

International Technology Scan Relating To: Plastic Recycling

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Key Study Participants:

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Executive Summary

CIF and EBC initiated an International Technology Scan to engage in an analysis of international technologies that may be available for use in Ontario specifically for recycling and reuse of post-consumer plastics.

Potential technologies of interest are sorting, densification, efficient transportation, cleaning of contaminated recyclables, and recycling in general.

Europe (with Israel) and Asia were the two major geographic regions of interest with 14 countries being identified. With each, a formal request was made for submissions.

The replies were divided into three categories:

- A) Responsive and highly relevant
- B) Responsive but not highly relevant
- C) Unresponsive.

A) The Netherlands	B) Singapore	C) Japan
Belgium	France	Germany
Korea	Austria	Switzerland
Sweden	Italy	United Kingdom
Israel	Denmark	

The responsive and highly relevant countries provided technologies and companies that are worthy of further examination and it is recommended that CIF and EBC explore the possibilities of trade missions with these countries. In many cases there are budget and subsidies available from foreign governments through their foreign trade agencies. In the five instances of the “A” countries identified, there is a system and program in place to assist in facilitating missions where business opportunities could result. This report outlines the specific companies and technologies identified, and suggests an “order of priority” for prospective trade missions.

It is the recommendation and final conclusion of this report that CIF and EBC explore possibilities with the countries identified as “A”s, and ultimately plan to continue the research that was initiated in this study.

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2. Background and Introduction to the Study

The Continuous Improvement Fund (CIF) provides grants and loans to municipalities to execute projects that will increase the efficiency of municipal Blue Box recycling and help boost system effectiveness. CIF also provides capital to Research and Development projects and funds directly to companies that will benefit WDO's initiatives. Specifically:

- To identify and implement best practices,
- To examine and test emerging technologies,
- To employ innovative solutions to increase blue box materials marketed, and
- To promote gains in cost-effectiveness that can be implemented province-wide.

The fund has approximately \$40 million and aims to direct 70% of these funds to projects promoting efficiency and the remainder to those that promote effectiveness.

Environmental Business Consultants (EBC) works with companies and government to achieve excellence in the business of the environment. Specifically, EBC provides consultation services in environmental and business management. EBC brokers relationships with new environmental technology companies, institutional investors, regulators, and industry to find cost-effective solutions that create win-win situations.

EBC's clients include new environmental technology firms, institutional investors, waste management companies, industry, and government.

CIF and EBC initiated this International Technology Scan in September 2009. As CIF's mandate has a particular interest in plastic, this study was commenced to engage in an analysis of international technologies that may be available for use in Ontario specifically for recycling and reuse of post-consumer resin. The Project Leader is EBC's Principal James Sbrolla.

At project commencement a list of potential technologies of interest to CIF was created:

- Technologies in general for recycling materials
- Technology to sort fibres
- Technology for cleaning and sorting contaminated plastics
- Technology that sorts consumer packaging plastics
- Material Recycling Facility design companies
- Systems for handling and transporting small quantities of recyclables
- Technologies for improving trucking efficiencies
- Technologies for improving material densification (curb side & centralized facilities)

Two major geographic regions of interest were targeted: Europe and Asia. For practicality, and based on basic knowledge of the countries initially discussed, the following countries were “short listed” to be examined in detail:

Western Europe (and Israel):

Austria
Belgium
France
Italy
The United Kingdom
Denmark
Germany
Sweden
The Netherlands
Switzerland
Israel

Asia:

Singapore
Korea
Japan.

In each case, the country’s international trade organization was contacted. In many instances there was a pre-existing relationship between EBC and the trade organization. A formal request for information was presented either in person, by mail, or by email. One example is provided in the appendix “A” of this report.

There were replies from all the countries contacted acknowledging receipt and committing to a formal submission. The quality, depth, and timing of the replies varied greatly. Some of the representatives of the foreign trade organizations were very responsive and provided relevant information in a timely manner. Others were responsive and provided material that was not relevant and it was clear that they did not understand the specific scope of the task. Still others while responding to the initial request and promising a formal submission, ultimately did not deliver. In general terms, approximately one third fit into each of the three categories of responsiveness and thus there are five countries that provided worthwhile information that warrants serious consideration.

In several instances companies and technologies were identified that were not relevant to the recycled plastics industry but they are in the waste management industry and while not directly related, they were potentially interesting for general knowledge of the participants in the study.

