



NAPCOR PET Thermoformed Packaging Recycling Initiative

Program Summary To December 31, 2010

Overview:

In 2009, NAPCOR embarked on a major initiative to identify and remove the obstacles that prevent PET thermoformed packages from being recycled. Much of this work was enabled through Ontario's Waste Diversion Ontario (WDO) and Stewardship Ontario, both of which have been active partners providing data, recycling program information, perspectives and contacts, as well as financial assistance.

The strategy employed to date has been threefold:

- 1) Commission various research and studies to identify the potential technical barriers, findings that can be disseminated to PET bottle reclaimers;
- 2) Work with Ontario MRFs that are collecting thermoform material within their programs, identify potential market options, and coordinate the movement of materials to US and Canadian reclaimers engaged in R&D work;
- 3) Work with reclaimers by passing along technical information on barriers identified and market options for the clean recycle produced.

The objective of this work was to provide MRF operators with a number of U.S. / Canadian market options that would all result in the PET thermoforms being recycled. Far eastern export markets are recognized as a current reality, but are not viewed as viable ongoing options. The domestic market options being pursued are:

- Dedicated bales of PET thermoforms;
- Bales of PET bottles and PET thermoforms mixed;
- Bales of mixed rigid plastic containers, including PET thermoforms

Progress to Date:

Technical Research: Plastic Technologies, Inc. of Toledo, Ohio, an internationally renowned test laboratory, was commissioned to process three aggregate samples of post consumer PET thermoform from the US and Canada and evaluate the fitness of the recycle produced in the production of sheet, fiber and bottles. The tests and subsequent analysis determined that the material itself was suitable to be used at percentages reflecting future

aggressive market penetration for bottles and sheet. However, issues of residual adhesives and fluorescence presented cosmetic challenges severe enough to prevent use in all three of the end-use applications tested. A test protocol was developed to guide brand owners that use thermoform packaging as to the compatibility of the labels used on those packages with those in the existing bottle stream. This protocol is in the final phase of the Association of Postconsumer Plastics Recyclers (APR) approval process and is expected to be issued shortly. The Canadian Plastics Industry Association (CPIA) and the APR also provided financial support for this phase of the project.

Market Options:

- Dedicated PET Thermoform Bales: Because PET, PVC, OPS, PLA and OPP thermoforms all look the same, it is not reasonable to assume that MRF operations that rely exclusively on manual sorters will be able to meet the 5% contamination (maximum) levels that reclaimers prefer. Therefore, the specification currently being used stipulates that packages be identified as PET through the use of an auto-sort unit, removed from the bottles, and baled separately.

NAPCOR has coordinated the shipment of over 700,000 pounds of this type of material to seven reclaimers to date in an effort to familiarize them with the material. Special mention must be made to the Region of Waterloo that provided much of that material and were an active partner in the project. As a result, we have been told that two operations will be retrofitting their lines to be able to accommodate thermoforms in the spring of 2011. We have also provided samples of this material to equipment manufacturers that are working with companies planning to bring on new plants in 2011. We've been told that two of these plants will have the capacity to run this type of bale by second quarter 2011. One of these operations is already actively purchasing this material and others are expected to follow shortly.

- PET Thermoforms within Mixed Rigid Bales: NAPCOR, along with SO and WDO, has been working with Ontario reclaimers to identify a market for the PET fraction recovered from mixed rigid packaging bales. This is more highly contaminated recycle than that normally produced by PET bottle reclaimers, and thus requires more robust market options. Four potential applications have been identified and multiple samples have been trialed and evaluated. Three of these four potential markets have indicated that they could use all of what is projected to be produced

if they allow for some additional processing. Based on preliminary indications of market acceptance and committed technical funding, we are optimistic that this market option will also be in place for the third quarter 2011 and thus expand market opportunities for MRFs without auto-sort capability.

- PET Bottles and Thermoforms Mixed: While this is the preferred option for all concerned at this time, it is not reasonable to expect it in the short term. A wide range of issues including variable IVs, adhesives, fluorescence, and additives – in addition to the multi-resin, look-alike issue – must be worked out before the two packages can be recycled together in an efficient manner. There are two reclaimers currently trying to process this mix on a limited basis; thus far, results have been inconclusive. Data from the aforementioned NAPCOR/CPIA/APR-sponsored research indicates that while there should be no technical “showstoppers,” the economics may be challenging, at least until Stewards start to adopt the design-for-recycling protocols that are being developed.