Deliverable B.1.3

Pilot test reports

Version 2.0

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Document history

Version	Date	Description
1.0	07/02/2020	1st version of the document with the proposed structure and format
2.0	30/08/2020	Modified structure, chapters and format; collection of all available pilot test reports

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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 reports on the pilot tests, their development, implementation and impact. It also reports on the training of organisations and actors involved in the tests. The pilot tests which took place in the pilot stadiums had the objective to assess the feasibility of the application of the previously identified practices included in the Guidelines.

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2. Pilot stadiums as hosts of pilot tests

The list of pilot stadiums presented in the deliverable B.1.1 "List of pilot stadiums to involve in the governance and operational pilot tests" provides all the necessary and key background information on where the pilot tests would take place. That list 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 was considered to contribute to the pilot test in case some of them took place in two or more different stadiums, as we would 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:

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

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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

3. Identification and overview of the pilot tests

Upon the selection of the pilot stadiums, the initial baseline assessment was carried out in each of the stadiums. This assessment, apart from the baseline data, already presented in the deliverable B.1.1 "List of pilot stadiums to involve in the governance and operational pilot tests" also included trainings of organisations and actors involved in the tests. These trainings had the objective to enhance the effectiveness of the tests through a specific knowledge transfer from one stakeholder to another, but also from LIFE TACKLE project technical partners to stadium managers and National Football Associations. The trainings also featured some of the particularities of the LIFE TACKLE project such as the way pilot tests should be structured, the project's timeframe, the European context of the project and the previously drafted Guidelines. All this was necessary to be done, so various stakeholder involved in the pilot test could understand their place and role in the project and above all, their contribution to the project.

The identification of the pilot tests included an initial assessment of the current performances and practices, both through data collection but also an environmental audit. The environmental audits were being undertaken by LIFE TACKLE technical partners (Lipor, AMIU, SSSA and ACR+) and they

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brought together stadium managers, waste management operators and event organisers (football clubs and/or football associations). The audits allowed the technical partners to collect as much qualitative and partly quantitative intelligence as possible which were an indispensable step before going back to the table to identify the pilot tests and deliver trainings. The audits and the baseline assessment in general, looked at various aspects of environmental management in football games, as predefined by the project – mobility, energy management, water management, waste management, general public procurements and governance. 67 pilot tests were identified prior to the implementation phase. The table 1 below presents an overview of these pilot tests per stadium and per category.

	Mobility	Energy	Water	Waste	GPP	Gov.	**TOTAL**
AVIVA Stadium, Dublin				1			1
Benito Villamrin, Sevilla	2			1		1	4
Anghel Iordanescu, Voluntari		2		2		2	6
Friends Arena, Solna		2		1	1		4
Olimpico, Rome		2	1	2	1	1	7
Dragao, Porto		1	1	2		3	7
Roi Baudouin, Brussels	3			2	1		6
Tele2, Stockholm				2		2	4
Luigi Ferraris, Genoa		1		3			4
Paolo Mazza, Ferrara	2	2		2	2		8
National Arena, Bucharest	1			3	1		5
Renzo Barbera, Palermo	2	1		2	1		6
TOTAL	10	11	2	23	7	9	62

Table 1. Overview of all the pilot tests identified in the pilot stadiums

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Furthermore, the identification of the pilot tests was done in a way to have them reflecting the previously published "Guidelines for Environmental Management of Football Events". Since these Guidelines were structured in a way to reflect all the various fields of environmental management, the aim of this identification phase was to match the pilot tests with practices listed in the Guidelines in order to be able to compare the results and achievements and modify and improve the Guidelines publication itself. The fields of environmental management examined and practices analysed included:

- Governance of Football Events
- Operational Management of Football Events
    - Context of the Event
    - Event
    - Stadium Management
    - Procurement
    - Mobility and Logistics

The following part of the report presents the descriptions of the pilot tests based on the baseline assessment, obtained through the audits, interviews, observations and data collection followed by the specifying the aspects of environmental management they are targeting and the practices from the Guidelines these pilot tests are referring to. Each pilot test contains the reference chapter and template of the existing practice elsewhere previously identified in the Guidelines. Furthermore, the report describes the implementation phase through key aspects:

- Designing the pilot test
- Success factors vs inhibitors
- Economics and feasibility
- Impact assessment
- Potential replicability

Each pilot test report will also suggest potential modification of the respective practice in the Guidelines.

[INFO ON THE IMPACT ASSESSMENT]

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4. Roi Baudouin/Koning Boudewijn Stadium, Brussels

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 is public, certain competences are shared between several departments of the city of Brussels. Therefore, any pilot test or improvements of the current state-of-art required the city's participation and approval.

As the stadium's waste management performance is rather basic with one bin per approx. 3.350 visitors), with no separate collection but only general waste collection and litter collection in the stands and around the stadium (Figure 1), both the stadium and 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).

Mobility was also an important topic as there are certain existing solutions in the region of Brussels including some previously tested practices.

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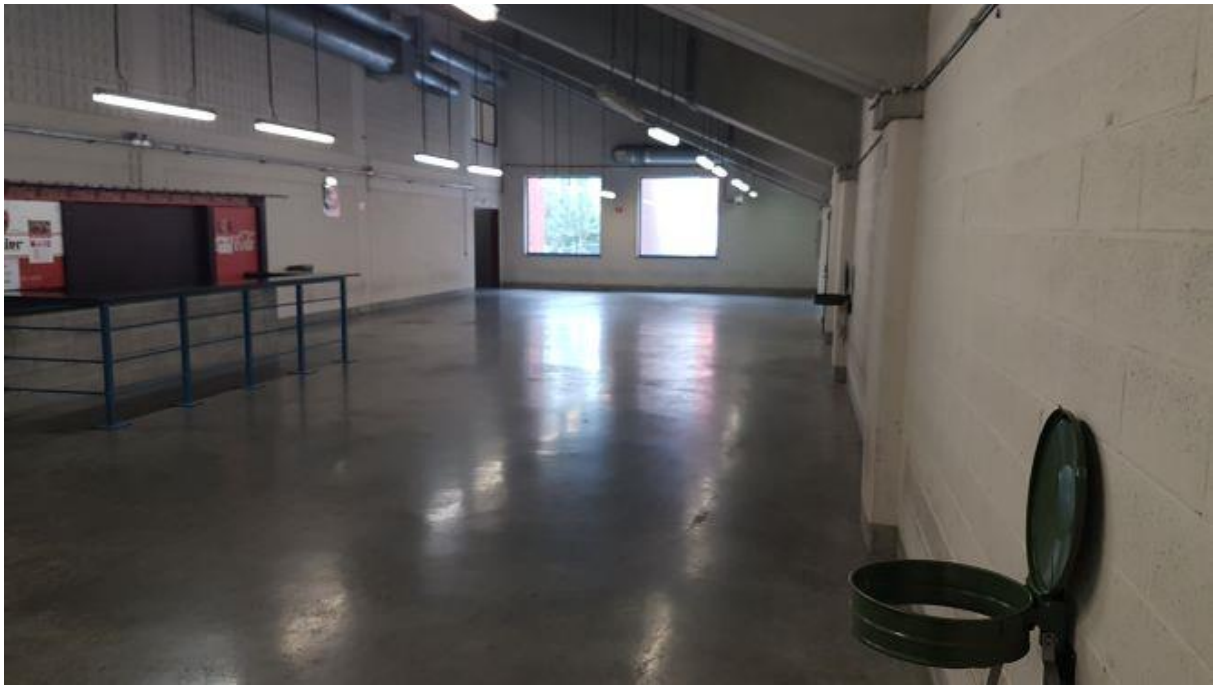

Figure 1. Basic waste collection infrastructure in the stadium – plastic bag holders for residual waste only

4.1 Separate waste collection and recycling; Section of the TACKLE guidelines: event (ch. 3.2.2.12, OM/E 4)

The stadium didn't have any separate collection scheme and all waste generated in the stadium ends in general waste. Although there was no data on waste composition and prevailing quantities of different types of waste, some assumptions were made. Most of this waste was assumed to be plastic waste (single use plastic cups) and litter from the stands and around the stadium (a lot of broken plastic cups). While other types of waste were rather negligible, according to the stadium management and the city of Brussels and while food was not allowed in the stadium (for regular visitors), the VIP areas, press centre and the two teams and staff are catered for. The food is not prepared in the stadium, as there is no equipment nor much space, but only reheated. Therefore, bio-waste from food preparation was nearly non-existent. However, the caterers usually leave the

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stadium without any leftover food, meaning all the food waste and leftover food stays with the stadium and ends up in general waste.

Pilot test

Brussels Propreté, SUEZ and Fostplus were identified for the introduction of adequate containers for separate collection. It was necessary to run a waste composition analysis in order to understand the needs and the way separate collection would be introduced. Furthermore, both pilot tests related to waste management would also require a sensibilisation campaign in order to reach an efficient deployment of the new system.

Furthermore, the survey would also explore the daily habits of game-goers and assess all the added values such a new scheme would bring.

Designing the pilot test

Since the stadium didn't have any separate collection scheme at the time of the beginning of this project and nonetheless no data on total waste quantities, RBFA decided to run a waste composition analysis in order to understand better the needs and potentials of a separate collection scheme. SUEZ and Bruxelles Proprete (Brussels Public Cleanliness Company) run a sampling of the waste generated inside the stadium's premises (A), waste bins outside the stadium's premises (B) and litter (C). The total amounts of waste collected and analysed for their mass composition were as shown in Table 2 below.

ZONE	COLLECTED AMOUNT	ANALYSED AMOUNT	SHARE OF ANALYSED VS COLLECTED
A	1380 kg	287 kg	20.7%
B	780 kg	192 kg	24.6%
C	470 kg	165,5 kg	35.2%
Total	**2630 kg**	**644.5 kg**	**24.5%**

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Table 2. The amounts of waste collected and analysed for their composition after

The three different areas of collection gave different results in mass composition. The findings are presented below in Figures 2, 3 and 4.

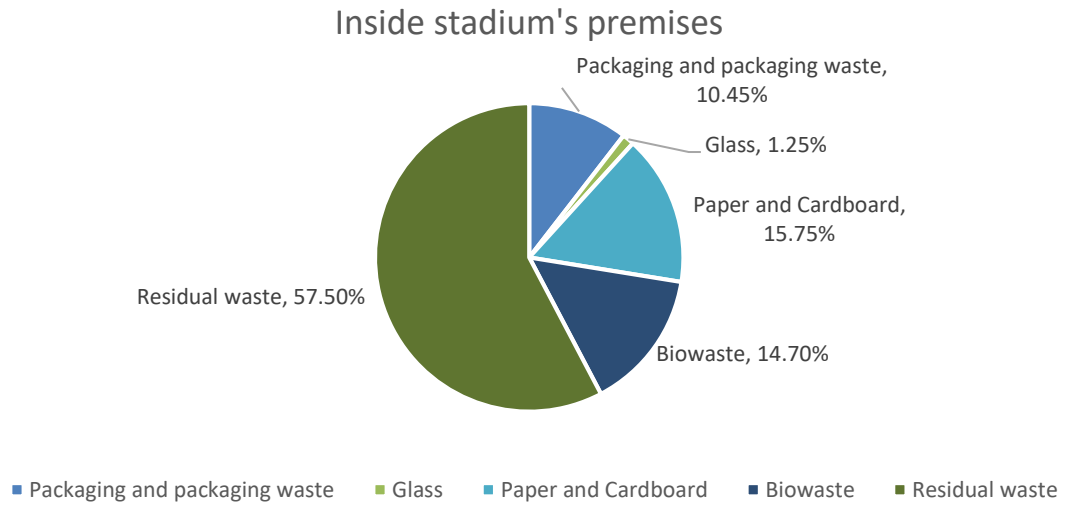

Figure 2. Mass composition of the waste sample collected inside the stadium's premises (Category A)

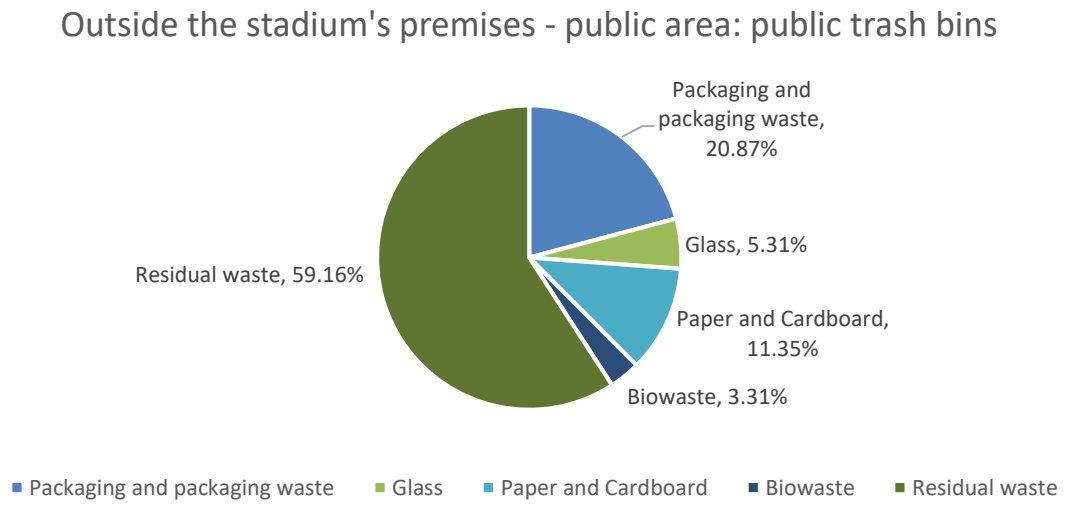

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Figure 3. Mass composition of the waste sample collected outside the stadium's premises in public area in public trash bins (Category B)

