Beverage Containers

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Introduction

- The global beverages industry generated a total of $1.125 trillion in 2007[1]
- Beverage containers represent ~5% of the waste stream, but take up a disproportionate amount of space in landfills, a significant stress on the waste management system[2]
- For example, PET bottles take up approximately 9.8 cubic yards per ton, compared to 2.75 cubic yards for “average” landfill materials[2]

[1] www.researchandmarkets.com/reports/835602/drinks_companies_report_global_top_10.pdf
[2] www.tennessee.gov/environment/swm/pdf/TFBottleBill2.pdf

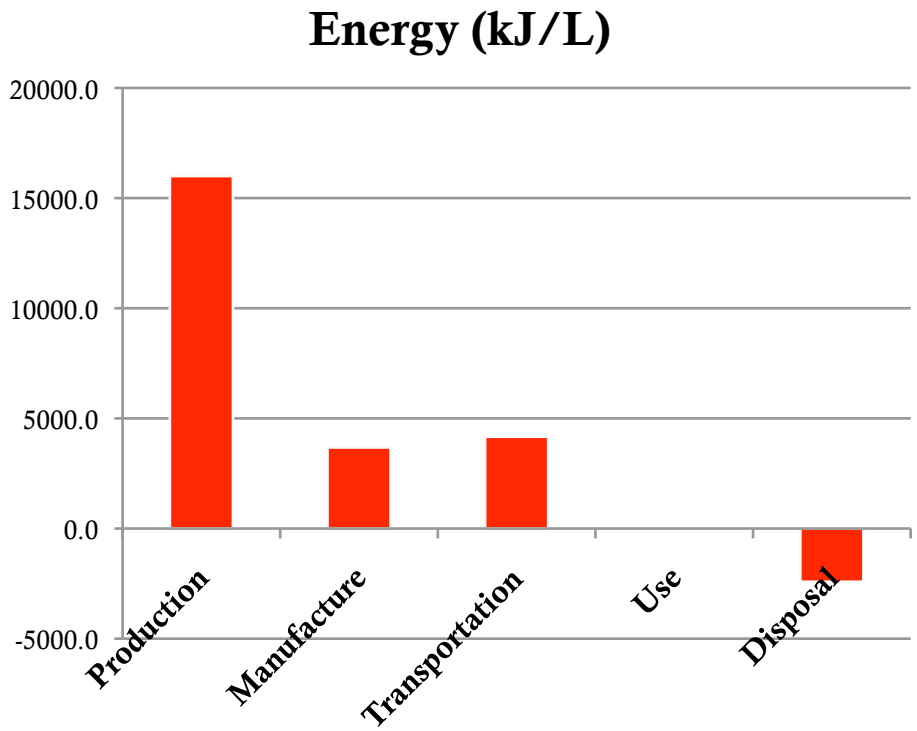
Containers for Comparison

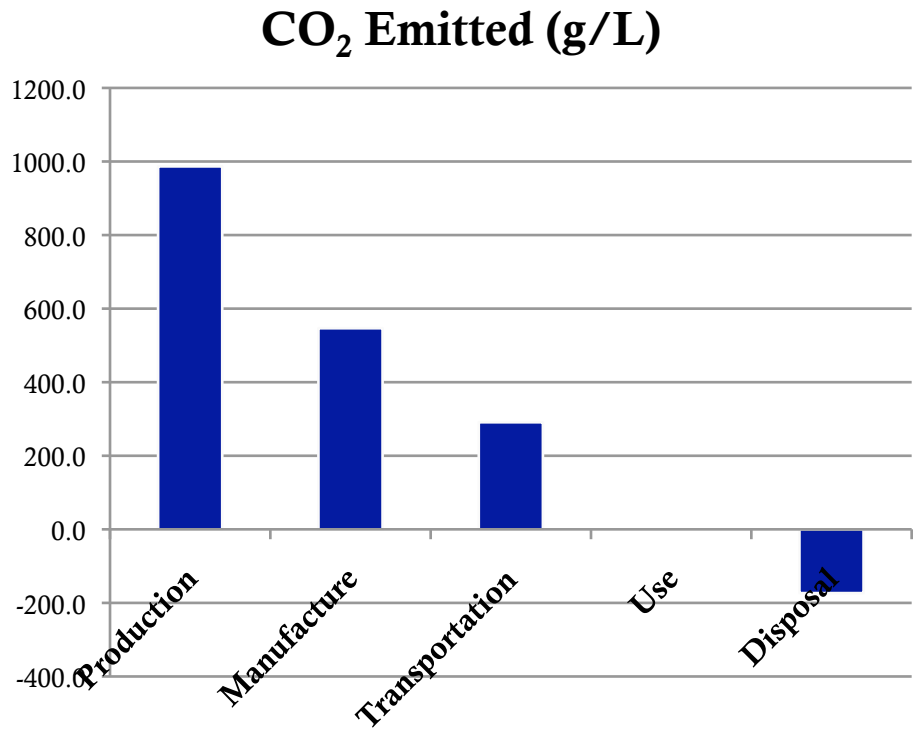
- Bottle of Red Wine from France
- Aluminum Bottle of Venom Black Mamba Energy Drink from New York
- PET Bottle of FIJI Water from Fiji
- Steel Can of Asahi Beer from Japan
- Cardboard Carton of Milk from Wisconsin

