

Differences in Lifecycle Oriented Tools to Evaluate Packaging: A Case Study

Funding Sources: Haas Sustainable Products + Solutions Program

Study Background

Five tools commonly used for packaging assessment were evaluated

- Compass (from Sustainable Packaging Coalition)
- GaBi (PE International)
- SimaPro (PRé)
- Sustainable Minds
- Walmart Packaging Scorecard



Study Background

Different types of packaging used in or everyday life that come in multiple sizes and packaging materials were evaluated

- Cookies
- Milk
- Diapers
- 16 oz. Cups



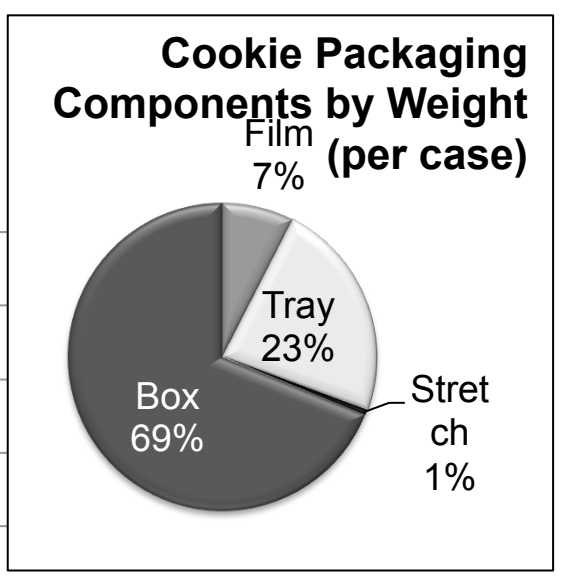
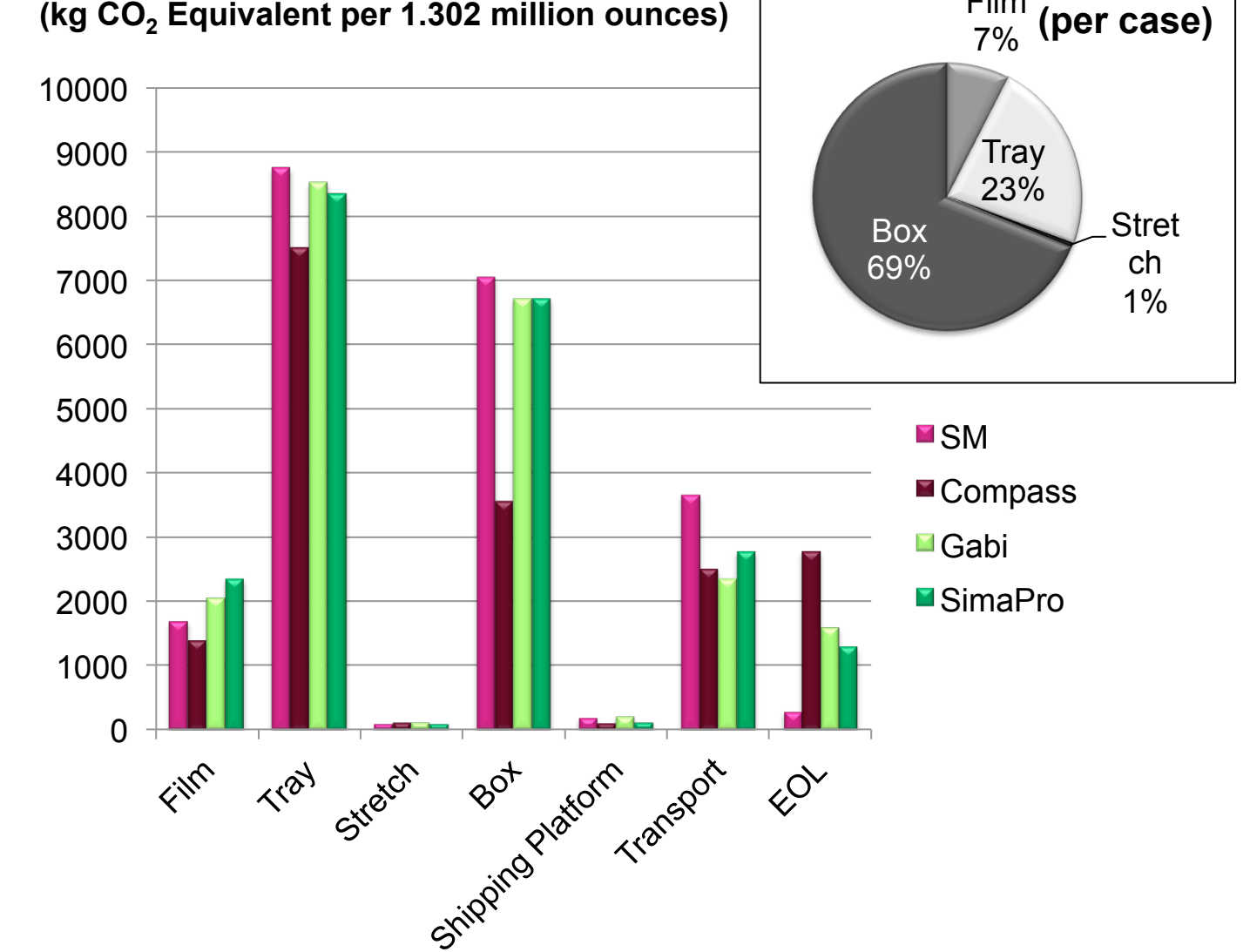
Results: Insights into Sustainability Practices