3. Selective Information From Individual Countries

3.1 Austria

Contact: Dara Hrnjez, Trade Officer

Email: Toronto@austriantrade.org

Phone: 416-967-3348

416-967-3380

Fax: 416-967-4101

Secondary Contact: Robert Luck, Trade Commissioner and Consul

A) M.U.T.

M.U.T. is an Austrian waste treatment handling equipment manufacturer. The company's main products include garbage collecting vehicles, street sweeping machines, sewer cleaning vehicles, logistics vehicles, waste water engineering etc.

Representative: Mr. Gerald Kurz

Homepage: <http://www.m-u-t.at>

B) Bernsteiner Silo

Bernsteiner Silo specializes in the material handling and production of silos in industrial use. This is potentially applicable to sort fabrics.

Representative: Mr. Alois Bernsteiner

C) PPM Energy

PPM Energy is an Austrian producer of biodiesel oil. The company offers techniques and products for a de-centralized energy circulation system. PPM Energy wants to meet with companies who have a large fleet of trucks and who would consider producing their own fuel.

Representative: Mr. Christian Hochstoeger

Homepage: <http://www.ppm-biodiesel.com>

D) Öko Agrar

The company concentrates on landscaping and applied soil sciences, especially on the solidification of solid and liquid wastes. They specialize in a process which is based on natural reactions as they deal in fertile soils. It is an economic alternative to other methods of waste treatment and disposal. Also in the agriculture branch, Öko Agrar has developed a special analysis of methods for a variety of problems like melioration of degraded or ecologically damaged soil systems and improvement of agricultural production. They also convert biosolids from waste water.

Representative: Mr. David Benko

Homepage: <http://www.oeko-datenservice.com>

3.2 The Netherlands

Contact: Elif Bagci, Consulate-General of the Kingdom of the Netherlands

Email: elif.bagci@minbuza.nl

Phone: 416-598-2534

Fax: 416-598-8064

Secondary Contact: Karim Tejani, Consulate-General of the Kingdom of the Netherlands

Email: karimt@rogers.com

The Netherlands provided a very comprehensive list of applicable companies. Below is a list of the companies provided, and attached is a very detailed summary of them. This summary includes website information, general information, activities, and contact information

A) Daly Plastics BV

Daly Plastics BV was set up in 1985, and has in the intervening years expanded to become one of the biggest plastic scrap processors in the Netherlands. With its own transport and a global network of agencies, they are a modern, internationally-operating company that specializes in the complete processing of the flow of plastic scrap. They focus on *collecting, sorting and preparation* for processing through to the return of materials for reuse.

B) Plastic Herverwerking Brabant

Since its foundation in 1987, Plastic Herverwerking Brakel B.V. (PHB) has grown into an international operating company, focused on the recycling of different streams of polluted plastic materials.

C) Plastinum

Plastinum has developed a new technique to prevent downcycling from mixed plastics. It is their ambition to become the reference in mixed-plastics waste processing solutions by creating new polymers from a variety of waste streams.

Homepage: <http://www.plastinum.com/>

D) Stichting Nedvang

Nedvang neither collects nor processes the materials, but contracts organizations, municipalities or companies who do this. On an annual basis, Nedvang reports to the Ministry of VROM exactly how much packaging material was produced and how it was reused (recycled or usefully applied).

E) Afvalplatform (Netherlands Waste Management Partnership)

NVMP pursues global business opportunities, by making detailed and valuable information gained from decades of Dutch Experiences in dealing efficiently with waste more available. The successful merge of both waste policy and professional waste management is reflected by the constructive co-operation between National, Regional- and Municipal governments and the Dutch Waste Management Industry. The company prides itself in the incorporation of calls from NGO's addressing environmental concerns.

F) Van Gansewinkel Groep (Part of Netherlands Waste Management Partnership)

The Van Gansewinkel Group is a provider of waste materials as well as an energy supplier. With its companies Van Gansewinkel, Coolrec, Maltha and AVR, they collect and process waste into raw materials and energy.

G) Nihot Recycling Technology BV (division of Stibbe BV) (Part of Netherlands Waste Management Partnership and VLM)

Controlled air is one of the core technologies of Nihot. It is versatile, offers greater flexibility than mechanical separation technologies, and it guarantees high separation efficiency. By using air, materials can be separated based on both material density and shape. Nihot optimizes air technology for waste separation. The company is a recognized key player in its field.