(All quantities are per liter of liquid contained)

Glass Bottle

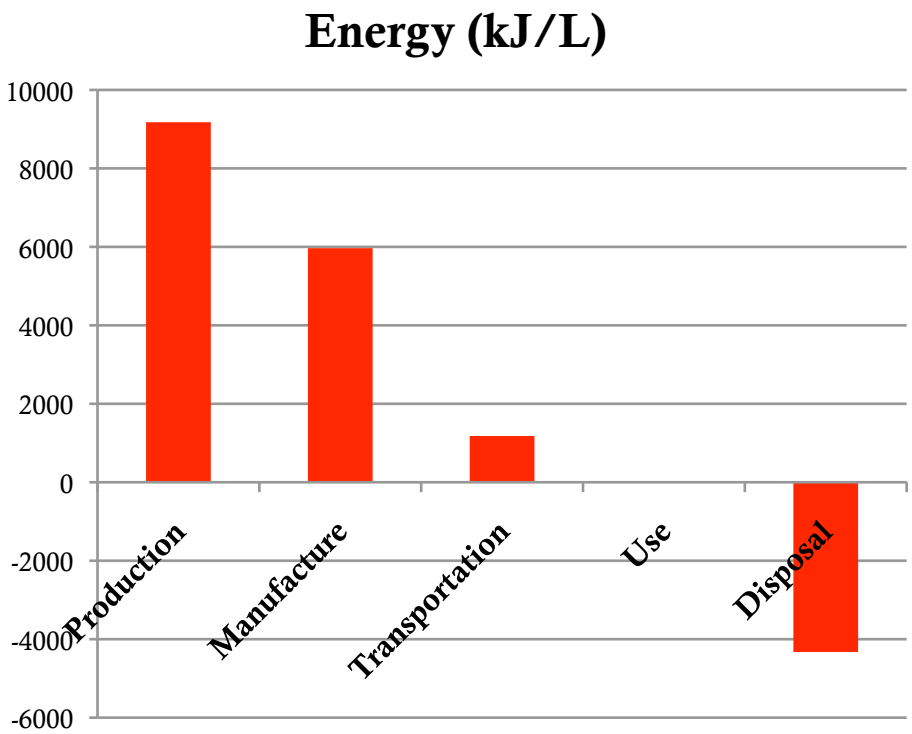
- 750mL standard bottle of red wine from France
- Assume no refrigeration required for red wine
- ~8000km total trip by sea freight and truck

