



THE QUEST FOR ZERO WASTE AND UL 2799



The U.S. Environmental Protection Agency (EPA) estimates that American industrial facilities generate and dispose of about 7.6 billion tons of non-hazardous solid waste each year, representing approximately 97 percent of all solid waste. For waste products that eventually find their way into landfills, even non-hazardous materials and chemicals can adversely affect the quality of soil, air and water. But, aside from environmental considerations, the sheer volume of industrial waste is rapidly outstripping our disposal capacity in several key U.S. states.

As part of their overall commitment to environmental sustainability, leading corporations are embracing the concept of “zero waste” in their operations and business practices, with the goal of reducing the waste they generate to the lowest possible levels. However, “zero” has been defined differently by various parties, and the absence of objective criteria and transparent validation processes lead to discrepancies among seemingly comparable practices, diminishing the potential value of corporate waste diversion claims to both brands and consumers.

This UL white paper will discuss UL’s approach to validating zero waste claims as presented in UL’s Environmental Claim Validation Procedure (ECVP) 2799. The paper begins with an overview of the emergence of waste diversion as a

corporate sustainability priority, and the potential benefits of such efforts. The challenges in validating zero waste claims will be presented, followed by a discussion of the requirements in UL 2799. The white paper will conclude with examples of successful zero waste programs, and some considerations for companies seeking to implement an effective waste diversion strategy.

Effective Waste Diversion as a Sustainability Priority

For most of the past 30 years, industrial recycling efforts have focused almost exclusively on the disposal of solid waste materials at the end of the production process, and the recycling of a limited number of potentially valuable and easily

recycled materials such as metals and paper. Although these efforts have helped to reduce the amount of solid waste that is either incinerated or diverted to landfills, they are no longer sufficient to keep up with the significant increase in the amount of industrial waste being generated. Further, they do little to address the actual root causes of waste created as part of industrial processes.

The quest for zero waste is part of a fundamental shift in the overall philosophy regarding waste management. Rather than focusing exclusively on solid waste material recycling, a zero waste approach brings equal attention to reducing total waste production by reevaluating product designs and material selection, and by restructuring production



¹ “Guide for Industrial Waste Management,” U.S. Environmental Protection Agency website, last updated November 15, 2012. Web. 25 May 2015. <http://epa.gov/wastes/nonhaz/industrial/guide/index.htm>

² For example, Massachusetts reportedly has less than 15 years of estimated landfill capacity available. See “The Lowdown on N.C. Landfills,” a blog post by Diane Cherry, Environments Policy Manager for the Institute for Emerging Issues at North Carolina State University. January 12, 2015. Web. 25 May 2015. <http://sustainability.ncsu.edu/change-yourstate/north-carolina-landfills/>

processes and distribution systems. Aside from reducing or eliminating certain waste streams, these efforts can also contribute to the more efficient use of limited material resources and operating capacities.

Zero waste initiatives also go beyond conventional recycling efforts to identify innovative ways to reuse or repurpose waste products. For example, scrap materials left over from standard production runs can sometimes be used in other applications with little or no reprocessing. So-called “cash from trash” programs exploit the hidden value in some waste products by selling them to others, often generating significant additional revenue.

Today, the adoption of the zero waste principles of “reduce, reuse and recycle” is viewed as central to the value and effectiveness of any corporate sustainability effort. By taking a holistic approach to the issue of waste management and addressing the root causes of waste generation, organizations are better positioned to achieve their long-term sustainability objectives in a manner consistent with their overall strategic goals.

