
Pursuing Zero Waste to Landfill for Manufacturing



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How does UL Zero Waste to Landfill validation work?

The Zero Waste to Landfill (ZWTL) validation program by UL Solutions focuses on helping organizations demonstrate the reduced amount of waste they contribute to the environment and communicate their achievements with confidence.

UL 2799, the Environmental Claim Validation Procedure (ECVP) for Zero Waste to Landfill, is the underlying Standard for the ZWTL program that uses quantitative analysis of discarded

material flows, combined with supply chain verification, to determine how discarded materials are managed and how much is diverted from the landfill. Your diversion rate is the amount of waste your organization produces that does not end up in a landfill.

The more waste that ends up in a landfill, the more harm that's done to our environment. Waste reduction is more important than simply recycling or reusing and incinerating for energy.

Waste diversion

According to the Environmental Protection Agency (EPA), in 2018, the U.S. has a 32.1% recycling and composting rate. Improving this diversion rate is an achievable goal. In order to receive ZWTL validation, your organization has to calculate its waste diversion rate.

Did you know?



Every year across the globe, more than 2 billion tons of municipal solid waste (MSW) is generated.



Between 2020 and 2050, municipal solid waste generation per year is projected to grow from 2.1 billion tons to 3.8 billion tons, a 56% increase within a generation or less.



If the direct and hidden costs of waste and the benefits of recycling are considered together, the true global annual cost of municipal solid waste in 2020 was \$361 billion (USD).

Global Waste Management Outlook 2024 by United Nations Environment Program - <https://www.unep.org/resources/global-waste-management-outlook-2024>



Confirm your claims

The UL Zero Waste to Landfill program provides the outline and requirements in order to measure, manage and validate waste diversion claims.

Scope:

- Processing residue – Byproducts created as a result of the process to recover waste material
- Mandated wastes – Waste materials that have regulated diversion requirements
- Inadvertent landfilling – Small quantities of waste that are unintentionally landfilled
- Liquid materials – Waste not including wastewater

Why pursue waste diversion validation?

Risk mitigation

- Reduce environmental impacts
- Reduce risks and monitor vendors

Improve cost savings

- Turn costs into revenue
- Reduce new material costs

Enhance reputation

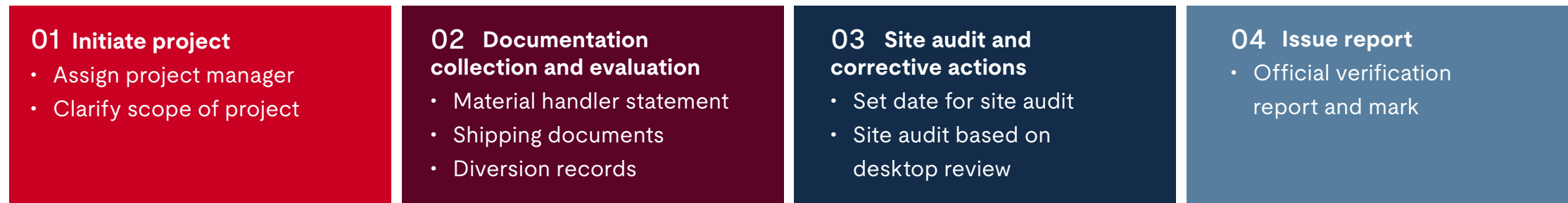
- Green the supply chains
- Enhance competitiveness

Who can achieve Zero Waste to Landfill validation?

Any company that produces waste, including:

Entities	Facilities or campuses with a specific address and defined boundaries	Mobile vessels or businesses	Time-based events
Examples	Restaurants, offices, sports stadiums, medical laboratories and manufacturing facilities	Food trucks and cruise ships	Concerts, construction projects

Typical validation process includes but is not limited to:



What is needed

Key information needed to start a Zero Waste To Landfill project:

- Materials inventory listing all of the goods produced and being discarded from the facility
- Standard Operating Procedures (SOPs) on how discarded materials are classified, handled and measured
- Quality systems to ensure that SOPs are correctly followed

- Waste hauler attestations to confirm the end-of-life pathway for the discarded materials
- Diversion rate calculations following the UL 2799 ECVP diversion equation
- Other documentation and steps may be required to complete the validation project, even if the above are the key pieces of information needed



What affects your waste diversion?

How much waste are you wasting?

What can you reuse?

Reused materials are employed in a function or application as a substitute for new commercial materials.

What can you reduce or eliminate?