H) Redox Recycling BV (Part of Netherlands Waste Management Partnership and VLM)

REDOX Recycling Technology specializes in the supply, process technology, engineering, and project management of sorting lines for solid waste. Sorting lines consist of various units like deposit hoppers, trommel screens, windshifters, stretch deck screens, star screens, overband magnets, and sorting cabins. With the REDOX sorting systems it is possible to separate construction and demolition waste, commercial and industrial waste, organic waste, household waste, dry recyclables, etc.

I) VLM (Association of Suppliers of Environmental Equipment and Technology)

The Association of Suppliers of Environmental Equipment and Technology (VLM) was founded in 1983 and has 100 member companies, who all specialize in environmental technology. Each VLM member company has a specific environmental know-how applicable in plants and equipment, in order to reduce or to prevent environmental harmful emissions. VLM has five sections, viz. Water, Air, Waste, Soil, and Sustainable Energy. Supplying technological solutions, preventing emissions at the source, and developing new technologies are an integral part of the company's production process.

J) Bollegraaf Recycling Machinery BV (Part of VLM)

Bollegraaf Recycling Machinery is a manufacturer of machines for the recycling industry worldwide. Bollegraaf Recycling Machinery supplies machinery to the waste paper industry, collectors of industrial waste and household waste, to municipalities, and to companies that produce voluminous waste. Bollegraaf Recycling Machinery produces balers, sorting systems, conveyors, shredders, starscreens, reel splitters, and other related equipment.

K) Knapsak Benelux BV (Part of VLM)

Knapsack Benelux, develops collection systems for synthetic packaging such as plastic foil, EPS, plant pots & plant trays, and PET bottles. Knapsack is a recycled plastic bag and Knapholder is a tubular steel frame.

3.3 France

Contact: Fabien Val, Senior Trade Attaché (Montreal)

Email: fabien.val@ubifrance.fr

Phone: 514-670-3983

Fax: 514-670-4001

Secondary Contact: Kamel El Bisat (Toronto)

Email: kamel.elbisat@ubifrance.fr

Phone: 416-977-1257 Ext 207

Deputy Trade Commissioner: Eric Morand

Fabien Val provided two websites which give an overview of French expertise within the waste industry.

A) Firmafrance

This website is the Official French exporters B2B directory, powered by Ubifrance and officially endorsed by the Ministry of the Economy and Industry of France. Dedicated to foreign companies seeking reliable suppliers and partners in France, it is an ideal way of seizing business opportunities on line. You can search by clicking on the following link: "environment" sector followed by "Waste Treatment".

Homepage: www.firmafrance.com

B) The French Eco-companies club

From the French Environment and Energy Management Agency (ADEME) which can also provide information on the above mentioned industry. Please conduct your search while using key words.

Homepage: www2.ademe.fr/servlet/getDoc?id=39551&sort=-1&cid=17746&m=3&ref=17776&nocache=yes

C) Mr. Val also made note of the Pollutec exhibition which will be held in Paris from the 1st to 4th of December 2009. Pollutec is one of the leading trade fairs in the environment sector where Canada is being received as the guest of honour this year.

Homepage: www.pollutec.org

3.4 Sweden

Contact: Lars Henriksson

Email: lars@norditrade.com

Secondary Contact: Peter Selemark, VP Salesgen AB (Sweden)

Email: peter.selemark@salesgen.se

Phone: 46(0)735 23 34 97 (Sweden)

Phone: +1 619-985-66 77 (only used when in US)

Fax: +46 (0)8 588 370 26

Communications have been with both Lars Henriksson and Peter Selemark.

Lars Henriksson provided the following information:

A) Envac: the underground waste collection system.

Recyclables is one of the companies fractions. So long as people put waste into the correct inlet, it will end up in the right container in the Terminal. Recyclables will end up in the Terminal in the container for recyclables. The full containers will then be transported to a location for further processing, as per the preference of the municipality. In Canada, Envac systems will most likely be installed in new areas, such as the Waterfront and Regent Park. Envac now has an office in Montreal, where a system is being installed in Quartier des spectacles, downtown Montreal. The system will result in substantially lower levels of green house gas emissions in an area, thanks to much less garbage truck traffic. Buildings can also be designed differently, freeing space that would otherwise be needed for dumpsters and garbage storage.

