California Waste Tire Generation, Markets, and Disposal: 2005 Staff Report

Introduction

California is faced with the challenge of safely managing 40.8 million reusable and waste tires generated annually in the state. In addition, an estimated 1.5 million tires remain in unpermitted stockpiles in California. In 2005, the state nearly tripled the number of waste tires that were diverted in 1990.

However, the number of waste tires generated annually continues to exceed the number of tires diverted. California Integrated Waste Management Board (CIWMB)staff estimated that in 2005, 30.6 million of the 40.8 million reusable and waste tires generated (75 percent) were diverted from stockpiling or disposal.

This report focuses only on waste tires generated and markets for these tires. The report provides estimates of reusable and waste tire generation, consumption, and disposal in California for 2005. For additional information on the CIWMB tire program, please visit our website at www.ciwmb.ca.gov/Tires/.

Estimate of Waste Tires Generated

California has struggled with the task of estimating how many waste tires have been generated during the calendar year. During the years between 1990 and 2000, CIWMB used the factor of 0.915 tires per person per year, which was developed by an industry survey in 1991 and 1992.

In 2001, CIWMB staff reassessed the validity of this method of calculating the generation rate and determined that the 0.915 factor needed to be updated. Staff therefore selected the number 0.958 as the waste tire generation factor for 2001 and 2002.

This number is halfway between the previous California factor of 0.915 and the U.S. factor of 1. For 2003, to calculate the number of reusable and waste tires generated in the state, CIWMB primarily used population statistics and State industry trends and approximations.

Because of the changing economic infrastructure and the variety of tire-derived products available on the market, staff determined that the adjustment factor should be slightly higher than the U.S. Environmental Protection Agency (U.S. EPA) number. The U.S. EPA calculates the number of waste tires by using the formula of one waste tire per person per year to obtain an average for the nation.

Based on a survey of major industry stakeholders and on other available sources, CIWMB staff estimated that of the approximately 40.2 million reusable and waste tires generated in 2005, approximately 30.6 million of the tires (75 percent) were diverted through various alternatives, including reuse, retreading, and combustion. Table 1 and Figure A present waste tire generation, diversion, and disposal in California for 2005.

Further, because of the lack of a uniform reporting system in past years on tire recycling activities in California, CIWMB has also relied on estimates to quantify tires recycled or diverted from landfill disposal and stockpiling. Staff arrived at these estimates by using information from industry contacts that transport, process, and/or recycle large quantities of waste tires.

For more accurate data to estimate the future waste tire generation, diversion, and disposal, CIWMB has awarded a contract to California State University of Sacramento to conduct “A Waste Tire Generation and Diversion Data Study.”

Markets for Waste Tires

Reuse

An alternative to disposal is tire reuse. After the purchase of new tires, the remaining reusable tires that still have a legal tread depth can be resold by a dealer, rather than being disposed of or recycled prematurely. Based on information from industry contacts, 1.2 million tires, or 3 percent of the estimated 40.8 million reusable and waste tires generated in 2005, were reused.

Crumb Rubber, Rubberized Asphalt Concrete, Alternative Daily Cover, and Civil Engineering Uses

Based on information from industry contacts, CIWMB staff estimated about 3.2 million tires were used to generate crumb rubber to manufacture crumb rubber products,[*] including playground cover, speed bumps, carpet tile, mats, sound walls, and other various cut, stamped, or molded products.

In addition, 2 million tires were used for rubberized asphalt concrete (RAC). Staff estimates 6.7 million tires were used for other activities, including 4.7 million tires for alternative daily cover (ADC). Approximately 2 million tires were used for civil engineering projects, such as landfill gas collection trenches, lightweight fill, and a levee reinforcement project.

Recycling and Other Uses

Staff estimated that 3.2 million waste tires were recycled (and used in products such as those made from ground rubber products) and put to other uses (such as agricultural uses).

Retreading

Tire retreading is a viable option for renewing reusable tires by reusing the tire casing after the legal tread has worn off. Based on surveys, industry contacts, and information obtained from the Tire Retread Information Bureau (TRIB—www.retread.org), there are 59 active retread plants in California. These plants sold an estimated 757,000 retreads in 2005. Most of these retreads were medium- and light-truck tires, with a very small percentage for industrial, farm, small aircraft, and passenger tires. Using an average weight of 120 pounds per medium-truck tire for retreads, CIWMB staff has determined that in 2005, approximately 4.4 million passenger tire equivalents (PTE) were retreaded tires sold in California.

Exported Tires

Tire export (both reusable and waste tires) reduces the number of tires requiring eventual disposal in California. According to industry contacts and staff estimates, approximately 2.3 million reusable and waste tires were exported in 2005.

Combustion

Tire combustion significantly reduces the number of tires requiring landfill disposal or stockpiling. In 2005, about 9.1 million tires were combusted as fuel in California (7.4 million were consumed by the cement manufacturing industry, and 1.7 million were consumed by a cogeneration plant in Stockton).

Imported Tires

CIWMB staff estimates that in 2005, approximately 1.5 million waste tires were imported into California for recycling from Utah, Oregon, Nevada, Arizona, and Canada. Imported waste tires were used in combustion as a fuel supplement and to generate crumb rubber. Imported tires have also been disposed of in landfills.

While not all disposal facility operators kept track of data on imported tires disposed of in landfills in 2005, staff is now working with industry to track these imports more accurately. The interstate transport of waste tires is market-driven; neither State nor local governments can regulate import and export of tires. Factors influencing importation are geographic proximity to end users and subsidies provided by other states or countries to facilitate collection, recycling, and disposal of waste tires.

