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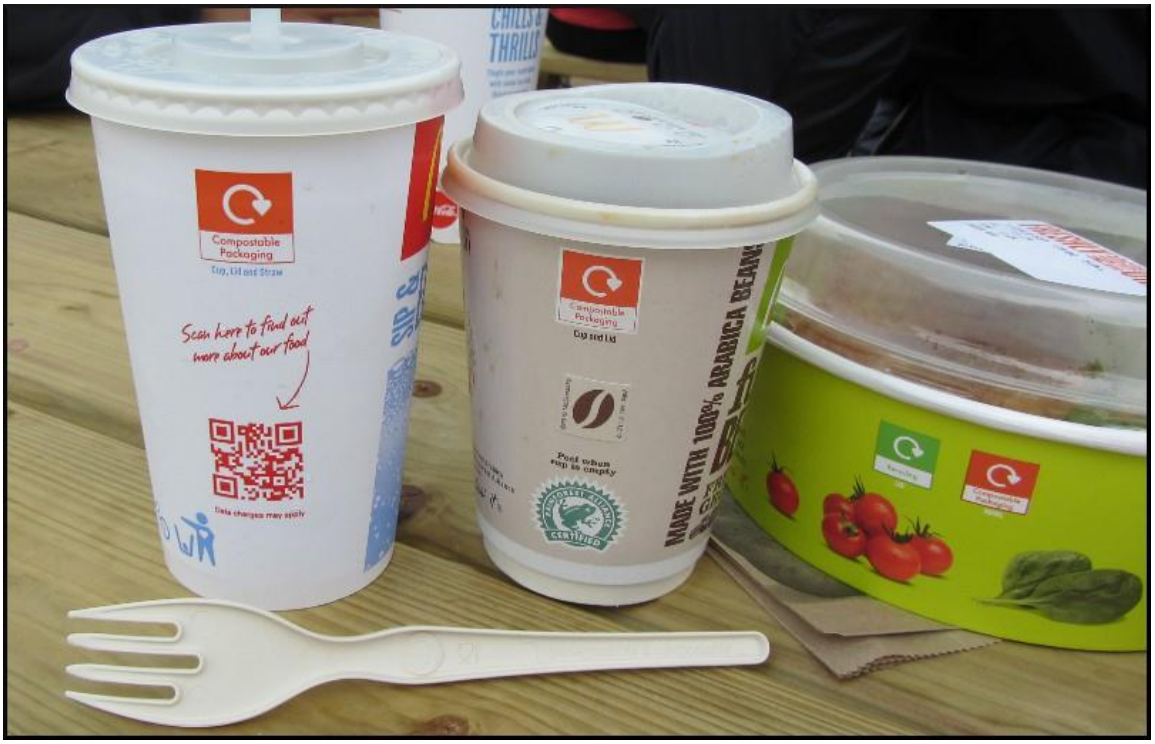
Final report

Working with Compostable Products: Key Lessons and Guidelines for Future Events



This guide highlights key lessons from experience in planning and managing the collection and composting of food and compostable packaging and non-packaging products at the venues for the London 2012 Olympic Games and Paralympic Games venues. It includes recommendations to promote inclusion of compostables of these types at future events.

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Material change for a better environment

Front cover photography: Orange bin for food and compostable packaging and non-packaging wastes, outside McDonald's restaurant at the Olympic Park, London.

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Introduction

In this guide

This short guide complements the report 'Working with compostable products and packaging in closed venue events' which aims to help the hospitality industry and organisers of UK and international events to understand how to deliver, measure and report more effectively on the management of biodegradable wastes that arise from events, with a focus on compostable packaging and non-packaging products e.g. cutlery.

This guide describes and highlights a number of lessons from the experience at the London 2012 Olympic Games and Paralympic Games (the Games). It also includes recommendations on planning the use of such products at events and after use, their collection and composting with food waste from the event.

