Case studies:

Circular food delivery systems at events

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CIRCULAR ECONOMY
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NETZWERK GREEN EVENTS

Testing automated cup returns at Hamburg Port Anniversary

Reverse vending machine pilot for reusable cups at a large maritime festival

HAMBURG PORT ANNIVERSARY 2025 celebrated the 836th birthday of the port with around 1.2 million visitors over a weekend along the Elbe river. To improve reusable cup logistics at busy beverage stands, organisers piloted a reverse vending machine (RVM) that allowed visitors to return reusable cups automatically and receive their deposit in cash.

Gains

98,1%
return rate achieved

1,300
cups successfully returned

Investment

RVM rental

Signage and setup

Staffing and cash fund

Category
Large public event / maritime festival

Theme
Reusable beverage cups with automated return system

Climate technology
Reverse vending machine (RVM) for reusable cups with cash deposit return

Organisations
Department for Economic Affairs and Innovation, bergmanngruppe, ÖkoRAST, Netzwerk Green Events

Acceptability

Feasibility

Scalability

Climate return on investment

The pilot tested whether automated cup return infrastructure could simplify reusable systems at large public events. By enabling visitors to return cups directly to a machine and receive a cash refund, the system aimed to increase return convenience and reduce workload for beverage vendors during peak hours.

”I could imaging that in the future, it will only work with such machines, that it will be standardized and all event organizers will work with them”

- Stand operator

Things to be aware of

Reverse vending machines require monitoring and maintenance. If the collection bag becomes full or coin boxes empty, the system stops functioning and must be serviced quickly.

Scaling potential

Automated return systems could significantly improve reuse logistics at very large events by reducing queues and vendor workload. However, scaling requires compatibility between cup systems and reliable operational support.

Requirements

Technical:
Reverse vending machine and compatible reusable cups.

Organisational:
Coordination between event operators and vendors.

Economic:
Machine rental, logistics and deposit funds.

Competence:
Staff training and visitor guidance.

How to get started!

1. Install automated return points.
2. Ensure clear signage and multilingual instructions.
3. Train staff to assist visitors and monitor the system.
4. Evaluate user behaviour and operational performance.

NETZWERK GREEN EVENTS

Reusable cups along the running track at Hamburg Sunset Series

Testing a reusable cup system during a running event

The Hamburg Sunset Series is an evening running event held in the Wilhelmsburger Inselpark. In 2025 the event tested a reusable cup system at the water station along the running track. The aim was to reduce single use waste generated by disposable cups while ensuring that runners could return cups safely without disrupting the race.

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Category
Sport event / running race

Theme
Reusable beverage cups at sports events

Climate technology
Reusable cup system with collection baskets and full-loop logistics

Organisation
Hamburg Sunset Series organisers, FAIRPLATE Mehrwegsysteme GmbH, Netzwerk Green Events

Reductions

Disposable cups replaced with reusable cups at refreshment stations along the running track

Gains

≈700
participants in the running event

≈3,000
reusable cups used during the race

Return baskets placed along the course to enable easy cup return

Investment

Reusable cups

Delivery, washing and collection logistics

Additional staff supervision for return baskets

Acceptability

Feasibility

Scalability

Climate return on investment

The pilot demonstrated that reusable cups can work even in dynamic environments such as a running race. Cups were distributed at a refreshment station and runners returned them in baskets placed along the course. The system significantly reduced single-use waste and showed that participants quickly adapt when the process is intuitive.

Things to be aware of

Cups left on the running track can create tripping hazards. Clear communication and well placed return baskets are necessary to ensure safety during the race.

Scaling potential

Reusable cups can be applied to running events when supply points and return points are centralised. However, scaling to large races requires higher capacity logistics and careful safety management as well as coverage for higher costs.

Requirements

Technical:
Reusable cups and collection baskets.

Economic:
Service provider for delivery, washing and collection.

Organisational:
Clear return process along the track.

Competence:
Communication to runners before and during the event.

How to get started!

1. Partner with a reusable cup service provider.
2. Place return baskets near refreshment stations.
3. Inform participants about the system in advance.
4. Use clear signage along the track.