Homepage: www.envac.net

B) Optibag

The Optibag is a system where people sort the waste in differently coloured plastic bags. The bags are then disposed into the same bin, chute or dumpster. One truck picks up the garbage from the house or building, taking it to a transfer/treatment station. The load is put on a conveyor belt, and the bags are sorted according to the preference of the municipality. Optibag is represented in Canada by Machinex in Plessisville, Quebec. Mr.

Henriksson finds Optibag very suitable and interesting for apartment buildings from the 60's, 70's and 80's, which were constructed before we started talking about separating waste.

Homepage: www.optibag.com

C) Mr. Henriksson sent a PowerPoint presentation from NSR in Helsingborg (see attached). Halfway through the presentation, there is a picture of the cart they are using as well as the collection vehicle. If there is any interest, Mr. Henriksson would be happy to find out more, including the manufacturer.

D) Every Swedish municipality has at least one recycling station, where people take their odd waste, e.g. white goods, computers, furniture, hazardous goods, garden waste, etc. These stations or depots are manned and very well organized, with dumpsters, sheds, and storage places for the different types of waste. They are open at odd hours, e.g. Saturdays and Sundays. Swedes typically visit these recycling stations 6-7 times per year.

E) Sweden has an extensive deposit system for glass and plastic bottles. Typically, they are taken back to the grocery stores, where there will be machines to collect them. The machines will issue receipts that can be used in the store. Most machines are made by Tomra, a Norwegian company, which Mr. Henriksson believes is represented in Canada. (www.tomra.com). As in Canada, the findings are that deposit systems will increase the recycling rate substantially.

F) In many cities there are also 'glass igloos' where people can drop non-deposit glass. Typically, there will be one unit for clear glass, and a second for coloured glass. This system is paid for by the producers in accordance with producer responsibility.

3.5 United Kingdom

Contact: Helen Hemmingsen

Email: Helen.Hemmingsen@fco.gov.uk

Secondary Contact: Ranvir Mahil, Trade Associate

Email: ranvir.mahil@fco.gov.uk

Phone: 416-593-1290 ext 1+ 2244

Fax: 416-593-1229

Communications were ongoing and regular, but ultimately nothing was ever received from the United Kingdom trade office.

3.6 Denmark

Contact: Krista Friis
Email: KRISFR@UM.DK
Phone: 416-640-7485
Fax: 416-843-7917
Secondary Contact: Peter Mork

A) The following websites were provided by Krista Friis:

<http://www.bramidan.com/>
www.miltek.dk

www.peoples.dk - a design company, who has developed the bins for public spaces for the Danish Municipal blue box program.

<http://www.envacgroup.com/web/Start.aspx>

B) Further Contact with the Exporters Association provided, through Ms. Friis an additional company:

M&J Industries A/S

Representative: Claus Warming, Area Sales Manager

Phone: +45 7626 6430

Mobile: +45 2028 6430

E-mail: cw@mj.dk

Homepage: www.mj.dk

3.7 Germany

Contact: Susanne Ritter

Email: Susanne.Ritter@germanchamber.ca

Phone: 514-844-3051

Secondary Contact: Thomas Beck

Email: thomas.beck@rogers.blackberry.net

Thomas.beck@germanchamber.ca

Phone: 416-598-7070

Communications were ongoing and regular, but ultimately nothing was ever received from the German Chamber of Commerce or the German trade office.

3.8 Italy

Contact: Gustavo Dichiarà, Trade Analyst

Email: g.dichiara@ice.it
Phone: 416-598-1566 ext. 106
Fax: 416-598-1610
Trade Commissioner: Paolo Ponti

In addition to the website addresses provided below, Gustavo Dichiara also provided a “hard copy” of a directory of Italian clean-tech companies. This is an interesting document but not particularly relevant to this particular study as it has no specific information on plastic recycling or related matters.

