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No clear environmental answer on bags, says paper

(August 14, 2012): There is no reputable, peer-reviewed life cycle analysis of paper and plastic grocery bags used in Canada that proves one is “environmentally better” than the other, according to the paper packaging industry’s environmental council, PPEC.

“What we have instead,” says executive director, John Mullinder, “is a proliferation of misleading statements and claims, frequently being peddled by commercial self-interest, and some flawed studies that have little to do with the bags that Canadians actually use.”

Most of the paper grocery bags that Canadians use are originally sourced from renewable forests that have been certified by internationally recognized third parties as being sustainably managed¹. Canada, in fact, leads the world in third-party sustainable forest certification, representing an amazing 42% of the world’s total certified forest².

And surprising as it may sound, paper grocery bags don’t come directly from the tree: they are rather made from “leftovers”; from wood chips, shavings and sawdust left over from logging and sawmilling operations (the lumber being used to build homes, schools, hospitals et cetera). And the trees are

¹ The Canadian Council of Forest Ministers (which comprises Canada’s federal and provincial forest ministers) has acknowledged that the following three standards demonstrate and promote the sustainability of forest management practices in Canada: Programme for the Endorsement of Forest Certification (PEFC), which has endorsed both the Canadian Standards Association (CSA) specifications and those of the Sustainable Forest Initiative (SFI); and the Forest Stewardship Council (FSC). www.sfmcanada.org

² Over 150 million hectares of Canadian forest is certified to one or more of the three globally recognized certification standards, meaning 42% of the world’s entire certified forests are right here in Canada. www.certificationcanada.org

The Paper & Paperboard Packaging Environmental Council (commonly known as PPEC) is the national trade association representing the Canadian paper packaging industry on environmental issues. Its members include both the mills that produce containerboard, boxboard and kraft paper packaging and the converters who turn this into boxes, bags and cartons.

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regenerated³. An increasing percentage of bags is also now being made from recycled material (from old corrugated boxes collected at retail and curbside).

Many of the so-called life cycle studies being touted as applicable to Canadian circumstances are based on false assumptions, says Mullinder. For example, some studies assume that the energy used to make kraft paper is 100% purchased electricity. This is not the reality in Canada. All the kraft paper producing mills in Canada generate steam and electricity from wood and process wastes (chips, shavings, sawdust). These are burned in the mill's recovery and power boilers to make energy and to recover the pulp-making chemicals. Usually this accounts for 60 to 80% of the energy used in a Canadian kraft paper mill.

The trend is to ramp this up so that the mills become what are called "energy islands" where they are producing more electricity than they consume themselves and so can receive revenue by selling what they don't need to the local energy grid. While Canada has now abandoned the greenhouse gas targets espoused by the Kyoto Protocol, one of its underlying measuring principles (that wood and wood waste is energy neutral and does not contribute to GHG accumulation), is still widely supported in scientific circles.

"It's very much a case of consumer-beware," says Mullinder. "False assumptions about energy usage for example, can completely skew your conclusions about overall environmental impact. Yes, we use energy to make paper, but most of it is *renewable* energy (carbon-neutral biomass)."

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³ By law, all forests harvested on crown land (93% of Canada's forest land is publicly owned) must be successfully regenerated. About 72% is currently regenerated through tree planting and direct seeding, while the remainder is regenerated naturally. *State of Canada's Forests, Annual Report, Natural Resources Canada.*



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Comments on two studies frequently referred to in the debate:

(1) Nolan-ITU *et al* (for the Australian Department of Environment and Heritage). The first of these studies (*Plastic Shopping Bags—Analyses of Levies and Environmental Impacts*, 2002) devotes only four paragraphs to the kraft paper bag and all it offers is a repeat of claims originally made at least 21 years ago.¹ Apart from that, the only specific reference to *actual paper data* is to a Melbourne-based study (*Stage 2 Report for Life Cycle Assessment of Paper and Packaging Waste Management Scenarios in Victoria*). The disclaimer on this study is worth reading but the clincher is that paper bags are not even analysed here (!!!) and that the functional unit is not environmental performance but rather waste management.²

A second Nolan-ITU study (*The impacts of degradable plastic bags in Australia*, 2003) outlines life cycle system boundaries for various plastic options but none for kraft paper.³ As you would appreciate, system boundaries are crucial for credible life cycle comparisons to be made.