Mandatory reusable system at UEFA EURO Fan Zone Hamburg

Scaling reusable food and beverage containers at a major international football event

The UEFA EURO 2024 Fan Zone in Hamburg brought together football fans from across Europe at Heiligengeistfeld for a month-long public viewing and cultural programme. With more than 600,000 visitors overall, the event introduced a binding sustainability concept including a mandatory reusable system for food and beverages. The system aimed to minimise single-use packaging while maintaining a simple and convenient experience for international visitors.

Category
Large international Fan Zone event

Theme
Reusable food and beverage containers at mega events

Climate technology
Mandatory reusable container system with central return station

Organisations
Netzwerk Green Events, Department of Environment, Climate, Energy and Agriculture Hamburg, bergmanngruppe, FAIRPLATE Mehrwegsysteme GmbH

Reductions

Disposable cups and containers replaced with reusable alternatives across the fan zone

Gains

≈614,000 visitors during the event

Up to 50,000 visitors per day

≈384,000 disposable cups and ≈30,000 food containers avoided

Investment

Reusable container system and washing logistics

Subsidies and coordination by the City of Hamburg

Communication materials and volunteer staffing

Acceptability

Feasibility

Scalability

© Frank Schwichtenberg

Climate return on investment

The Fan Zone demonstrated that reusable systems can operate successfully at very large events with international audiences. A mandatory reuse regulation ensured that all providers either used a centrally organized and subsidized system or implemented their own solution. The reusable system was supported by a central return point and clear communication. The approach prevented approximately 384,000 disposable cups and 30,000 disposable food containers during the event.

Things to be aware of

Selecting a service provider capable of handling the scale of the event proved challenging. An initial cash based return system without tokens led to professional cup collecting and theft. After introducing tokens, the return process stabilised. Multilingual communication was also necessary because visitors came from many different countries.

Scaling potential

The case shows that reusable systems can be implemented at large international events when clear rules apply to all vendors and infrastructure is designed for high visitor flows. Central return stations and strong coordination are key elements for scaling reuse at major sporting events.

Requirements

Technical:
Reusable food containers and cups with central return infrastructure.

Economic:
Subsidies and logistics support for reusable service providers.

Organisational:
Binding sustainability concept and vendor coordination.

Competence:
Multilingual communication and volunteer support for visitors.

How to get started!

1

Define binding reuse rules

Require all vendors to use reusable cups and food containers.

2

Install central return infrastructure

Provide easily accessible return stations for large visitor flows.

3

Support vendors and logistics

Work with a specialised service provider for washing and container logistics.

4

Communicate clearly with guests

Use signage, screens and volunteers to explain the reusable system.

Copenhagen Sprint saves 1,111 kg of CO_2 through digital reuse systems

Digital 'reverse' vending machines and mandatory reuse packaging optimise waste management at major city festival.

The Copenhagen Sprint is an international cycling race and festival attracting around 10,000 visitors per day. Like many free-entry public events, it faces challenges with packaging waste and low return rates for reusable cups. A reverse vending machine solution, supported by a digital deposit platform, enables visitors to return their reusable cups and either reclaim or donate their deposit, while allowing organisers to monitor return rates in real time.

Category
Events

Theme
Reuse systems & circular packaging

Climate technology
IoT-enabled reverse vending machines & digital platform

Organisation
CPH Sprint

Reductions

1,111 kg CO_2
saved through reuse

71 kg waste
diverted from landfills

Gains

87.54%
return rate achieved

23,750
items successfully returned

21%
Items donated to charity

Investment

Vending machines and boxes

Staff training and logistics

●●●●○
CO_2 reduction

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Return on climate investment

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Scaling potential

© Esben Zøllner Olesen

Climate return on investment

The pilot demonstrates that digital reuse systems significantly reduce the carbon footprint of large-scale public events by preventing waste at the source.
The integration of a digital donation option proved to be an effective way to boost visitor acceptance and generate charity contributions without increasing operational costs. The data collected provides a solid business case for scaling the system to future city festivals, where standardisation and higher volumes will ensure even greater climate impact per invested krone.

Things to be aware of

Digital barriers and complex return steps can also cause queues. Ensure a simple UI, sufficient return capacity in boxes, and thorough staff training. Note small vendors' challenges with storage and pre-financing.