The Business Benefits of a Zero Waste Approach

In addition to helping organizations achieve sustainability priorities, a zero approach to waste management offers a number of other business benefits,

including the following:

- **Improved resource economy and efficiency**—A key principle of zero waste is the reduction of waste at its source. This usually means redesigned products and/or reengineered processes that require less materials and fewer resources to produce and manage.
- **Synergy with continuous improvement initiatives**—By closely evaluating current processes for potential waste, taking a zero approach to waste management can complement new and existing continuous improvement initiatives, such as lean manufacturing or Six Sigma, and quality management systems.
- **Improved financial performance**—The elimination of waste products and the more efficient use of resources results in economic benefits that directly impact an organization’s financial performance. Further, “cash from trash” programs can be an important source of new revenues.
- **Stronger brand identity**—By sending less waste to incinerators and landfills, zero waste programs can more strongly support an organization’s environmental sustainability claims, potentially building a stronger environmental brand connection with key customer groups.
- **Reduced legal exposure**—Finally, zero waste programs could reduce potential legal liability stemming from the direct

or indirect disposal of hazardous waste or the contamination of adjacent natural resources.

Validation Issues for Zero Waste Claims

Although there are many potential benefits for those organizations that adopt a zero approach to solid waste management, there is no universally accepted definition of what “zero waste” really means. A number of U.S. companies, for example, promote zero waste claims that are based on diverting 100 percent of their waste from incinerators and landfills, while others claim zero waste based on diverting significant but smaller percentages of waste. The Zero Waste International Alliance has reinforced the acceptance of a “less than 100 percent” standard by establishing 90 percent as the minimum threshold for its zero waste designation.³ These deviations in waste diversion rates creates confusion for both organizations and the public regarding the real meaning of “zero,” and potentially undermines the importance and value of zero waste claims.

Another challenge regarding the meaning and acceptance of zero waste claims has been the absence of a common method for validating such claims based on objective and transparent criteria. For instance, some validation programs exclude construction and demolition debris, hazardous substances, or cafeteria waste. These waste streams are among the more difficult to divert from landfills,

³ “Zero Waste Business Principles,” website of the Zero Waste International Alliance (no date). Web. 28 June 2015. <http://zwia.org/standards/zw-business-principles/>.

but excluding them from diversion calculations can inflate diversion claims.

Even when organizations employ good faith efforts to qualify their zero waste claims, individual methodologies and interpretations are inherently subjective and may be unable to withstand rigorous scrutiny. For example, most organizations include recycled materials in calculating the total percentage of diverted waste. But some internal recycling collection processes are more stringent than others, and even small amounts of non recyclable trash can contaminate a recyclables batch, relegating the entire batch to incineration or landfill disposal. The absence of a generally accepted validation method makes it nearly impossible to objectively compare seemingly similar results, further compromising the significance of zero waste claims.

The lack of a clear definition of zero waste and of an accepted method for validating zero waste claims presents other potential problems for organizations seeking to promote their solid waste reduction efforts. In recent years, the U.S. Federal Trade Commission (FTC) has stepped up enforcement activities against organizations who use deceptive or misleading environmental claims in the labeling, marketing or promotion of their products. Organizations that violate the FTC's Truth-in-Advertising standards can be subjected to penalties ranging from cease and desist orders to financial forfeitures.⁴

UL ECVP 2799: A New Approach to Validating Waste Diversion Claims

First published in May 2012, UL's ECVP 2799, Environmental Claim Validation Procedure for Zero Waste to Landfill, was developed to support waste reduction efforts by providing clear definitions of what constitutes waste and an objective and transparent process for validating zero waste environmental claims at individual facilities. For organizations committed to reducing waste, UL 2799 establishes an objective basis for quantifying waste diversion rates and helps set benchmarks for continued improvements in diversion rate performance. Waste diversion claims validated in accordance with UL 2799 also enable consumers and the general public to more accurately assess such claims and to make meaningful comparisons between waste diversion rates among competing organizations.

The following sections provide a summary of the key aspects of the current version of UL 2799.

Waste Diversion Performance Tiers

Under the current version of UL 2799, zero waste claims are validated for compliance with one of the following three performance tiers:

- "Landfill Diversion Rate"—This claim rating designation is available to any facility that achieves a landfill diversion



⁴ "Advertising FAQs: A Guide for Small Business," U.S. Federal Trade Commission, Bureau of Consumer Protection. Web. 28 June 2014. <http://business.ftc.gov/documents/bus35-advertising-faqs-guide-small-business>.



rate of equal to or greater than 80 percent for a period of at least one year.

