

Defining Zero Waste to Landfill: The Need for a Common Industrial Standard

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Abstract

Zero Waste to Landfill (ZWL) is an ill-defined waste management policy practiced within the United States' manufacturing sector, as nearly every fortune 100 company self-proclaim their achieved ZWL business. Companies manipulate their zero landfill policies to avoid costly environmental friendly business practices. In my study, I investigate current zero landfill practices of 3M's competitors, exploring whether or not it is viable for the US to implement a standardized ZWL definition and certification program to increase landfill diversion efficiency. This study conceptualizes ZWL management and explores barriers and solutions for success using a literature review of zero landfill and benchmarking twelve companies' current ZWL practices. Analysis of those data suggests that a national ZWL definition and certification program is mandatory in order to achieve true zero landfill and sustainable business practices, while systematizing green engineering techniques provides the technical solution for ZWL implementation success.

Methods

Through an extensive review of academic journals, corporate sustainability reports, EPA and other government documents which directly analyze ZWL's viability, three major components of this research project were identified. First, provides data supports the need for a national definition of zero landfill, as current ZWL practices fail to institutionalize waste management leading to substantial land-filling and misleading ZWL claims. Second, this literature review assisted in the process of selecting a national zero landfill definition and certification program to support a company's credibility when ZWL is achieved. Third, it provides a solution for achieving zero landfill through systematic green engineering, which allows companies to respond efficiently and profitably to the effects of a national ZWL policy. Lastly, 12 companies that are 3M's competition were benchmarked based on their zero landfill policy. This supplied knowledge on the current status of 3M's peers' ZWL policies, which provided an outlook on 3M's competition, ZWL viability, and how companies choose what waste streams to include in their ZWL policy. Using those research techniques, an accurate representation of ZWL viability is provided, suggesting that a national, standardized definition is necessary in order to achieve sustainable business practices and efficient landfill diversion.

