

## EXECUTIVE SUMMARY

MARCH 2015

### MULTI-LAYER LAMINATES & FILMS RECYCLING PROJECT 2014 PROGRESS REPORT



The purpose of this PAC NEXT executive summary is to share the progress made on the multi-layer laminates and film recycling project program through 2014 and to highlight priorities for 2015.

#### **Team Membership & Project Objectives:**

The project co-chairs are Guy McGuffin of Guy McGuffin Consulting and David Yousif, City of Hamilton. The project team had the participation of 33 PAC NEXT members (see list in Appendix). The program objectives are as follows:

- To bring together industry experts to evaluate and develop strategies to recover and recycle flexible mono and laminated films
- To explore opportunities to run pilot programs (with partners) for both mono films and multi-layer laminates.

#### **Project Highlights:**

The project team held 7 meetings through 2014 including one Material Recovery Facility tour at the City of Hamilton. The team leveraged earlier work sponsored by CPIA / CIF / SO and supported by PAC NEXT, "Analysis of flexible film plastics packaging diversion systems" which highlighted the reality that regular mono films that have good end markets needed to be kept separate from multi-layer laminate films that do not have viable end markets today (see report here: <http://ow.ly/K6JLn>). As such, the emphasis has been on creating a forum for expert information sharing including guest presentations as follows: (Continued on the next page)

- Enval presentation on Aluminum recovery from laminated packaging:
  - Patented technology based on a process known as Microwave Induced Pyrolysis, developed at the University of Cambridge. Plant in Alconbury UK can process 2000 tonnes of laminates per year (10% Al) efficiently recovering aluminum and hydrocarbons while delivering a reduction of 80% in the carbon footprint associated with the disposal of laminate packaging.
- TeTechS presentation on Terahertz sensor technology to characterize different plastic laminates for efficient sorting:
  - An array of plastic laminates samples were provided to TeTechS to test "proof of principle" at bench scale for the TeraHertz sensor technology and connections have been made within the value chain to explore scalability.
- Reclay StewardEdge sharing a MRF sampling case study for composite paper:
  - Reviewed new opportunities to increase the recycling performance of post-consumer beverage cartons and hot beverage paper cups with a focus on:
    - o Increase recycling convenience to consumers by harmonizing materials accepted in the Blue Box
    - o Grow volumes of material accepted in the Blue Box
    - o Make it more attractive for WM industry to sort all compatible CPP into its own grade (make it worth it)
    - o Gauge opportunities to optimize components of the recycling value chain
- Flexible Packaging Association talking about their Packaging Resource recovery program:
  - The FPA has three focus areas: Innovation throughout the entire value chain (technology, sorting, end markets), Economics (viable and self-sustaining), Outreach (avoid duplicating efforts). Plastics to fuel considered most viable solution for laminates. Worked with Terracycle to get representative samples of laminated packaging to run pilot trials. Challenges included collection, sortation, material quantity and quality, end markets & economics; e.g. manual sort – not cost effective on large scale & long term, end-market development requires critical mass.
- York & Durham Region providing background to their energy recovery center:
  - The first energy-from-waste facility approved in Ontario in over 20+ years. Located in Clarington, Ontario and a joint venture between the Regions of Durham and York (78.6/21.4 ownership share). Designed, built and operated by Covanta.
  - This EFW facility uses MSW as a fuel to generate electricity, looks and operates like a conventional power plant with a boiler and turbine, incorporates state-of-the-art emission controls including continuous monitoring equipment.
- Dow Chemical presenting the Citrus Heights Energy Bag Pilot Program:
  - The Energy Bag Pilot Program located in Citrus Heights, a suburb of Sacramento, California with 27,000 homes. Residents instructed to place non-recyclable plastic (NRP) such as bags, pouches and wrappers into a purple bag (“energy bag”) that gets placed in their regular recycling bin for collection. When mechanical recycling is not an option, the pilot gives the opportunity for these materials to be converted to waste to energy/fuels. Purple bags are manually sorted at the MRF at front of line <http://www.citrusheights.net/295/Energy-Bag-Recycling>
- Progressive Waste Solutions and TerraCycle promoting Zero Waste bag program in Maple Ridge (Vancouver area) – this is a subscription-based collection service (not serviced by municipality). See website for details <http://zerowastebags.terracycle.ca>