Key facts about planning and managing Games wastes

The Games were planned and managed according to a target to re-use, recycle or compost 70 % of the operational waste created within the Games venues throughout the 77-day Games period and to send none of that waste directly to landfill. In support of this, the London Organising Committee of the Olympic Games and Paralympic Games (LOCOG) instructed suppliers and licensees to minimise the use of primary, secondary and tertiary packaging and source those made from materials that can be re-used, recycled, or recovered by commonly available methods in the UK. Games suppliers and licensees were required to maximise the use of recycled content in products and packaging, using compostable packaging and non-packaging products e.g. cutlery and plates, only where it was not possible to re-use or recycle such items easily.

During event planning LOCOG identified that the controlled use of compostable packaging and non-packaging products - associated with the preparation and consumption of food and hot drinks - would help to maximise the amount of quality compost made from biodegradable wastes arising at the Games venues.

The European market for biodegradable plastics is between 140,000 and 217,000 tonnes per year and is expected to follow a similar trend in growth of the global market. Differentiating compostable products from non-compostable products is made easier with knowledge of the materials used in their construction, the requirements for certifying products as compostable,

where to find lists of certified products, and the key industry bodies that provide information and product certification services (see the main report 'Working with compostable products and packaging in closed venue events' sections 3.9, 2.2.4 and 9.0 in particular).

The experience of using compostable packaging and non-packaging products during the Games included the procurement and checking of all items to be used, a total of 150. The criteria that all compostable packaging and non-packaging products had to meet facilitated the procurement of products that performed in the 'use' stage of their lifecycle and adequately biodegraded under composting conditions after they became waste.

A total of 2,568 tonnes of waste was collected via the compostables bins from all Games venues UK wide, of which 1,706 tonnes (66.4 %) was accepted for composting by the seven composting facilities that treated biodegradable wastes from the Games. A full evaluation of the Games' waste streams is provided in the larger accompanying report. Despite the challenges, these figures represent an unprecedented achievement given that a compostables waste stream has never been attempted on such a scale for an event in the UK.

Although this guide focuses on recycling of compostable packaging, non-packaging products and food waste the importance of food waste prevention should be highlighted. There are number of resources which can aid this prevention, available through the WRAP[1].

Acknowledgements

Information and feedback about experiences with procuring compostable packaging and non-packaging products for the Games and recycling them after being co-collected with food waste arising from the Games venues has provided the basis for the key lessons and recommendations made in this guide. Such contributions from staff of the London Organising Committee for the Olympic Games (LOCOG), SITA UK and Countrystyle Group are gratefully acknowledged.

LOCOG and Novamont are also thanked for supplying images used in this guide and agreeing to such use.

[1] *Love Food Hate Waste* http://www.lovefoodhatewaste.com/

1.0 Key lessons from the Games

This section of the guide describes aspects of experience in the planning and management of biodegradable wastes arising from the Games, with limited coverage of the recyclable waste stream which was affected by directing compostable packaging and non-packaging items into the biodegradable waste stream. Key lessons are highlighted for the benefit of those who seek to more sustainably manage biodegradable wastes from events in future.

1.1 Encouraging positive behaviours and addressing negative behaviours at event venues

Control of packaging to aid waste streaming and management

Key lesson: Event organiser needs to establish and keep control of all aspects of packaging, from setting the direction of travel, through procurement and use by caterers and in concessions at the event, to where it will be/is discarded and stored at the event and then how it will be managed after being collected from the event venue(s).

Consistent message and rollout

Key lesson: Consistency in terms of messaging, training, goals and methods for getting tasks done was vital to successful management of wastes within the Games venues.

Behaviour change amongst the public and on-site staff and contractors

Behaviour change was seen in action in the Front of House (FoH) areas. Many of the public and visitors to the Games seemed to look at the different bins, read their labels and try to put their different wastes in the appropriate bins.

Key lessons:

- A simple FoH waste streaming system, appropriately placed, clearly labelled and with colour coded bins resulted in the majority of public and visitors to the Games learning and appropriately using a waste collection system that many of them would have been unfamiliar with, particularly in terms of the 'compostables' bins for food and used compostable packaging and non-packaging products.
- A slightly wider BoH (Back of House) waste streaming system with similarly labelled, colour coded bins, coupled with training about which bins to use for which wastes and feedback from LOCOG about quality of the compostables waste stream led to the majority of cleaners, workforce, caterers and other contractors appropriately using the waste collection system after they had become more familiar with it.