Summary

Figure A displays information pertaining to waste tire reuse, recycling, diversion, and disposal in California. In 1990, CIWMB staff estimated that 11.3 million of the 33.8 million California waste

[*] In actuality, more tire rubber is used for RAC or crumb rubber products. However, the extra rubber used consists of tire buffings from tire retread operations. These tires are already accounted for as retreaded tires.

tires generated were diverted from landfill disposal and stockpiling (34 percent). In 2005, staff estimated that 30.6 million of the 40.8 million California tires generated were diverted from the annual waste stream (75 percent).

Table 1: California Waste Tire Generation, Diversion, and Disposal, 2005
(Numbers except for diversion percent in millions of passenger tire equivalents[1])

A	B	C	D	E	F	G	H	I	J		K	L	M	N
Generated A=L+M	Reused	Crumb Rubber	RAC	Civil Engin. Applic.	Alternative Daily Cover	Recycling and Other Uses[2]	Retreads[3]	Exported	TDF		Imported	Diverted[7]	Disposed Of[8]	Diversion Percent[9]
									Cogen-eration[4]	Cement[5]				
40.8	1.2	3.2	2.0	2.0	4.7	3.2	4.4	2.3	1.7	7.4	1.5	30.6	10.2	75 %

[1] Based on an average weight of 20 pounds per passenger car waste tire. One passenger car waste tire generates 12 pounds of crumb rubber.

[2] "Recycling and Other Uses" includes tires used in ground rubber products and other products made from waste tires. It does not include tire buffings from retreading operations because buffings are accounted for in the “Retreaded Tires” category. However, tire buffings are recycled. Therefore, the number of waste tires recycled is greater than shown here.

[3] Retreaded tries are mainly medium- and light-truck tires. CIWMB staff used an average weight of 120 pounds per retreaded tire.

[4] Represents the number of tires combusted in power plants primarily from the annual waste tire stream, but may also include some stockpiled tires from site cleanups.

[5] Represents the number of tires combusted as fuel supplement in cement kilns, primarily from the annual waste tire stream, but may also include some stockpiled tires from site cleanups.

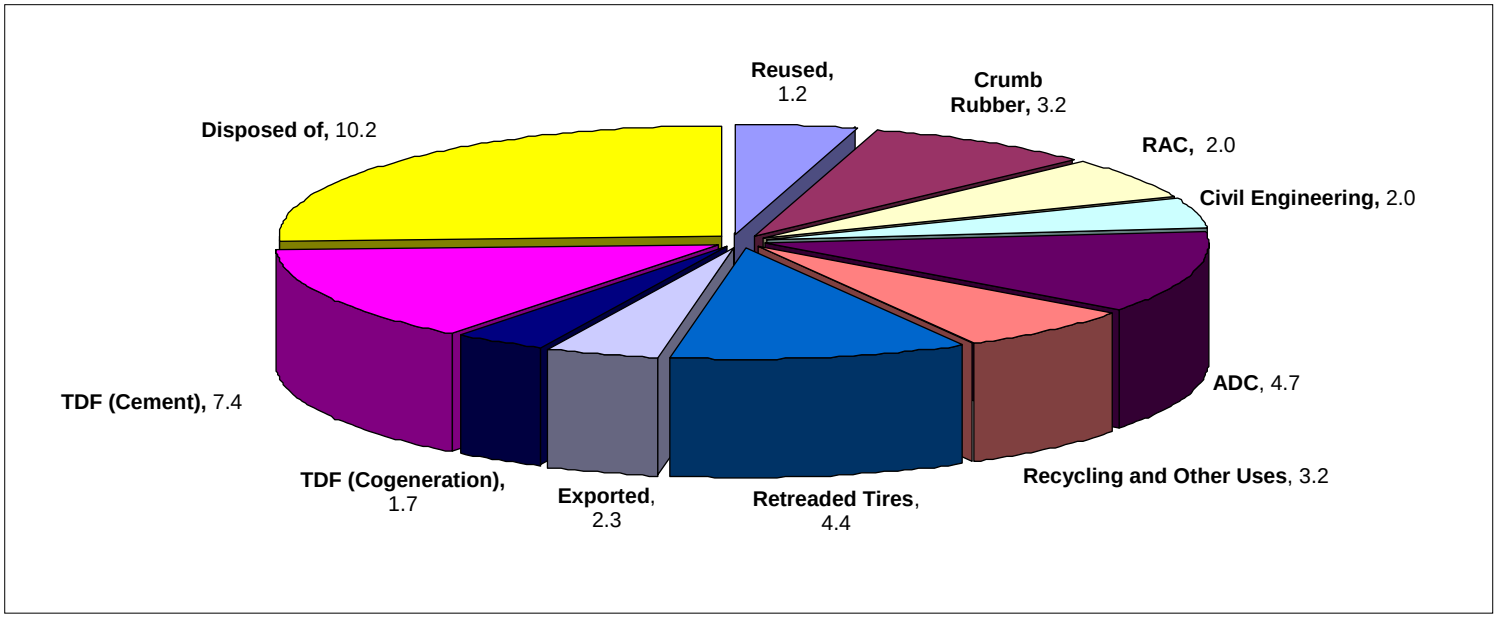
[6] Includes tires imported for combustion as fuel supplement or used to generate crumb rubber.

[7] Determined by summing Columns B, C, D, E, F, G, H, I, J, and K, and subtracting Column K.

[8] Determined by summing the number of tires disposed of at landfills and mono-fills, primarily from the annual waste stream.

[9] Represents the percentage of waste tires diverted primarily from the California-generated annual waste stream.

Figure A: Estimated Reusable and Waste Tire Recycling and Disposal, 2005
(Numbers in millions of passenger tire equivalents)



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