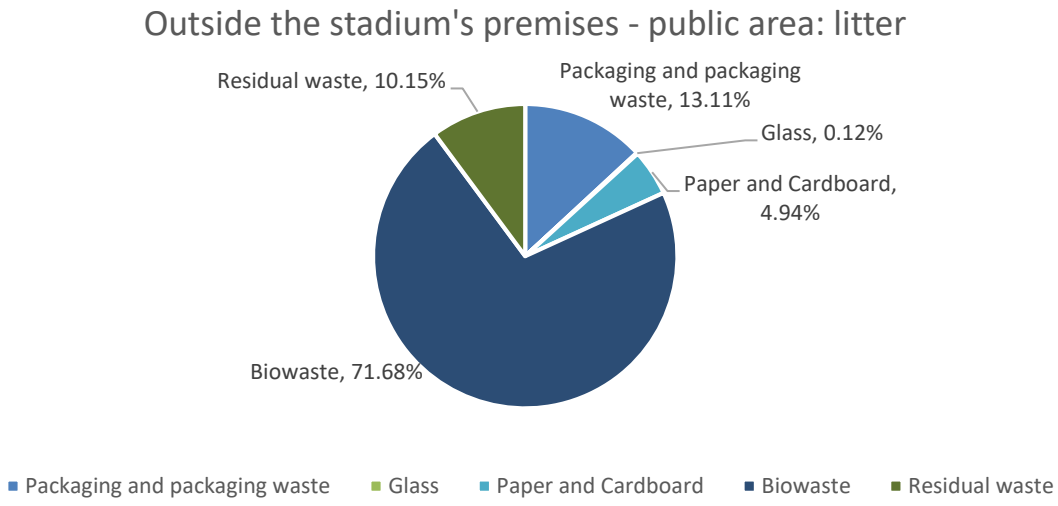

Figure 4. Mass composition of the waste sample collected outside the stadium's premises as litter (Category B)

As the objective of this analysis was to identify hotspots and prevalent waste streams in different areas, further observations were made concerning specific waste streams when the different areas were compared. Packaging and packaging material were of special concern in order to assess quantities of metal, PET and other packaging and packaging waste materials. It was found that out of all the collected metal cans in the three areas 64% come from public trash bins outside the stadium's perimeter, while PET bottles were prevailing inside the stadium's perimeter (76%). The high share of biowaste collected as litter was declared irrelevant as it contained a lot of foliage, as the analysis took place in autumn.

Based on the results of this analysis the pilot test was further defined and it was decided to set up temporary selective collection infrastructure for the first time. It was decided to introduce only one additional bin for packaging and packaging material (PMC).

Further activities related to this pilot were the installation of permanent selective collection infrastructure, as this pilot test only saw temporary bins for selective collection (green for residual

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waste and blue for PMD). As for the are outside the stadium's perimeter, certain proposals and suggestions will be drafted and forwarded to the local authorities.

Success factors vs Inhibitors

In order to tackle the areas outside the stadium's perimeter, where simple waste bins for residual waste were present only, ABInBev ran a pilot test with its "Eco-Team". The objective was to assess the amount of PMC which is lost in public residual waste bins and as litter. According to the waste composition analysis it was found that 64% of all empty beer cans end up in public waste bins.

It was furthermore decided that Fostplus (Belgian EPR scheme), Coca-Cola, AB InBev would mobilise their eco-teams and organise additional activities in order to give the new selective collection scheme more visibility, as it would be enrolled for the first time. Some images in Figure 5 portray the activities that were taking place during the game.

Figure 5. Sensibilisation campaigns upon the introduction of selective collection inside the stadium's premises.

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It is important to add that a survey was conducted over the period of 4 weeks which had the objective to assess and understand the visitors' behaviour when it comes to waste management, their subjective reflection on the current waste management practices and readiness to adhere with new potential practices. The survey did a comparative analysis of behaviour, affinity and expectations from the visitors in regards to waste management. The survey was targeting three groups: visitors from the region of Brussels (B), region of Flanders (F) and region of Wallonia (W); 234 respondents in total. The results are presented on a scale from 1 to 5, where "1" symbolises "never", 2 "very rarely", 3 "sometimes", 4 "very often" and 5 "always".

The survey found that the behaviour and daily habits in the private life (at home and at work) of the three target groups are rather coherent and they all scored very well in terms of separation of waste at home and at work (the score ranged from 4.77 to 5), use of recycled products (3.5 – 4.48), waste prevention (3.48 – 3.93), prevention of food waste (3.64 – 4.28), buying sustainable products (3.18 – 3.64), use of water fountains (3.54 – 3.71).

From the survey's results it can be concluded that certain lacks at the stadium, such as the absence of separate collection, reusable cups prevent the visitors from maintaining their good daily habits.

The survey also wanted to know what improvements would be the most beneficial for the visitors and what improvement could make the biggest impact. The survey resulted in the list of following preferences in order of importance: separate waste collection, reusable cups, reusable/biodegradable cutlery and plates, informative panels and banners on good waste management practices inside and outside the stadium and sale of souvenirs and other merchandising made of biological, recyclable or other sustainable material.

Furthermore, when comparing the results of their daily waste management performance and the performance new practices in the stadium would bring, two conclusions could be drawn from the survey results:

- The share of visitors which would decrease their environmental impact during football games with improvements in waste management in the stadium, compared to their daily habits would range from 61.5% in Brussels (relatively low compared to other two regions, because

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respondents from Brussels already have the highest performance of the three regions) to 71.8% in case of Walloons

In general, the survey results enhanced the motivation of RBFA and the stakeholders for improving certain practices and gave a kind of approval, as the respondents did not express any repulsion nor hostility towards proposed measures.

Few other success factors and inhibitors were observed during the pilot test by the food and beverage providers, as well as Suez, the waste collection operator. The large number of PMC bins allowed the visitors to locate them in their near vicinity quickly without needing to look for one for too long.

Few suggestions which need to be taken into consideration next time are targeting mainly the quality and purity of the collected PMC waste – PMC bins should be moved further away food trucks and other stalls serving greasy food (e.g. fries, burgers) and prevent impurities and decreased quality of the collected PMC, as many greasy food containers, wraps, food leftovers end up in PMC bags, as they are located conveniently close to the consumers. Few other suggestions were related to posters and maps showing location of PMC bins, better labelling of the bins. One challenge Suez faced was the short time for waste collection, as the stadium was shutting down the waste rooms and the tunnels too fast after the game. This could mean that the stadium operators didn't adapt this time to selective collection (as it increases the time needed for all the waste to be collected).

Economics and feasibility

The waste operator who was in charge of this temporary pilot measure was chosen through several offers. SUEZ was chosen based on its offer. This pilot measure incurred in the costs presented below in Table 3:

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EQUIPMENT				
Item	**Capacity**	**Pieces**	**Rental price per month per piece**	**Extra fee**
Residual waste bin	240 l	150	€2	€350 in total for their placement €350 in total for their collection
PMC+ plastic cups bin	240 l	150	€2	€350 in total for their placement €350 in total for their collection
+ €0.17 per 240 l bag				

TREATMENT					
Waste type	**Unit**	**Pieces**	**Rental price**	**Transport price**	**Treatment price**
Residual waste	40 m^3	1	Sponsored	€165	€155/t
PMC + plastic cups	40 m^3	1	Sponsored	€165	Free
Paper	40 m^3	1	Sponsored	€165	Index paper value

+ Human workforce: €66/h (for >30 mins of work)

Table 3. Costs incurred for the implementation of this pilot test

Since the pilot stadium that run this pilot test serves as the host ground for the home games of the Belgian men's national teams that plays only up to 8 home games per year, repeating this measure could bring certain benefits and improved waste management performances. The only costs that could be avoided with permanent infrastructure for selective waste collection is the price of the equipment (its rental and placement/collection). The savings could be €2000 per game. The treatment costs are expected to remain the same. This is why it is advised that the owner of the stadium – the city of Brussels considers installing permanent infrastructure, as the stadium is also used for athletic competitions and concerts. It could bring added value, as other event organisers could benefit from this already available infrastructure.

Other savings could be obtained through sponsorship deals, whether from the waste operator, or other companies providing food and beverage or are involved in the game organisation elsewhere.

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Impact Assessment

The results of this pilot test were more than satisfactory, as the new collection scheme managed to redirect 120 kg of PMC from the residual waste. This basically means that the capture rate of PMC was 83.2%, since 120 kg out of 144.21 kg of PMC was captured. It also reflected in the total amount of residual waste inside the stadium's premises dropped to 1120 kg from 1375.17 kg.

The result of the sensibilisation and PMD collection pilot test outside the stadium's perimeter were 10550 cans collected which amounted up to 2.85 tonnes of empty beer cans which were redirected for recycling.

Replicability potential

This pilot test showed remarkable achievements and further potential benefits in terms of environmental management could be achieved through its replication. The temporary selective collection pilot test already showed certain improvements in selective collection and collected amounts in general. While the capture rate of packaging and packaging material was 83.2%, the overall amount of residual waste dropped as well compared to the baseline game, even if the attendance was higher in the second game.

The replicability potential increases even more if baseline data is known in advance, which avoids the need of a waste composition analysis. The replicability potential can also be marked as high in case of high environmental awareness among the visitors. In case of cities and regions where the environmental awareness is high, it wouldn't take much for the visitors the get used to selective collection in stadiums and would adhere to the new practice quickly. However, introduction of separate collection needs to be accompanied by communication campaigns, activities and visuals.

In technical and logistical terms, what we observed was the fact that many waste management companies awarded with this job, have the know-how and can cover the needs of waste disposal and assess the number of bins necessary. In terms of space, if the event organiser opts for 2 different bins, the new system can easily comply with the available space. However, the event organiser needs

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to take into consideration longer times for different operations, as the separate collection might take several rounds.

Feasibility/Scores	Economic	Environmental	Technical	Replicability	Total
Guidelines					2.5
Pilot test					2.75

4.2 Reusable cups for drinks; Section of the TACKLE guidelines: event (ch. 3.2.2.12, OM/E 18)

The city of Brussels decided to ban all single use plastic in events organised on its territory as of 1 July 2019. This puts a pressure on RBFA to improve their performance in this regard during their games. At the same time, two main beverage suppliers – Coca Cola and ABInbev had already expressed their interest in teaming up for this improvement. FostPlus, also had certain schemes that were worth exploring.

Pilot test: This pilot test would see reusable cups deployed in the stadium during the football games of the Belgian men's national team.

Since both Coca Cola and AB InBev were interested in improving the waste management and prevent waste in football games, it was agreed to involve these two in the project.

This pilot measure would bring one important added value to waste prevention. What is well known from experiences in festivals and other music events where reusable cups with a deposit system are already used, is that there is a large number of people who take advantage of reusable cups, still under deposit but discarded somewhere in perfect shape and who return them and get to "win" few euro. This prevents litter not only in the stadium but also around stadium as the visitors could return their cups at several points while leaving the stadium, too.

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This pilot action would however need another accompanying action to be developed – the money handling. Since each reusable cup in use would be under a deposit, the event organiser would have to keep that deposit temporarily and pay the customers back upon returning their cups.

Designing the pilot test

This particular pilot test included mainly RBFA as the event organiser who is responsible for setting the rules for what kind of food and beverages are served and how. RBFA included several stakeholders in this pilot test, namely Bevers & Bevers who are serving drinks and OVAM the Flemish waste management authority, as well as ProLeague, the association of professional cubs in Belgium. ProLeague organised a one-day workshop on reusable cups which gathered not only all the professional football clubs in Belgium but also waste management operators, authorities and beverage providers. The workshop looked into existing good practices and potential business solutions. OVAM also shared its study on the LCA of cups made of different material. This study would serve to identify the cups which would ensure the lowest environmental footprint. The study shows that for what the pilot test wants to achieve bioplastics (Bio-PE), thermoplastic (PLA) and compostable thermoplastic (C-PLA) and recycled PET (rPET) give the best scores both in durability (usage above 150 times) and treatment options at the end of their lifetime. The Table 4 below shows the comparison between different materials (Beverage and eating utensils at events, OVAM, 2017).

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	hergebruik hoog (>150)	hergebruik beperkt (<150)	selectieve inzameling voor recyclage	restafval of compost
Tweedehands vaatwerk (glas, keramiek, metaal)	A	A		C
rPET (gerecycleerde PET)	A	A	B	C
PLA (polymelkzuur) & C-PLA	A	A	B	C
Bio-PE (biogene polyetheen)	A	A	A	B
PP (polypropeen)	A	B	C	D
PET (Polyethyleen Tereftalaat)	A	B	C	D
PS (polystyreen)	A	B	C	D
PC (polycarbonaat)	B	C	D	E
Copolyester	B	C	D	E
Gemodificeerd zetmeel				D
Karton (gerecycleerd)			B	C
Vormkarton (moulded fibre)				B
Suikerrietvezel (bagasse)				B
Hout				C
Cellulosepulp				D
Glas (gerecycleerd)	B	C	E	G
Metaal	B	D	G	G
Keramiek	C	E		G

Table 4. Comparative LCA of plastic cups made of various material

As the full enrolment of reusable cups was postponed to the spring of 2020, a temporary pilot test took place as a part of the pilot test on selective collection. The pilot test wanted to explore the number and weight of plastic cups that could be taken out of the packaging and packaging material waste stream during a football game.