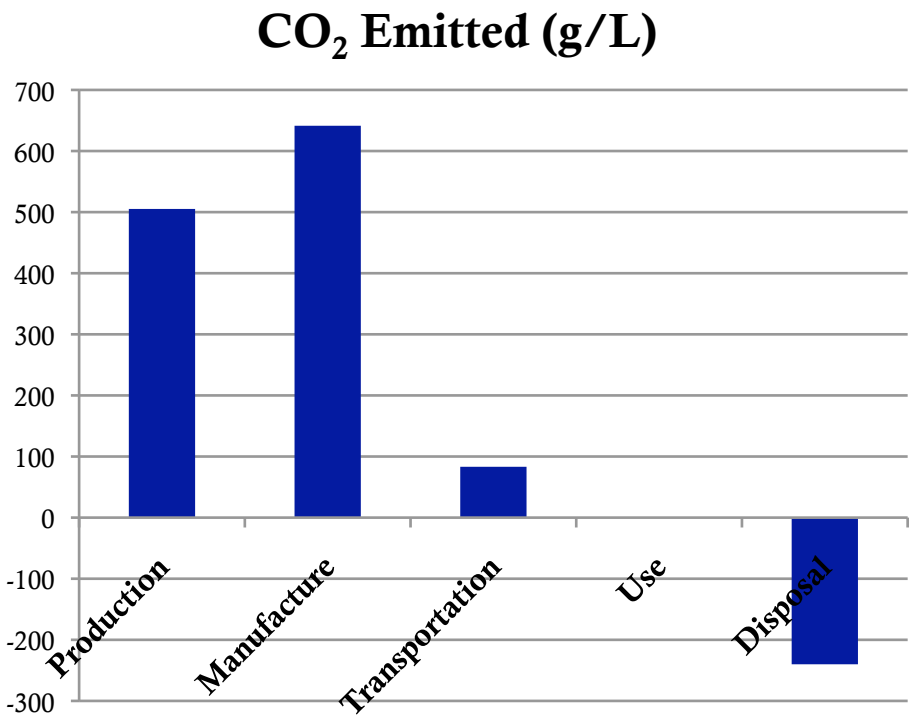




Aluminum Bottle

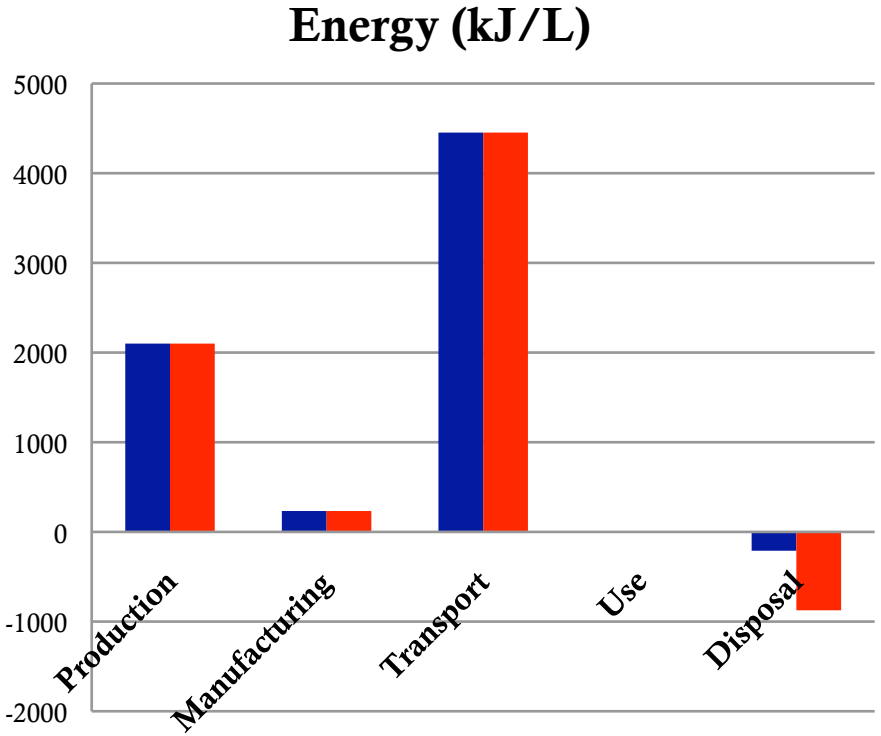
- Venom Black Mamba Energy Drink from New York (~1200km by truck from New York to Chicago)
- Assumed energy drink ≈ soft drink, used energy to produce soft drink
- Assume no refrigeration