Improving bin use behaviours through labelling and signage

Limited observation of public behaviour at the Games venues saw that some of the public who put compostables in the incorrect bin had paid attention to bin labelling, suggesting that those individuals had misunderstood the instructions. Sponsor branding on the FoH covered-top bins included the 'Coca Cola' image and associated 'Live Positively' text (see figure 1). On the bins for compostables this led to some of the public mistakenly thinking that empty Coca Cola bottles - and by association, empty water and fizzy drinks bottles – should also be put into these bins.

Figure 1 Signage near BoH bins in catering area (left) and sponsor branding on FoH compostable bins (right)

This was addressed during transition between the Olympic and Paralympic Games by putting stickers instructing 'No plastic' on the compostables bins and adding the same instruction to signage near the appropriate bins. In addition, during the transition period, in the Back of House (BoH) catering areas posters above the bins were made clearer in terms of which waste types should go into which bin.

In workforce dining areas 'No plastic' stickers were added to bins for compostables and 'No food' stickers were added to bins for recyclables. Combined, the improvements to bin labelling and signage were perceived, by the composter, to result in less physical contamination in biowaste delivered for composting.

Key lessons:

- Bin and liner colour coding needs to be supported by clear signage. Large, prominently placed, clearly visible labelling on bins is important. Signage near bins aids correct use of each bin, though in high footfall areas signs are less likely to be noticed or seen soon enough or may not be practical to use.
- Sponsor branding of bins needs to be considered carefully. Where possible, it should only be on the bins in which discarded sponsor product and its packaging should be placed to avoid unintended contamination.
- Adding the simple message 'No plastic' on bins for compostables should keep much non-compostable plastic out of those bins; such a simple message may be counterproductive if any of the packaging or non-packaging products are certified compostable, bio-based plastics.

Back of House

The majority of contamination seen in deliveries at the composting facilities seemed to be from BoH sources, particularly the catering areas and was worst around the time when the Olympic Games began. At times, some of the staff and contractors placed compostable waste into the wrong bin, with individuals in busy catering areas often not following guidance provided about which waste types should go into which bin.

Efforts to put compostables into the right bins lapsed towards the end of the Olympic Games period at the Olympic Park. Checks carried out at the venue seemed not to have quickly identified this kind of problem and it is possible that if they did, management controls were not applied quickly enough or were only partially effective. Penalties were applied but, at £100 per contaminated bin, this did not result in the anticipated behaviour change.

Key lessons:

- Contracts need to clearly define performance requirements and penalties for non-compliance with instructions about which waste types should go into which bins.
- Training is key and management should expect to spend time making checks on what wastes have been put into which bins and applying controls as quickly as possible if misplacement occurs.
- Penalties should be higher than £100 per contaminated bin and a penalty escalator - in the event of repeated contamination of the same bin(s) - should be written into contracts.

Waste streaming

Reflecting on the waste streaming experience, which is where the flow of specific waste types e.g. food is managed, LOCOG considered whether this had been appropriate for FoH and BoH areas. At FoH, where the recyclables, compostables and general waste bins were closely clustered, quality and quantity of waste capture was good. The dominant waste types seemed to be packaging (compostable, non-compostable, and recyclable). If FoH provision had just been bins for compostables and the general waste, dry recyclables would need to have been separated from the general waste at the Materials Recycling Facility and it seems likely that the recyclables tonnage would have been lower.

At BoH (kitchen and concession areas), the main waste arising was food, there was relatively little residual waste and some rinsed recyclables. A system of just two bin types could have been provided; one for food only which goes to anaerobic digestion and the second for general waste (including items with food residue on them). Heavily supervised, this seems a workable alternative to the three bin BoH system that was provided. However, in order to correctly bulk up and store each waste stream in on-site compounds, the event would need space for bulk-up bins for:

- Recyclables from FoH and BoH;
- Compostables from FoH;
- Anaerobic digestibles from BoH[2];
- Glass from BoH, and
- General wastes from FoH and BoH.