This temporary pilot test included a return scheme for single-use plastic cups in order to ensure their appropriate treatment and prevent them from ending up in residual waste. The temporary pilot test also had the objective to assess the behaviour of the visitors and see how much would they participate in a return scheme and later in a fully implemented reusable cups scheme.

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Success factors vs inhibitors

The survey that was conducted among the fans showed that the visitors identified reusable cups as the second most favourable change they would like to see at the stadium (after separate waste collection). In fact, the share of the visitors which thinks football games would be more environmentally friendly if reusable cups and reusable/biodegradable plates and cutlery were introduced was rather high as 69.2% of respondents from Brussels thought so 69.2% and 66.9% and 66.7% Flemings and Walloons respectively.

These high scores and the recognition of reusable cups among game goers can be taken as a good success factor, as the acceptance rate is expected to be high. Nonetheless, reusable cups are already a common occurrence and practice at various events in Brussels and Belgium, including festivals, concerts and other mass events.

Furthermore, the ban on single use plastic products that came into place in July 2019 in the city of Brussels initiated event organisers to look for alternatives. The same ban was later made in the region of Flanders, too.

Impact assessment

Prior to the temporary pilot test, which took place during the Belgium – Cyprus game on 19 November 2019, a comprehensive waste composition analysis was conducted. It gave date on the total waste collected during the Belgium – San Marino game on 17 October 2019. The results reported 14.21 kg of packaging and packaging material waste generated inside the stadium's perimeter. Bevers & Bevers was the stakeholder who was offering a free drink for each 10 single-use cups returned (Figure 2.)

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Figure 2. Bevers & Bevers single-use cups collection scheme

The temporary pilot test ended with 6740 single-use cups collected through the temporary scheme, which equals to 24.2 kg of single-use plastics which were sent to an appropriate treatment.

The full impact assessment of this pilot test could not be conducted, as the total CO_2eq savings could not be calculated, as the collected single-use cups were replaced with other single-use cups. The full impact assessment will be conducted once the full enrolment of reusable cups takes place.

This particular temporary pilot test resulted in the following CO_2eq savings due to the diversion of these polypropylene cups from incineration to recycling. The table 5 below gives the results based on the French Environmental and Energy Agency's (ADEME) emission factors:

AMOUNT DIVERTED	EMMISION SAVED BY AVOIDING INCINERATION	EMISSION LOST BY AVOIDING INCINERATION	EMISSION SAVED BY RECYCLING	TOTAL
24.2 kg	72.2 kgCO_2eq	2.83 kgCO_2eq	74.1 kgCO_2eq	**143.44 kgCO_2eq**

Table 5. Emission savings from the pilot test (ADEME)

Economics and feasibility

It is difficult to asses the economics and the feasibility at this stage as the full enrolment of the reusable cups didn't take place yet and the stakeholders who would bear the costs are not identified yet.

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In any case, for this temporary pilot tests, Bevers & Bevers offered a free beer worth of €2.5 for each ten single use cups collected. Through this sponsorship, 674 beers were given for free.

In terms of feasibility, this temporary pilot test served well for what would come later with reusable cups. Fans showed motivation and willingness to go back to the bar and take their cups back to the bar. As a one-time practice, it was sponsored by the beverage and food providers, but in order to replicate this pilot test, the event organiser might need to look at different financing.

Potential replicability

As the full enrolment of the reusable cups didn't take place yet, we are unable to comment on potential replicability.

4.3 Incentivise public transport means; Section of the TACKLE guidelines: mobility and logistics (ch. 3.2.5.1, OM/ML 1)

Nearly 70% of the visitors come to RBFA's games by car and park at the nearby parking which belongs to the Brussels Exhibition Centre. As the stadium doesn't have its own parking for visitors, they are forced to park there what, as reported, was quite pricy and it was leading to a bad feedback from the visitors.

On the other side, the stadium is perfectly served by public transportation, both by the Brussels region's and the Flemish lines. The stadium can be acceded through 3 metro stops which give access to three different stands. This is even more enriched by 5 tram lines, 3 bus lines as well as two train stations. The Flemish public transportation network has more than 10 bus lines serving the stadium and linking it with the neighbouring region of Flanders. The local trams and buses connect the stadium with the centre of Brussels and all other corners of the capital region. Once trains are added

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to this offer, the conclusion was that it was indeed a pity that more visitors weren't using public transportation.

The Brussels region's public transportation company STIB/MIVB already has in place an "event pass" which is often featured on concert tickets, but not football games tickets. Visitors who arrive from the neighbouring Flanders or even Wallonia could benefit from it and avoid traffic jams when entering and/or leaving Brussels.

Pilot test: This pilot action would explore the possibility of adding the "event pass" to tickets for RBFA games in Brussels. Since this already exists, RBFA would only need to assess the financial consequences, if any and explore the best way to cooperate with STIB/MIVB. Additionally, De Lijn and SNCB/NMBS (railways) would be contacted in order to explore a similar scheme.

This measure would also allow us to monitor how many visitors used this advantage and obtained event passes from STIB/MIVB. The survey which was planned to asses waste management behaviour of game-goers was decided to be expanded to mobility, too. It was also decided to look for a support from the local or regional authorities.

Designing the pilot test

n/a yet

Success factors vs Inhibitors

An existing scheme put in place by the Brussels region's public transportation company required very low efforts in designing the logistics.

The survey that was conducted over a 4 weeks' period, gave some intelligence on how often do game-goers use public transportation when going to the stadium, depending on the distance of their residence from the stadium. The results showed different habits which can easily be related to the distances from their homes to the stadium. Table 6 below shows the responses we obtained from

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game-goers, with the score ranging from 1 (never) to 5 (always) in terms of how often do game-goers use public transportation when going to football games.

REGION	<5 km	6 km – 15 km	16 km – 30 km	31 km – 60 km	61 km – 100 km	> 100 km
Brussels	2,67	3,86	2	n/a	n/a	n/a
Wallonia	n/a	n/a	3,33	2,70	1,94	2
Flanders	3,57	2,43	2,96	2,87	2,38	2,6

Table 6. The frequency of using public transportation when going to football games based on the distance from the respondent's residence to the stadium

We can see that the number of those who go to games by public transport is rather low and never crosses the mark 4 (often). Therefore, this pilot test had a potential achievement to increase the use of public transport. Therefore, we also wanted to know how many more visitors would use these means of transport if they were incentivised. If there was an event-pass system in place, 77.4% of Flemings would consider using it, 66.7% of Walloons and 53.8% of Brussels residents. Since many Brussels residents already have their monthly or annual subscriptions, the lowest feedback of the three was expected.

When it comes to inhibitors, the same survey showed some concern over public transport which was said to be unreliable and especially useless at the late hours when the games end. What was underlined by the respondents, especially from Wallonia and Flanders is that trains rarely run at those hours even to key hub cities in the two provinces (e.g Gent, Brugge, Antwerp, Namur, Liege). This inhibits the increased used of public transport for going away from the games.

Add inhibitors, if any

Economics and feasibility

n/a yet

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Impact assessment

n/a yet

Replicability potential

n/a yet

4.4 Secured bike parking; Section of the TACKLE guidelines: mobility and logistics (new practice)

The stadium is well accessible by bikes from all parts of Brussels and even the neighbouring Flanders and several towns in the imminent neighbourhood. However, the stadium does not have any infrastructure to welcome cyclists.

One negative occurrence, quite notorious in fact, in Brussels is bike theft and tentative theft. This turns down many cyclists from cycling to mass events, such as concerts, sport events and similar.

Pilot test: Since it was proven to work, the RBFA would look into the logistics and the necessary equipment, staff, material for replicating this practice during its football games, too. A temporary bike parking could turn into a permanent one if an agreement is reached and a cooperation between concert organisers and sport event organisers is achieved. It would be also worth looking at regional funds available for such an infrastructure which could result in savings and creating a permanent bike park.

Such an opportunity would surely be well perceived by the visitors and cyclists as it would save them time when returning home, as they would not only avoid traffic jams but also cramped trams, metros

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and buses. The only additional efforts that RBFA would need to provide is staff that would make the bike park secure.

Designing the pilot test

The stadium had already designated a space for such temporary bike park, as it was the case for the two concerts in June and July 2019. Therefore, this wouldn't be a new practice when it comes to events organised at the stadium. RBFA had several consecutive meetings with Brussels Mobility, the regional mobility authority. The good response from stadium visitors during the two concerts lead to an acquisition of a mobile secured bike parking which can be installed temporarily for various events. The owner of this mobile bike parking is Brussels Mobility.

RBFA and ACR+, as the technical partner on the project, had meeting with the cabinet of Benoit Hellings, Brussels' vice-mayor, in order to discuss the deployment of the bike parking, among other topics.

Due to winter conditions, the full implementation of this pilot test has been postponed.

Success factors vs Inhibitors

While Brussels is known to be a city with a remarkable number of cyclist and an annual in-crease of cyclist of around 15% it also has a successful cycling strategic plan in place which saw the number of cyclists in the streets doubling since 2013. The infrastructure in the region is improving on a monthly basis and many associations are included and involved in this mission.

In June 2019, during a Metallica concert at the very same stadium, a temporary bike park was set up on the band's demand. More than 1000 spots were available for bikes and according to the stadium management it was very well perceived and nearly full. The visitors who came by bike also received a little present from the band (a guitar pick). Another large-scale concert – Rammstein, which took place in July 2019 also had a temporary bike park. This shows that cyclists are happy to cycle to the stadium, despite its location, if there was a secured bike parking.

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Furthermore, when we asked the game-goers in the survey about their cycling habits, they all responded with considerably high marks on the rank from 1 to 5, 3,33 and 3,67 in case of respondents from Brussels and Flanders respectively but only 2 in case of Wallonia. However, if there was a secured bike parking at the stadium, 61.5% of respondents from Brussels would consider cycling to the stadium, but only 56.4% and 30.4% from Wallonia and Flanders, respectively. The numbers were expected to grow with the implementation of this pilot test.

Economics & Feasibility

n/a yet

Impact Assessment

n/a yet

Replicability Potential

n/a yet

4.5 Parking space dedicated to car-sharing; Section of the TACKLE guidelines: mobility and logistics (ch. 3.2.5.7; OM/ML7)

One of the well-known negative feedback, already acknowledged by RBFA, is driving to games and finding a place to park. While the neighbouring park can welcome all the cars, it was reported to be expensive and the fact that everyone was parking there, it was creating big traffic jams and late departures from the area.

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As RBFA is not the owner of the parking space but the city of Brussels, this issue was pretty much out of their control.

Pilot test: While this pilot test would have the objective to encourage visitors to drive to the game, it would explore the possibilities of encouraging alternative models of going to games, such as coaches and car-sharing schemes.

In order to assess how much would this be of an interest for the visitors, a survey was conducted which included this option. This pilot measure would need to seek for support from the City of Brussels. The solution could be a dedicated parking to car-sharing and vehicles which would allow those to leave the parking first or facilitate their arrival and departure in a different way.

Designing the pilot test

After a meeting with Benoit Hellings and his cabinet, it was concluded that a part of the parking space dedicated to car-sharing could incentivise some slightly more environmentally friendly practices of going to games and reduce the number of cars. Car-sharing implies a private vehicle or a rented bus which transports smaller or larger groups of people.

Since this was discussed after the last game in the qualifiers, the full implementation has been postponed.

Success factors vs Inhibitors

The survey on mobility that was conducted among the game-goers, showed that this way of travelling to games is not very common ad popular, much less than using a private car. In range of 1 (never) to 5 (always), respondents from almost all three regions replied with 2,24 (Brussels), 2,67 (Wallonia) and 1,87 (Flanders), which is rather a bad indicator.

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However, apart from those who are using car-sharing, 71.8% of respondents from Flanders would consider opting for car-sharing solutions, 61.5% of respondents from Brussels and 48.7% from Wallonia.

Economics and feasibility

n/a yet

Impact assessment

n/a yet

Replicability potential

n/a yet

4.6 Green Procurement Guidelines; Section of the TACKLE guidelines: Procurement (ch. 3.2.4.7; OM/PR6)

Single-use cups weren't assumed to be the only cause of a high share of plastic waste. Certain practices were identified to contribute to this, such as the sale of food and beverages. External food and beverage providers are responsible for this through sponsorship contracts. It was difficult to change any of these practices while the contracts were running. The waste these providers were creating was ending up in the general waste and was becoming a responsibility of the event organiser.

Pilot test: As the contracts were ending with the end of the European Qualifiers, it was decided to look into improvements in the contracts and introduce new requirements for food and beverage providers which would impose more responsibility concerning waste management upon the

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subcontractors and also introduce few improvements in the quality of the service and its environmental impact.

Designing the pilot test

As the call is currently still open, the full implementation of this pilot measure is expected to start with the next home game for which the date is still unknown.

I will add the new specifications once I receive the document.

Success factors vs Inhibitors

n/a yet

Economics and feasibility

n/a yet

Impact assessment

n/a yet

Replicability potential

n/a yet

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5. Aviva Stadium, Dublin

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 Rugby Union (IRFU) and the Football Association of Ireland (FAI), providing an outstanding venue for matches, concerts, conferences and events, offering exceptional customer experience in a sustainable manner."

The figures on recycling were being provided by Greenstar, the company responsible for waste management in the stadium. One of the achievements the stadium wanted to make was to have an average recycling rate per month of 75%. This rate at the beginning of the project was 67% (2018 average).