- Lightweighting consistently led to greatest improvements.
- Energy is often the most important contributor, but most software does not allow users to consider alternative energy.
- Focusing on the primary packaging alone obscured relevant data about the system.
- Where the impacts of materials can be negative for biomass credits, the relative importance of transportation increases.
- Local sourcing was not always better, due to differences in the impacts of the various modes of transportation.
- Most tools are limited in evaluating the whole system of reuse (e.g. washing process for glass bottles).
- Recycled material resulted in small improvements in impacts, but an increase in weight countered these improvements.
- Bulk selling units may have more overall packaging.

Findings: Beyond Primary Packaging

It is important to look at all components in a packaging system to see where improvements can be made.

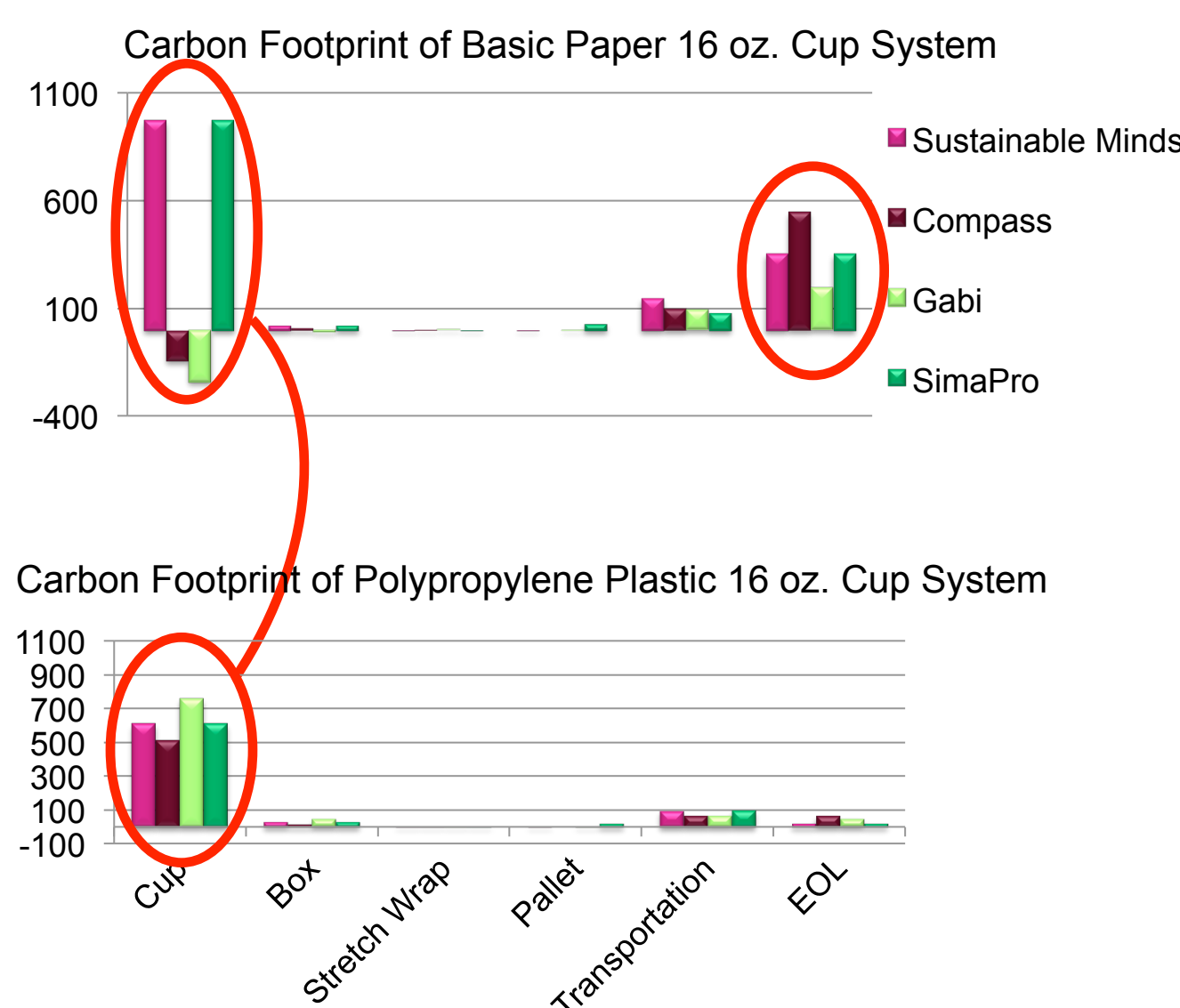
Carbon Footprint of Cookie Packaging System (kg CO₂ Equivalent per 1.302 million ounces)



Findings: Results Vary between the Tools

Different tools treat different materials in different ways

- Weight matters
- Biogenic credit assumption changes results
- End-of-Life (EoL) values vary a lot



Findings: Single Score Rankings Differ in Tools

- Sustainable Minds rank based on end of life treatment for materials
- SimaPro and Wal-mart rank determined by amount of material, but type of material is important for packaging systems close in weight

Comparative Ranking of Cup Packaging Options in Various Scoring Tools