[2] *Food waste from BoH could also go to IVC composting*

This assumes that the contractual and practical arrangements for streaming the wastes in this way would not be too complicated. The waste streaming chosen by LOCOG was simpler than this.

Areas in which the workforce had their breaks generated a variety of wastes with no noticeably dominant waste type. In terms of location, workforce waste is BoH material but the biodegradable fraction seemed more appropriate to be recycled by composting rather than anaerobic digestion, due to composting tending to be better suited for managing packaging and physical contaminants.

Since the Games, LOCOG has considered whether using multiple bins for waste streaming purposes actually leads to a high proportion of reuse, recycling and composting of the event's wastes? The Games experience shows this has been possible given careful waste stream planning and robust controls to minimise contamination.

Key lessons:

- In support of a waste management strategy that aims to encourage behaviour change as well as achieving a high proportion of reuse, recycling and composting, it is important to plan waste streams carefully and manage them robustly so they are as uncontaminated as possible.
- Waste streaming needs to be considered in the context of the event/business and will very much depend on what the vision is and how much control can be exerted over the supply chain and venue.

1.2 Managing compostables and recyclables and their role in event waste management performance

Semi-transparent compostable bags aided quality control

The light-orange, semi-transparent compostable bags/bin liners were important in terms of:

- Waste collection at the Games venues,
- Bag-level sorting at the Barking waste transfer station, and
- Suitability for shredding and feeding into composting processes accepting biowaste from the Games venues.

The different colour bags used for (dry) recyclable (green) and residual wastes (black) facilitated time-efficient bag-level sorting at the transfer station. They also enabled quick identification and removal of any recyclable or residual waste bags that occasionally reached the composting facilities.

As well as checking that the compostable bags were of suitable dimension for lining the corresponding bins at the Games venues, assessment also covered their strength, thickness and robustness when exposed to high temperatures (e.g. disposal of hot food and drink into compostables bins in BoH catering areas). These are all important aspects of assessment and procurement.

Countrystyle expressed a preference for compostable bags that are more transparent so it is easier to see what is inside such bags without having to open them when checking deliveries in the reception hall. Such a change implies that transparent bags would need to bear repeated pattern certification markings over both sides of each bag so that they are quickly visually identifiable.

Key lessons:

1. The use of compostable bags/bin liners for the collection of compostable wastes arising at an event facilitates efficient bag-level sorting (if carried out after collection) and its transfer to composting sites for treatment.
2. Composters may prefer transparent bags bearing repeated pattern certification markings rather than opaque or coloured bags because it is easier to check whether individual bags contain physical contaminants and decide appropriate quality control actions.

A contractual limit was agreed on the level of physical contaminants in biowaste delivered for composting. Compliance with a percentage volume per volume limit or a percentage weight per weight limit is difficult to reliably evaluate given that assessment tends to be done visually rather than by removing and measuring or weighing physical contaminants. Limited time and enclosed space (required for storing food waste before treatment) at commercial scale composting facilities are constraining factors.

Key lessons:

- Composters and event organisers should agree a workable maximum number of items which, if exceeded, trigger rejection of the load and a lower 'pick' number of items. If this is exceeded it will trigger charged-for removal of the majority of those items. Such 'item number' limits could over-ride any volume or weight-based physical contaminants limit).
- Quality control at the composting facility and the input specification should include guidelines that any glass seen in a delivered load must be removed if the load is accepted and before it's biowaste content is fed into the shredder.

Recycling and composting: Tolerance of contamination

In FoH eating areas some of the public put compostable items into the recyclables bins, particularly cups, lids and straws. There was relatively limited room for labelling on the open loop bins and it was not always feasible for such bins to have nearby signage about which waste types should go into which bin.

Compostable items mistakenly put into the recyclables bins were not reported to be problematic at SITA UK's Materials Recycling Facility that received, sorted and baled dry recyclables recovered from the green bins at the Games venues in London and the south east of England. As such the contamination 'tolerance' of the dry-recyclables stream was high in comparison to the compostables bin as it did not affect the viability of the recycling process. In contrast, experience with managing the compostable waste stream (food and compostable packaging and non-packaging wastes) was that this stream is less tolerant of physical contaminants.