5.1 Reusable cups for drinks; Section of the TACKLE guidelines: event (ch. 3.2.2.12, OM/E 18)

Most of the recyclables collected during games at AVIVA stadium are plastic cups, especially in case of rugby games. However, although a proper treatment is ensured for them by Greenstar (if they end up in the recyclables), some of them end up in the streets around the stadium, putting pressure on the local community and city council. At the same time, the stadium would like to decrease the use of single use plastic cups. They already run a test with reusable cups, where the consumer would pay €1 for the cup as a deposit and get it back once he/she return the cup. However, there were issues with the design as the beverage provider wasn't satisfied with the solution. This is why the pilot test had to include Diageo, the beverage provider.

Pilot test: This pilot test would run another test with reusable cups. It would be necessary this time to ensure the design, size and other characteristics with all beverage providers/caterers in order to have both sides agreeing on it. The plan is to run the test at a football game in November or rugby

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game in December but only in one part of the stadium in order to be able to compare the amount of waste collected in that part of the stadium with the others.

Designing the pilot test

While AVIVA wanted to introduce reusable cups for some time already, it was Diageo who decided to take over this task of developing and coming up with the appropriate design. They presented the design they developed that met their requirements and the new reusable cups were used during the Ireland – Wales rugby game. The cups were branded with the IRFU logo. In order to maximise the use and the resources a discussion was necessary between several different stakeholders involved in this pilot test, namely FAI, IRFU, AVIVA stadium, Compass (caterers) and Diageo. Both FAI and IRFU were happy with the solution as long as both logos were displayed. Due to this slight delay, the full implementation which was planned for November was pushed back to February 2020 and the Rugby 6 Nations Cup.

However, the system was already tested in September during a rugby game only in one part of the stadium with 20.000 deployed cups. According to the stadium manager and Compass representatives, there weren't any complaints neither from the customers, nor the caterers' side and the scheme was considered as an easy one to deploy with minimal requirements for additional trainings and briefings for people working behind the bar.

Preparation for the full deployment started on time in order to have the cups introduced for the Ireland – Scotland rugby game on 1 February. The supplier was EcoFriendly Cup which is a subdivision of Racedisplays. Racedisplays are a printing company who cover a wide range of events and industries. The owner saw the likes of Ecocup and Green goblet on the continent and saw an opportunity in Ireland as there was no one yet doing the cups. The choice of material was Polypropylene cups which can be washed up to 300 times.

65.000 cups were deployed for the Ireland - Scotland match before the test was repeated on 8 February during the Ireland – Wales match, again a 6 Nations Cup.

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Success factors vs Inhibitors

Customers had very positive feedback after the first game and appreciated the efforts the stadium was making to eliminate single use plastics. They have received feedback that there was not enough signage so they had to increase this from the Scotland game going into the Wales game. This seemed to work and they had less complaints from people who said that they did not know about the initiative. The signage which was developed for the pilot test are below:

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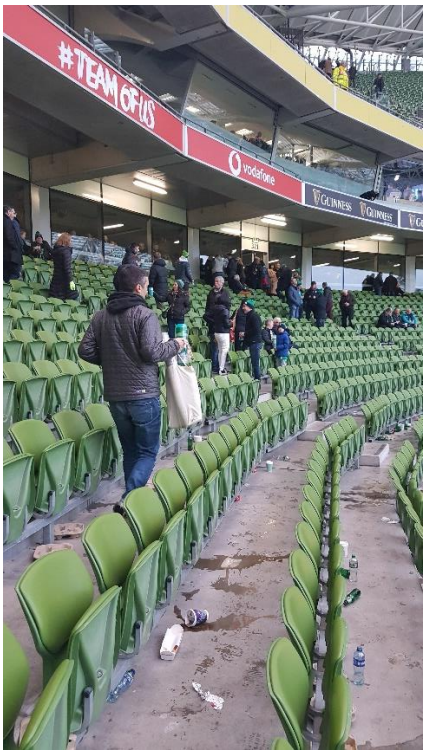
While we unfortunately didn't obtain any data on the loss rate, meaning how many cups were left unreturned in this pilot test, we could report on one observation we made. A lot of cups were left in the stands (a large share still collected by some visitors, not necessarily the original owners of those cups). The reason behind this could be found in the drink vs deposit rate. While a drink, in our case a pint, could cost somewhere between €2 to €4 in southern or central Europe, a pint in Ireland is between €6-€7. The usual deposit price for a cup, on the other hand, is €1 in both cases. This leads to a conclusion that the deposit elswhere could be a half or a third of a price of a new drink, while in Dublin it's way less. This is only an observation we made, thus we can't prove it with numbers. The images below show this occurrence at AVIVA stadium:



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Economics and feasibility

Just like the majority of reusable cup schemes in events, the customer pays an extra €1 when buying the first drink. The money that doesn't get returned to customers (due to unreturned cups) is used to wash the cups and is reinvested to replace any unreturned cups. The model is designed to be cost neutral.

For this pilot test, it wasn't the stadium neither the Football Association/Rugby Union who bare the costs, but Compass, who is subcontracted to provide beverages. This included the full cycle – delivery and cleaning.

Unfortunately, we were not able to obtain any commercial figures, as Compass was unable to share them.

Impact assessment

At the very end of the Ireland – Scotland game, 52360 reusable cups were returned to the washing facility. If these 52.360 were replaced with single-use plastic pint cups, they would amount up to 418.88 kg.

In terms of CO_2 savings, this pilot test achieved a saving of above 2 tonnes of CO_2eq. This saving includes savings by avoiding incineration and manufacturing new single use cups and losses by not incinerating them and the emissions coming from washing.

AMOUNT DIVERTED	EMMISION SAVED BY AVOIDING INCINERATION	EMISSION LOST BY AVOIDING INCINERATION	EMISSION SAVED BY REUSING AND LOST BY WASHING	TOTAL
418.88 kg	1250.35 kgCO_2eq	46.08 kgCO_2eq	924.88 kgCO_2eq	**2129.15 kgCO_2eq**

Table 7. Emission savings from the pilot test (ADEME)

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Furthermore, thanks to the data obtained from Greenstar, one could look at the total amounts of collected waste. Since the stadium hosts the home games of the FAI and IRFU only, it means that the stadium is not visited regularly each month as if it was the home ground of a football club or similar, hosting games every two weeks. Therefore, instead of looking at the 2019 average amount of collected mixed packaging waste where single-use cups end up, this impact assessment looks at the months of March, September and November 2019. The stadium hosted the same number of matches in those months like in February 2020 when the pilot test was conducted. In addition to the mixed packaging waste, we looked at the dry mixed recycling rate, too, which indicated the purity of mixed waste. The table below shows the achievements of this pilot test.

	MARCH 2019	SEPTEMBER 2019	NOVEMBER 2019	FEBRUARY 2020
Games hosted	2	3	2	2
Mixed packaging (t)	4.54	3.02	3.96	3.1
Dry Mixed Recycling rate	14%	10%	14%	17%

Table 8. Collected waste amounts per months of interest (Greenstar)

The success of this pilot test is obviously reflected in two different manners, yet very much interlinked. While the decrease in the collected amount of mixed packaging waste is caused by eliminating single use cups and replacing them with reusable ones, the dry mixed recycling rate increases as the quality of that waste is improved by preventing dirty and wet plastic from being a part of that waste.

Replicability potential

This particular pilot test was proved to be rather easy to run and the entire practice easy to be implemented. Several different important factors played an important role in its enrolment. Above all, reusable cups recently became a staple principle in organising festivals, concerts and any other

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kind of mass events. This implies that the visitors are rather accustomed already to this practice. Furthermore, the key factor that was proven to have driven this pilot forward was the fact that a company which has experience in this particular practice was brought in. There is a large pool of national or international companies providing such services, something that can facilitate everyone's effort in "greening" a sport or a music event. A mutually beneficial business model can easily be achieved and it can greatly improve the environmental performance of events.

The replicability potential can be even bigger if sponsorship and similar deals are considered. Many multinational companies operating in Europe are looking for potential opportunities to present their products and services as a green one. Their sponsorships can easily cover certain costs that might occur during the implementation of such a practice.

Feasibility/Scores	Economic	Environmental	Technical	Replicability	Total
Guidelines					2.5
Pilot test					3

6. Dragão Stadium, Porto

Dragão Stadium has always paid attention to the improvement of environmental performances, from the project's conception to the present day, being therefore an example of good environmental management and sustainability.

Environmental aspects such as water, energy, waste, noise and gas emissions have been adequately monitored in order to minimise the environmental impacts of infrastructure, reduce consumptions and increase recycling levels.

Dragão is certified by the ISO 9001 (Quality) and ISO 14001 (Environmental Management) Standards since 2007. Among other distinctions in this sector, FC Porto received certificates like Greenlight from European Commission (2003), UEFA Five-Star Stadium (2004), Best Achievement (non-sporting) by

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European Club Association (ECA) (2010) and EDP Energia Elétrica e Ambiente (electricity and environment for service buildings) (2017). In this way, FC Porto has a higher level of process control, increases the levels of satisfaction of all stakeholders, carrying out your social duty and influencing the people who accompany FC Porto daily.

Usually, FC Porto involves fans in environmental initiatives:

- Sensitise the community on environmental issues, through advertising campaigns;
- Celebrate World Environment Day,
- Organize talks and visits to the Stadium.

Since the Estádio do Dragão has a good history of environmental management, it was very interesting to conduct pilot tests as an improvement. The first one identified was Carbon Footprint calculation to identify the footprint, which will allow to set goals for reduction of the GHG emissions. In addition, other opportunities for improvement were identified that would be interesting to share in this project, such as reducing water consumption, purchasing clean energy, further improving waste management (either in the administrative areas, in the separation of waste or the use of advertising panels for upcycling).

6.1 Improving Waste Management; Section of the TACKLE guidelines: Event

(ch. 3.2.2.6, OM/E4)

Waste management is one of the themes that FC Porto has been working on over the last few years, having a very interesting history in adopting good practices. FC Porto has a habit of participating in the European Week for Waste Reduction and marking the European Day of Recycling with actions or awareness campaigns aimed either at supporters or at employees and service providers. An example was an awareness campaign aimed at fans with images of the state of the stands at the end of a game, calling for the separation and cleanliness of the space. This was a campaign that had a big impact.

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Other examples of waste management prevention are the phasing out of paper tickets as fans can enter the stadium using a digital application instead and the replacement of single use cups with porcelain cups in the administrative areas as the latest awareness campaign.

Another relevant example is the collection of food items that supporters bring on match days, but that cannot enter the Stadium. The food items collected are donated to associations and charities. Otherwise, these foods would be deposited in mixed waste and sent for energy recovery.

Pilot test

Since FC Porto was experiencing a significant increase in mixed waste, they decided to start an analysis of the possible causes. In this sense, the pilot test consisted of the following steps in characterizing waste and defining and implementing measures to improve waste sorting.

This pilot project involved different entities: FC Porto, LIPOR and a service provider that performs waste sorting.

Designing the pilot test

LIPOR carried out a characterisation of residues and samples were collected from different areas of Estádio do Dragão, including benches, food courts and stands. Two analyses were carried out:

1. Analysis of recyclable waste in order to verify the level of contamination of waste selectively disposed of;
2. Analysis of the mixed waste in order to estimate the share of recyclables in this waste.

The types of waste evaluated were plastic and metal packaging, glass packaging, paper and cardboard and mixed waste. This analysis excludes the quantification and analysis of food waste. For the analysis, a characterization point was improvised where bags were opened, and waste sorted, as shown below:

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As a result of this analysis, there was a good separation of the waste that was being selectively disposed of. This conclusion was proven by the contamination rates identified in glass (0.3%), followed by paper and cardboard (5.9%) and plastic and metal packaging (6.3%).



When it comes to the mixed waste, as a result, there was a high percentage of waste that could be more adequately addressed, especially waste coming from areas dedicated to visitors.

The results were very illuminating and proved the high recyclability potential of mixed waste. In a sample of 128 kg of unsorted waste, 79.5% of the waste was mixed waste, with a recyclability potential of 20.5% of recyclables that can be sent for recycling. The image below shows the exact shares of different wastes.

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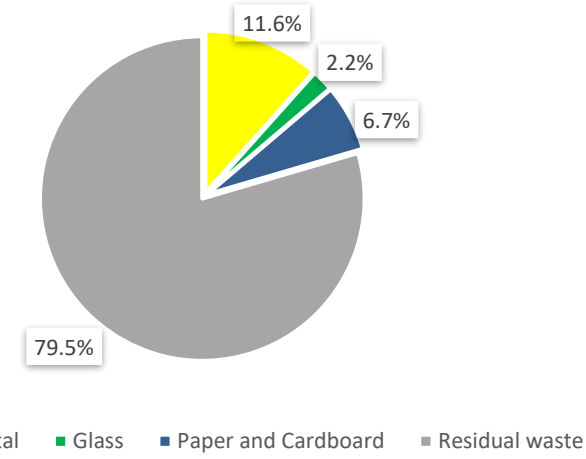

Of the areas analysed, there was a worse separation rate of waste where there is a greater circulation of visitors.

The next phase focused on defining and implementing new measures to improve the results of separate waste collection. The following measures were taken:

1. Installation of equipment for selective waste collection in the administrative areas
2. Acquisition of a mixed waste sorting station

To enhance selective collection, LIPOR installed bins for selective collection of plastic and metal packaging, glass and paper and cardboard packaging in the administrative area, as shown on the image below:

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Since FC Porto had already installed various equipment for the selective disposal of waste (e.g. areas for visitors, bars and restaurants and others) and had carried out actions and awareness raising campaigns over several years. However, the recent increase in the amount of unsorted waste and the results of its analysis showed a large potential of capturing even larger quantities of recyclables. This is why FC Porto decided to go for setting up a sorting station. For this purpose, a market research was carried out, and an external entity was hired to design the sorting station according to available space. The sorting station in shown below:

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As this equipment needed human resources, all the waste produced by the visitors during a game, as well as the waste produced in bars and restaurants are sent to the sorting station. To be able to sort mixed waste, at least one employee is allocated daily (depending on the volume of waste). After sorting, the waste is stored and sent to the appropriate final destination.