- “Virtually Zero Waste to Landfill”—This claim rating designation is reserved for facilities that achieve a waste diversion rate of 98 percent or greater for a period of at least one year.
- “Zero Waste to Landfill”—This claim rating designation is reserved for facilities that achieve a waste diversion rate of 100 percent for a period of at least one year.

For facilities that achieve the “Landfill Diversion Rate” claim rating designation, the actual diversion rate achieved, e.g., 84%, is denoted on UL’s validation claim mark. In addition, all validated diversion claims must be accompanied by the exact percentage of discard materials that are being put to beneficial use, as well as the exact percentage diverted to incineration facilities, e.g., “Virtually Zero Waste to Landfill Facility—98% Diversion Rate with XX% incineration with energy recovery”.

UL 2799 also permits the use of product-specific claims when those products are entirely produced at a given facility, e.g., “Product A—Produced at a Zero Waste to Landfill Facility.” However, to avoid possible enforcement actions by the FTC, all waste diversion claims should conform to the guidance on environmental claim wording found in the FTC’s Guides for the Use of Environmental Marketing Claims (the so-called “Green Guides”).

Acceptable Methods of Waste Diversion

To qualify for waste claim validation under UL 2799, waste diversion efforts can take any or all of the following forms:

- Recycling of waste products

- Returning waste products to the supplier of the original material
- Reusing waste materials in the same production process
- Reusing waste materials in a different production processes
- Processing waste materials and reselling them to a third party
- Commercial composting of waste materials
- Converting waste materials to energy through biodiesel (biofuel) or anaerobic digestion
- Incinerating waste materials and recovering energy (limited, depending on claim)

Additional diversion methods may be approved for use by the UL environmental project manager assigned to the claim validation process.

Calculating Waste Diversion Performance

For the purposes of calculating waste diversion rates, the following formula is currently used:

$$Diversion\ rate = 1 - [(Mass\ Landfilled + Mass\ Incinerated\ without\ Energy\ Recovery) / Mass\ Discarded\ Material]$$

Fractional results are rounded down to the nearest whole number. For example, a computed diversion rate of 99.9 percent would result in an environmental waste diversion claim of 99 percent.

In calculating incineration with energy recovery rates, the following formula is currently applied:

$$Incineration\ with\ Energy\ Recovery\ Rate = (Mass\ sent\ to\ Incineration\ with\ Energy\ Recovery) / (Mass\ Discarded\ Material).$$

For incineration with energy recovery

rates, calculations that result in fractional results are rounded up to the nearest whole number.

Validation Procedure and Documentation

The current procedure for validating waste diversion claims requires the submission of specific information that fully documents the movement of waste at the facility. At a minimum, required information includes details of products produced at the facility, manufacturing processes used, waste diversion methods, documentation of waste handling procedures (especially for reuse and reduce activities), records of waste pick-ups for the preceding 12 months, and landfill and incinerator documentation.

Once UL has carefully reviewed the submitted documentation, the facility seeking claim validation then undergoes a physical audit of its waste handling processes and procedures. Facilities whose waste diversion claims are validated according to UL 2799 must also complete an annual review to confirm ongoing compliance, and may also be subject to periodic re-audits based on the findings presented in its annual reviews.

Profiles of Effective Waste Diversion and Zero Waste Validation Programs

A number of diverse facilities and events operated by major organizations have already had their waste diversion claims validated according to the requirements of UL 2799. They include:

- Bridgestone Americas—Bridgestone America’s Wilson, N.C., tire manufacturing facility has been in



the forefront of a multi-year effort to reduce, reuse and recycle waste, ultimately achieving 100 percent waste diversion in 2013. However, the facility was seeking ways to objectively validate this important accomplishment and communicate its significance throughout the company and with its environmental partners and customers. In 2014, Bridgestone underwent the UL 2799 validation process, receiving validation as a “Zero Waste to Landfill” facility, the highest-rated claims validation available.

