Consultations on a Canadian Resource Recovery Strategy

Summary of
Toronto/Ontario Consultation
Held at Mississauga, Ontario on May 7, 2002

Natural Resources Canada | Ressources naturelles Canada

Canada

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1. Background

Natural Resources Canada (NRCan) is holding a series of consultation sessions over the spring of 2002 on the development of a Canadian Resource Recovery Strategy. Sessions are being held in seven locations including Vancouver, Yellowknife, Edmonton, Toronto, Halifax, Montreal and Iqaluit. Representatives from industry, non-governmental organisations and all levels of government are being invited to participate. The objectives of these sessions are to identify:

- Resource recovery priorities in urban and rural communities across Canada;
- Resource recovery priorities in Canada's North;
- Barriers to resource recovery in every region;
- Potential resource recovery demonstration projects in industrial, post-consumer and institutional sectors;
- Estimated levels of project funding and co-funding partners.

At the Ontario Consultation, the day began with an introduction by each participant, followed by an overview from Mike Clapham, NRCan, of the Canadian Resource Recovery Strategy (see Background Paper, Attachment I). Rob Sinclair (City of Ottawa; see Attachment II), Cindy Thomas (Noranda Inc.), Howard Holt (Dofasco Inc.) and Leonard Shaw (Canadian Association of Recycling Industries), provided introductory comments about resource recovery issues, priorities, barriers and opportunities.

The group then held a plenary discussion of resource recovery issues in Ontario. They identified criteria for prioritizing resource recovery projects, the roles of different stakeholders in the development and demonstration of projects and barriers to resource recovery. Participants met in three breakout groups to identify several potential resource recovery projects for potential co-funding by NRCan and reconvened for a plenary discussion of concluding remarks and next steps in the development of the Strategy.

A copy of the agenda and the list of participants at the Ontario session are attached (Attachments III and IV). In addition to the facilitators and Mike Clapham, 37 participants attended, representing resource recyclers and recycling associations, the Cities of Hamilton, Ottawa and Toronto, industry and industry associations, several federal government departments, the Government of Ontario, technology developers, the Federation of Canadian Municipalities and consultants.

2. Items of Note in the Discussion

- Participants noted a need for criteria to select resource recovery priorities and to help focus consultations on a Canadian Resource Recovery Strategy.
- The projects identified by the group address post-consumer, cross-sectoral and industrial resource recovery needs.
- Suggested projects cover policy and regulatory and education needs in addition to infrastructure support for networking and separation centres, as well as technology demonstrations to verify economic and technical feasibility. Establishment of centralized facilities to serve several municipalities was suggested as a means of achieving economies of scale.
- One recommendation suggested focussing more on resource recovery for solid by-products rather than gases.
- It was noted that large quantities of biosolids were available for energy recovery.
- Mike Clapham noted that suggestions related to recovery of agricultural by-products would be referred to Agriculture Canada.
- Marketing of a resource recovery strategy needs to address three main issues: consumer perception that these products cost more, ensuring that the business plan makes sense to stakeholders and a harmonized framework (of policy and regulations) for projects (across Canada and between US/Canada).
- Concern was expressed that a resource recovery strategy could be pre-empted by the government focus on the Kyoto accord.
- A 'red tape' initiative to address the resource recovery regulatory regime was suggested.

3. Resource Recovery Issues

Participants identified the resource recovery issues listed in Table 3-1.

Table 3-1: Resource Recovery Issues in Ontario

Issue	Industrial	Institutional/ Commercial	Post-consumer
Biosolids		Y	
Construction demolition	Y	Y	
Used roofing materials	Y	Y	
Inorganic sludges from steel manufacture	Y		
Inorganic solid by-products from many industries	Y		
Wine and liquor bottles			Y
Hydrogen from coke oven gas	Y		
Residues from recycling operations containing energy value	Y	Y	
End of life electronics	Y	Y	Y
By-product gases from industrial operations	Y		
Energy from flare gas from industrial operations	Y		
Electric arc furnace dust	Y		
By-product heat from steam, etc.	Y	Y	
By-product methane/energy - from landfills - from agricultural operations - from organic by-products	Y	Y	
By-product energy - from forestry - from pulp and paper	Y		
By-products from electricity production - flyash, gypsum and bottom ash	Y		
Scrap tires and rubber	Y	Y	Y
Plastics from end-of-life vehicles	Y		
Batteries from hybrid vehicles	Y		
Inefficient use of transportation infrastructure for moving people, goods	Y	Y	Y
Post-consumer packaging			Y
Post-consumer products			Y
Post-consumer organic by-products			Y
By-product cellulose (to make sugar)	Y		
Mine tailings	Y		
Metals from mine tailings ponds	Y		
Cyanide from mine tailings	Y		
Acids from plating operations	Y		
Contaminated soils	Y	Y	
Asphalt stockpiles from road construction	Y		
Product destruction from food, pharmaceutical, electronics, construction/demolition industries	Y		