The equipment is currently in the testing phase. Due to the pandemic period, it was not possible to carry out tests with waste produced by the supporters since the games started to be carried out without visitors.

Success factors vs Inhibitors

A success factor of this pilot test was all the work previously done by FC Porto. FC Porto has been devoted to the topic of waste, having already a history of improvements and actions and awareness raising campaigns developed over the years. This was essential to have a critical spirit and make the right decisions.

The installation of the sorting station was a logical step after identifying a large recyclability potential within the unsorted waste collected in the stands.

One of the inhibiting factors was proven to be the economics of this pilot test, as it required investment, but since it was identified as one of the priorities of the club's sustainability agenda, the decision was positive.

Economics and feasibility

In economic terms, the club had to make an investment, but it would return in the coming years. One of the potential advantages is that the smaller the amount of unsorted waste produced and the higher the percentage of recyclable waste, the faster the return on investment. Savings would also reflect in the decrease of waste sent for energy recovery, and gains from the sale of some materials.

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Having a sorting station requires allocated human resources, not only for the pilot test itself but also for keeping this new practice running. One person was allocated to this task.

Impact assessment

In terms of waste management, this pilot test facilitated the selective collection in the administrative areas. Together with the sorting station the stadium is boosting the collection of recyclables, diverting it from the unsorted waste fraction and consequently from being incinerated. In this way, more effective and efficient waste management helps to move up the waste management value chain.

Due to the current pandemic, the sorting station didn't start to operate yet, so no data is available at this very moment for a full impact assessment.

Replicability potential

This pilot test can be replicated in any sports facility including administrative areas. However, it requires some financial investment and the allocation of human resources periodically to sort the waste produced.

Feasibility/Scores	Economic	Environmental	Technical	Replicability	Total
Guideline OM/SM18					2.25
Pilot Test					2.5

6.2 Green Power Acquisition from Renewable Energy Sources; Section of the TACKLE guidelines: Procurement (ch. 3.2.4.1, OM/PR1)

During the last several years, FC Porto highlighted their concerns about energy consumption. This led to carrying out studies with an objective to optimise the stadium's energy efficiency as well as

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other club structures' ones. Solar panels installed at Dragão, already allowed a reduction in gas consumption for heating water.

Pilot test

The pilot test aimed at assessing the possibilities of acquiring green energy for the Estádio do Dragão and consequently reduce its carbon footprint. FC Porto needed to start a new energy supply contract in 2019. To this end, the club prepared a call for offers, specifying the requirements for the purchase of clean energy before they would start receiving proposals from suppliers.

It is known that there are companies in Portugal who guarantee that the electricity they sell indeed comes from renewable sources. For strategic reasons, FC Porto did not advance with a new contract, but made other investments in the energy efficiency area of the building.

Designing the pilot test

Within the scope of the new call for offers, FC Porto decided to give advantage to offers based on renewable sources, which, simultaneously, would not imply an increase in energy supply costs. A call for offers was prepared in January 2019 with the desired specifications - acquisition of 100% clean energy. This was released, so the companies could make their proposals.

FC Porto received proposals from different suppliers. It evaluated the different proposals to close a new contract with 100% clean energy provider.

Since the arrived offers had a higher annual cost, FC Porto decided, for strategic reasons, not to award any offers. Instead, FC Porto preferred to keep the same type of contract as before and boost the investment for energy efficiency solutions and passive air conditioning (placement of sunscreen films on the windows). Films that allow high visible light transmission and neutral appearance, providing an increase in the thermal insulation performance and heat rejection were placed. Simultaneously, by reducing harmful UV rays, the films would protect the condition of the materials inside and the well-being inside the building.

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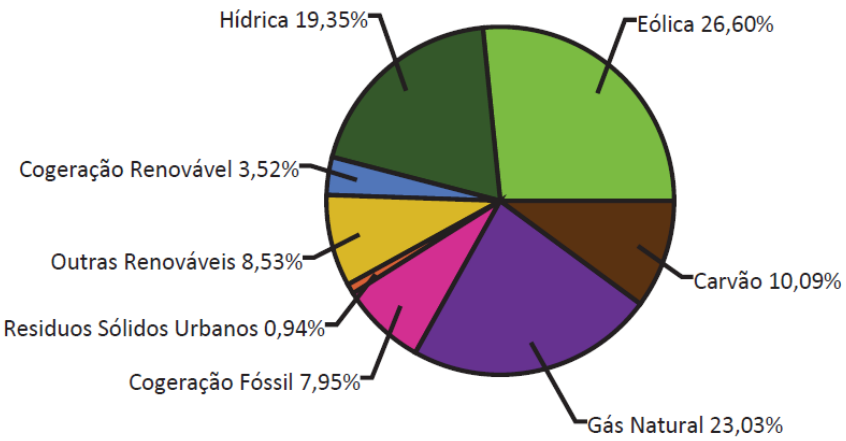
On the positive note, the current energy supplier already contemplates an energy supply mix which includes renewable energy sources and non-renewable energy sources, as shown in the following graph:



58% of the electricity supplied came from renewable energies, with emphasis on wind power (26.6%).

Success factors vs Inhibitors

Electricity from renewable sources in Portugal is more expensive than others on the free market. The companies justify price difference by the need to purchase guarantees of origin to ensure that the electricity is 100% renewable.

Suppliers of 100% green energy purchase the electricity they supply to customers through contracts with producers of renewable energy (mini-hydro, wind, solar) which allows them to guarantee for the origin of the energy they sell. Certificates have a cost associated with their acquisition and processing, which is naturally reflected in the tariff. Currently the system in force in Portugal, obliges traders to buy guarantees of origin abroad to ensure that their electricity is green.

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Economics and feasibility

The purchase of clean energy from a supplier is highly dependent on the costs associated with the purchase of clean energy from the producers by the supplier. Therefore, decision making are clearly affected by the acquisition cost and the strategic decisions of each entity / club.

Impact assessment

N/A[1]

Replicability potential

In addition to the increased costs, the transition to clean energy supply is dependent on current electricity supply contracts and the availability of clean energy in a given country. These can be long and the transition to a new contract may take some time to take effect.

The replicability potential will also depend on the number of suppliers and how the certification system works in each country where the purchase of clean energy is intended.

Feasibility/Scores	Economic	Environmental	Technical	Replicability	Total
Guidelines OM/PR1					2
Pilot test					2.5

7. Benito Villamarín, Seville

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

[1] Since the acquisition of clean energy has not gone ahead, we cannot analyse its impact.

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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 stressed the need for introducing specific environmental policies that would reward the club on the basis of its environmental practices and not only on their financial resources. In the past, the club concluded some agreements with Ecoembes, which is the local wasting company, in order to make supporters more aware of recycling actions.
The home club, Real Betis Balompié established a Foundation which works under the parameters driven by the club's historical and philosophical values, and the Club's universal social dimension, but always adapting to the new challenges set out by Sustainable Development Objectives.

The club showed interest in pilot test mainly targeting governance, mobility and logistics, green procurement, as well as event management.

7.1 Identification and implementation of environmental KPI (Key Performance Indicators); Section of the TACKLE guidelines: Governance (ch. 3.1.7, GOV 14)

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. A proposal which would include KPI for energy-related and water-related consumptions as well as food and material waste would need to be developed. These indicators would be monitored in absolute terms or relative values, depending on the productivity and/or the total number of supporters per season.

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Pilot test: This pilot would design and implement a specific method for a systematic and periodical collection and elaboration of environmental data with the aim to monitor the environmental performance of the organisation.

Designing the pilot test

Success factors vs Inhibitors

Economics and feasibility

Impact assessment

Replicability potential

7.2 Supporters' mobility; Section of the TACKLE guidelines: mobility and logistics (ch. 3.2.5.6, OM/ML 6)

The club expressed the need for more intelligence on the mobility patterns in order to icrease the knowledge about mobility behaviour of supporters and boost the use of bikes through installing bike racks around the stadium.

Pilot test: This pilot test would see a launch of a survey among Betis supporters. Through interviews, the club would be able to understand how visitors arrive to the stadium, barriers for using bikes or public transport and similar insights.

Designing the pilot test

A game on 21 February 2020 between Betis and Mallorca served as a good opportunity to conduct the survey among 200 gamegoers.

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These questionnaires were analysed by Sant'Anna School of Advanced Studies (SSSUP). A report that would reflect the survey results was prepared.

Success factors vs Inhibitors

Economics and feasibility

Impact assessment

Replicability potential

7.3 Green procurement guidelines; Section of the TACKLE guidelines: procurement (ch. 3.2.4.7, OM/PR 6)

The Stadium management and the organisation of football events require procurements of high volumes of products and services. Some of the services (e.g. cleaning, catering, grass cultivation, etc.) have also an important environmental impact. The adoption of specific criteria could contribute to the transition towards green behaviours among suppliers, as well as enhance environmental performances of the club.

Pilot test: This pilot would result in designing and putting in place a procedure which would further result in taking green criteria into consideration when selecting suppliers of products and services.

Designing the pilot test

After the initial analysis of the main products and services and their corresponding providers which looked at the presence of suppliers holding some environmental certification (EMS) or label (Ecolabel), Betis agreed to apply the criteria.

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Success factors vs Inhibitors

Economics and feasibility

Impact assessment

Replicability potential

7.4 Donation of unused prepared food; Section of the TACKLE guidelines: event (ch. 3.2.2.9, OM/E 14)

The catering service is managed by a third company called ARAMARK which provides food inside the stadium. Catering can be provided to up to 1800 people. ARAMARK was recording a surplus of 20% to 40% after Betis' home game. This was partially eaten by ARAMARK staff present at the stadium. What they were not able to consume was collected as separated organic waste.

Taking this into consideration, ARAMARK was willing to sign a document for exemption of responsibility to donate the remaining food to some Charity Association. The remaining foods to be donated have to be con-sumed before 24 hours.

Pilot test: This particular pilot test would see the establishment of an agreement between Betis/ARAMARK and one of Charity Associations to donate the remaining food at the end of each match in order to avoid the generation of food waste and achieving social benefits.

Designing the pilot test

Several contacts between Betis and Charity Associations (Hermandad de La Paz, Hermandad de La Estrella and Hermandad de San Juan de Dios) were made, but all these charities had the same

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problem - they had no resources to collect and pick up the remaining foods. In the end, Betis and Banco de Alimentos de Sevilla reached an agreement to donate/collect the remaining food after the matches or the next day within 24 hours.

In order to agree on various principles between Betis, ARMARK and El Banco de Alimentos de Sevilla, several calls and meetings took place throughout March 2020.

Success factors vs Inhibitors

Economics and feasibility

Impact assessment

Replicability potential

8. Tele2 Arena, Stockholm

Tele2 Arena is one of the world's most accessible venues. It was built using locally Scandinavian materials that give the building a cultural context and reduce its environmental impact at the same time. Its construction spurred the regeneration of the Johanneshov district and contributed to its urban development. Connectivity to neighbouring areas was promoted through environmentally conscious ways to get to and from the Arena: pedestrian connections to nearby subway stations were strengthened and 1,000 new bicycle parking spaces were introduced.

The impact of Tele2 Arena on the local environment was mapped through comprehensive Environmental Impact Assessment; risk and safety, traffic, air quality and noise were assessed and findings incorporated into the stadium's design. Tele2 Arena was awarded the Miljöbyggnad Guld environmental standard.

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8.1 Separate waste collection and recycling and composting program; Section of the TACKLE guidelines: event (ch. 3.2.2.6, OM/E4, OM/E12)

Tele2 Arena had a separate waste collection system but, at a certain point, decided to return to a unique unsorted waste collection.
However, given the recent attention paid to the reduction of plastic waste, it is of utmost importance to separate at least plastics and organic waste.

Pilot test: This pilot test would reintroduce separate waste collection at least for plastic waste, organic waste and for liquids. The test would include the installation of bins for separate waste collection in the public space in the imminent surrounding of the Arena, as well as appropriate infographics and signage indicating the different types of waste being accepted in those bins

Designing the pilot test

Success factors vs Inhibitors

Economics and feasibility

Impact assessment

Replicability potential

8.2 Reusable cups for drinks; Section of the TACKLE guidelines: event (ch. 3.2.2.12, OM/E18)

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The stadium's owner, Stockholm Live, was strongly committed to get rid of single-use plastic items. They were struggling to achieve this target because of the safety measures that ban the distribution of closed plastic bottles for drinks: this limitation was obliging caterers to serve drinks in single-use disposable plastic glasses. The result was that waste quantities doubled up with plastic bottles and plastic glasses.

Pilot test: The objective of this pilot test was eliminating single-use plastics tableware, bottles, glasses and cups. The underlying idea was to test and take into consideration several possible alternatives. The first one would be the distribution of reusable cups with a return fee: supporters would be incentivised to return the used cup and reclaim the deposit fee or have another drink without paying the deposit again.

Another possibility could be the adoption of biodegradable and compostable cups. They could be disposed of in the organic fraction. Finally, other more innovative types of glasses could be tested (i.e. pcup or others).