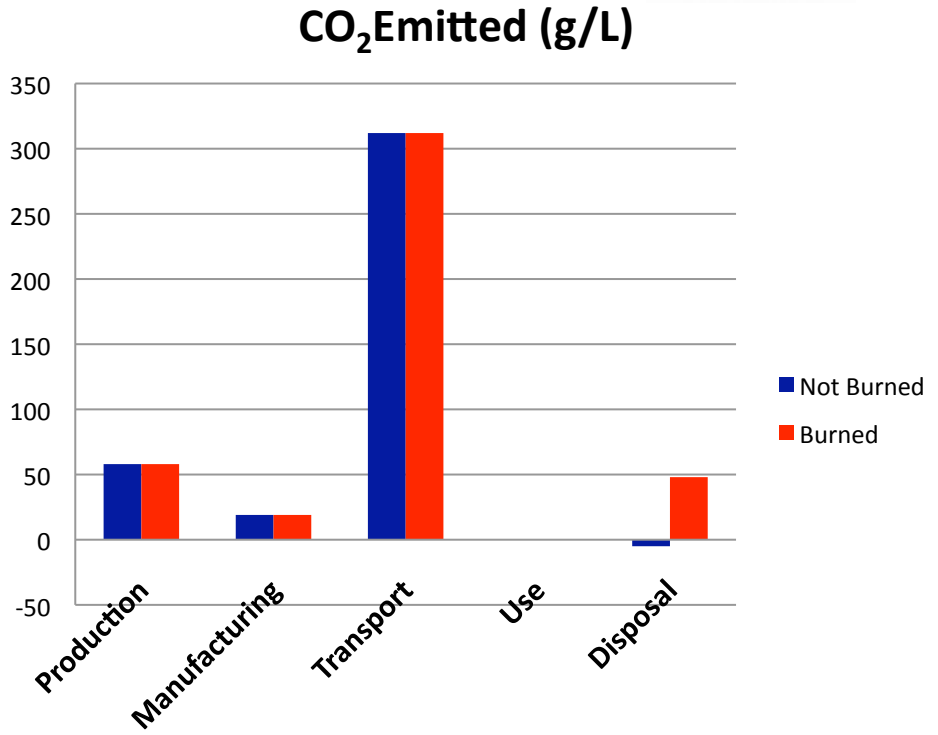




PET Bottle

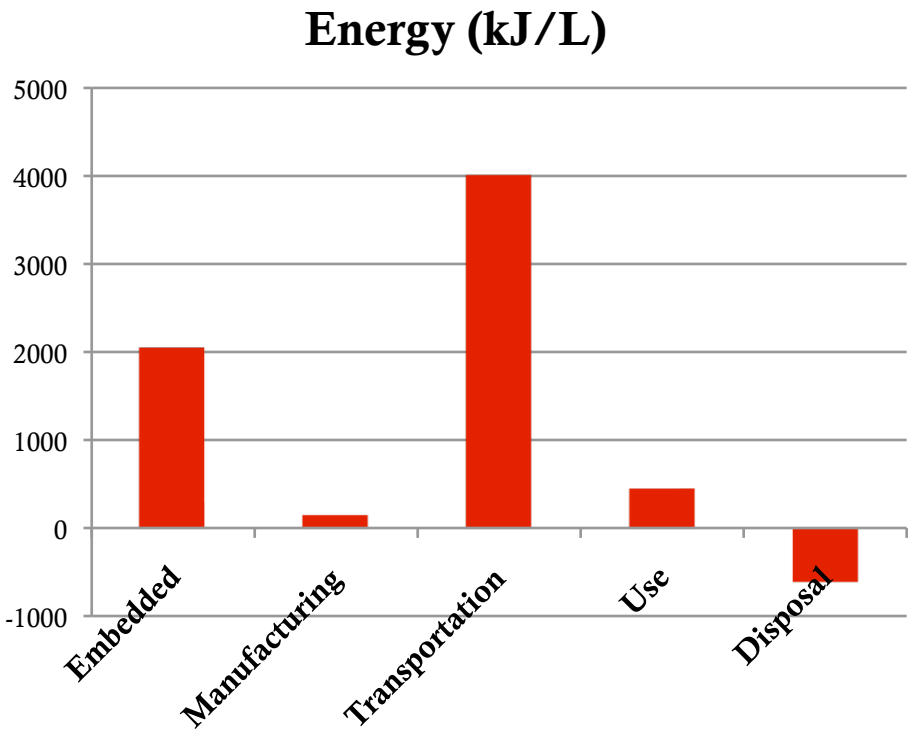
- Bottled water from Fiji Islands (~20,000km by sea freight and truck including empty bottle transport)
- 1 L PET bottle, not refrigerated
- Water extraction is negligible