4. Criteria for Selecting Priorities

The participants identified the following criteria for selecting resource recovery project priorities:

- environmental benefit
- public acceptance
- technical viability
- health and safety of process
- volume of by-product
- an alternative to landfill
- finding the highest value use
- job creation
- meets investment criteria
- cost effectiveness
- market for by-product
- transferability to more than one location
- application in more than one sector
- a 'photo opportunity' - offers good publicity value, 'good news'

The criteria for identifying resource recovery opportunities can be generally grouped into the following areas:
environmental, health and safety considerations
technical considerations
business considerations
increasing the value of the by-product (the resource reuse, recovery and recycling hierarchy)
publicity and educational value

5. Barriers

Participants identified the following barriers to resource recovery:

- regulations that inhibit recycling - punishing the many to catch the few bad actors
- product standards that inhibit use of recycled raw materials
- perception that recycling affects product quality
- a recycled logo can act as a deterrent to product sales
- aversion by banking and insurance communities to finance/insure resource recovery projects/technologies
- lack of application of design for environment principles when designing and manufacturing products
- short product cycles (e.g. computer monitor technology - CRT's are a huge waste issue now, but there is little incentive to develop solutions because CRTs may be replaced by flat screens within 5 years)
- lack of communication and information sharing across different business sectors
- availability of staff time to devote to finding resource recovery synergies
- financial resources for facilitation and coordination of efforts to identify resource recovery synergies across different organizations
- attitude of staff in organizations that think they are 'already doing everything they can'
- lack of leadership in resource recovery in Canada results in technologies and investments occurring elsewhere
- lack of relevant separation technologies
- lack of education
- lack of demand for recycled products and/or products containing recycled materials (secondary material markets)
- lack of consistency of definitions - recycled, waste, by-product, etc.
- lack of information on compositions of materials being disposed
- availability of cheaper alternatives - because of lack of full cost accounting
- low landfill costs due to landfill overcapacity result in new technologies not being able to compete
- lack of information (case studies) on effective public-private partnerships

- lack of infrastructure to transfer cleaner production technologies across industry sectors
- lack of local decision-making authority by Canadian operations of multinational companies
- Canada's geography
- Lack of economies of scale (lack of sufficient quantities of by-products within economic transportation distances)
- Other issues receiving higher priority, e.g. greenhouse gas emissions, 4 year election terms, quarterly shareholder results, etc.

Main Groupings of Barriers
Remote and low density populations resulting in long transportation distances and low volumes that make collection and recovery of materials very costly
Lack of local decision-making authority by Canadian operations of multinational companies
Life cycle and social and environmental costs not included in costs of products and product disposal making alternatives to resource recovery appear less costly
Lack of resources to provide coordination services needed to network across companies and business sectors
Lack of appreciation of opportunities for savings that can be realized by networking across sectors, applying eco-industrial principles
Lack of public and political priority for resource recovery
Perception that products containing recycled materials are of lower quality than products containing natural resources
Regulatory and product standards inhibiting resource recovery
Lack of by-product separation technologies

6. Roles

The following roles for stakeholder in enhancing resource recovery were identified (see Table 6-1):

Table 6-1: Roles of Stakeholders in Enhancing Resource Recovery

Role	Federal	Provincial	Territorial	Municipal, Institutional	Industry	Environmental Organizations
Leadership from CCME (Canadian Council of Ministers of the Environment)	Y	Y	Y			
Green procurement of products that are recyclable and/or with recycled content	Y	Y	Y	Y	Y	
Education and awareness of benefits of resource recovery	Y	Y	Y	Y	Y	Y (env. groups and media)
Engage university researchers in resource recovery	Y			Y		
Invest in resource recovery technology research and development	Y	Y	Y		Y	
Establish/learn appropriate roles for public, private sectors	Y	Y	Y	Y		
Establish preferred financing for resource recovery	Y				Y (banking & insurance community)	
Coordinating, facilitating development of eco-industrial parks by providing information on material flows into and out of regions	Y	Y		Y		
Centres of excellence focussing on multisectoral resource exchange	Y				Y	
Require product/packaging takeback by manufacturers and retailers	Y	Y	Y	Y		
Create economic incentives for resource recovery	Y	Y	Y	Y	Y	
Shared responsibility. Recognize success	Y	Y	Y	Y		Y
Develop policy/regulations that encourage resource recovery	Y	Y	Y	Y		
Support communities that show leadership in resource recovery						