Key lesson: The dry recyclables waste stream seems to be more tolerant of contamination by compostable packaging and non-packaging items than the compostable waste stream is tolerant of non-compostable packaging and non-packaging items.

At facilities for sorting and baling dry recyclables and at composting facilities, it has been difficult to pinpoint the quantity of contaminants from the Games venues and the quantity of contaminants from waste from other business and local authority clients who were served by the facility over the same period.

Key lesson: A common reporting protocol that makes provision for recording quantities of waste reused, recycled, recovered and sent for disposal is a useful tool where there is an intention to make claims about how much of the event's wastes have been reused and recycled (including composting and/or anaerobic digestion if EoW criteria are met) recovered and sent for disposal.

Recycling: Quality and price obtained for dry recyclables from the Games

Providing FoH and BoH bins for food waste and compostable packaging and non-packaging products (e.g. cutlery and plates) kept the majority of food and drink soiled packaging, plates, cutlery and paper napkins out of the green bins for dry recyclables (e.g. water and fizzy drink bottles, coated and printed card and paper, non-compostable plastic bags). Consequently, this aided efficient sorting of dry recyclables at SITA UK's Materials Recycling Facility in Barking and resulted in high quality recyclables (PET, card and LDPE) which the company sold for good rates of return (relatively high £/tonne given average market price for each resource at the time). In addition, the total amount of baled dry recyclables from the Games was higher than usually achieved from wastes from municipal sources.

Key lesson: Collecting food and food-soiled compostable packaging and non-packaging products separately from dry recyclables aids efficient sorting at Materials Recycling Facilities. This can result in higher quality recyclables that have potential to be sold for a higher price per tonne in recyclables markets than low quality recyclables.

Management time spent on the biodegradable waste stream

The amount of 'compostables' management time consumed amongst LOCOG, SITA UK, and additional composters Countrystyle, Eco-Sustainable Solutions, Scottish Water Horizons, Viridor Waste Management and Cowbridge Compost was considerable. There was a perception that although a higher amount of Games biowaste was recycled than if compostable packaging and non-packaging products had not been used, management time spent on planning, monitoring, reviewing and controlling the biowaste stream from the Games venue resulted in more pressure and lower priority being given to the composting companies' other projects and commitments.

Given that the Games was the first large-scale event in the UK that has aimed to achieve such a high degree of control over wastes arising at multiple venues, it is possible that the management time required for future events with similar aims would be lower.

Key lesson: Advance planning and allocation of significant management time is important, both for the organisation responsible for the event and the businesses involved in managing the event's wastes.

The role of compostable and recyclable packaging in event waste management performance

Including provisions for separate capture of compostable and recyclable packaging and managing those waste streams differently cost a considerable amount of money to procure, used much space at Games venues, made waste management logistics more complicated and impacted on waste management costs. Encouragingly, LOCOG and its waste management contractors achieved an 82% re-use, recycling and composting rate (see note below).

LOCOG's target to reuse, recycle and compost 70% by weight of the Games operational waste would not have been met if recyclable and compostable packaging had not been procured, as much more would have ended up in the general waste stream and less packaging would have been suitable to separate and supply the dry recyclables markets.

Key lesson: The procurement of recyclable and compostable packaging enables a high proportion of the wastes that arise from an event to be recycled and composted.

Note about performance against target

LOCOG's 82% re-use, recycling and composting rate was calculated in the same way that most businesses in the UK report on their waste performance; by measuring the proportion of different streams leaving their sites or venues.

However, experience from following up the fate of waste leaving event venues suggests that reporting on this basis is misleading and does not clarify the true end fate of the waste. The bulk of commercial waste is normally comingled with waste from other producers at an intermediary site such as a transfer station or MRF, so there is no way of knowing how much is truly recycled. Levels of contamination in the streams and efficiencies of treatment facilities are not generally taken into account.