Nolan-ITU acknowledges that greenhouse gas emission values are dominated by electricity and fuel consumption, but then gives no sources for the data it uses to compare kraft paper with plastics. It says: “Kraft paper is high in (resource depletion) due to the consumption of electricity and gas in paper production”⁴ but no source is given for the data or the energy mix used (which, as we point out later in our comments on the Carrefour study) is quite different in Canada and Québec).

(2) The Carrefour Study: The Scottish Government recently rejected the Franklin, Fenton and Nolan-ITU studies as inadequate, preferring instead the 2004 Ecobilan study of French supermarket

¹ Nolan-ITU for Australian Department of Environment and Heritage (*Plastic Shopping Bags--Analyses of Levies and Environmental Impacts*, 2002), section 4.2.6, page 33. It repeats claims made in the Winnipeg Project report without apparently even seeing it, preferring the modified version that appears on the British Plastics Federation website.

² Grant T. James K. Lundie. S. Sonneveld K. (*Stage 2 Report for Life Cycle Assessment of Paper and Packaging Waste Management Scenarios in Victoria*, Executive Summary, January 2001). The Disclaimer is on page 3, the “functional unit” outlined on page 6, and the materials studied (including some paper, but not bags), is listed on page 9.

³ ExcelPlas Australia, Centre for Design at RMIT, Nolan-ITU for Australian Department of Environment and Heritage (*The impact of degradable plastic bags in Australia*, 2003, page 67).

⁴ *Ibid.* section 6.6.1 on page 79 and 6.6.2 on page 80.



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chain Carrefour's operations as being more appropriate guidance for Scottish conditions.⁵ However, it noted several major problems with the Carrefour study.

- (i) *the age of the data* (the 1990s, i.e. old)⁶
- (ii) *the source of the bags* (Malaysia, Spain and France for plastic and Italy for paper). "Most plastic bags used in Scotland will not be manufactured and produced in these countries. Instead it seems likely that most plastic bags will be manufactured and produced in China (*we understand that about 30% of the plastic grocery bags used in Canada are sourced and/or manufactured in Asia*) where the energy mix is different to Europe and industry operates to different environmental standards. It is unlikely that most paper bags in Scotland will be manufactured in Italy, as assumed by Carrefour."⁷ (*We look forward to an LCA that recognizes that 30% of the plastic grocery bags used in Canada are sourced and/or manufactured in Asia.*)
- (iii) The prime source of electricity assumed in the French Carrefour study is nuclear, particularly for reusable bags. What's really important in a Canadian context, however, is that *all kraft paper producing mills generate steam and electricity for their own paper production from wood and process wastes (chips, shavings, sawdust) not 100% purchased petroleum-based energy, as many so-called LCAs assume.* The chips and shavings are burned in the mills' recovery and power boilers to make energy and to recover the pulp-making chemicals.
- (iv) Usually this accounts for 60-80% of the energy used in a Canadian kraft paper mill. The trend is to ramp this up so that the mills become "energy islands" where they are producing more electricity than they consume themselves and so can receive revenue by selling what they don't need to the local grid. One of the underlying measuring principles of the Kyoto Protocol is that wood and wood waste energy is energy-neutral and so does not contribute to greenhouse gas accumulation.
- (v) The Scottish backgrounder also observes that the rationale for some aspects of the Carrefour analysis is "*unclear and possibly questionable. For example, it appears that greenhouse gas emissions of bags at the end-of-life are treated similarly irrespective of the nature of the raw material inputs. Emissions of carbon dioxide from the decomposition of paper, for example, can be considered part of the carbon cycle and hence do not add to the total carbon dioxide load in the atmosphere. However, emissions of CO2 from plastic bags are additional to the existing CO2 load because they originate from fossil carbon, previously unavailable to the atmosphere.*"⁸

⁵ Research Report 2005/2006 (*proposed Plastic Bag Levy –Extended Impact Assessment volume 2* for the Scottish Government, August 2005, Appendix 3: Life Cycle Analysis Background Information available at [http://www.scotland.gov.uk/Publications\(2005/08/1993259/33001](http://www.scotland.gov.uk/Publications(2005/08/1993259/33001)

⁶ Ibid. page 3/16

⁷ Ibid. page 3/16

⁸ Ibid. page 3/16