



Wood waste reduction

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Is your industry burdened by excess wood waste? Do you generate more scrap wood or pallets than you can reuse, and then have difficulty disposing of them? This is a common problem throughout the country, and unfortunately, this valuable natural resource often ends up taking up valuable landfill space or is burned illegally, negatively impacting the environment. This fact sheet attempts to strike a balance between minimizing wood waste generation and the realities related to proper disposal of wood waste that can't be recycled or reused.

Sources of wood waste

Wood waste is generated from a variety of industrial operations, including furniture production, cabinet fabrication, and other manufacturing which uses wood to make products as part of its production process. Use of wood pallets generates waste for many businesses. If this type of wood waste is disposed, it is often classified as municipal solid waste or acceptable construction and demolition wastes.

During demolition or land-clearing operations, a considerable amount of wood waste can also be generated. Typically, this waste is disposed as commercial demolition and land-clearing (CDL) waste, or construction and demolition waste (C&D). EPA estimates 12.7 million tons of wood waste were generated in 2000 and that approximately 42 percent of residential new construction debris is wood waste. Typically, treated wood, which contains preservatives (pesticides) to extend the life of the wood, requires special disposal.¹ Kansas Department of Health and Environmental (KDHE) technical guidance at <http://www.kdheks.gov/waste/guidance/sw94-02.pdf> defines C&D wastes.

Burning

Some businesses and property owners have used small incinerators or have openly burned pallets, cardboard, documents, or scrap wood. These small incinerators are almost never in compliance with EPA or KDHE regulations, and in fact, should be dismantled. Open burning is banned in other than a few specific instances, such as emergencies. The SBEAP fact sheet, *Open burning—when is it allowed?*, found at <http://www.sbeap.org/ppi/industry/general.htm>, details open burning options and alternatives. KDHE informational sheets explaining current requirements can be found at http://www.kdheks.gov/air-permit/tech_guidance.html.

Case study

As a result of an enforcement action due to illegal wood waste burning, KDHE has worked out an agreement whereby a company will donate an air-curtain destructor to its resident county, which will then operate the unit for all county commercial and industrial facilities to use for clean wood waste incineration.

Landfilling these wood wastes is not always economically or environmentally preferred, and too many area businesses and industries have been illegally burning their clean wood wastes. This project will provide an economical alternative to landfilling or long-distance hauling to a recycling facility.

An air-curtain destructor operates much like an incinerator in the ground and provides an air flow or "curtain" across the upper portion of the chamber in which the wood is loaded. The powerful curtain of air created in the process traps unburned particles under the air curtain for re-burn of these particles at temperatures as high as 2000 degrees. This process provides for "re-burn" of the smoke and unburned particles, for more complete combustion of the wood waste, with very little smoke emitted from the process.

Burning (continued)

Wood can be an effective fuel for biomass combustion systems. Many industries in forested areas of the country do use wood-fired boilers. Potentially, industries with thermal or process energy demands may benefit from a steady source of wood waste. The difficulty is in matching the need with the supply. Certainly industries wanting to burn wood for fuel would need to make sure appropriate KDHE permits or approvals are in place prior to purchasing or installing equipment. Contact SBEAP at 800-578-8898 if you need help.

Other disposal

While some wood waste is reused for composting, mulch, and recycling of various forms, a majority still goes to landfills. Landfills are filling up with wastes that could be reduced, reused, or recycled rather than disposed. Proper management of wood waste can save money, conserve resources, and preserve the environment.

Benefits of recycling wood can vary greatly from company to company. Composting sawdust is highly beneficial, because it can decrease toxicity and reduce the volume of waste while producing a soil amendment. It requires minimal knowledge, space, and machinery. If time is not a factor, the sawdust can decompose with just moisture and aeration, but the time to decompose can be decreased with the addition of manure or other nitrogen-rich products. Businesses that desire to compost or dispose of their waste on site need to contact KDHE at 785-296-1121 for technical assistance and to determine if a permit is required.

Cabinet and furniture making

A large volume of wood waste is typically generated in cabinet and furniture manufacturing processes. Management of wood and wood waste, from receiving through dust collection, is key to saving money, increasing efficiencies, and reducing wood waste. Proper management includes—

- minimizing storage problems—avoiding damage from weather and humidity
- collecting dust and segregating wood wastes—improving sanding efficiencies by preventing dust from becoming embedded in the sanding belt and

keeping sawdust from becoming contaminated so it can be easily recycled

- training employees to minimize generation of wood scrap

An excellent reference that details good management practices for manufacturers that use wood is “***Waste Reduction Guide: Wood Furniture Industries***,” found on the Internet at

<http://www.p2pays.org/ref/01/00418.pdf>.