	Wal-mart	Sustainable Minds	SimaPro
Basic Paper 16 oz. Cup	3	6	1
Compostable Paper 16 oz. Cup	2	5	2
PCF Paper 16 oz. Cup	4	7	n/a
PP 16 oz. Cup	1	2	3
PET 16 oz. Cup	5	3	4
rPET 16 oz. Cup	n/a	4	5
PLA 16 oz. Cup	6	1	6

Conclusions

- Limited or poor quality data leads to deficient results.
 - Resources needed to accurately carry out assessments.
 - Tool trainings are recommended to minimize errors.
- Users should select the tool that best suits their needs.
 - Tradeoff between ease and accuracy.
 - Tools for a quick estimate of the different options (i.e. Compass and Sustainable Minds) make evaluations easier for the user by incorporating several assumptions.
 - Tools for full scale assessments, or substantiating marketing claims, differentiate between the nuanced complexities of different packaging systems. However more time is needed to collect all relevant data and learning how to use the tool.
 - Each of the tools also adopts its own inherent assumptions on:
 - composite materials,
 - end of life treatment of materials, and
 - biogenic resource use and emissions.

- The case studies were sufficient to show that differences in packaging and software exist, but the small sample size prevented us from making further generalizations about the tools and means to achieving more sustainable packaging.
- Future work will further investigate the differences:
 - between various packaging options
 - between different materials
 - between competing sustainability design practices, and
 - in assessment software options