- A) www.colmarspa.com
- B) www.degremont.com
- C) www.emit.it
- D) www.fisiait.com
- E) www.laltecoen.it
- F) www.laduner.it
- G) www.montello-spa.it
- H) www.guadrifoglio.org
- I) www.passavantimpianti.it
- J) www.teseco.it

3.9 Belgium

Contact: André Mathieu, Trade Commission – Consulate of Belgium
Email: tradecommission@on.aibn.com
Phone: 416-515-7777

Belgium provided a concise list of companies that recycle plastic materials (Guide to the Belgian Plastics Recycling Industry – 2009). As this project is focused on connecting with companies that sell equipment to improve recycling for these companies, this list was not particularly useful. After pointing this out to Mr. Mathieu he agreed to make a second effort to deliver some more useful information. The supplementary information (below) was provided promptly and it is relevant and worth examining:

- A) Nv Ad Rem

Representative: Peter Vandeputte
Krommebeek Straat 14
8930 Menen
Phone: 056 521388
E-mail: mieke.ollevier@valvan.com
Homepage: <http://www.adrecyclingmachines.com>

B) Nv Ats Groep

Representative: L.Moreels
Karel De Roosestraat 15
9820 Merelbeke
Phone: 09 2100411 Fax: 09 2317744
E-mail: luc.moreels@atsgroep.be
Homepage: <http://www.atsgroep.be>

C) Bvba Csb

Representative: Stefaan Paulus
Doorniksesteenweg 81A B-7
8500 Kortrijk
Phone: 056 216660 Fax: 056 204898
E-mail: csb.waste.solutions@skynet.be
Homepage: <http://www.csb-wastesolutions.be>

D) Nv De Pecker Gent

Representative: P.Grulois
Eddastraat 43
9042 Gent (Desteldonk)
Phone: 09 2511851 Fax: 09 2515300
E-mail: info@depeckergent.be
Homepage: <http://www.depeckergent.be>

E) Bvba Ebc

Representative: Erik Beeckman
Mouterijdreef 7
9800 DEINZE
Phone: 0475 343537 Fax: 0475 343538
E-mail: erik.beeckman@gmail.com

F) Sprl Pierret Industries

Representative: M. Philippe Pierret
Rue Du Sommet 32
6838 Bouillon (Corbion)
Phone: 061 465100 Fax: 061 466263
E-mail: info@pierret.com
Homepage: <http://www.pierret.com>

G) Nv Schepens Air & Solids
Representative: John Kostense
Wissensstraat 21
9200 Dendermonde
Phone: 052 213666 Fax: 052 214765
E-mail: info@schepens-air-solids.be
Homepage: http://www.schepens-air-solids.be

H) Sa V Concept 3 M
Representative: M. Bernard-Marie Feron
Rue Des Heros 40
4000 Liege (Rocourt)
Phone: 04 2293727 Fax: 04 2781624
E-mail: vc3m@skynet.be

I) Nv Vds-Concepts
Representative: Eric Vandersteene
Prins Albertlaan 65
8870 Izegem
Phone: 051 319394 Fax: 051 317378
E-mail: info@vds-concepts.com
Homepage: http://www.vds-concepts.com

Supplementary from Belgium:

A) Rentec nv, Nijverheidsstraat 13, 8740 Pittem (www.rentec.be)

B) Valvan Containers & Milieutechniek, Moorselestraat 121, 8930 Menen (www.valvan-containers.com)

C) Mol cy nv, Diksmuidesteenweg 63, 8830 Hoogleden, (www.molcy.com) Please see VDK waste systems.

3.10 Switzerland

Contact: Philippe Crevoisier, Consul
Email: philippe.crevoisier@eda.admin.ch
Phone: 416-593-5371, ext 229
Fax: 416-593-5083

Secondary Contact: Kathy Utigard, Consulate General of Switzerland
Email: Kathy.Utigard@eda.admin.ch
Phone: 416-593-5371, ext. 227

Fax: 416-593-5083

While there was extensive communication with Swiss government officials, little was accomplished. Mr. Crevoisier sent a request to OSEC in Zurich, which is the office of promoting Swiss exports abroad as well as to the Federal Office for the Environment. This was to see if they could provide more accurate information about Swiss companies that built technologies in the recycling industry. After several attempts nothing materialized.

There were other suggestions given by Philippe prior to the aforementioned, but all appeared to be of no use to the scope of this project.

3.11 Israel

Contact: Jonathan Levy
Email: Jonathan.L@israeltrade.gov.il
Tel: (416) 640-8540/1
Consul for Economic Affairs & Trade Commissioner
Government of Israel
Economic Mission to Canada
180 Bloor St. West, Suite 700
Toronto, ON M5S 2V6

A) <http://www.avivplastic.co.il/en/>

B) Mihzur Hanegev <http://dunsguide.dundb.co.il/D532220220.aspx> polyethylene recycling (such as plastic bags)

C) <http://www.talel.co.il/english.html>

D) <http://www.cycle-tec.com/profil.htm>

E) Mihzur Hanegev <http://negevltd.en.ec21.com/> low grade material, film scrap. Interested in plastic bag recycling.

