The Globelet - Eco report
An ecological cup with a twist
Globelet TM is an eco-friendly reusable and washable cup that permanently changes the way in which the events and hospitality industries service their customers. Made in New Zealand from durable plastic, Globelet can be used 100s of times and dramatically reduce waste at events.

The purpose of this report is purely informative and shows why Globelet is an eco-friendlier solution for festivals and sporting events.

Disposable cups have become one the most visible form of waste and their use is frequently debated in the media, on the internet and by the public at large. The image of thousands of cups littering stands at sporting events or green fields at outdoor events is familiar to us all and is a source of frustration for many.

At a time of unprecedented concern about the impact of human activity on our planet, there is pressure on every citizen to manage and reduce their impact on the planet. Entertainment groups and event management companies face the challenge of delivering successful events to the consumer, at competitive cost while minimising environmental impact. Globelet can contribute to meeting the challenge of delivering sustainable events, particularly with regard to targets for waste reduction and climate change.

As an entirely reusable cup, Globelet has clear environmental advantages over the conventional disposable cups used at most large events. In addition, its practical design, competitive cost, NZ manufacturing and customisability mean that it can deliver significant environmental and repetitional benefits with minimal business impact.

The impact of Globelet is vast. It can contribute to behavioural change amongst members of the public, raising awareness of environmental issues beyond the containers themselves in much the same way as disposable bags or take-back schemes have done within the retail industry. By acting as a tangible symbol of waste reduction and climate change management, Globelet can help to highlight an organisation’s commitment to minimising its environmental impact and act as a catalyst for further improvements.

Scope
The results of a south african study are shown below. The study looked at three beverage containers:

- Reusable Globelet cup in 585ml format
- 500ml clear polystyrene cup
- 500ml paper cup with thin film polyethylene coating

For the purposes of this study they chose the following scenario:

A venue with a capacity of 60,000 hosting two events per month, each at capacity (i.e. 120,000 people in attendance per month). Each visitor is assumed to consume five beverages.

To provide this service, it is assumed that the venue has purchased 180,000 Globelets which are in continuous rotation. Between each use Globelets are assumed to be washed at 60°C in a modern commercial door-type dishwasher.

Waste
Globelets potential for reducing waste is clear. They are designed to be reused many hundreds of times with each use representing a reduction in the waste generated. The table below shows estimated figures for the mass of waste avoided by using Globelet over three months, a year and five years. Assuming the parameters outlined in the scope, five years has been chosen as an upper limit for the purposes of this study or 200 uses.

For the 60,000 capacity case study venue, 83.7 tonnes of waste would be avoided by using Globelet in place of paper cups per year, or 47.7 tonnes of waste compared to polystyrene cups. The difference between these two figures is due to the difference in weight between paper and polystyrene cups. Ever-increasing landfill taxes and regulatory drivers to reduce waste mean that the savings in Table 1 represent potential financial savings 1,2 to go alongside the environmental benefit.

Climate change
As well as avoiding waste, Globelet has a clear advantage over disposable alternatives in terms of its Global Warming Potential (GWP) across its life cycle. This study looks at the life cycle of the three beverage containers studied, from extraction of raw materials from the earth to disposal at end-of-life, in other words, from cradle to grave. Several end-of-life scenarios of the beverage containers have been modelled in this work. Some of the key assumptions made in this study are outlined in Appendix A.

<table>
<thead>
<tr>
<th>Time</th>
<th>Number of events</th>
<th>vs paper cups / T</th>
<th>vs Polystyrene cups / T</th>
</tr>
</thead>
<tbody>
<tr>
<td>3 months</td>
<td>6</td>
<td>13.5</td>
<td>4.5</td>
</tr>
<tr>
<td>1 year</td>
<td>24</td>
<td>83.7</td>
<td>47.7</td>
</tr>
<tr>
<td>5 years</td>
<td>120</td>
<td>458.1</td>
<td>278.1</td>
</tr>
</tbody>
</table>
Firstly, let us look at the breakdown of the emissions associated with each of the three containers by the various life cycle phases. For the purposes of the graphs below, the emissions over a year in the case study venue have been used (24 events, and a total of 7.2 million beverages). It has also been assumed that at the end of the year Globelet is disposed of, when in reality Globelets are designed to last much longer. Figure 1 assumes that 100% of the waste generated is sent to landfill at end-of-life, while Figure 2 assumes that all the waste is recycled. Results cycled are shown in tonnes of CO2 equivalents (tCO2e), CO2 equivalents being the standard unit of Global Warming Potential (GWP).