The following are some ways wood waste from these operations can be recycled or reused:

- Animal bedding—usually composed of sawdust, shavings, or chippings, needs to be dry and be free of chemicals and non-wood materials.
- Boiler fuel—cleaner to burn than fossil fuels and can be mixed with fossil fuels as a supplement. However, some wood wastes need to be dried or palletized before being used as fuel. Burning treated or coated wood could release hazardous air pollutants. Be familiar with applicable KDHE regulations before installing and operating a wood boiler.
- Chunkrete aggregate—a mix of concrete and small wood chips, producing a lightweight, low-strength material with increased insulating and sound absorption, used for road barriers and decking.
- Composting—should not contain any chemical contaminants; could be combined with food scraps, sewage sludge, manure, etc. in producing a soil amendment.
- Hardboard/fiberboard/particleboard—shavings and chips are pressed under heat and pressure to form panels. Consistent, high-quality feedstocks are required.
- Landscape mulch—shavings and chips which are used to control weeds, prevent water loss, and provide aesthetic uses.
- Reclaimed flooring—takes wood from old buildings and turns it into flooring.
- Trade schools—some schools take scrap wood for reuse.
- Wood plastic composites—combination of wood and plastic extruded into various shapes with numerous uses.

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Some public and privately operated wood waste recycling programs will chip, grind, or compost commercial wood waste. Tipping fees for these services are generally lower than landfill fees, but often the costs related to transportation create a barrier to using these programs. See the comprehensive list of wood waste outlets on the following page.

Wood pallets

With the demand for wood pallets on the rise, wood waste generated from this industry is becoming an ever-growing problem. More than 223 million pallets (6 million tons) were discarded at landfill facilities in 1995. Overall, about one out of four pallets purchased in 1995 was recovered/repaired.²

The first step in reducing pallet waste is to determine if there is an alternative to single-use pallets that would be appropriate, such as durable, returnable/reusable pallets or lightweight slip sheets. (Slip sheets are five-foot-square plastic or corrugated sheets. They are lighter, cheaper, and more compact than pallets. They can be moved with fork lifts, but special attachments are required.) If wood pallets are needed, examine internal procedures to determine how pallets are damaged; look for management solutions that will prevent damage; and establish ways to extend pallet use. Consider redesign of pallets if necessary.

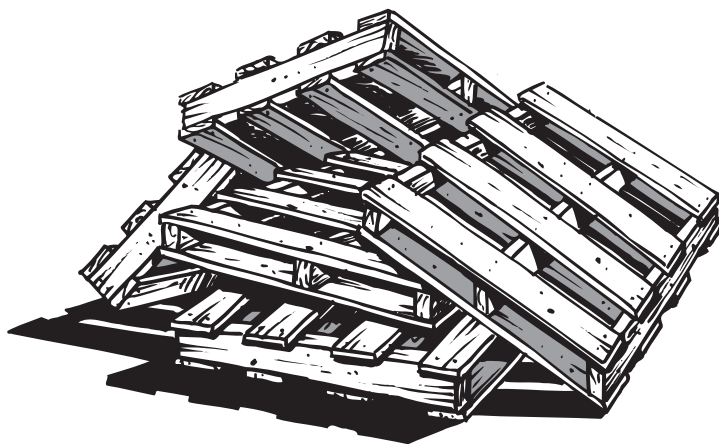
Instead of landfilling pallets, consider the following alternatives that offer financial and environmental benefits:

- Use more durable pallets made from plastics, metals, etc. They will last longer and can save money over the long run.
- Introduce take-back programs where customers standardize the sizes of pallets they will accept and require vendors to take back pallets when they deliver product.
- Switch from pallets to plastic slip sheets—a process that helped save Home Depot and its vendors an estimated \$2 million dollars in the first year.³
- Use recycled pallets, which are cheaper and can reduce handling costs.

- Repair and salvage material from used pallets to make new ones.
- Chip pallets and sell shavings for composting, mulch, or animal bedding.
- Pay lower tipping fees at landfills if pallets are received for recycling. Studies have shown that refurbishing pallets at the landfill can be economically viable.²

On average, pallets are used for fewer than two trips each. A sample cost comparison for different types of pallets is provided below.⁴ This is simply an estimate; actual costs will vary based on local factors such as durability of materials, items being shipped, cost of materials, etc.

	Hardwood	Softwood	Plastic	Corrugated /Plastic
Cost (new)	\$9.00	\$6.00	\$60.00	\$4.00
Cost (rebuilt)	\$6.00	N/A	N/A	N/A
Est. use life	25 trips	2 trips	100 trips	5 trips
Cost per trip	\$0.36	\$3.00	\$0.60	\$0.80



Wood Waste Reduction

Wood waste outlets in Kansas

The following companies offer various services from building and repairing pallets to grinding them for use as

animal bedding or landscape mulch. Call to verify preparation requirements, quantities, and transportation options. This is not a complete list of available companies or services and does not represent an endorsement by SBEAP.