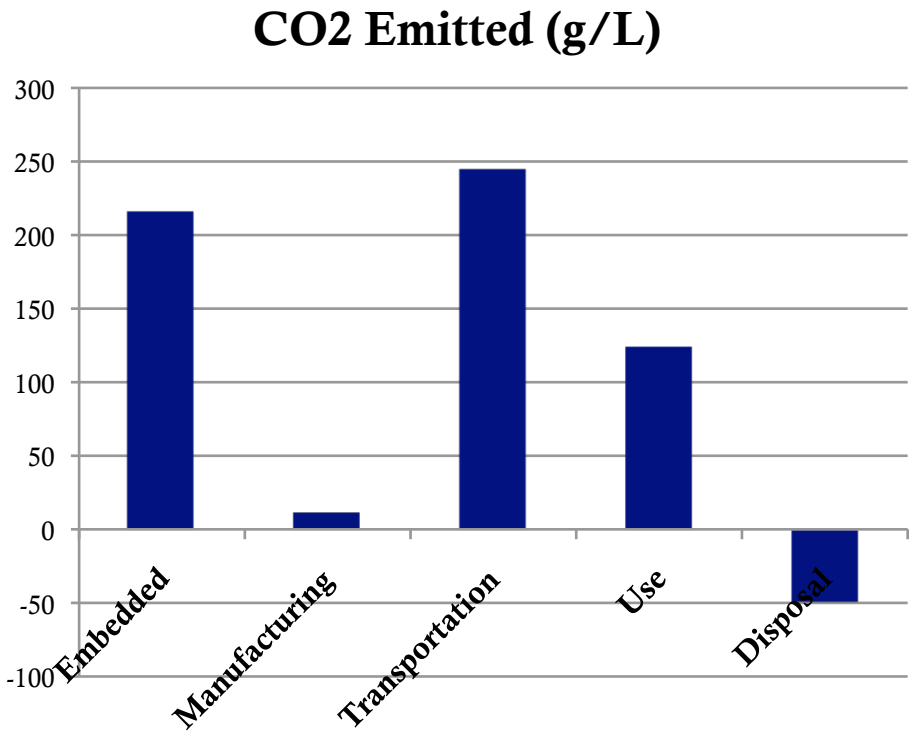




Steel Can

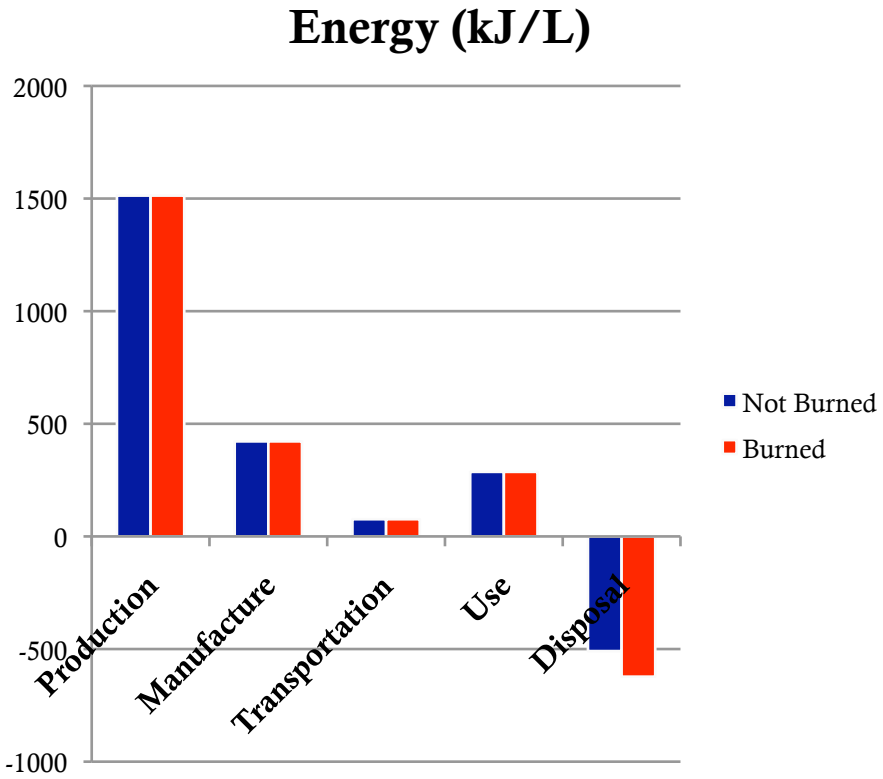
- Steel can of Asahi beer from Japan
- Shipping by sea freight and by truck (~10,700km trip)
- 350mL can, kept refrigerated