3.12 Singapore

Contact: Amreeta Eng,
Email: Amreeta_ENG@iesingapore.gov.sg
Phone: (212) 421-2207

The Canadian Trade office for the country of Singapore closed permanently in 2008. As a result, the business development activities for Canada are now managed from the United States. The liaison, Ms. Eng operates from a Washington office and provided a formal response that was of no material value.

A) Stream Peak International Pte Ltd

Representative: Jason Tay, Assistant Marketing Manager

Phone: 68623800

E-mail: jason@streampeak.com.sg

The Company was established in 1976 as a traditional packaging company. They have since evolved to become the largest converter of desiccants in Singapore. Their core products are converting silicon gel, clay into desiccants sachets, and container desiccants, as well as oxygen absorber for use in containers and packaging. On top of it, they are able to provide cold chain solutions for shipping temperature sensitive products. The company has also developed new products like

1. Humi dryer plus, a specially formulated desiccant product designed to lower the dew point inside shipment and storage containers.
2. Shockswitch ID which is compliant with OSHA standards and reduces rack and product damage etc. The company exports to the Americas and Europe and is looking in the Middle East as well. To date, the company has clocked about S\$7 million in sales, of which, 50% is accrued from overseas sales. Staff strength is at 50, with about 8 managers.

B) Aeris Dynamics Pte Ltd

Representative: Ronald Toh

Phone: 97312286

E-mail: ronaldtoh@aeris.com.sg

Representative: Henri Lee

Phone: 96627278

E-mail: henrilee@aeris.com.sg

Homepage: www.aeris.com.sg

Aeris Dynamics Pte Ltd was established in 2001 and is in the business of Cold-Chain Bio-Packaging and environmentally friendly CO2 cleaning technology. Its headquarters & main factory are located in Singapore and have two other factories cum warehouses in China (Shanghai & Guangzhou) from which they operate via a Singapore invested company under a mutual agreement (not formal JV).

C) Greenpac (S) Pte Ltd [more for best practices]

Greenpac is an environmentally friendly packaging solutions company that is able to customize efficient packing solutions for manufacturers in various industries. One of the company's unique products is a nail-free returnable packaging material that is easy to assemble (save on packing costs). The company's USP lies in its ability to provide the

full value chain of supply chain services to its customers - from warehousing, kitting, heat treatment to managing inventory. CGs may want to highlight Greenpac as a cost saving logistic service.

The company has developed packing solutions for HP, Leica, Siemens, Exxon Mobil, Flextronics and so on. In order to be closer to its customers, Greenpac plans to setup a presence in Munich & San Francisco. The initial plan is to set up representative offices in the above markets.

Even though the company is very nimble, it prides itself for its high quality. Greenpac clinched the Enterprise 50 award in 2008, Singapore Quality Class and Singapore Packaging Star Award for its patented product (revolutionary systems concept packaging).

D) Buysingapore portal

E) LHT holdings

Waste wood to furniture

Homepage: <http://www.lht.com.sg/>

F) Material recycling facility design coys

Sembcorp and STSE are both significant Singapore companies whom the United States has ties with; STSE won a US project and are developing a US presence.

Homepage: Sembcorp: <http://www.sembwaste.com/svcs/index.shtml>

G) Other technologies;

Organic waste to high grade fertilizer

Homepage: <http://www.biomaxtech.com/home/index.php>

3.13 Korea

Contact: Justin Jo

KOTRA, The Agency for Foreign Trade which is a section of the Consulate of the Republic of Korea

Email: jjo@kotra.ca

Phone: (416) 368-3399 ext 226

The Korean government has a very active foreign trade organization and it aggressively markets the technologies of the country overseas. They commit money to this and organize missions where Korean companies meet with foreign buyers in a structured manner. Whilst working on this report, both James Sbrolla and Andy Campbell visited Korea on subsidized missions where the Korean Government (through Kotra) absorbed significant costs and provided organizational services to meet with relevant companies.