Company	Services	Location	Phone
Ace Pallet Service	Buys used pallets; rebuilds or mulches	Kansas City	913-371-2777
Brooks Construction and Demolition Landfill	Accepts used pallets; makes and sells compost	Wichita	316-722-0601
Capital City Pallet, Inc.	Accepts 40x48 used pallets for repair and mulch; minimum load required	Topeka	785-379-5099
Emporia Pallets Plus	Buys used pallets; rebuilds; and grinds, burns, or landfills scrap	Emporia	620-342-7586
Evergreen Pallet	Buys used pallets; rebuilds; mulches scrap	Wichita	316-821-9991
Hoyt Pallet Co.	Accepts or buys used pallets; rebuilds; gives away scrap	Hoyt	785-986-6785
Industrial Pallet and Lumber	Accepts pallets and trees for a fee; mulches and sells mulch	Wichita	316-832-0400
Joe's Pallet Yard	Buys used 40x40 or 40x48 pallets; rebuilds; gives away scrap	Haysville	316-806-5544
Locust Hill Farms	Buys scrap boards; makes smaller products	Newton	316-284-4781 (cell)
Midwest Pallet	Buys standard-sized used pallets; rebuilds; third party handles scrap	Kansas City	913-371-3555
Wheat Straw Products	Combines wood waste with straw, compressing into pellets for burning	Bushton	620-562-7167 (cell)
One Accord Enterprise	Picks up used pallets; rebuilds and sells; third party handles scrap	Manhattan	785-375-4255
Pal-Co	Buys 40x48 used pallets; rebuilds; landfills scrap	Hutchinson	620-663-6191
Pallets Plus	Charges for used pallets according to condition; rebuilds; mulches scrap	Topeka	785-862-0771
R&R Pallet Service	Accepts wood scrap for a fee; grinds, sells mulch to businesses	Garden City	620-275-2394
Schneider Pallets	Buys 40x48 and 40x40 used pallets; rebuilds; burns scrap	Natoma	785-885-4516
Scott's Pallet and Lumber	Buys used GMA pallets; rebuilds; burns scrap for heat	Hutchinson	620-662-5613
Seward County Landfill	Accepts wood scrap and used pallets for a fee; grinds, sells mulch (colored or natural) to businesses or public	Liberal	620-626-3266
Sonny's Pallet Service	Buys used pallets; rebuilds and sells; third party recyclers handle scrap	Kansas City	913-299-9872
Southeast Kansas Recycling	Recycles pallets	Pittsburg	785-231-8930
Whiteley's Pallet and Blocking	Buys used pallets; rebuilds; burns scrap for heat or landfills	Topeka	785-233-3801
Woodstock LLC	Picks up wood waste; makes products such as stakes	Newton	620-344-6886

Construction and demolition

Traditionally, when buildings are torn down, very little of the building is salvaged. Recently, however, the “deconstruction” industry is growing. Deconstruction is an alternative to demolition and landfilling, and combines the salvage and recovery of building materials for creative reuse and recycling. It is the process of removing a building by taking it apart in the reverse order of construction. As with any recycling, labor and transportation costs are key to economic success. Finding a local market for products is critical. Often, local businesses will accept good quality used building materials such as banisters, beams, buffets, cabinets, columns, doors, flooring, lumber, mantles, and staircases. The Deconstruction Institute, <http://www.deconstructioninstitute.com/index.php>, a project funded by the Florida Department of Environmental Protection, is a good resource for techniques, case studies, and tools. When disposal is required, a C&D landfill may be the best option.

Case study

When Johnson County built their new facility, a “green” facility, the decorative wood used near the front entrance was recovered from what was previously designated as waste at a different construction site. In addition, the facility is estimated to have utility savings of 40% as compared to other similar buildings. Read more about this building design at <http://facilities.jocogov.org/buildings/Sunset.htm#bf>.



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Land clearing/storm damage

Kansas operates more than 400 active burn sites for the purpose of burning trees and brush. Many of these are located at permitted, solid-waste landfills and transfer stations. These sites are not to be used for burning commercially generated wastes.

Where can I get more help?

SBEAP operates a toll-free technical hotline you can call for additional assistance. In addition, SBEAP can visit your facility to review current compliance needs and identify pollution prevention opportunities. Contact SBEAP at 800-578-8898 or sbeap@ksu.edu.

References

- ¹ Treated Wood: Use, Disposal, and Alternatives for Businesses
www.pca.state.mn.us/waste/pubs/4_67.pdf
- ² Wood Pallets and Landfills – Status and Opportunities for Economic Recovery and Recycling
http://www.srs.fs.usda.gov/pubs/ja/ja_araman039.pdf#xml=http://www.fed.us/cgibin/texis/searchallsites/search.allsites/xml.txt?query=pallet&db=allsites&id=424adeca0
- ³ Slip Sheets Replacing Pallets at Home Depot
www.ciwmb.ca.gov/Packaging/CaseStudies/HomeDepot.htm
- ⁴ Are you wasting pallets and money?
www.moea.state.mn.us/berc/pallets.cfm

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