

# ENVIRONMENTAL FOOTPRINT COMPARISON TOOL

*A tool for understanding environmental decisions related to the pulp and paper industry*



SOLID WASTE

## EFFECTS OF RECYCLED FIBER USE ON SOLID WASTE

### Wastes from Manufacturing

The manufacture of paper and paperboard results in the generation of solid waste. The amounts generated vary among mills depending on a number of factors, including the type of products made and the manufacturing processes being used. In considering the co-benefits and trade-offs between increased recycling and solid waste generation, one must consider the differences in solid waste generation between virgin and recycling mills making comparable grades. It should be noted that in terms of hazardous waste generated in pulp, paper, and paperboard manufacturing, the amounts are very small in all cases.

The following table contains representative paper and paperboard mill solid waste generation rates. It is important to understand that for some grades, linerboard and medium/fluting for instance, it is increasingly rare for products to be made only of virgin fiber. In addition, the total amounts of solid waste will be influenced by factors other than whether the mill is a recycled fiber mill or a virgin mill. Ash is generated in the burning of some fuels, with the amounts depending primarily on the selection of fuel. Also, biological sludges are generated at many mills with secondary wastewater treatment plants, with the amounts varying depending, in part, on the design and operation of the treatment plant. The generation of these additional solid wastes is only loosely related to whether the mill is a virgin or recycled mill, meaning that they are less important than process-related solid wastes in considering solid waste trade-offs.

The information in the table illustrates that for products consisting mostly of bleached chemical pulp fiber (e.g., tissue, toweling, copy paper) the amount of solid waste from recycled mills is much greater than the amount from virgin manufacturing, with recycled production resulting in approximately 200 to 300 kg per tonne of additional mill-related solid waste. Statistical analysis of NCASI site-specific data confirms that solid waste generation from recycled mills is higher in these types of recycled mills.

For grades of paper composed primarily of mechanical fibers (e.g., newsprint), recycled production results in about 150 kg per tonne more solid waste than virgin production. Statistical analysis of NCASI site-specific data confirms that solid waste generation is higher at recycled newsprint mills compared to virgin newsprint mills.

In the case of containerboard and recycled paperboard as well as bleached board, the differences between virgin and recycled production are much smaller. The data below suggest that solid waste generation rates at virgin and recycling mills in these sectors overlap to a great degree. Statistical analysis of NCASI site-specific data confirms this observation.

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**Table R18.**

Type of Paper or Paperboard	Solid Waste Generation (dry kg per tonne)*	Reference
Recycled graphic paper (e.g., newsprint) from news and magazines	150 to 200	Paulapuro 2000
Recycled graphic paper (e.g., newsprint) from "superior grades"	100 to 250	Paulapuro 2000
Recycled newsprint	376**	Paper Task Force 2002
Paper (e.g., newsprint) from mechanical pulp (includes solid waste from pulping and papermaking)	20 to 30	Springer 2000
Virgin newsprint	215**	Paper Task Force 2002
Hygienic paper (tissue and toweling)	280 to 400	Gottsching and Pakarinen 2000
Market deinked pulp	320 to 400	Gottsching and Pakarinen 2000
Recycled office paper	376**	Paper Task Force 2002
Virgin kraft pulping and papermaking	25 to 35	Springer 2000
Virgin office paper	197**	Paper Task Force 2002
Recycled containerboard (linerboard and medium/fluting)	40 to 90	Gottsching and Pakarinen 2000
Recycled containerboard (corrugated)	105**	Paper Task Force 2002
Virgin kraft or semi-chemical pulping and board production	25 to 40	Springer 2000
Virgin containerboard (corrugated)	108**	Paper Task Force 2002
Recycled boxboard, tube stock and other recycled paperboard	40 to 90	Gottsching and Pakarinen 2000
Recycled paperboard	105**	Paper Task Force 2002
Virgin unbleached kraft or semi-chemical pulping and board production	25 to 40	Springer 2000
Virgin unbleached board	86**	Paper Task Force 2002
Coated recycled paperboard	105**	Paper Task Force 2002
Virgin bleached board	96.5**	Paper Task Force 2002

\*Except as noted, does not include biological sludge from wastewater treatment or ash from fuel combustion.

\*\* Includes all mill solid wastes, including ash, biological wastewater treatment sludge and other solid wastes.

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## References

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