



BENDIX DEVELOPS ZERO WASTE TO LANDFILL CERTIFICATION PROCESS FOR MANUFACTURING FACILITIES

SOLUTION OVERVIEW



2021 BETTER PRACTICE WINNER

Bendix Commercial Vehicle Systems LLC is a manufacturing company that develops and supplies leading-edge active safety technologies, energy management solutions, and air brake charging and control systems and components under the Bendix® brand name for medium- and heavy-duty trucks, tractors, trailers and buses. In 2015, Bendix began targeting alternative waste management strategies for industrial waste, which accounts for the largest quantities of waste generated. As the first step in this process, Bendix identified that approximately 50 percent of the trash output from their facilities was being deposited into landfills. Bendix began to investigate methods of reducing industrial waste generated from facility manufacturing processes. Step 1 in this investigation was a Spent Material Audit Process (also referred to as a Dumpster Dive). The audit analyzed what types and quantities of waste were being discarded by specific areas in the company, ultimately revealing the need to find solutions for organic materials and office waste. With this information in hand, Bendix formulated a plan to eliminate, reduce, or repurpose its waste materials.

Bendix began by drafting sustainable policies that emphasized reusable, compostable, or recyclable items at company locations, along with the elimination of Styrofoam and plastic water bottles. By the fourth quarter of 2020, Bendix implemented these policies and developed the Zero Waste to Landfill Certification Process. The process instructs Bendix sites on how to achieve and maintain Zero Waste to Landfill status. Zero Waste to Landfill is achieved by diverting 100% of the waste a company produces from a landfill to an alternate disposal source. The Zero Waste to Landfill Certification Process is reviewed monthly by Bendix sites and a yearly re-submission is required to ensure practices and procedures are maintained. In 2020 the company achieved Zero Waste to Landfill status by diverting 100 percent of the waste generated by the company from landfills.

ORGANIZATION TYPE

Industrial

BARRIER

Approximately 50 percent of trash from Bendix facilities was being deposited into landfills

SOLUTION

Development of Sustainable Policies and the Zero Waste to Landfill Certification Process to guide facilities on how to achieve Zero Waste to Landfill status

OUTCOME

Zero waste to landfill expected across Bendix facilities in 2021

POLICIES

Bendix developed a series of waste management policies as a result of their Spent Material Audit Process. These policies included banning the purchase of plastic bottled water and Styrofoam by the company. Additionally, the policies mandate the purchase of reusable, compostable, or recyclable items. A summary list of the policies is listed below:

- [Zero Waste to Landfill Process](#)
- [Managing Spent Material Audit – A Roadmap to Zero Waste](#)
- [Spent Material Audit Guideline](#)
- [Sustainable Food Service Policy – Hierarchy of Foodservice Products \(Styrofoam ban\)](#)
- [Zero Waste to Landfill Verification Process](#)
- [Zero Waste to Landfill Facility Submission Form](#)

PROCESS

Bendix approached waste management using the concept of the waste hierarchy pyramid. The waste hierarchy pyramid establishes an order of preference for actions to reduce and manage waste. Wherever possible, Bendix focused on moving up from the least preferred waste management strategy of landfilling to the most preferred methods of reducing, recycling, or recovery of waste.



Bendix faced several barriers in the process of achieving its goal of 100 percent landfill diversion. Under the initial plan, the company's facilities in Indiana, Kentucky, and Ohio would have had to transport their waste to Waste to Energy Disposal sites. The location of these sites meant additional costs compared to landfill disposal, but Bendix addressed this by devising a strategic alliance with a waste management company. This alliance increased the presence of the waste management company at Bendix sites and as a result, Bendix achieved the benefit of cheaper transportation cost plus assistance with waste tracking.

With a cost-effective method of moving waste to Waste to Energy Disposal sites, Bendix moved towards actually reducing the amount of waste that is going to landfill. Bendix addressed this by conducting a Spent Material Audit at company facilities to gather specific data on the trash being generated. This data informed the development of Bendix's Sustainable Policies and Sustainable Purchasing Guide. The Sustainable Purchasing Guide bans the purchase of plastic bottled water and Styrofoam by the company. Additionally, the guide mandates the purchase of reusable, compostable, or recyclable items whenever the company gets a new food service provider or has a company-sponsored event. Bendix also installed centralized office waste collection points and subsequently removed small trash containers.

Bendix further reduced the amount of waste to landfill by addressing the waste coming from remanufacturing operations. A significant barrier during this process was finding an alternative method of disposal for used brake pads. Bendix reached out to a waste broker who is currently developing a solution that would reuse this product as a cement aggregate and therefore divert this waste from landfill.

The COVID pandemic placed additional barriers to Bendix's goal of zero waste to landfill. The company had to perform additional sanitation and provide personal protective equipment (PPE), which created additional waste streams. In response, Bendix took action to support waste management processes by providing online training to help employees in the correct disposal of waste items. Ultimately, the additional trash generated from these actions is going to waste to energy.

Once these processes were in place, Bendix developed business cases that showcased the potential increase in waste disposal cost (due to the additional transport required) and how the additional opportunities to reduce waste generation will offset the added cost of waste to energy. Thus far, six Bendix facilities have achieved Zero Waste to Landfill certification.