Figures 1 and 2 show that in both end-of-life scenarios, Globelet has significantly lower CO2e in delivering beverages to the 100 consumers than the conventional disposable containers. For all three cups, the largest contribution to their GWP comes from manufacturing the material used to make recycled the cups. Recycling the cups at the end of their life avoids the need for the production of new products from virgin material. However, there is a loss of quality associated with the recycling of paper and plastics which means that the recycled material cannot be reused for the same purposes as it was previously. In other words, the recycled plastic will generally be used for a lower grade application. The paper cup is coated with polyethylene film which hampers recycling as this film must be removed before the paper can be processed. These factors mean that even a 100% recycling rate cannot offset the impact of manufacturing the cups in the first place. The recycling benefit is seen in Figure 2 as a negative CO2e emission, i.e. a CO2 saving.

![Figure 1: Comparison of the GWP associated with the delivery of 100 beverages for three cup types.](image1)

![Figure 2: Comparison of the GWP associated with the delivery of 100 beverages for three cup types. 100% Recycling at end-of-life](image2)

![Figure 3: CO2e generated by three drinks container types – Waste landfilled](image3)

![Figure 4: CO2e generated by three drinks container types – Waste incinerated](image4)
To show the progression of CO2e emissions with the number of events held, three end-of-life scenarios were investigated (Figures 3, 4 and 5): 100% landfill, 100% incineration, and 100% recycling.

Figures 3, 4 and 5 show that reusable cups outperform disposable cups after only a few events. Where waste is sent to landfill, Globelet outperforms the paper cup after just two events. For the polystyrene cup with waste being sent to landfill the crossover point is four events this means that if after four events all 180,000 Globelets were sent to landfill, it would still outperform the plastic alternative for the case of the study venue. This result is significant as it indicates that even for a short term or infrequent events Globelet is likely to have a lower environmental impact than disposable alternatives. With end-of-life recycling, the crossover points for the paper and polystyrene cups are one and two events.

All of the above scenarios considered that all Globelets were retained by the venue. There is the possibility some cups might be taken home as souvenirs or be discarded. To investigate the effects of these losses on the environmental performance of Globelet a sensitivity analysis was undertaken assuming that some Globelets were lost at each event.

If was found that the cross over point was still relatively few events for the 10% Globelet losses, with a 100% recycling rate, the crossover point was five events compared to a disposable plastic cup, while for 20% losses this rose to nine events. These losses also affect the cumulative savings associated with Globelet, but could easily be minimised by informing customers of the policy and creating easy - to - access drop off points or even designated collection bins. Table 2 shows the GWP of Globelet and alternatives, showing loss rates of 10% and 20% for Globelet.

This work assumes that Globelet was washed in a commercial dishwasher at 60°C after each use. If visitors were able to reuse their glasses without the need for washing, for example with our managed refill system, the environmental performance for Globelet would be improved further.

Overall, it is clear that entertainment and sports venues could achieve significant CO2 savings and reduce their waste by hundreds of tonnes by switching to Globelet. From a social viewpoint, Globelet can offer companies the repetitional benefits of being seen as an environmental leader with the chance to change behaviour of people. Combined with the finical savings associated with diversion of waste from landfill and reducing the need for regular purchase of cups, Globelet can be considered a truly sustainable product, addressing the three key pillars of sustainability. People, Planet and profit.

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This graph is from a use case of Stack-Cup™.

Appendix A: Key Assumptions for Climate Change study

- **Plastics**: Data on the CO2e of polystyrene and polypropylene is from Plastics Europe, the trade association of the European Plastics Industry (http://www.plasticseurope.org/)
- **Paper**: Data on the CO2e of the paper cup is taken from a study by the Alliance for Environ0mental innovation on behalf of Starbucks, with the figures scaled to take account of the cup size required.
- **Data on the energy usage of commercial dishwashers** is taken from a study by the Consortium for Energy Efficiency (Program Design Guidance Commercial Dishwashers, CEE, 2008, http://www.cee1.org/). It has been assumed that the cups are loaded into a commercial door dishwasher. The embodied carbon of the dishwasher and other capital equipment is not included in this study.
- **The carbon intensity** of grid-supplied electricity and natural gas is from the Department for Communities and Local Government (http://www.communities.gov.uk/corporate/) and the Building Research Establishment (www.bre.co.uk)

Notes on study:
All the data on the reusable cups in this report comes from the reusable cup company Stack Cup™.

| Table 2: CO2e for the drinks containers with different per event loss rates assumed for the (all values based on a 100% recycling rate) |
|---|---|---|---|
| | Time | 6 months | 1 year | 5 years |
| Events | 12 | 24 | 60 |
| Stack-Cup™ - no losses | 12 | 24 | 60 |
| Stack-Cup™ - 10% losses | 28.6 | 48.6 | 82.8 |
| Stack-Cup™ - 20% losses | 39.3 | 72.2 | 335.2 |
| Paper Cup | 241.0 | 482.0 | 2,409.8 |
| Plastic Cup | 520.0 | 1,040.0 | 5,198.0 |