Designing the pilot test

Success factors vs Inhibitors

The option which considered biodegradable and compostable cups was very much relying on whether separate collection of organic waste was implemented or not.

Economics and feasibility

Impact assessment

Replicability potential

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8.3 Life Cycle Assessment; Section of the TACKLE guidelines: governance (ch. 3.1.10, GOV16)

Stockholm Live manages both Friends Arena and Tele2 Arena in Stockholm. The first one has a natural grass pitch whereas the second has an artificial turf pitch. They both require intense maintenance activities. It could be of interest to compare the related environmental impacts of these two types of pitch taking into consideration their whole life cycle.

Pilot test: This pilot test would result in performing a comparative LCA study of the grass pitch of Friends Arena and the artificial pitch of Tele2 Arena.

Designing the pilot test

Success factors vs Inhibitors

Economics and feasibility

Impact assessment

Replicability potential

8.4 Sport events GHG inventory; Section of the TACKLE guidelines: governance (ch. 3.1.6, GOV1)

Stockholm Live developed a rich monitoring system that requires monthly collection of environmental KPIs aimed at measuring its GHG emissions. This evaluation system can be used to calculate the GHG emissions caused by the venue in one year.

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Pilot test: The underlying idea was to calculate the GHG inventory over one year of the activities at Tele2 Arena. Based on the outcome, the test would further set a GHG emissions reduction strategy aimed at targeting the most impactful activities.

Ideally, it would be interesting to also calculate the emissions caused by one single match and by one single concert.

Designing the pilot test

Success factors vs Inhibitors

Economics and feasibility

Impact assessment

Replicability potential

9. Friends Arena, Solna

A private company owns the stadium (75% real estate company) with the football associations owning the other 25%. Stockholm Live is the current manager of the stadium. 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.

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No specific indicators are used for monitoring environmental aspects.

9.1 Green procurement guidelines; Section of the TACKLE guidelines: procurement (ch. 3.2.4.7, OM/PR6)

The stadium management and the organisation of football events requires the procurement of high volume of products and services. Some of the services (e.g. cleaning, catering, etc.) could also have an important environmental impact. The adoption of specific criteria could contribute to the transition towards greener practices among suppliers as well as the enhancement of environmental performance of the club.

Stockholm Live has already implemented some steps in order to include some green requirements in some tenders/contracts (e.g. catering)

Pilot test: The aim of this test would be to develop further the capacity of the stadium manager in green procurement through the design and implementation of a procedure which would further result in taking green criteria into consideration when selecting suppliers of products and services.

The added value that this pilot test could have reflects in benefits beyond the boundaries of Friends Arena, since some contracts/tenders of Stockholm Live include all stadiums managed by them.

Designing the pilot test

Success factors vs Inhibitors

Economics and feasibility

Impact assessment

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Replicability potential

9.2 Light management optimisation; Section of the TACKLE guidelines: stadium management (ch. 3.2.3.10, OM/SM5)

General illumination was an important topic for Friends Arena, since it caused relevant environmental and economic impacts. Prior to the project, a suitable technology and management system were not identified to reduce this impact. However, according to the stadium manager opinion, there were some stadiums across the EU which had advanced systems in this field. It was concluded that a possible networking with these stadiums could have beneficial effects on the stadium.

Pilot test: The aim of this pilot test was to establish an exchange of experiences between Amsterdam Arena and Friends Arena in order to identify possible best environmental practices in the field of general illumination, already adopted by Amsterdam Arena that can be replicated in Friends Arena. The action would foresee also an assessment of these practices by the Friends Arena in order to evaluate the technical and economic feasibility to adopt these practices.

Designing the pilot test

Success factors vs Inhibitors

Economics and feasibility

Impact assessment

Replicability potential

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9.3 Donation of unused prepared food; Section of the TACKLE guidelines: event (ch. 3.2.2.9, OM/E4)

The stadium management had previously identified certain potential improvements in the catering sector. The catering sector includes both the catering which is provided inside the stadium prior to a game and the food stalls. When it comes to the food stalls, the pilot test would also look at the opportunities for reducing packaging waste. In particular the food stalls were using small plastic bottles for soft drinks which would be transferred into plastic cups doubling the amount of packaging waste (bottles and cups).

Pilot test: This pilot test would aim at an agreement between Stockholm Live, the catering service provider and some charity associations, parishes, food banks or similar which would regulate the donation of the remaining food at the end of each match. The benefits would be twofold - avoiding the production of food waste and achieving social benefits. Regarding the plastic waste from the food stalls, some specific solutions could be adopted in order to overcome the unnecessary packaging waste.

Designing the pilot test

Success factors vs Inhibitors

Economics and feasibility

Impact assessment

Replicability potential

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9.4 Energy consumption – reduction of heat losses; Section of the TACKLE guidelines: governance (new practice)

Heat losses from the stadium, especially when it is covered and heated during the winter is a big environmental and economic issue for Friends Arena.

Pilot test: This pilot test would carry out a study that would give relevance to the issue through defining suitable Key Performance Indicators (KPI) related to heat consumption. They would further be compared with other stadiums for benchmarking reasons. In addition, the study could point out proper management actions and technologies in order to reduce heat losses in the stadium. After the study the stadium owner would assess the suggestions provided by the study in order to evaluate the technical and economic feasibility of these practices.

Designing the pilot test

Success factors vs Inhibitors

Economics and feasibility

Impact assessment

Replicability potential

10. Luigi Ferraris, Genoa

The stadium's organigram does not list any responsibilities in the field of environmental management and neither the two football teams who use the stadium do not hold such roles within their managing bodies. One of the main reasons for the lack of environmental standards within the

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management of the stadium is the fact that the arena is rather old - inaugurated in 1911, enlarged for the championships in 1934, and finally brought to its actual shape in 1990. Therefore, most of the efforts are focused on keeping the building functional under an infrastructural point of view.

Inside the stadium there is a waste bin for each of the catering points (18 bars around the whole perimeter of the stadium). These bins collect undifferentiated waste, but the catering company reported that it was making every effort to separate paper and plastic (there were no such obligations in the contracts in this field). Furthermore, the catering policy is to always have enough food available to all kind of visitors (regular and VIP). However, this meant certain amounts of leftover food at the end of each match.
The waste generated by the natural pitch is recycled. Only natural-based fertilizers are used for the pitch. The pitch is composed of two varieties of grass (couch grass and ryegrass); one is dormant in summer and grows in winter, the other does the opposite.

The stadium management decided to focus on several waste prevention measures as well as boosting recycling and separate collection of waste while in the field of energy management the stadium would like to see the use of LED lights for grass growth.

10.1 Waste recycling planning; Section of the TACKLE guidelines: Practices on the governance of football events (ch. 3.1.3, GOV10)

Upon visiting the stadium, it could be noticed that waste collection was organized in three different streams. The first stream was the waste produced by the catering service. At each match the catering service provided food and beverages, which it prepared in the kitchen or kiosks and served to visitors. All catering staff was instructed to serve drinks only in single-use plastic cups and food in single-use plastic plates with a paper towel (if the visitor was served at a kiosk) or to serve the drinks and food in glass cups or ceramic dishes with steel cutlery (as was the case in the VIP areas). The second stream of waste was the one produced by the stadium management operations. It included mostly paper from the offices, cartridge from printers, and organic waste from the pitch. The third stream of waste

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was the one produced by visitors, which was composed of paper towels and single-use plastic cups and plates, and snacks' wrappings. The first two streams of waste (from the catering service and from the stadium management operations) included a selective sorting in which organic waste from the kitchen and kiosk, organic waste from the pitch, paper and cardboard, plastic and metals and glass were all collected separately in accordance with the city's indications on waste management. The third waste stream (waste produced by fans) was left completely unsorted.

The waste collection schedule at the stadium was organized as an on-call service in which the stadium's staff would call the waste collection agency, AMIU Genova, and ask the company to empty the waste bins.

Despite the goodwill of the staff working for the catering service and day-to-day operations, who all cooperated to separately collect waste, all waste produced inside the stadium, except glass, would not go to recycling plants. The one and only cause of this mismanagement of waste was due to the fact that the stadium was endowed only with bins dedicated to the mixed and unsorted waste. The stadium had in fact at its disposal 20 large bins (1100 litres) color-coded "green", meaning for unsorted waste.

Pilot test

The pilot test was entirely about implementing a recycling scheme which would see all materials sorted within the stadium. At the time of the implementation only glass was sorted, while plastic, cardboard and paper, organic waste and metals would go in the mixed waste stream.

The stakeholders involved were the stadium management, the stadium staff, the stadium cleaning service (Genova Insieme) and the local waste management company, AMIU Genova. Together with the stadium management, AMIU Genova organized a new waste collection schedule and in order to endow the stadium with the necessary recycling containers.

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As the catering service already performed a selective collection of waste it was only necessary to give them the recycling containers. Together with the cleaning association (Open Genova), it was decided that the workers would try to separate recyclables when collecting waste from the stands.

The main aim of the pilot test was to establish a long-term, efficient waste collection scheme in order to increase the recycling performances of the stadium.

Designing the pilot test

The pilot test started in October 2019 and still ongoing. However, the preparations started in September 2019. 2 on-site visits were performed by AMIU Genoa together with the stadium manager in order to understand the organization of the waste disposal at the stadium and 1 on-site visit with the catering service in order to understand how the kitchens and kiosks disposed of the waste.

Once the on-site visits were completed the stadium manager included the association Genova Insieme in the pilot test, which was in charge of cleaning inside of the stadium. The association Genova Insieme was included in order to try to recycle as much as possible the trash that fans leave in the stands.

In addition, 2 on-site visits were organized at the stadium with the stadium manager and two heads of operations of AMIU Genova in order to redefine which containers the stadium was using, which ones were needed and where would it be optimal to place them in order for the waste collection truck to unload them easily.

Once the collection scheme tailored for the stadium was agreed on and planned, AMIU Genova started looking for the recycling containers to give to the stadium. In the meantime, since September 2019, AMIU Genova started diverting the organic waste from the pitch from landfilling to composting.

In October 2019 AMIU Genova handed over the new waste containers to the stadium and the new recycling scheme started on 11 October.

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Success factors vs Inhibitors

The first challenge that appeared was diverting the organic waste from the pitch, which was previously sent to landfilling to composting. The composting plant would initially not accept the organic waste from the pitch because of the enormous quantity of grass produced from the stadium (approximately 12.000 litres per month in the high growing season) would have negative effects on the final product. In order to solve this issue AMIU Genova had to find a new composting plant which had the capacity to treat great quantities of turf.

The second challenge was the evaluation of the amount of recyclables produced by the stadium before and after the pilot test. The challenge was posed by the fact that it was impossible for the waste management company, AMIU, to bring a scale to the stadium to weigh the containers emptied. Hence, in order to monitor the impacts of the pilot test AMIU had to implement an evaluation scheme based on the number of waste containers emptied (quantified in m^3), the estimated density of the waste, and estimated weight of the waste.

Social acceptance was very positive among all staff members working in the stadium, and thanks to everyone's cooperation the pilot test was well accepted and made possible. Also, thanks to the efficient communication with all actors from the stadium manager, to stadium staff, catering staff and cleaning service staff, it was possible to improve the stadium's recycling performance.

Economics and feasibility

The pilot test did not have any financial implications for the stadium nor for the waste management company or any other stakeholder involved. This is because the stadium was already paying a waste tax and the waste company was already providing waste collection service to the stadium. The costs of the new waste containers were covered by from AMIU, and financed through the waste tax.

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Impact assessment

Prior to the pilot test, the stadium did not perform any selective waste collection, apart from the glass waste. All discarded material, be it paper from the offices, plastic, aluminium or aluminium cans, or even the grass from the pitch, was considered mixed waste. The "business-as-usual" scenario included a proper sorting in the kitchen and kiosks as well as in all day-to-day operations, but eventually a less sustainable waste disposal due to the presence of only large bins for mixed waste.

Together with the stadium manager and catering service manager it was decided to reorganize the waste collection scheme. First, an inspection was made in order to find an adequate space in which to place the waste bins. The location had to be big enough to host 20 large bins of 1100 litres, and have an easy access for the large waste collection truck. Once the location was found the 20 bins dedicated for the unsorted waste were swapped for a total of 20 bins for the collection of paper and cardboard, organic waste, plastic and metals and glass.

The results of the pilot test are startling as the recycling percentage more than quadrupled rising from 7.7% in 2018 (before the pilot test), to 32.9% in 2019, after the pilot test.

Replicability potential

This pilot test is very easily replicable as all EU countries promote the recycling of all recyclable waste. Moreover, this pilot test was based on the optimisation of pre-existing resources. In this case the waste collection scheme was revisited and improved in order to ensure the recycling of all waste produced from the catering service and from the stadium management. This pilot test did not include the waste produced from football fans inside the stadium premises.

The running of the pilot test was relatively easy as waste collection is a necessary service, which the stadium was already paying for. In addition, since the pilot test benefited from much social acceptance the test had a major impact on the results obtained.

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Feasibility/Scores	Economic	Environmental	Technical	Replicability	Total
Guidelines					3
Pilot test					3

10.2 Donation of unused prepared food; Section of the TACKLE guidelines: event" (ch 3.2.2.9, OM/E14)

Each week, prior to a game, the catering service replenishes kiosks and bars with fresh sandwiches, beverages and other delicacies. All packaged snacks are checked for the expiry date and those expiring near the date of the match are taken off the shelves in order to sell only fresher snacks to visitors.

