified to be involved in the project were:

- Swedish Football Association
- Stockholm Live

3. Conclusion

The list of pilot stadiums presented in this deliverable presents the starting point of conducting the pilot tests. The list contains a good mixture of stadiums both in terms of ownership, capacities, geographical distribution and their purpose. This mixture will contribute to the pilot test in case some of them take place in two or more different stadiums, as we will be able to compare the efficiency and the complexity of a certain pilot test under different circumstances.

A summary of the pilot stadiums is given in the table below:

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Stadium	Capacity	Opened	Owner	Purpose
Aviva, Dublin	51700	2010	Co-owned	Football, rugby, concerts
Luigi Ferraris, Genoa	36599	1990	Co-owned	Football
Anghel Iordanescu, Voluntari	4500	2012	Municipality	Football
Olimpico, Rome	72698	1990	Olympic Committee	Football, rugby, concerts
National Arena, Bucharest	55634	2011	Municipality	Football, concerts
King Boudouin, Brussels	50093	1995	Municipality	Football, athletics, concert
Friends Arena, Solna	54329	2012	Co-owned	Football, concerts
Benito Villamarin, Betis	60720	2017	FC Betis	Football
Dragao stadium, Porto	50033	2003	FC Porto	Football
S.P.A.L., Ferrara	16134	2018	Municipality	Football
Tele2 Arena, Stockholm	35900	2013	Municipality	Football
Renzo Barbera, Palermo	37619	1990	Municipality	Football

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