A) I2 Corp

Contact: Sunsoo Lee

Phone: 82-2-779-0872

Mobile: 82-10-8759-5867

I2 Corporation focuses on plastic and rubber scrap from Korea and Japan. Through the use of an Authentic Recycling Factory, no damages to the environment result from the recycling process or even after being recycled. The recycled materials are turned into usable resources. At present, I2 corporation is dealing with many kinds of recycling projects in Korea, Japan, and Vietnam and their recycled resources are being exported to 8 countries. The following three points are I2 Corporation's focus:

- 1) Collection of materials to be recycled - Long-term Collection (Planning of product based on quality of scrap)
- 2) Recycling process - Top-qualified compounding technology (Minimize unevenness of spec)
- 3) Recycled material products use - Marketing of the products

Collect materials to be recycled

Several meetings with parties wishing to discard materials are essential for I2 Corp to get recyclable materials stably and safely. Moreover, the collection has to draw some of the profits from the parties and reduce their space to stock those kinds of materials. It is the first and base step of material recycling.

Recycling Process

The company not only recycles PE, PP such as basic plastic materials, but also thermal plastic elastomer, rubber, engineering plastic and so on. Moreover, I2 Corp prides itself in its quality assurance. Recycled materials have to be useful resources. This is the reason that the company is considering QA more than many other recycling companies.

Overseas Activity

I2 Corp recycles many materials from Korea and Japan. The materials are mostly being recycled in the above two countries. Moreover, the company is consulting its recycling technology and system in Vietnam with no harm to their environment while they make efforts to develop their economy.

B) Ionia Ent Co., Ltd

Contact: Thomas M.Chung, vice president

Phone: 82 2 866 8856

Fax: 82 2 866 1864

Mobile: 82 11 222 8220

Homepage: www.ioniaent.com

Ionia Ent Co., Ltd is an automation recycling plant in Korea. The automation recycling plant is an auto sorting system. It has a Near Infrared Ray (NIR) Detector for all plastics. The company developed this system on its own, and it is the only one in Korea. Ionia has installed and constructed these automation recycling plant systems since the company started to research and develop the NIR Detector in 2000. The market share in Korea is about 80% and the waste is controlled by the government

Recently the Korean Government decided to change from all sorting systems to automation. The company is improving more and more especially in NIR Detector market, which they are supplying to plastic sorting companies. The recycled plastics PET, PS, PI, PP, PE, ABS are made to their frake and pallet for raw materials again. These processes are done within the company's factory. Data files are available at the following: www.webhard.net

ID: mihedisplays

Password : mihe

Download the file: CANADA.

C) Hans Oh, Autis Corp. (Seoul)

Phone: +82 11 9209 6420

Fax: +82 505 920 6425

Autis Corp. is the leading company specialized in the handling of Recycling Equipment and consulting in Korea. They are proud of their experience over the years in the field of exporting products with best quality and competitive price.

D) Byung-Sun, Lee, Forcebel (HwaSeong)

Phone: +82 31 355 0006

Fax : +82 31 355 0183

Forcebel has two pieces of equipment of interest: bag opener and bag separator. When Andy Campbell visited Korea the newest version was just being installed so it was not yet operational but the it appears to be quite unique and worth further examination.

3.14 Japan

Contact: David Anderson, Japan External Trade Organization

Phone: 416-861-0000 ext229

Fax: 861-9666

Email: David_Anderson@jetro.go.jp

There were several conversations with the Japanese trade organization and evidently enquires were made in Japan, but a formal submission was never received. The foreign

trade organization was relying on the home country representatives to deliver and while they were not unprofessional in their response, ultimately they did not deliver.

4. Project Conclusions and Recommendations:

The following countries provided formal replies with strong relevance and are worthy of further examination and study:

- The Netherlands
- Belgium
- Korea
- Sweden
- Israel

The following countries provided formal submissions but the information was not on topic and is not really worthy of further study and examination:

- Singapore
- Austria
- France
- Italy
- Denmark

While all of the countries identified for the study acknowledged receipt of the formal request, the following countries did not provide a proper submission:

- Japan
- Germany
- Switzerland
- United Kingdom

Further Examination and Study:

The Netherlands, Belgium, Israel, Korea and Sweden all provided very compelling responses to the formal requests for submissions.

It is the recommendation and conclusion of this study that CIF and EBC explore the possibilities of trade missions with these countries.

The two most compelling countries providing new and interesting technologies are the Netherlands and Belgium. Perhaps not coincidentally, the two countries are neighbours and are both part of the “Benelux” countries. A trade mission to both would be quite easy to facilitate as the Benelux countries are visitor friendly, distances are not great, and language is not a big barrier as most inhabitants speak English well. In the case of the Netherlands, there is a foreign trade organization (the EVD) which has a significant budget for foreign business missions to visit and see their technologies applied, and EBC has been active with them in the past in organizing missions. Belgium probably has similar facilities available but EBC has not yet had the opportunity to collaborate with them.