Zero Waste to Landfill Certified Locations

Plant	Location	Product	Certification Date
Bendix Huntington Plant 1	Huntington, IN	Compressor Remanufacturing	08/27/2020
Bendix Huntington Plant 2	Huntington, IN	Torsion Vibration Dampers	08/27/2020
Bendix Huntington Plant 3	Huntington, IN	Post-Sales Center	08/27/2020
Bendix Distribution Center	Huntington, IN	North America Distribution	03/13/2021
Bendix Bowling Green	Bowling Green, KY	Air Disc Brakes	08/31/2020
Bendix Corporate Offices	Elyria, OH	Corporate Offices, R&D	08/31/2020

OUTCOMES

Implementation of the Zero Waste to Landfill Certification Process at Bendix facilities has led to the complete elimination of landfilling as a disposal method from company operations in the US and North America. Additionally, the policies developed based on the data captured by the Spent Material Audits are now ingrained in the standard operating procedures at Bendix. On an individual level, Bendix employees are taking increased accountability to achieve the next continuous improvement action that would move the company one step closer to Net Zero Waste.

Another positive outcome of the Zero Waste to Landfill Certification Process is that Bendix is now leading Knorr-Bremse's (Parent Company to Bendix) global waste reduction efforts related to Global United Nations Sustainable Development Goal 12: Sustainable Consumption and Production. Locally in the United States, the Zero Waste to Landfill Certification Process is being expanded to the rail division of Knorr-Bremse at facilities in Watertown, New York, and Westminster, Maryland.



Bendix THIS FACILITY IS CERTIFIED AS:

ZERO WASTE TO LANDFILL



BENDIX HUNTINGTON PLANT 1
1850 Riverfork Dr
Huntington, IN

Initial certification date:
August 27th, 2020



Setting the course together.

Knorr-Bremse for the Sustainable Development Goals.



MEASURING SUCCESS

Bendix quantified their progress towards Zero Waste to Landfill by tracking and calculating the percentage of waste diverted from landfills (%DFL) monthly for all US facilities. The %DFL metric is a key performance indicator for waste disposal and minimization of waste sent to landfill. The metric is measured in the tons of hazardous and non-hazardous waste not sent to landfill plus all recycled materials divided by the tons of waste, trash, and recycled materials combined. For all of 2020, Bendix established a target of 99.7 percent %DFL per month. The company surpassed this goal and in June 2020, realized a 100 percent %DFL. Furthermore, in during October, November, and December 2020, Bendix sent approximately zero tons of total waste to landfill. By year-end 2020, Bendix achieved 100 percent %DFL for the entire year.

BENDIX CVS 2020 US Manufacturing Facilities

	2019	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	2020
	Mo. Avg.													YTD
Industrial Waste (Tons)	178.25	205.44	185.79	170.78	150.49	157.57	187.51	121.16	141.91	117.22	163.08	103.22	105.50	1809.68
Trash (Tons)	43.74	29.44	18.18	21.14	25.18	18.85	9.72	43.05	14.07	42.75	27.32	28.30	30.91	308.91
Waste Generation (Tons)	222.00	234.88	203.97	191.92	175.67	176.42	197.23	164.21	155.98	159.97	190.40	131.52	136.41	2118.59
Recycled Materials	327.17	237.87	163.77	189.42	130.57	128.93	155.22	130.48	144.29	154.98	159.42	141.95	142.31	1877.11
Recycled Metals	531.97	434.94	362.15	487.37	248.34	234.88	289.99	303.79	317.21	426.22	349.41	349.93	344.73	4128.96
Total Recycled	859.14	672.81	525.91	656.79	376.91	361.72	445.22	434.27	461.49	581.20	508.84	491.87	487.04	6004.07

Solid Material Generation	1081.14	907.69	729.88	848.71	552.58	538.14	642.45	598.48	617.48	741.17	699.24	623.39	623.44	8122.66
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Recycling	996.5	672.81	526.02	656.79	376.91	361.72	445.22	434.50	461.49	581.20	508.84	491.87	487.04	6004.40
Reclamation	21.5	35.49	23.48	7.55	5.76	52.63	48.48	8.14	17.23	16.55	35.16	18.89	1.19	266.54
Energy Recovery	183.7	179.91	167.72	171.97	155.46	111.77	135.99	137.01	123.35	111.34	135.05	93.53	113.56	1636.05
Incineration	0.4	0.39	0.24	0.85	0.25	0.18	0.00	0.00	1.35	0.67	0.00	0.00	0.00	3.91
Landfill	42.4	0.60	0.60	0.60	0.60	0.30	0.30	0.30	0.30	0.30	0.00	0.00	0.00	3.90
% DFL Month	96.6%	99.9%	99.9%	99.9%	99.9%	99.9%	100.0%	99.9%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
%DFL YTD	96.6%	99.9%	99.9%	99.9%	99.9%	99.9%	99.9%	99.9%	99.9%	99.9%	99.9%	99.9%	100.0%	100.0%
% DFL GOAL	98.0%	99.7%	99.7%	99.7%	99.7%	99.7%	99.7%	99.7%	99.7%	99.7%	99.7%	99.7%	99.7%	99.7%

Overall, total waste sent to landfill went from 273.05 tons in 2019 to just 3.90 tons in 2020. Since 2016, the total weight of waste sent to landfill has realized significant improvements. Bendix achieved a 137.19 ton reduction in waste sent to landfills from 2018 to 2019 and a 269.15 ton reduction in waste from 2019 to 2020. Bendix anticipates that the tons of waste sent to landfills will be zero in 2021.

	2020	2019	2018	2017	2016
	YTD				
Recycling	6004.40	11957.88	10609.28	10336.61	8684.89
Reclamation	266.54	258.46	149.89	179.98	36.38
Energy Recovery	1636.05	2204.86	1985.26	2536.50	2460.74
Incineration	3.91	4.67	7.10	2.15	0.83
Landfill	3.90	273.05	410.24	468.96	327.04
% DFL Month	100.0%	96.6%	95.9%	95.7%	96.4%
%DFL YTD	100.0%	96.6%	95.9%	95.7%	96.4%
% DFL GOAL	99.7%	98.0%	97.0%	98.0%	98.0%