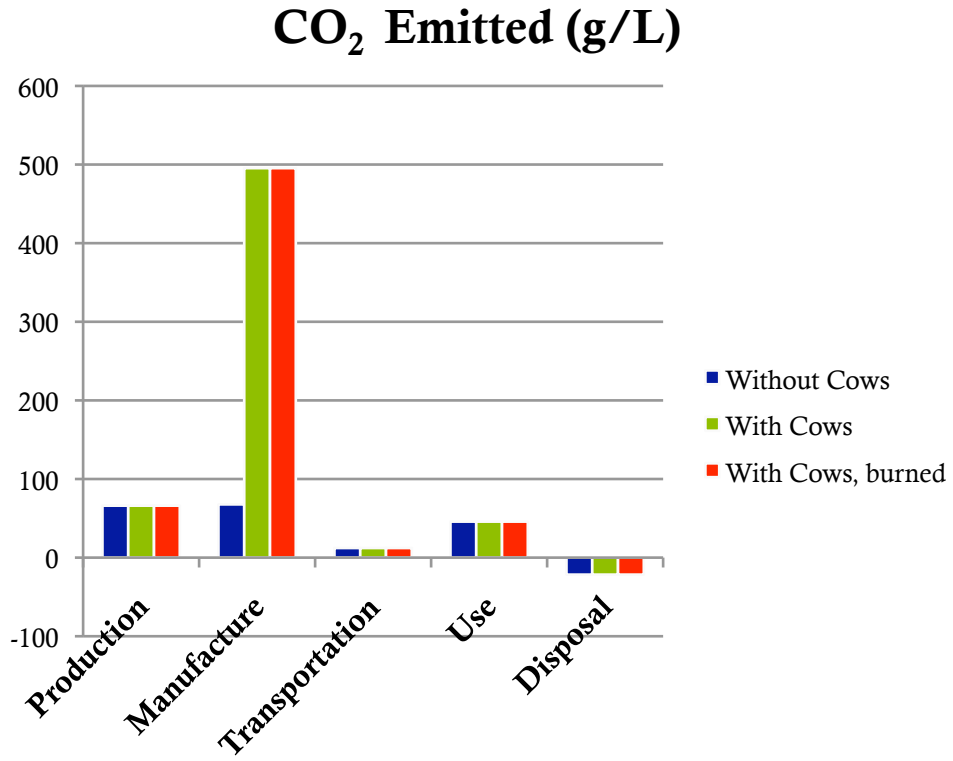




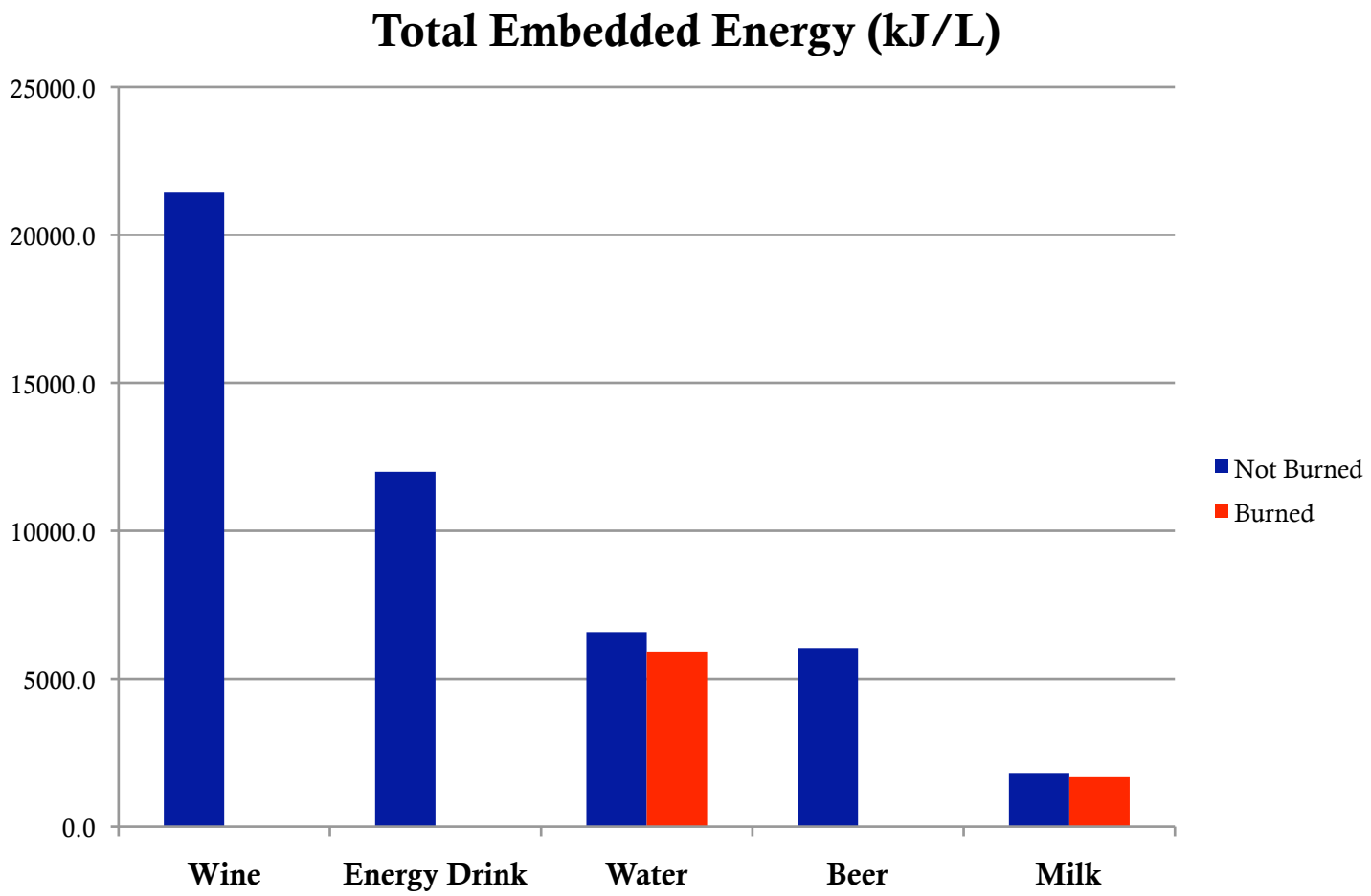
Cardboard Carton

- ½ Gallon carton of milk from Wisconsin
- Assume refrigerated transport (~400 miles round trip Green Bay to Chicago)
- Assume cardboard burning is carbon neutral (i.e. trees cardboard is processed from are grown sustainably)