In contrast, LOCOG has been able to dig deeper into these figures as it had exclusive use of SITA UK's MRF in Barking for 78 days and a contractual requirement to track all waste to its end processes – which many businesses in the UK do not do. **This tracking showed the true re-use, recycling and composting rate was 62%.**

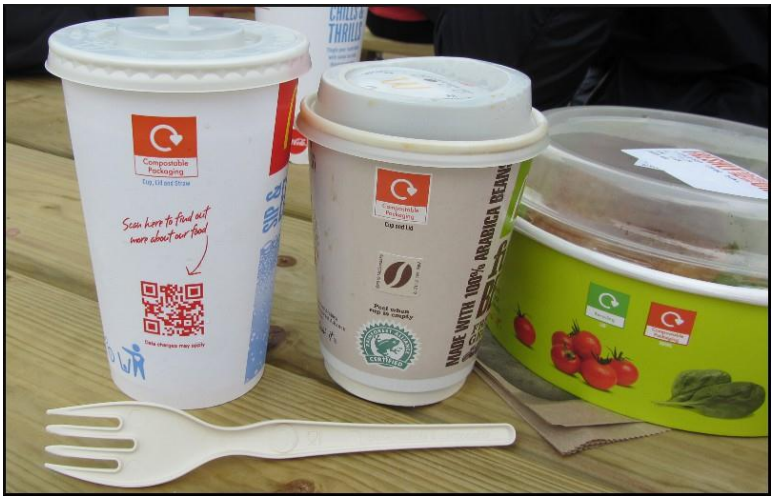

Figure 2 Examples of compostable food and drink packaging and cutlery

2.0 Guidelines for events in the future

This section brings together the key points and lessons from the London 2012 Olympic Games and Paralympic Games that are relevant to planning the management of biodegradable wastes that arise at events. Its focus is on the inclusion of compostable packaging and non-packaging products used for preparing and consuming food and hot drinks at events and their composting after arising as wastes co-collected with food wastes.

The second part of this section provides more detailed recommendations for procuring compostable packaging and non-packaging products for events in future and making arrangements at the event and with the composter(s) who will treat the event's biodegradable waste stream (food waste and used compostable packaging and non-packaging products).

2.1 Key points relevant to event waste planning and lessons from the Games

The waste hierarchy

- Businesses and public bodies (including local authorities on behalf of householders) that handle waste are legally obliged to take all such measures as are reasonable in the circumstances to apply the waste hierarchy. Organisers of events must try to prevent wastes and manage those that do arise using the highest legally allowed and practicable option in the waste hierarchy. Managing any specific waste stream according to a lower option in the hierarchy must be justified.

Assessing acceptability of products for use at an event

- For events in future, the packaging and non-packaging products associated with the preparation and consumption of food and drinks at the event should only be those final products which are certified compostable. Exception: Such certification is not necessary for final products that consist of plain (non-coloured, non-printed), uncoated card, board, cardboard, paper or tissue. Such items must not have any seams that have been fixed together using staples, glue or any other substance.

Procuring compostable packaging and non-packaging products for use at an event

- Develop and communicate a packaging specification for suppliers and licensees; and
- From the time of receiving the packaging and non-packaging product list, and due to the complexities associated with the process as described in the sister report, at least 8 weeks should be allocated to evaluate and sign-off a product, excluding any testing which might be required.

Encouraging positive behaviours and addressing negative behaviours at event venues

- Event organisers need to establish and keep control of all aspects of packaging, from setting the direction of travel, through procurement and use by caterers and in concessions at the event, to where it will be/is discarded and stored at the event and then how it will be managed after being collected from the event venue(s);
- Consistency in terms of messaging, training, goals and methods for getting tasks done was vital to successful management of wastes within the Games venues;