- Zzyzx Polymers presentation on their cold extrusion re-processing technology:
  - Zzyzx creates novel plastics from virgin and recycled materials. As long as a thermoplastic is the main component, a wide range of materials can be compatibilized and fully dispersed. They use a mechanochemical process to accomplish this. Under high shear force, polymers are broken apart and then chemically recombined, allowing plastics to bond with other polymers or filler materials. This mechanochemical process is called Solid-State Shear Pulverization, or SSSP, and it allows Zzyzx to compatibilize, encapsulate and fully disperse just about anything into plastics.
  - Zzyzx have agreed to test a small batch of PCR laminates in their facility in Allentown, PA. Stewardship Ontario is in the process of providing the material.
- Creative Plastics Technology LLC
  - Developed a process technology that will melt and mix co-mingled plastic waste into a cohesive and structurally sound compression molded product. The process achieves a bond between non-compatible plastic materials that will allow for full function of a molded part - without compatibilizers or any stabilizing materials added.
- Connected with Merlin Plastics in BC as they are providing material as an alternative fuel source for the cement industry
- Continuing to connect with re-processors across NA to explore alternative material uses

### **Plans for 2015:**

- Continue to share information, latest technology developments and explore viable alternatives for multi-layer laminates other than the current options of landfill or energy recovery.
- Explore opportunities to run pilot programs (with partners) for both mono films and multi-layer laminates.
- Run a webinar to share project results.

To receive access to the presentations mentioned in this document and to find more about joining this project team, please contact Rachel Morier at [rmorier@pac.ca](mailto:rmorier@pac.ca).

*Guy McGuffin and David Yousif for and on behalf of the PAC NEXT working group*

## Appendix - Project Team Members

**Guy McGuffin (Chair)**  
**David Yousif (Chair)**

**Guy McGuffin Consulting**  
**City of Hamilton**

Patrick Kerrigan  
Shari Jackson  
Rosalyn Bandy  
Wayne Wegner  
Ryan L'Abbé  
Tricia Berta  
Debbie Mowat  
Joe Hall  
Krista Friesen  
Daniel Lantz  
John Baldry  
Paul Van Leeuwen  
Shane Hedderson  
Claudio Gemmiti  
Erica Ocampo  
Mukesh Bisaria  
Émilie Bamard  
Martin Vogt  
Paulina Leung  
Cheryl Babcock  
Patricia Enneking  
Ben Bennett  
Keith Fanta  
Geoff Rathbone  
Norm Lee  
Ravinder Diwan  
Philippe Cantin  
Rick Denyes  
Leo Blakely  
Sherry Arcaro  
Frances Gamache

Alpha Poly  
American Chemistry Council  
Avery Dennison  
Bemis  
Blue Mountain Plastics  
Canada Fibers Ltd.  
Canadian Liquid Processors  
Canadian Plastics Industry Association  
Canadian Plastics Industry Association  
Cascades Recovery  
City of Toronto  
CKF Inc.  
CleanFARMS  
Club Coffee  
Dow Chemical  
DuPont  
Éco Entreprises Québec  
EFS Plastics  
Emterra Environmental  
Haremar Plastic Manufacturing  
Klockner Pentaplast  
Municipal Waste Association  
P&G  
Progressive Waste Solutions  
Region of Peel  
Region of Peel  
Retail Council of Canada  
Rick Denyes Consulting  
Rivalries Corporation  
Stewardship Ontario | Canadian Stewardship Services Alliance  
Sobeys