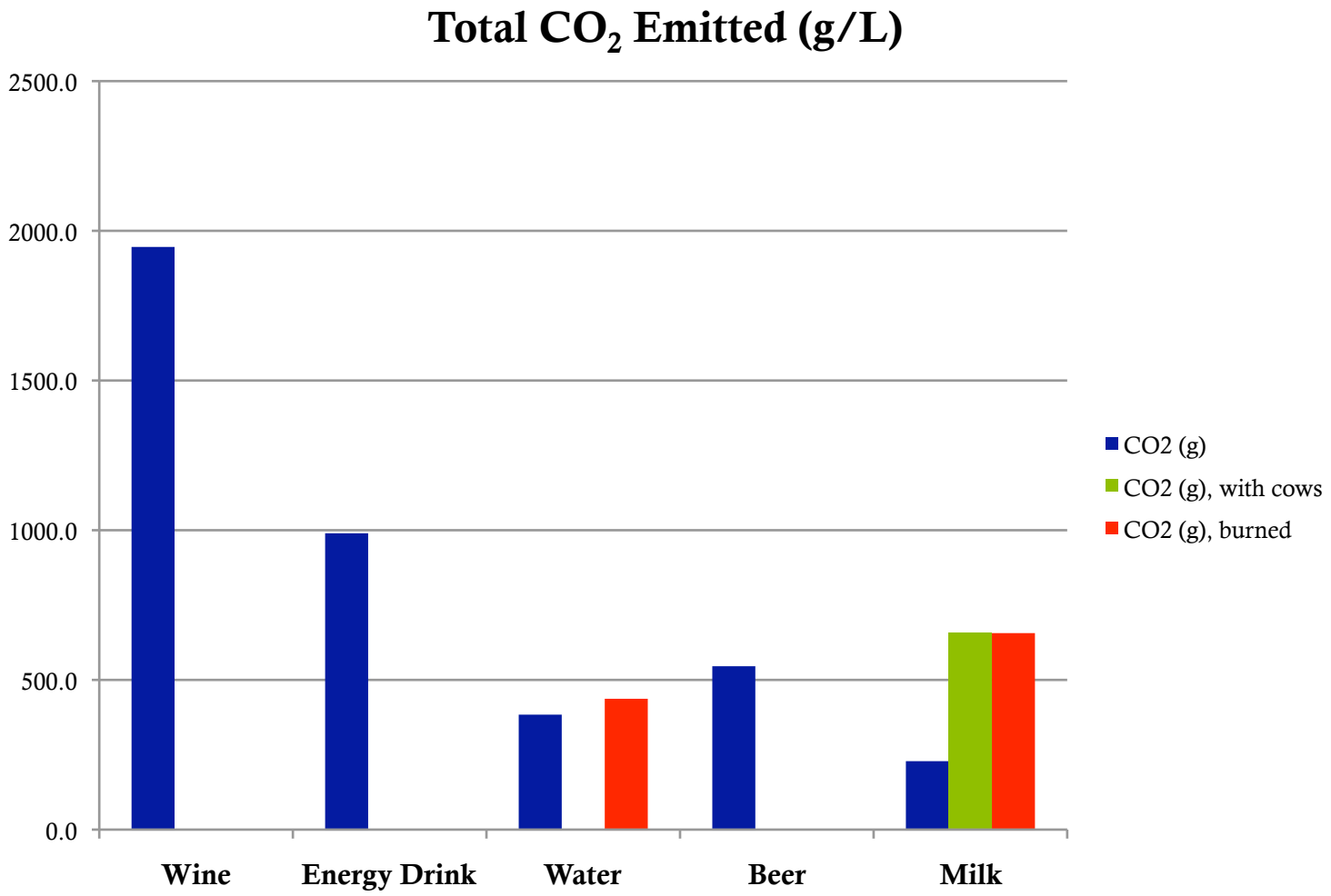




Total Energy Consumption



Total CO_2 Emissions



Conclusions

- In terms of total embodied energy, bottle of wine from France was by far the worst, while milk and water were the two best.
- In terms of CO_2 emitted, the bottle of wine was also the worst, with the bottle of water being the best (if you include the CO_2 emitted by cows from milk production)
- Milk has a much larger carbon footprint if you factor in the CH_4 (and thus CO_2) emitted by the cows that are necessary to produce the milk

Questions?