On a matchday, the stadium canteen is full of chefs who fresh food (pasta, vegetables, meat, fish and deserts) which are later served in the VIP areas and to football players. For each serving more than one type of starter, first and second courses and desert are offered. During a match there can be as much as 10000 clients for the catering. At the end of a match leftovers are common and in order to avoid throwing out premium quality food, when possible, leftovers are recuperated by the staff. However, despite the efforts, food waste would always occur.

Pilot test

The pilot test was centred on eliminating food waste, especially hot dishes such as pasta, meat, fish and vegetables cooked for the VIP areas. All stadium kiosks and bars were also part of the pilot test as unsold fresh sandwiches and packaged snacks with near expiry date would have to be thrown out after matches.

In order to eliminate food waste, the stadium catering agreed to redirect all leftovers to charities. The identified stakeholders were the stadium catering as well as a local charity which distributes food to the homeless and the network RICIBO, which connects all charities in order to ensure an efficient

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organisation of food distribution in the city of Genova. The pilot test was planned in June/July 2019, it started in September 2019 and it ended on 1 January 2020. In order to monitor the results of the pilot test, AMIU Genova and the association RICIBO overlooked and provided assistance to the newly established relationship between the stadium's catering and the local charity.

Designing the pilot test

Throughout the months of June and July 2019, AMIU Genova and a representative of the association RICIBO visited the stadium kitchen and kiosks in order to understand what types of food were being served, hence what type of leftovers to expect and to estimate the amount of food being wasted. It was established that apart from fresh sandwiches and snacks the freshly cooked food required special containers in order to keep it warm until serving it to the homeless.

Thanks to the association RICIBO a charity was identified – it was located in the stadium's vicinity and had the possibility of driving to the stadium after the matches on a call-by-call basis from the catering.

Good donations are possible in Europe thanks to the Gadda law, which made possible the donation of food to charities from a hygienic and fiscal point of view in 2016.

In order to donate food in Italy donors need to create transport documents, which would contain details on what is being transported, the weight, the beneficiary and the provider. Creating such documents may be burdensome. Hence, in order to make the donation swifter it was decided to use the app Bring the Food, where both the donor and the beneficiary create an account the and the donations are traced.

Three meetings were organised in order to help both the stadium catering and the charity to register on the app, and to ensure they would be using it correctly.

Success factors vs Inhibitors

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This pilot test was a success because all stakeholders were onboard, and everyone put 100% effort to make things work as swiftly as possible.

At the very beginning it was hard to make the app work and to calibrate it for the donations as there were certain parameters, such as the type of food, that had to be inserted manually by the association RICIBO. Nonetheless, thanks to the willingness of the stakeholders the donations did not stop and they proceeded using manual documentation.

Economics and feasibility

The financial implications of the pilot test were mainly the cost of the food given to the charity. The catering service was nonetheless very pleased to give the food to charity as they were on board with this good cause.

Impact assessment

Over four months of pilot test (September-December) the stadium catering stadium met with the charity six times and donated over 170.5 kg of food. The environmental impact is very high and positive as it avoided the creation of organic waste, and from an economic point of view it contributed to food waste avoidance and spending money for the treatment of waste. Disregarding the carbon footprint and the emissions caused by food preparation or land use change, as well as its transport and storage to the stadium, the estimated CO_2 savings this pilot test were estimated based on the emissions caused by the food waste treatment. In Genoa, the food waste originating from the stadium was being collected as unsorted waste and landfilled. Both the Food and Agriculture Organisation (FAO) of the United Nations and several studies, such as the one of Lee Han and Wang (2017)[2] estimate the emissions from landfilling food waste at 2.54 kg Co_2eq per a kilogram of food waste. Therefore, the overall CO_2 savings originating from this pilot test is estimated at 433.07 kg CO_2eq.

[2] Evaluation of landfill gas emissions from municipal solid waste landfills for the life-cycle analysis of waste-to-energy pathways; https://doi.org/10.1016/j.jclepro.2017.08.016

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On a more qualitative note we were able to create an effective link between the stadium's catering and the charity, which even after the pilot continued to perform the food donations.

Replicability potential

The replicability potential depends on the existing policies and operations in stadiums and those of catering services (sometimes contractors). Nevertheless, people in need and charities are present all over the world, hence, it should be quite feasible for every other stadium to implement a similar pilot test.

Feasibility/Scores	Economic	Environmental	Technical	Replicability	Total
Guidelines					3
Pilot test					3

11. Paolo Mazza Stadium, Ferrara

The Paolo Mazza Stadium is owned by the municipality of Ferrara and is the home ground of SPAL football club. The stadium is a multi-use stadium, but is mostly used to host football matches of the home team. In 2015, the municipality implemented a major reconstruction of the stadium's infrastructure. Currently, the stadium hosts up to 16.134 people.

Energy supply constitutes a major challenge in the stadium: during football matches, the stadium relies on a diesel generator (a second generator operates in case of emergency), due to the inability of the electrical substation to supply the stadium's electricity needs.

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The ordinary maintenance of the stadium's grass pitch is energy intensive and a major cost item: the mobile lighting rigs used for stimulating growth and regeneration of the grass account for approx. 35% of total energy consumption of the stadium, for a monthly cost of approx. €10000.
Garbage bins are not present within the stadium for security reasons. Therefore, garbage collection and waste sorting (plastic and paper) is operated by the cleaning company. The hospitality area of the stadium is operated by an external company and hosts up to 700 people. Approximately 1300 kilos of unsorted waste are generated in the stadium every year.

The whole stadium is provided with LED lights.

11.1 Feasibility assessment of replacing the current electrical substation for the ordinary energy supply of the stadium; Section of the TACKLE Guidelines; Stadium Management (new practice)

The energy needs of the stadium during sport events are supplied by a diesel-powered generator. A second generator is also used in case of energy shutdowns. The use of diesel generators is due to the inability of the current electrical substation to fulfil the energy needs of the stadium. This implies large consumption of diesel, about 300 litres per football match, and a considerable environmental impact in terms of climate-altering emissions.

Pilot test

With the aim of reducing the stadium's dependence on the diesel generator, and therefore reducing emissions of greenhouse gases during sport events, this pilot test aimed at evaluating the feasibility of replacing the current electric substation with a more powerful one, able to fulfil energy needs of the stadium during matches. As the stadium is owned by the Municipality, representatives of the Municipality needed to be involved in this pilot action.

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Designing the pilot test

The need to assess the feasibility of replacing the electric substation to reduce the stadium's dependence on diesel generators emerged during the first stadium visit and meeting with the general director of SPAL (Andrea Gazzoli) and the stadium manager (Pietro Pelucchi), in November 2019. Due to the necessary endorsement from the municipality in order to proceed with the feasibility assessment, the stadium manager proposed to involve the municipality by introducing the feasibility assessment as part of a broader maintenance intervention in the stadium scheduled for end of 2020 and beginning of 2021. The stadium management held a preliminary meeting with the municipality and ENEL (Italian energy company) in early March 2020.

Activities will be resumed as soon as the national provisions about covid19 will allow to proceed safely.

Success factors vs inhibitors

Economics and feasibility

Impact assessment

Replicability potential

11.2 Feasibility assessment of installing photovoltaic panels on top of the stands; Section of TACKLE Guidelines: Stadium Management; (ch. 3.2.3.11, OM/SM9)

Energy consumption during football matches constitutes a major concern to SPAL. In order to enhance energy efficiency in the stadium, this pilot test was focusing on assessing the feasibility of installing photovoltaic panels on the top of the stands in the certain areas of the stadium.

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Pilot test

With the aim of reducing dependence on diesel generators, and enhancing energy efficiency of operations while limiting emissions, SPAL assessed the feasibility, both technical and economical, of installing photovoltaic panels in the stadium to generate solar energy to feed into the power network. In order to support the pilot test, the TACKLE team involved a provider of solar panels, which assessed the feasibility of installing panels on top of the roofs of the stadium's North and East stands.

Designing the pilot test

During the first stadium visit and meeting with SPAL's general director and stadium manager in November 2019, TACKLE team proposed to assess the feasibility to install photovoltaic panels as a solution to increase the stadium's energy efficiency and reduce dependence on diesel generators. Consequently, the TACKLE team identified and contacted ESPE Srl, a provider of photovoltaic panels based in Padua, Italy. The TACKLE team organized a web meeting in early March 2020 inviting both ESPE Srl and SPAL to discuss how to proceed with the feasibility assessment. During the meeting, ESPE Srl had the opportunity to access relevant documentation concerning the stadium's infrastructures and energy needs. Based on the documentation, ESPE Srl and SPAL identified the roofs of the Northern and Eastern blocks as the most appropriate locations of the solar panels, estimating a total of 563 kW capacity for the entire surfaces. Following this meeting, in March 2020, ESPE Srl formulated a technical layout of the photovoltaic panels. Given the size of the roofs, ESPE Srl suggested installing two panels on the Northern block and one panel on the Eastern one. In total, the three panels would account for 335 kWp. The analysis also assessed the technical feasibility of safely installing

The photo below shows the parts of the stadium identified for the pilot test.

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Designing the pilot test

Success factors vs Inhibitors

Economics and feasibility

Impact assessment

Replicability potential

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11.3 Eco-friendly cups; Section of the TACKLE Guidelines: Event (ch. 3.2.2.14, OM/E18), ch. 3.2.2.12, OM/E10)

The bar and hospitality service at the Mazza stadium are contracted to a local company, whose current contract expires in 2023. The current bar service used non-reusable and non-compostable plastic cups, whose collection at the end of use is in charge of the cleaning company. The cleaning company also deals with the differentiation of waste during collection, sorting paper and plastic. Approximately, the catering company serves around 5.000 and 6.000 drinks per football match.

Pilot test

The pilot action was focusing in the identification of eco-friendly alternatives to "disposable" plastic cups, more suitable for use in the context of sporting events at the Mazza stadium. The feasibility study aimed at identifying the most suitable technology or material by evaluating different options, including compostable plastic cups, reusable cups and recyclable paper cups. For each option, in order to identify the most suitable one, the feasibility study examined aspects such as the involvement of stakeholders and/or suppliers necessary for adoption, methods of collection/ disposal of cups and compatibility of these with existing processes and actors, as well as the costs and benefits of each option.

Designing the pilot test

Despite the need for adopting eco-friendly cups in their catering service, SPAL was not sure about what kind of technology to go for: reusable cups or compostable cups, or something third. Therefore, the TACKLE team identified and selected two suppliers of eco-friendly cups – Amico Bicchiere (a brand owned by Ekomon Italia) and PCUP Srl – using different technologies: compostable plastic cups, reusable cups and recycled paper cups. Both suppliers were invited to participate in a web meeting together with SPAL and the catering company to showcase their products, describe advantages, costs and modalities of application associated with these technologies and answer questions from SPAL and the catering company.

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Success factors vs Inhibitors

Economics and feasibility

Impact assessment

Replicability potential

11.4 Donation of surplus food; Section of the TACKLE Guidelines: Event (ch. 3.2.2.9, OM/E14)

The bar and catering service in the hospitality area host up to 700 people and are contracted to a local company, whose current contract expires in 2023. No data were available on the disposal of unused food during activities at the stadium. Accordingly, the contractor was contacted in order to gather some intelligence on type and quantity of surplus food, and the existing way of disposal. Based on the information provided by the catering company, the TACKLE team identified the opportunity to collect and redistribute approximately 30 to 50 kg of unused fresh food deriving from the hospitality area (buffet) of the stadium at the end of each football match.

Pilot test

In order to prevent unused fresh food from the hospitality area from being disposed of, this pilot test focused on donating surplus food from buffets in hospitality area of the stadium during football matches. Surplus food is collected by and donated to local charitable associations that then distribute the food to people in poverty. The TACKLE team identified and contacted local charitable associations and volunteers.

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Designing the pilot test

SPAL collected information from the catering company about the amount and type of food that remains unused in the hospitality area of the stadium at the end of football matches. Once collected similar information, TACKLE team identified and contacted local charitable associations to assess their interest in collecting the surplus food with the aim to re-distribute it in local canteens for people in poverty.

Success factors vs Inhibitors

Economics and feasibility

Impact assessment

Replicability potential

11.5 Merchandise and promotional materials; Section of the TACKLE Guidelines: Procurement (ch. 3.2.4.6, OM/PR2)

SPAL did not include environmental criteria in contracts related to the purchase of goods and services, such as cleaning services, sports materials, merchandising etc. The adoption of these criteria in selected supply contracts can improve the environmental profile of the services and processes within the stadium, reducing its environmental impact. SPAL supporters' choreographies during football matches (e.g. flags, banners etc.) imply a large consumption of materials, mainly plastics. SPAL collaborates with supporters with the aim to ensure that choreographies comply with safety norms and, sometimes, directly procure materials for choreographies.

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Pilot test

The pilot test focused on purchasing and utilising choreographic materials (specifically flags) made from recycled plastics, instead of virgin material, to be showcased during selected football matches. On the occasion of the Serie A SPAL - Bologna match played on 25 January 2020, SPAL supporters utilised six thousand white and blue flags (the colours of the SPAL team) made of recycled polyethylene.

Designing the pilot test

Given the large amount of waste generated by the supporters' choreography at the end of football matches, the TACKLE team identified the opportunity to reduce the environmental impact of the choreography by using accessories made of recycled and recyclable plastics (recycled LDPE). The pilot action was feasible as SPAL closely monitors supporters' choreographies for security and safety reasons, and often directly procures materials for its fan base. The TACKLE team identified a supplier of choreography materials (flags) made of recycled plastics (recycled polyethylene). Six thousand

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flags (3.000 blue and 3.000 white) were ordered and purchased by SPAL for the SPAL - Bologna match, and distributed to the fan base.