Scaling potential

- High relevance for all municipalities hosting large-scale festivals, sports events, or public celebrations.
- The pilot demonstrates that standardized digital reuse systems can be implemented with low barriers by partnering with specialised service providers.
- With a proven return rate and high visitor acceptance through donation incentives, the model offers a scalable 'plug-and-play' approach to reducing waste and CO2 emissions at major city events

Requirements

Technical:
IoT-enabled vending machines and a stable digital return platform.

Economic:
Subscription/leasing models and pre-financing for small vendors.

Organisational:
Centralised coordination and selection of experienced service providers

Competence:
Staff training to act as "Reuse Ambassadors" and guide users.

How to get started!

1

Partner for logistics

Select a specialised service provider (like New Loop) to manage the deposit system and monitor real-time data

2

Gamify the return

Integrate a donation option; users are more likely to return items if they can easily support a charitable cause

3

Simplify the UX

Ensure the digital return process is "one-click" or staff-assisted to avoid bottlenecks during peak hours

4

Download

Tools & templates on Change(K)now's website.

Closing the loop at Copenhagen Street Days

Testing reusable food packaging and cups at a large urban sports festival

Copenhagen Street Days 2025 combined the European 3x3 Basketball Championship with an urban sports festival in central Copenhagen. Food stalls and public areas attracted thousands of visitors each day.

To reduce single-use waste, the organisers piloted a reuse system for food packaging and beverage cups using return stations, a digital deposit flow and a donation option.

Donation share:
53.8% of returned items (~16,000 DKK)

Visitors:
~8,000–10,000 per day

Return stations:
8 stations

Reductions

~200 kg
CO_2 savings

~16 kg
Waste reduction

Gains

89.17%
Return rate overall

99.6%
Return rate of bowls/trays

80.9%
Return rate of cups

Investment

Reuse logistics, digital deposit system and communication measures

Category
Public event / urban sports festival

Theme
Reusable food and beverage packaging

Climate technology
Digital deposit and return system for reusable cups and food containers

Organisations
City of Copenhagen, New Loop, event organisers and food vendors

Acceptability

Feasibility

Scalability

Climate return on investment

The reuse system achieved a high return rate and measurable environmental benefits while maintaining a positive visitor experience. Return stations across the venue enabled visitors to return containers and either reclaim their deposit or donate it. Overall return performance indicates that reuse can work in open urban festivals when infrastructure and communication are strong.

”Visitors didn’t just return the containers – many chose to donate their deposit to support youth initiatives.”

– Sarosh Qureshi

Things to be aware of

Mixing reusable and single-use packaging created confusion for visitors and vendors. Digital return processes can also create friction if users must use smartphones or enter payment details.

Scaling potential

- Urban festivals and sports events are well suited for reuse systems because food courts and return points can be organised centrally.
- Scaling is strongest when reusable packaging is mandatory across vendors and return stations are clearly placed and staffed.

Requirements

Technical:
Return stations and a digital deposit platform.

Organisational:
Coordination between organisers, vendors and reuse provider.

Economic:
Vendor deposit handling and logistics for washing and transport.

Competence:
Staff training and clear visitor communication.

How to get started!

1. **Define reuse requirements**
   Require reusable packaging for food and drinks.
2. **Install return infrastructure**
   Place clearly marked return stations in central visitor areas.
3. **Communicate the system**
   Use signage, staff guidance and online information.
4. **Provide incentives**
   Offer deposit refunds or donation options.

RIGA CITY COUNCIL

Testing reusable cup systems at the Riga City Festival

Assessing a decentralised deposit system for reusable cups at a major public event

The Riga City Festival is one of Latvia's largest public celebrations, attracting tens of thousands of visitors across multiple locations in the city. In 2025 organisers piloted a reusable cup deposit system at the main festival venue along the 11 November Embankment. The pilot tested whether a decentralised return model – where cups must be returned to the issuing vendor – could function during a large open-air event while reducing disposable beverage packaging.