- A simple FoH waste streaming system with appropriately placed, clearly labelled, colour coded bins resulted in the majority of public and visitors to the Games learning and appropriately using a waste collection system that many of them would have been unfamiliar with, particularly in terms of the 'compostables' bins for food and used compostable packaging and non-packaging products;
- A slightly wider BoH waste streaming system with similarly labelled, colour coded bins, training about which bins to use for which wastes and feedback from LOCOG about quality of the compostables waste stream led to the majority of cleaners, workforce, caterers and other contractors appropriately using the waste collection system after they had become more familiar with it;
- Bin and liner colour coding needs to be supported by clear signage. Large, prominently placed, clearly visible labelling on bins is important. Signage near bins aids correct use of each bin, though in high footfall areas signs are less likely to be noticed or seen soon enough or may not be practical to use;
- Sponsor branding of bins needs to be considered carefully. Where possible, it should only be on the bins in which discarded sponsor product and its packaging should be placed to avoid unintended contamination;
- Adding the simple message 'No plastic' on bins for compostables should keep much non-compostable plastic out of those bins, but such a simple message may be counterproductive if any of the packaging or non-packaging plastic products are certified compostable (compostable and non-compostable plastics were used during the Games);
- Contracts need to clearly define performance requirements and penalties for non-compliance with instructions about which waste types should go into which bins;
- Training is key and management should expect to spend time making checks on what wastes have been put into which bins and applying controls as quickly as possible if misplacement occurs;
- Penalties should be higher than £100 per contaminated bin and a penalty escalator - in the event of repeated contamination of the same bin(s) - should be written into contracts;
- In support of a waste management strategy that aims to encourage behaviour change as well as achieve a high proportion of reuse, recycling and composting, it is important to plan waste streams carefully and manage them robustly so they are as uncontaminated as possible; and
- Waste streaming needs to be considered in the context of the event/business and will very much depend on what the vision is and how much control can be exerted over the supply chain and venue.

Managing compostables and recyclables and their role in event waste management performance

- The use of compostable bags/bin liners for the compostable wastes arising at an event facilitates correct transfer into bulk-up waste containers at event venues and efficient bag-level sorting (if carried out after collection);
- Composters may prefer transparent bags bearing repeated pattern certification markings rather than opaque or coloured bags because it is easier to check whether individual bags contain physical contaminants and decide appropriate quality control actions;

- Composters and event organisers should agree a workable maximum number of items which, if exceeded, trigger rejection of the load and a lower 'pick' number of items. If this is exceeded, it should trigger charged-for removal of the majority of those items. Such 'item number' limits could override any volume or weight-based physical contaminants limit);
- Quality control at the composting facility and the input specification should include that any glass seen in a delivered load must be removed if the load is accepted and before it's biowaste content is fed into the shredder;
- The dry recyclables waste stream seems to be more tolerant of contamination by compostable packaging and non-packaging items than the compostable waste stream is tolerant of non-compostable packaging and non-packaging items;
- A common reporting protocol that makes provision for recording quantities of waste reused, recycled, recovered and sent for disposal is a useful tool where there is an intention to make claims about how much of the event's wastes have been reused and recycled (including composting and/or anaerobic digestion if EoW criteria are met), recovered and sent for disposal;
- Collecting food and food-soiled compostable packaging and non-packaging products separately from dry recyclables aids efficient sorting at Materials Recycling Facilities and can result in higher quality recyclables that have potential to be sold for a higher price per tonne in recyclables markets than low quality recyclables;
- Advance planning and allocation of significant management time is important, both for the organisation responsible for the event and the businesses involved in managing the event's wastes; and
- The procurement of recyclable and compostable packaging enables a high proportion of the wastes that arise from an event to be recycled and composted.

2.2 Procuring compostable packaging and non-packaging products for an event

Issues for event organisers to consider when procuring compostable packaging and non-packaging products are that:

- All compostable packaging and non-packaging products should be formally certified to one standard for compostability, i.e. EN 13432;
- Obtaining compostable certification can take up to and over seven months, so the procurement process should be started even earlier to allow enough time to decide on each packaging/plastic products base or intermediate material, thickness, dimensions, pigments and inks, and make a prototype of each product ready for testing;
- It is important to plan for enough time to work with the catering/packaging suppliers and allow extra time in the procurement schedule if there will be a competitive tender process;
- The dimensions, thickness and heat-resistance of compostable bags/bin liners to be used needs to be checked during procurement;
- Labelling on bins at the event should be large and prominently placed. This is important in addition to bin colour coding and should not include sponsor brand image and/or text about the sponsor's product (unless residues of the product and its packaging are allowed in the bins bearing that messaging);
- Transparent compostable bags enable quicker inspection of biowaste deliveries at the composting facility than coloured compostable bags, but they should be print-marked compostable in a large, repeated pattern on both sides of each bag; and

- Operatives at the composting facilities would have liked the orange compostable mark printed on the compostable packaging and non-packaging products to have been larger than the size(s) used for the Games so that such items could be more quickly visually identified.