Criteria for Company Selection: ENVR Awareness & 3M Competitor

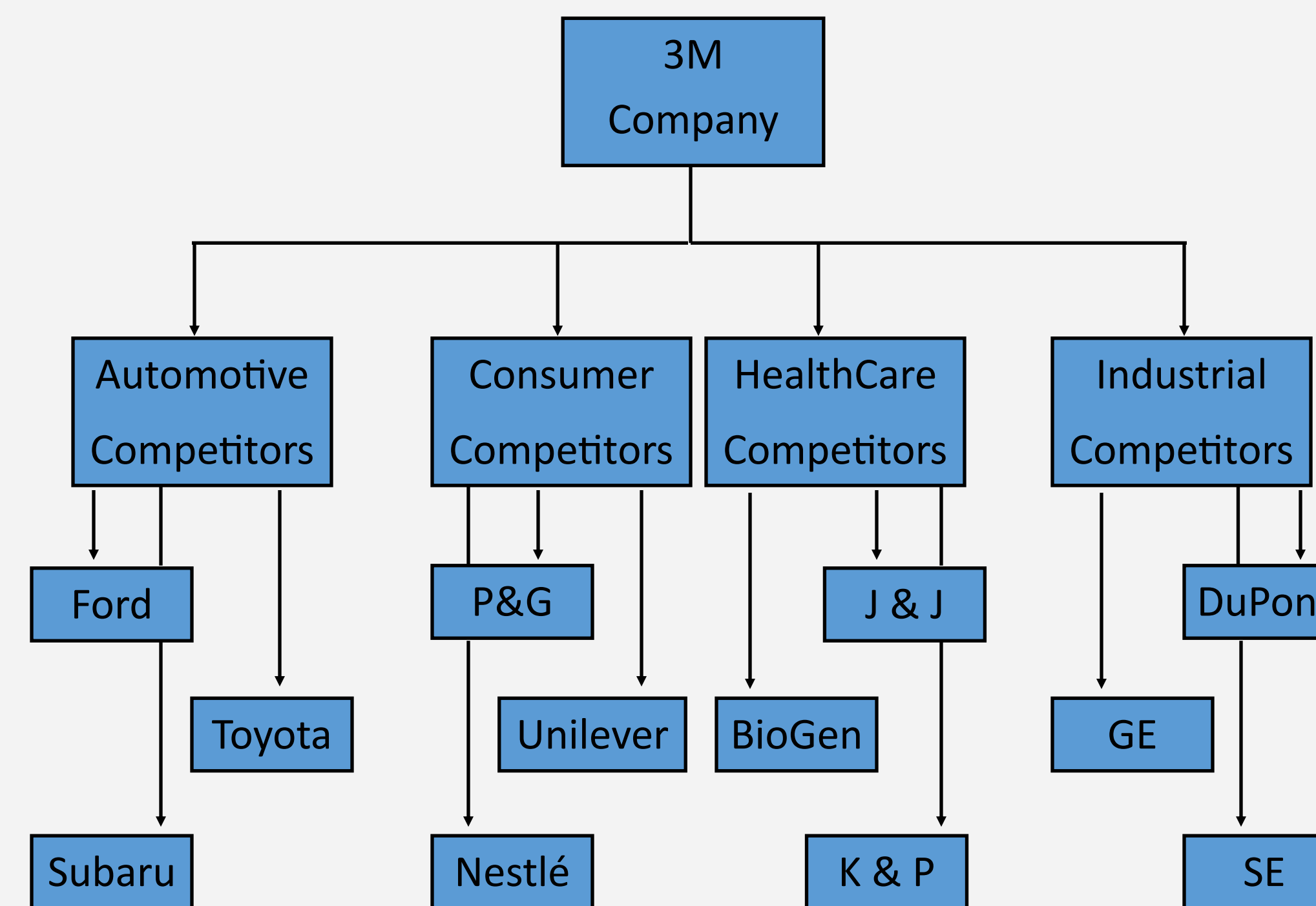


Figure 1: The table above displays the criteria for how the 12 companies were chosen in order to benchmark their zero landfill policies. All of the companies above are competitors of 3M, and they were chosen based on their environmental awareness, track record of ZWL, and competitiveness towards varying 3M business sectors.

Descriptive ZWL Definitions Versus Non-Descriptive Definitions

Company	Descriptive Def.	Company 2	Non-Descriptive Def.
Unilever	Less than 0.5% of non-hazardous waste is disposed to landfill in a 12 month period	Nestlé	No materials generated in any facility go to landfill or incineration without energy recovery
Toyota	90% or greater diversion of all waste from landfill, incineration, and the environment of the FY 1995 level in 12-month period	Ford	No production waste sent to a landfill
Proctor & Gamble	Zero manufacturing waste is disposed directly to landfill or to incineration without energy recovery by the site (3 months continuous)	BioGen	No manufacturing waste is sent to a landfill

Table 2: The table above displays descriptive definitions of ZWL versus non-descriptive definitions, which often determine the success of ZWL policy. The descriptive definitions, or SMART goals, allow for successful implementation of zero landfill policy by creating a specific, measurable, attainable, results-oriented, and time predicated goals of zero landfill. As one can see in table 2, companies with descriptive goals will have a strong understanding of ZWL policy because they consciously determine what waste streams are included or not included in their zero landfill policies.

Companies' Understanding of ZWL: What's Included?

Type of Waste	Automotive			Consumer			Health Care			Industrial			
	Ford	Subaru	Toyota	UL	P & G	Nestlé	J & J	BioGen	K & P	DuPont	GE	SE	BASF
Ash from Incineration	-	-	x	x	x	-	x	-	-	-	-	-	-
Cafeteria	-	-	x	-	x	-	-	-	-	✓	-	-	-
Construction	x	x	-	x	x	-	-	-	-	✓	-	-	-
Demolition	x	x	x	x	x	-	-	-	-	✓	-	-	-
Hazardous	✓	-	✓	x	✓	x	-	x	x	-	-	-	✓
Manufacturing	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	-	-	✓
Non-hazardous	✓	-	✓	✓	✓	-	-	-	✓	✓	-	-	✓
Office	-	-	✓	✓	x	-	-	-	-	-	-	-	-
Raw Materials	-	-	-	-	x	-	-	-	-	✓	-	-	-

Table 3: The table above displays how companies pick and choose what to include or what not to include in their zero landfill policy. Due to the absence of a standardized, national definition of ZWL companies pick the most cost effective waste to include in their ZWL policy, which avoids true environmentally friendly business practices, and ultimately leads to inefficient landfill diversion.

Conclusion

- Without a national ZWL definition, companies manipulate its meaning avoiding sustainable business practices. As seen in table 3, companies choose what to include in ZWL, which does not result in efficient landfill diversion.
- Adoption of the United States Zero Waste Business Council's certification program and the Zero Waste International Alliance's definition should serve as the national policy for ZWL. This will create a standard of ZWL, forcing companies to effectively divert *all* waste streams from landfills.
- ZWIA's Definition: Zero landfill means designing and managing products and processes to reduce the volume and toxicity of waste and materials as close to zero as possible, conserve and recover all resources, and not burn or bury them.
- USZWBC certification program requires,
 - 90% *overall* diversion from landfill and incineration for *all* wastes.
 - The last 10% of waste can be processed above ambient biological temperatures to recover energy.
 - Recertification is required every three years.
- Takeaway:** A national, standardized ZWL definition and certification program create sustainable business practices, as companies must divert *all* waste streams from landfills. It ensures that companies challenge their environmental awareness, while maintaining economic profitability through waste minimization. There is revenue in lost waste, as mass-landfilling techniques reduces the effectiveness of businesses and vitality of surrounding communities, which drive economic, environmental, and social incentives for companies to become zero landfill.

References

- Staley, Bryan, and Jenna Cameron. "Defining Diversion." *Waste Age* 42, no. 7 (2011): 22-24.
- Friend, Gil. *The Truth About Green Business*. Upper Saddle River, New Jersey: FT Press, 2009.