Category
Large public city festival

Theme
Reusable beverage cups at public events

Climate technology
Decentralised reusable cup deposit system with vendor-based return

Organisations
Riga City Council, festival organisers and participating food and beverage vendors

Reductions

Disposable beverage cups replaced with reusable cups during the festival pilot

Gains

≈60,000 visitors at the Riga City Festival

Reusable cup system tested across multiple vendors at the main event venue

Unified €2 deposit system introduced to simplify communication

Investment

Communication materials including posters and stickers

Vendor briefings and coordination by municipal organisers

Operational monitoring and data collection during the event

Acceptability

Feasibility

Scalability

Climate return on investment

The pilot demonstrated that visitors are generally willing to participate in reuse systems when they are simple and clearly communicated. Reusable cups were distributed by participating vendors and returned to the same stands where they were issued. The system reduced disposable cup use while providing practical insights into operational challenges and visitor behaviour at large public events.

"The pilot showed that reusable cups work well – but asking visitors to return them to the exact vendor quickly creates queues. The return system must be simpler than the purchase system."

– Emīls Zinkēvičs

Things to be aware of

Because cups had to be returned to the issuing vendor, the return process often merged with purchase queues, creating delays and frustration. Handling deposit refunds also proved challenging because many visitors paid by card but vendors needed small amounts of cash for refunds.

Scaling potential

- Reusable cup systems can work well at large festivals, but decentralised return models can create operational challenges.
- Centralised return stations with separate queues and digital refund systems could significantly improve visitor experience and vendor efficiency.

Requirements

Technical:
Reusable cups and deposit management system.

Organisational:
Coordination between municipality, organisers and vendors.

Economic:
Printing of communication materials and coordination costs.

Competence:
Vendor training and clear visitor communication.

How to get started!

1

Define the return model

Decide whether deposit cup system should be organised by the municipality or vendors.

2

Separate returns from purchase queues

Place dedicated return points so visitors can return cups without waiting in vendor lines.

3

Simplify deposit handling

Use digital refunds or unified deposit rules to reduce cash handling for vendors.

4

Communicate clearly to visitors

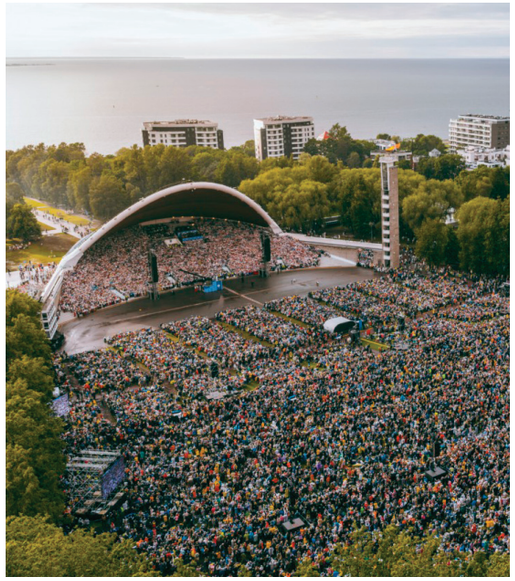
Use signage and vendor guidance to explain where cups should be returned.

TALLINN STRATEGIC MANAGEMENT OFFICE

Scaling reuse at the Estonian Song and Dance Celebration

Testing reusable food packaging systems at a cultural mega-event

The Estonian Song and Dance Celebration in Tallinn is one of the largest cultural events in the Baltic region and part of UNESCO's Intangible Cultural Heritage. The festival brings together performers, volunteers and visitors from across Estonia and abroad. In 2025 the organisers piloted a multi-level reuse system across performer catering, visitor food courts and meal deliveries to accommodation schools. The initiative aimed to reduce single-use packaging while testing how reuse systems can function in a complex event environment with tens of thousands of participants and visitors.



Category
Large-scale cultural festival

Theme
Reusable food packaging and tableware at large public events

Climate technology
Multi-level reusable system including deposit-based tableware, staff-managed return points and reusable meal delivery packaging

Organisations
Tallinn Strategic Management Office, festival organisers, reuse service providers, caterers and delivery platforms

Reductions

Single-use tableware replaced with reusable dishes across multiple festival areas

Gains

≈120,000 visitors and ≈40,000 performers at the festival

Reuse systems implemented across catering areas, food courts and accommodation schools

Deposit return stations and staff-managed collection points

Investment

Reusable tableware logistics and coordination

Communication materials and training sessions

Volunteer staffing and return station management

Acceptability

Feasibility

Scalability

Climate return on investment

The pilot demonstrated that reuse systems can be implemented even at very large cultural events. While previous experience had already shown that reusable tableware can be implemented at large-scale events, this pilot focused on learning how to combine different return systems and service providers for different target groups within a single event. Reusable dishes and cups were introduced across several festival settings, including performer catering and visitor food courts, while reusable packaging was also tested for meal deliveries to accommodation schools. The measures reduced the use of single-use packaging and raised awareness of circular solutions among visitors, performers and organisers.

