

Beer in PET vs Glass Bottles

Section I:

Introduction

- A. What is the purpose of this study?
- B. Key definitions
 - 1. Point of view
 - 2. *SavvyPack* Analysis Service
 - 3. *SavvyPack* Index
- C. Study organization
- D. Geographic considerations
- E. Study methodology
- F. Conventions

Section II:

Economics

- A. Key assumptions
 - 1. Bottle size
 - 2. Product waste
 - 3. Scope of the analysis
 - 4. End-of-life
- B. Case 1a: Glass bottle – Manufacturing cost
 - 1. General assumptions
 - 2. Manufacturing cost results
 - Table 1 – Case 1: Manufacturing Cost – Glass Bottle and Metal Cap
- C. Case1b: Glass bottle – Filling cost
 - 1. General assumptions
 - 2. Filling cost results
 - Table 2 – Case 1: Filling Cost – Glass Beer Bottle
- D. Case 2a: PET bottle – Manufacturing cost
 - 1. General assumptions
 - 2. Economic results
 - Table 3 – Case 4: Manufacturing Cost – PET Bottle and HDPE Closure
- E. Case 2b: PET bottle – Filling cost
 - 1. General assumptions
 - 2. Filling cost results
 - Table 4 – Case 1: Filling Cost – PET Beer Bottle

- F. Results Summary
 - Table 5 – Economic Summary – PET vs Glass

Section III:

Environmental

- A. Key assumptions
 - 1. Product waste
 - 2. Scope of the analysis
 - 3. End-of-life
- B. Case 3: Glass bottle LCA
 - 1. Energy consumption
 - Table 6 – Case 3a: Glass Bottle – Energy
 - 2. Greenhouse gas releases
 - Table 7 – Case 6: Glass Bottle – GHG
 - 3. Water consumption
 - Table 8 – Case 6: Glass Bottle – Water
 - 4. End of life
 - Table 9 – Case 6: Glass Bottle – Disposal
- C. Case 4: PET bottle LCA
 - 1. Energy consumption
 - Table 10 – Case 9: PET Bottle – Energy
 - 2. Greenhouse gas releases
 - Table 11 – Case 9: PET Bottle – GHG
 - 3. Water consumption
 - Table 12 – Case 9: PET Bottle – Water
 - 4. End of life
 - Table 13 – Case 9: PET Bottle – Disposal
- D. Results Summary
 - Table 14 – Environmental Summary – PET vs Glass

Section IV:

SavvyPack Index

- A. *SavvyPack* Index defined
 - Table 15 – *SavvyPack* Index Defined
- B. Metric results
 - Table 16 – Results for Glass Bottle and PET Bottle
 - 1. Package manufacturing cost
 - 2. Package filling cost
 - 3. Greenhouse gas (GHG) releases

4. Energy consumption
 5. Water consumption
 6. Material to landfill
 7. Package efficiency
 8. Pallet efficiency
 9. Post user recycling rate
 10. Raw material recycled content
 11. Product protection
 12. Package safety
- C. Convert performance metric results to *SavvyPack* Index scores
- Table 17 – Range for All Performance Metrics
1. Inversely proportional
Figure 1 – *SavvyPack* Index Score for Package Manufacturing Cost
 2. Directly proportional
Figure 2 – *SavvyPack* Index Score for Post Consumer Recycle Rate
Table 18 – Scores for Each Metric
- D. Glass bottle industry position
Table 19 – Glass Bottle Industry Position
- E. PET bottle industry position
Table 20 – PET Bottle Industry Position
- F. Reconciliation
Table 21 – Glass Bottle and PET Bottle Percentage Comparisons
1. Package manufacturing cost
 2. Package filling cost
 3. Greenhouse gas (GHG) releases
 4. Energy consumption
 5. Water consumption
 6. Material to landfill
 7. Package efficiency
 8. Pallet efficiency
 9. Post consumer recycling rate
 10. Raw material recycled content
 11. Product protection
 12. Package safety
- G. Conclusion
Table 22 – Overall *SavvyPack* Index Scores

Section V:

What-ifs

A. What-ifs

B. Oxygen furnaces

1. Concept

2. Model adjustments

3. Results

Table 23 – Oxygen Fuel Furnace Comparison

Table 24 – PET Bottle Industry Position

Table 25 – Overall *SavvyPack* Index Scores