Reduced material is the result of redefined processes, methods or materials that eliminate or reduce the mass of material or product discarded.

What can you recycle?

Recycled material is reprocessed from recovered material and made into a final product or into a component of a product.

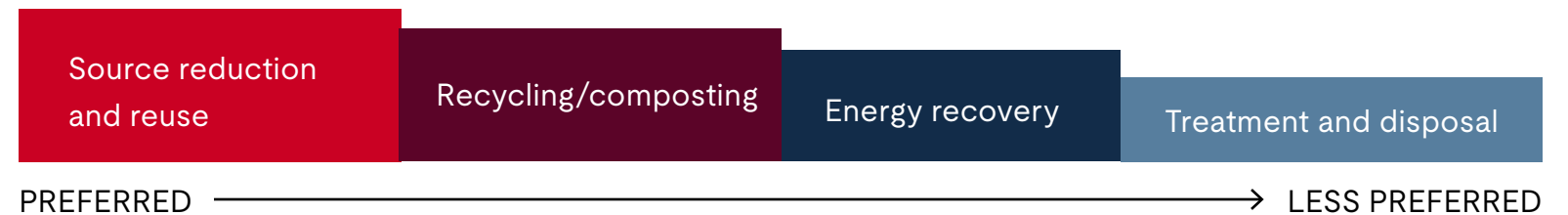
What can you compost?

Composting is the biological process of breaking organic waste into a useful substance by various microorganisms in the presence of oxygen. It also includes converting organic waste into industrial and manufactured products, such as fertilizer, tallow and industrial chemicals.

Can your waste turn into energy?

Waste-to-Energy (WtE) is the process of generating energy in the form of electricity or heat from the incineration of waste.

Waste management hierarchy



Source: U.S. Environmental Protection Agency, 2019 "National Overview: Facts and Figures on Materials, Wastes, and Recycling"

How is waste diversion calculated?

Diversion rate shows how much of your waste does not end up in a landfill.

The diversion equation

$$\text{DIVERSION RATE} = \frac{\text{Sum of mass of individual materials that are diverted}}{\text{Total mass of all material that is discarded}}$$

There are two types of diversion:

On-site diversion

Reusing materials or reducing the overall amount of waste created

→ E.g., switching to reusable pallets or redesigning manufacturing processes to reduce waste generation

Off-site diversion

Recycling materials, using waste as energy, and composting

In regard to off-site diversion, the UL 2799 Environmental Claim

Validation Procedure assumes that all materials leaving the site are properly processed by the processor as they have declared. If any materials are not processed as intended, they are considered landfill when calculating your diversion rate. If waste is not diverted, it ends up in a landfill or is incinerated without energy recovery.

Validation rates for zero waste

In order to receive a zero waste claim, your diversion rate has to be at 90% or higher. If your diversion rate includes a fractional value, the reported rate will be rounded up or down based on half-up rounding. For example, if your diversion rate is 99.5%, your claim will be 100%. If the diversion rate is less than 90% and above 80%, the site can still qualify for a certified landfill diversion claim. Lastly, a site must first reach a 90% diversion rate without WtE before WtE can be included in the calculation. WtE is also limited to a maximum of 10%.

Designation	Diversion rate (including WtE)
Certified Landfill Diversion Rate	>80%
Zero Waste to Landfill Silver	90%-94%
Zero Waste to Landfill Gold	95%-99%
Zero Waste to Landfill Platinum	100%

How do we treat waste exemptions?

There are laws that regulate how some types of waste can be disposed of, such as hazardous or toxic waste. UL 2799 ECVF allows for the exclusion of these materials from the diversion rate calculation to ensure comparability between industries and facilities with different mandated waste considerations.

In order to exempt this type of waste, you have to apply for a waiver. This application will ask for a description of the materials and a copy of the regulation mandating the disposal method for applicable waste.

Another instance where exemptions may apply is for the process of

Waste To Energy (WtE). WtE is the process of generating energy in the form of electricity or heat from the incineration of waste. Normally, the UL 2799 ECVF requires you to achieve 90% diversion through other methods besides WtE in order to be validated with a zero waste claim.

However, when WtE of materials with high energy value significantly reduces carbon emissions compared to conventional energy sources, more than 10% can be considered a source of diversion. This application will ask for a description of the materials and evidence through studies or other literature that can demonstrate the environmental benefit.

To contact a UL Solutions representative visit: [UL.com/ZWTL](https://www.ul.com/ZWTL)



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