Things to be aware of

The scale and complexity of the event required strong coordination between organisers, reuse service providers, caterers, schools and volunteers. Some vendors did not always follow reuse guidelines when monitoring was limited. The overall loss rates of cups and bowls remained relatively high during the festival were lower than the typical benchmarks.

Scaling potential

- Reuse systems can be scaled to other large festivals when communication, training and monitoring are clearly defined.
- Cultural mega-events provide strong visibility for circular solutions and can help normalise reuse behaviour among large audiences.

Requirements

Technical:
Reusable dishes, cups and food delivery packaging

Economic:
Communication materials, training and coordination resources

Organisational:
Cooperation between organisers, caterers, schools and volunteers

Competence:
Training sessions and clear visual communication for guests and staff

How to get started!

1. Introduce reusable tableware for both visitors and performers.
2. Provide clearly visible return stations and staff support.
3. Train vendors, volunteers and organisers before the event.
4. Use strong visual communication and digital reminders to guide visitors.

LIEPĀJA CITY MUNICIPALITY

Closing the loop at MAD Liepāja Youth Festival

Testing a shared reusable cup system at a youth festival

The Kopums / MAD Liepāja Youth Festival is a two-day youth opportunities festival held in Jūrmalas Park by the Baltic Sea. The event brings together young people, youth organisations and the wider public to explore culture, creativity, civic engagement and social issues. In 2025 the organisers piloted a shared reusable cup and deposit system for the first time to reduce single-use beverage packaging.

Category
Public youth festival

Theme
Reusable beverage cups at public events

Climate technology
Shared reusable cup system with a central return station and card or cash deposit refund

Organisations
Liepāja City Municipality, festival organisers and participating caterers

Reductions

Disposable beverage cups replaced with reusable cups during the festival

Gains

≈16,000 participants at the youth festival

Reusable cup system tested across multiple food and drink vendors

Central return station enabling card or cash deposit refunds

Investment

Reusable cup rental and service fees

Communication materials and workshops for vendors

Operational coordination by municipal when the municipal participates in organizing the event

Acceptability

Feasibility

Scalability

Climate return on investment

The pilot demonstrated that a shared reusable cup system can function effectively at dynamic youth-focused outdoor events. A central return station enabled visitors to return cups and receive their deposit either by card or in cash. The system reduced disposable cup use while also raising environmental awareness among young visitors and encouraging reuse behaviour.

Things to be aware of

Because participation in the system was voluntary, not all caterers joined the scheme. Some vendors were hesitant to prepay deposits due to cash-flow concerns. Irregular visitor flow during the event also made it difficult to collect precise data on return rates.

Scaling potential

Reusable cup systems can be scaled to other public events when participation rules are mandatory and clearly communicated to all vendors. Financial support or shared cost structures can also help smaller vendors adopt reuse systems more easily.

Requirements

Technical:
Reusable cups, central return station and deposit refund system

Organisational:
Coordination between municipality, organisers and vendors

Economic:
Cup rental, service provision and communication materials

Competence:
Training workshops and clear visitor communication

How to get started!

1. Define a shared reusable cup system for all vendors.
2. Install a clearly visible central return station.
3. Provide training workshops for caterers and organisers.
4. Communicate the deposit system through signage, social media and local media.

The publications of Circular food delivery systems were produced under the Change(K)now! project. The Change(K)now! project is co-funded by Interreg Baltic Sea Region. The project´s main objective is a mindset change from single-use to circular or multiple-use of food delivery systems in cities and residents of the Baltic Sea Region. The responsibility for the content lies with the author(-s) and don´t necessarily reflect the funder position on these topics.

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