Success factors vs Inhibitors

Some of the success factors which contributed to the successful pilot test were surely the availability of a supplier of choreography that uses recycled plastics for its products. Furthermore, large availability of choreography items made from recycled materials and the opportunity to customize choreography materials made of recycled materials made it easier for the club to go for the pilot test. What drove this pilot test forward was the proactive collaboration between SPAL and its supporters, coordination on choreographies during football matches.

The regenerated polyethylene utilised in the manufacturing of the flags is both recycled and recyclable, after disposing of it in the appropriate waste stream.

No relevant inhibiting factors were detected.

Economics and feasibility

The pilot test is highly feasible and replicable due to the availability and price of choreography items made of recycled plastic. Price and performance of choreography items made of recycled materials are equally comparable to choreography items made of virgin materials. The price of a single flag was €0.08.

Impact assessment

The environmental benefit of the pilot test was assessed by performing an LCA on the flags made of recycled polyethylene, especially focusing on the reduction of greenhouse gases (specifically CO_2). Recycled polyethylene is mainly obtained from processing waste of industrial products (e.g. plastic bags for the food sector) made of low-density polyethylene (LDPE), followed by adding a portion of

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virgin material in the mix. LDPE is a thermoplastic polymer made from the monomer ethylene and belonging to the polyolefins group.

The size of each flag was 40 cm x 60 cm, weighting 39 g with the thickness of 009 µm, which corresponded to a total of 234 kg of recycled polyethylene for the 6000 flags. Producing 1 kg of recycled polyethylene corresponds to emission of 0.79 kg of CO_2, against emissions of 2.78 kg of CO_2 for producing 1 kg of virgin polyethylene. Accordingly, each 1 kg of recycled polyethylene corresponds to savings of 2 kg of CO_2eq. Therefore, the analysis showed that use of the six thousand flags made of recycled polyethylene resulted in a saving of 936 kg CO_2eq, which can be compared to the emissions produced by heating a 60 m^2 apartment for 47 days.

Replicability potential

The pilot test is highly replicable, and can be extrapolated to similar practices and procurement contracts for promotional material, merchandise, choreography products. This could lead to even larger environmental benefits. The high replicability of the pilot test reflects in the fact that the use of choreography and promotional materials in football, both by supporters and football clubs themselves is quite common. Nevertheless, this pilot test also showed that products made of recycled materials are available in many countries and are easy to procure for.

Given the high replicability potential, as well as the media attention obtained thanks to this pilot action, SPAL committed to replicate this action in numerous occasions, beyond the scope of TACKLE activities, in order to turn it into a business-as-usual practice.

Feasibility/Scores	Economic	Environmental	Technical	Replicability	Total
Guidelines					2.5
Pilot test					2.5

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12. Stadio Olimpico, Rome

Stadio Olimpico is situated in the Foro Italico park and hosts several sport venues and facilities: swimming pools, tennis courts, athletics track etc. The whole Foro Italico is owned by the Italian National Olympic Committee (CONI), a public company. The stadium is mainly used for football matches as the home stadium of both S.S. Lazio and A.S. Roma and for concerts and events. The stadium can host up to 70.634 people.

As a public owned stadium, Olimpico has to follow the Public Tender Code (D. Lgs. 50/2016) that imposes the inclusion of minimum environmental criteria in all its main tenders and calls for offers, as defined by the Italian Ministry of Environment. However, the definition and evaluation of such requirements is often complicated for the Procurement team since they do not have environmental technical experts.

Water supply also constitutes a major challenge for the stadium: it consumes 100.000 m^3 of water per year and right now, water is taken from the public aqueduct with consequent higher costs and environmental impacts.

The stadium also generates considerable waste: it substitutes around 600 seats every year. Furthermore, separate waste collection and plastic waste prevention should be further encouraged and implemented. Finally, the Stadium consumes impressive amount of energy (around 8 million kWh per year).

12.1 Green procurement guidelines; Section of the TACKLE Guidelines: Procurement (ch. 3.2.4.7, OM/PR7)

Olimpico is a public owned stadium. As such, it has to follow the Public Tender Code (D. Lgs. 50/2016) that imposes the inclusion of minimum environmental criteria in all its main tenders and requests of

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proposals as defined by the Italian Ministry of the Environment. The Ministry has set pre-determined green criteria for certain types of goods and services e.g. detergents, furniture, food and catering service, green maintenance etc. Public entities are supposed to copy and paste these requirements into their tenders and take them into consideration during the offers' revision and evaluation. However, the evaluation of such requirements is often complicated for the Procurement team since they do not have an environmental technical expert.

Pilot test

The aim of this pilot test was supporting the procurement team in optimising the insertion of the appropriate green criteria as set by the Italian Ministry for the Environment and to properly and easily evaluate the different offers.

Designing the pilot test

To design the pilot test, SSSA and FIGC set up a preliminary meeting with the Procurement manager of Foro Italico to identify the needed steps to support them in the implementation of a more efficient Green Procurement system.

SSSA reviewed the Procurement procedure and added some amendments aimed at ensuring the insertion of green criteria where required by law and when appropriate even if not mandatory by law. To this end, a matrix with all the main goods and services to be purchased by Olimpico was completed with relevant links to the existing environmental criteria set by Ministry or to other useful standards or criteria that could lower the environmental impact of that products ore services' impacts. In addition, SSSA developed a document with the most relevant ecolabels and a description of the different types of labels and certification to take into consideration when evaluating an offer. As part of the supporting activities, SSSA made also an analysis of the ISO 20400 standard on Sustainable Procurement and on the services offered by ECOVADIS on suppliers' level of sustainability evaluation.

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Success factors vs Inhibitors

The fact that national laws and policies existed implied that publicly owned organizations needed to adopt and implement green procurement practices. This pilot test benefitted from two key contributions – the presence of a sustainability manager or environmental expert that can support the procurement team in the insertion of relevant green criteria and in the evaluation process of the offers and the presence of an Environmental Management System that includes the procurement procedures. However, a small procurement office with limited personnel inhibited the pilot test to some extent.

Economics and feasibility

Green products and services may be more expensive than regular alternatives. However, the selection of greener products and services could ensure long term cost savings (e.g. energy and water bills). In addition, an external consultant would be necessary if the organization does not have a sustainability manager or an environmental expert.

Impact assessment

Difficult to measure because it derives from the multiple lower environmental impacts caused by the greener products and services that will be purchased thank to the green procurement system. For sure, the broader the extension of the green procurement system, the bigger the positive environmental impacts.

Replicability potential

The development of a green procurement system is mandatory in Italy when the stadium is managed by a public entity. In all the other situations, it tends to be a voluntary engagement. It definitely requires a significant investment in terms of time and money (especially when an external consultant is needed). However, the selection of greener products and services could ensure long term cost savings (e.g. energy and water bills).

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12.2 Rain water management system and rainwater recovery system; Section of the TACKLE Guidelines: Stadium Management (ch. 3.2.3.13, OM/SM23)

Water supply constitutes a major challenge for the stadium - Olimpico consumes, on average, 100.000 m^3 of water per year and water was taken from the public aqueduct with consequent higher costs and environmental impacts.

Pilot test

The aim of this pilot test was to verify if there was a possibility to utilise rainwater to water the pitch and the green areas around the stadium.

There were different possibilities that had to be assessed: there was an old water well that could be restored, some undergrounds tanks could be excavated and/or some tubes could be placed in the nearby hill. However, as the area was highly urbanised, it was difficult to find an ideal location for the tank or the tubes. Thus, a feasibility study on the possibility to recover rainwater from the stadium roof stadium and/or from the surroundings was necessary.

Designing the pilot test

Calls with an external consultant and the relevant managers of Olimpico were made. The external consultant was provided with all the preliminary information by the stadium (maps, hydrogeological analysis, water consumption etc.).

FIGC would cover the expenses for the feasibility study that would also highlight all the economic and environmental benefits that could derive from the infrastructural intervention.

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Success factors vs Inhibitors

For a pilot test such as this one, the sufficient quantity of rainwater per year was secured. Furthermore, for the successful pilot test, the local environment allowed the needed infrastructure to be constructed.

Economics and feasibility

Feasibility study requires an external expert to be hired. If the feasibility study is positive, significant investments will be needed for the infrastructural changes.

Impact assessment

It varies according to local environment and conditions: how much it rains, how much water is used on average, what is the regular water source, water price etc. A cost/benefit analysis is strongly encouraged.

Replicability potential

Replicability potential is moderate due to few reasons - rainwater recovery could not make sense for certain environments and on the other hand, because it requires significant investments.

12.3 Seats made of recycled material; Section of the TACKLE Guidelines: Stadium Management (ch. 3.2.3.1, OM/SM24)

The stadium has to substitute 600 seats per year. Sometimes, seats are damaged by supporters, other times they just need to be replaced because old and deteriorated by usage.

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Pilot test

In conjunction with the pilot test on green procurement, this action aims at finding "green seats" to purchase and gradually substitute all the seats in place. More precisely, the possibility to create seats made of recycled material is under consideration.

Designing the pilot test

A cooperation with Revet, a company that recycles plastic, was established to find the right composition of virgin and recycled plastic for ensuring the required technical characteristics (fire resistance, hardness, elasticity etc.) required by international Federations (UEFA and FIFA) for stadium seats. As a result, Revet has developed a seat that contains 40% of recycled plastic.

The general manager of the stadium visited Revet plant in Pontedera to explore the possibility of purchasing this new model of seats. Additionally, a meeting in Rome took place with the recycled seats producer (OMSI) in order to verify the technical and economic feasibility of the supply.

The main outcome of this pilot action is that Stadio Olimpico would start replacing broken and old seats with 40% recycled seats manufactured by Revet and OMSI.

Success factors vs Inhibitors

The availability of these seats in Italy was the underlying success factors. Locally produced and supplied, it already cut certain costs associated with transport. This particular producer appeared to be the unique producer in the EU.

The well-defined criteria and requirements for stadium seats which exist and which are imposed by various governing bodies in football. They include fire resistance, colour codes, elasticity, resistance to sunlight etc.

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Economics and feasibility

Recycled plastic seats are not significantly more expensive than regular ones, especially if the stadium orders a large number of seats. Ordering a large number of seats in advance and stocking them could cut the costs and ensure a certain number of seats in reserve. This would also lower the transport costs. The main variable is the location of the seats' producer.

Impact assessment

The carbon emission savings could be significant on the long run, especially if the stadium substitutes all its seats. Furthermore, it could also have a reputational positive impact and educational and engaging side effects if properly communicated to supporters. Based on SimaPro software for LCA we have estimated the environmental benefits of the adoption of recycled seats compared to virgin plastic seats. As we can see relevant improvement of carbon footprint (-35%) and water footprint (-41%) can be achieved.

If we look at one seat, which weights 1.75 kg comparing the two different seat, one made of 100% virgin polypropylene and the other with 40% recycled plastic (0.7 kg of recycled plastic and 1.05 kg virgin polypropylene) the comparison gives us the following carbon and water footprint:

	CARBON FOOTPRINT	WATER FOOTPRINT
100% Virgin plastic seat	5.34 $kgCO_2eq$	1.65 m^3 water eq
40% recycled plastic seat	3.47 $kgCO_2eq$	0.98 m^3 water eq

AMOUNT DIVERTED	EMMISION SAVED BY AVOIDING INCINERATION	EMISSION LOST BY AVOIDING INCINERATION	EMISSION SAVED BY REUSING AND LOST BY WASHING	TOTAL

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Replicability potential

This pilot test turned out to be highly replicable in other stadiums.

12.4 Eco-friendly cups; Section of the TACKLE Guidelines; Event (ch. 3.2.2.14, OM/E18), ch. 3.2.2.12, OM/E10)

The bar service used non-reusable and non-compostable plastic cups which implies a significant production of unsorted waste at the end of each match.

Pilot test

The pilot action refers to the identification of eco-friendly alternatives to disposable plastic cups, which would be more suitable for use in terms of environmental impact at Olimpico. The feasibility study aimed at identifying the most suitable technology or material by evaluating different options, including compostable plastic cups, reusable cups and recyclable paper cups. In order to identify the most suitable one, the feasibility study examined aspects such as the involvement of stakeholders and suppliers necessary for the setup, collection and disposal of cups and compatibility of these with current processes and actors, costs and benefits of their introduction.

Designing the pilot test

Despite the need for introducing eco-friendly cups in their catering service, Olimpico was not sure about what kind of technology - reusable cups or compostable cups - would be more appropriate to adopt by their catering company operating in the stadium. Therefore, the TACKLE team identified and selected two different suppliers of eco-friendly cups, using diverse technologies: compostable plastic cups, reusable cups and recycled paper cups.

Success factors vs Inhibitors

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Success factors:

- Capacity to engage caterers and/or to impose them the adoption of reusable/biodegradable cups in their contracts
- Capacity to engage supporters

No relevant inhibiting factors were detected.

Economics and feasibility

The pilot test is highly feasible and replicable due to the availability of reusable/biodegradable cups: there is plenty of providers. Prices are higher than normal cups and this can constitute a major barrier. However, higher incomes can derive from the selling of reusable cups that supporters decide to keep or from ancillary services (cautions etc.).

Impact assessment

Direct environmental benefits are linked to waste prevention. Reduced amount of waste to dispose of ensures also costs savings. Additionally, the usage of reusable/biodegradable cups can have a positive impact on supporters, raising their awareness on environmental issues and engage them in preventing waste production.

Replicability potential

The pilot test is highly replicable, since there are several providers of these types of cups and the overall EU level of interest and awareness over plastic waste is raising.

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