2.3 Arrangements at the event

Issues that should be considered by the event organiser are:

- How to control what packaging and non-packaging products are allowed at the event in connection with the supply, preparation and sale or serving of food and drinks (consider whether visitors, guests and/or customers will want to bring food and drinks to the event and if it is feasible to have a policy that tries to restrict the bringing in of food and drinks packaged in non-compostable and/or non-recyclable packaging);
- How to train the cleaning, site maintenance and catering staff in terms of how the events wastes will be managed and particularly in terms of:
  - Which bins to use for which types of waste and how they are labelled;
  - The locations where each type of bin can be found; and
  - Which contaminant types are difficult to cost-effectively remove at composting sites, i.e. glass, high density plastics and any packaging or non-packaging items that have a metallic lining but are not marked compostable.
- The size, clarity and colour of signage and labelling on the bins or open-loop bags for the event's compostable wastes (recognisability from near-distance as well as close-up seems to be an influential factor); and
- Incentives and/or penalties that could be applied to staff and/or contractors according to the proportion or number of inappropriate items in the food waste collected via the 'compostables' bins.

An example relating to the first of the issues above is for the event organiser to speak to waste contractors about what they can deal with and consider developing a (even a simple) packaging specification that guides suppliers.

Earlier sections in this guide provide examples from the Games experience with regard to bins for waste types, bin labelling and signage and locations of bin provision. An example of penalties relating to the last of the bullet point items above is that they should be higher than £100 per contaminated bin and a penalty escalator - in the event of repeated contamination of the same bin(s) - should be written into contracts.

2.4 Arrangements with the composter(s)

In order to treat food and compostable packaging and non-packaging wastes from events, the composting process receiving these kinds of controlled biodegradable waste must:

- Be authorised by the regulator to treat controlled biodegradable wastes;
- Have the appropriate waste codes and descriptions in the authorisation; and
- Be approved by the competent authority to treat animal by-products ('Category 3 Animal By-Products' or 'catering waste').

When planning or checking arrangements, if an event organiser is in any doubt about the type of ABP approval required for the composting of an event's biodegradable wastes, the local Animal Health vet (or the Department of Agriculture and Rural Development if in Northern Ireland) should be contacted for advice.

Issues that should also be discussed by the event organiser and composter and may need to be agreed are:

- Whether the composting process(s) must meet quality criteria applicable in the country where the composting process is located;
- Timing of deliveries and the maximum period for which the biowaste is allowed to be stored before treatment;
- Expected maximum and minimum quantities of biowaste per delivery;
- The composter's existing contractual obligations with other suppliers of biowaste;
- The basis on which physical contaminants in the delivered biowaste will be controlled, e.g. a maximum limit set on a volume basis, a weight basis or number of physical contaminant items basis;
- The maximum quantity of physical contaminants in any single delivery, above which all the waste in the delivered load will be rejected;
- The quantity of physical contaminants in any single delivery, which would trigger manual ('litter picking') or mechanical pre-treatment in order to accept the delivered load and remove sufficient physical contaminants before shredding the biowaste;
- Efficacy of the particle size screening equipment used at the end of the composting process, in terms of removing residual physical contaminants; and
- Conditions to be included in the contract to be agreed with the composter.

It is possible that:

- Extra moisture may need to be added during composting if the event's biowaste includes a high proportion of fibre-based compostable packaging/non-packaging products;
- Composting batches that include some of the event's biowaste may benefit from extra time to biodegrade in an additional maturation phase, especially if the normal composting process is only six weeks duration; and
- Some compost grades (e.g. 0 – 40 mm) may need to be double-screened or litter picked to remove sufficient physical contaminants to ensure the compost meets the PAS 100 minimum quality criteria and is fit for purpose.

Waste & Resources Action Programme

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