The Swedish trade consul to Canada was quite helpful on this project and they did provide some interesting “innovations” for examination. The word innovations is in quotation, as in the case of the Scandinavian countries in general, they are more likely to approach advances in waste management with process changes (and changes in concept) before approaching with changes in technology. There is a Swedish trade mission planned for 2010 with municipalities participating that is not geared specifically to this study but could have some overlap and is worth considering. Notwithstanding that mission, there is an infrastructure in place with the Swedish consul to Canada and it is likely that the foreign trade office will accommodate a mission from Canada with some sort of support.

In the case of Korea, both James Sbrolla and Andy Campbell visited Korea to examine technologies during the course of this study. This was facilitated by KOTRA, the Korean Foreign Trade Organization, by subsidizing the costs and organizing the itinerary. Whilst there were some significant and interesting technologies witnessed in Korea, some of the most compelling technologies were not visited on the Korean missions due to a number of reasons. A supplementary mission to Korea could be quite useful.

In the case of Israel, the information provided was very compelling and interesting. The challenge is the accessibility and logistics of arranging a trade mission and the costs may also be a factor. The Israeli Economic Affairs and Trade Office may have a program to facilitate trade missions and this should be pursued if this project continues.

In many cases there are budget and subsidies available from foreign governments through their foreign trade agencies. In the five instances of the “A” countries identified, there is both a system and a program in place to assist in facilitating missions where business could result. While this report does not outline the specific order of priority of companies and technologies identified, the report suggests that an “order of priority” for prospective trade missions be established based on the potential funding of foreign trade offices and the practicality of the potential visits when considered with the individual prospects.

It is the recommendation and final conclusion of this report that CIF and EBC explore the possibilities with the countries identified as “A”s, and ultimately to continue the research that was initiated in this study.

This Project has been delivered with the assistance of Waste Diversion Ontario’s Continuous Improvement Fund, a fund financed by Ontario municipalities and stewards of blue box waste in Ontario. Notwithstanding this support, the views expressed are the views of the author(s), and Waste Diversion Ontario and Stewardship Ontario accept no responsibility for these views.

Appendix “A”

Sample Letter to Foreign Trade Organization Page 1 / 2

From: James Sbrolla [sbrolla@rogers.com]

Sent: September 10, 2009 1:39 PM

To: 'petmor@um.dk'

Subject: Seeking Danish Technologies!

September 10, 2009

Mr. Peter Mork:

Please accept this letter as a formal request for information on technologies from Denmark. I have been engaged by the Continuous Improvement Fund (CIF) to do an analysis of technologies that may be available for use in Ontario. If you are not the appropriate person to deal with this request, please let me know whom I should contact.

For your information, CIF provides grants and loans to municipalities to execute projects that will increase the efficiency of municipal Blue Box recycling and help boost system effectiveness. CIF also provides capital to Research and Development projects and funds directly to companies that will benefit WDO's initiatives. Specifically to:

- identify and implement best practices,
- examine and test emerging technologies,
- employ innovative solutions to increase blue box materials marketed, and
- promote gains in cost-effectiveness that can be implemented province-wide.

The fund has approximately \$40 million and aims to direct 70% of these funds to projects promoting efficiency and the remainder to those that promote effectiveness.

Appendix “A”

Sample Letter to Foreign Trade Organization Page 2 / 2

Potential technologies to be identified as of interest to CIF:

- Technologies in general for recycling materials
- Technology to sort fibres
- Technology for cleaning and sorting contaminated plastics
- Technology that sorts consumer packaging plastics
- Material Recycling Facility design companies
- Systems for handling and transporting small quantities of recyclables
- Technologies for improving trucking efficiencies
- Technologies for improving material densification (curb side & centralized facilities)

If you can provide information and/or contact information for appropriate Danish companies, this would be greatly appreciated. If you have any questions or would like to discuss this, please don't hesitate to contact me directly.

Please let me know that you got this email and if you can provide a general timetable for a detailed reply; that would be greatly appreciated.

Thanks and regards,

James Sbrolla
(416) 234-5120 main
(416) 828-2077 cell
james.sbrolla@ebccanada.com