- Mayer Brothers Apple Products—In an effort to codify its commitment to the environment, Mayer Brothers worked with Waste Management Recycle America and other regional recyclers to more effectively manage every byproduct waste stream of its manufacturing process. As part of the effort to validate its waste diversion efforts under UL 2799, the company increased from three to 19 the number of different recyclable commodities it tracks, ultimately achieving validation from UL as a “Zero Waste to Landfill” facility. Mayer Brothers directly attributes the expansion and improvement of its waste tracking system to UL 2799.
- Professional Golf Association and Waste Management—Manufacturing and production facilities are not the only entities seeking to improve the environment through increased waste diversion efforts. Now dubbed “the

greenest show on grass,” the PGA Tour’s Waste Management Phoenix Open has earned the “Zero Waste to Landfill” validated claim under UL 2799 for three consecutive years.

As these examples illustrate, UL 2799 offers organizations of all types an objective and transparent method for validating waste diversion claims. The claims validation process also serves to spur further improvement in waste diversion rates by expanding the scope of waste diversion activities.

Considerations for Implementing an Effective Waste Diversion Strategy

The extent of effort required to achieve the goal of zero waste will differ from organization to organization. However, the following considerations are essential for the development and execution of an effective 100 percent waste diversion strategy:

- Begin with the end in mind—Set long-range goals, e.g., “Zero Waste to Landfill” claim validation, broken down into short-term objectives, e.g., 80 percent diversion at the end of the first year, 90 percent and the end of year two, and 100 percent by the end of year three. This approach provides a roadmap that helps sustain momentum and track progress.
- Partner with vendors—Engage suppliers in the effort to achieve waste diversion goals. The best suppliers will welcome the opportunity to contribute

to the process. They’ll also bring a fresh perspective to waste management challenges, and are likely to be a source of new ideas and innovative approaches.

- What’s measured gets attention—Rigorous data collection and reporting practices are vital for establishing baseline performance rates and for measuring improvements over time. Timely reporting can also help to identify unanticipated problems while they can still be effectively addressed. UL 2799 provides specific guidance on what types of discarded material to track and measure.
- Get everyone involved—The most successful waste reduction efforts align with the overall goals and objectives of the business, and leverage the power of collective engagement. The commitment to a zero waste strategy must begin at the highest levels of an organization. But every employee can contribute to its success. And regular communication on program efforts and results are essential to keep everyone engaged and committed.
- Success is a journey, not an event—Achieving the goal of zero waste does not happen overnight. Instead, it typically requires an ongoing commitment of resources and energy over an extended period of time. Therefore, a focus on continuous improvement can help push the effort forward, even in the face of unanticipated setbacks.



Summary and Conclusion

Reducing the amount of industrial waste destined for incinerators and landfills increasingly depends on the adoption of a zero-based approach to waste management. Achieving 100 percent waste diversion may be unrealistic for every organization, but applying the principles of zero waste can significantly improve waste diversion rates in almost any setting. Further, a zero-based approach to waste management can also stimulate efforts to attack waste generation at its source, ultimately reducing the dependence on waste diversion.

UL 2799 prescribes a clear methodology for measuring and validating actual waste diversion rates. In doing so, it gives organizations an effective tool for benchmarking waste diversion performance and for assessing the impact of new waste diversion initiatives over time. Waste diversion claims validated in accordance with UL 2799 also provide employees and suppliers, consumers and the general public with objective information about an organization's waste diversion efforts, better enabling them to make informed choices that support their own environmental goals and objectives.

A revised version of UL 2799 is expected to be released in late 2015/early 2016. For the most recent edition, reference UL's online standards catalog at comm-2000.com.

UL Environment provides a range of services that help organizations around the world make and market healthier and more sustainable products and services. For more information about UL 2799 and UL's environmental claim validation services, visit www.ul.com/zerowaste.