Role	Federal	Provincial	Territorial	Municipal, Institutional	Industry	Environmental Organizations
Practice product stewardship					Y	
Participate in arms-length resource recovery organization	Y					
Harmonize regulations, communication and policy, locally and internationally, with emphasis on US/Canada	Y	Y	Y	Y		

7. Opportunities

Group discussion revealed the following opportunities for improving resource recovery in Ontario:

- Design products for recyclability
- Practice green procurement
- Require product stewardship (require suppliers to take back packaging and products)
- Develop small scale mobile technologies to address economies of scale and remote distance barriers
- Map material flows - but be careful to set parameters to make sure database is clear and not confusing
- Redefine the silos that prevent business units within organizations and separate organizations from sharing information/communicating
- Define the resource recovery priority and then engage/focus energy from all sectors on the priority
- Learn/benefit from the experience of others in other organizations and countries
- Green energy and greenhouse gas emission credits from landfill gas recovery
- Developing integrated waste management master plans
- New technologies e.g., gasification (e.g., University of Sherbrooke), plasma arc (e.g., Resorption Canada Ltd.), anaerobic digestion
- Consider central, shared facilities by several municipalities to treat hard-to-market or hard-to-recover municipal waste resources.

8. Projects

Participants identified a variety of possible resource recovery projects in Ontario. These are presented in Table 8-1 below under the headings of post-consumer, institutional and industrial projects; projects that could potentially address more than one category are grouped together as “cross-cutting” projects. Some projects were more fully developed. All project ideas have been reported below. Where details were available, they have been included.

Participants were encouraged to consider the following questions when introducing projects:

- What is the project?
- Who is the proponent of the project?
- What resource recovery issue does it address?
- Who are the potential or existing partners and co-founders?
- What is the estimated cost?
- What sector/barrier does the project address?

Project submissions received after the May 7 consultation are listed in Table 8-2.

Table 8-1: Potential Resource Recovery Projects

Project	Sponsor	Impact	Cost	Potential Partners
CROSS-CUTTING				
Biogas demonstration project - phased demonstration of anaerobic digestion technology/cogeneration (A project sheet has been submitted)	Kinectrics	• Applicable to agricultural, municipal solid waste, industrial organics	Phase I: $300k (14 mo) Phase II: $2M (2 years) Phase III: $18M (4 years)	IRAP, SDTC, OMAFRA, MOE, CRRS, livestock farmers, community, municipality (Cambridge, and Chatham-Kent; Ontario)
Demonstration plants for recovering energy from mixed waste plastics (# 3 to # 7) to improve and enhance plasma and microwave technologies. Target waste streams include those containing high percentages of LPDE film plastic, and rigid plastic. (A project sheet has been submitted.)	SAIC Canada (Science Applications International Corporation)	• Divert from urban landfills significant volumes of by-product plastics from post-consumer/ industrial sectors	$750,000 (2 years)	Federation of Canadian Municipalities (FCM), a number of municipalities, and possibly, Environment and Industry Council (EPIC) of the Canadian Plastics Industry Association (CPIA)
Post mortem on Extended Producer Responsibility (EPR) and Noranda electronics recycling and Swiss company experience	Consumer Electronics Marketers of Canada			
Undertake advertising campaign (social marketing)	Canadian Association of Recycling Industries			
Optimization study to increase throughput of pyrolysis systems - consider modules, mobile or transportable systems				
Establish a task force to harmonize policies to encourage resource recovery with regulations	Noranda			Industry, all levels of government
Co-composting of biosolids (sewage sludge) and municipal solid waste				

Project	Sponsor	Impact	Cost	Potential Partners
Develop and implement a resource recovery education program in primary and secondary schools and colleges - make it fun, e.g. a contest for most material efficient/recyclable design; contest could be local, national, international		• Addresses education, awareness barrier	~$150,000 to test run a pilot	Industry, MWIN, OWMA, CARI, RCO, CCC, MOEE
Study which policies/programs are most effective in achieving tire recycling in US/Canada, e.g. if tire recycling cost goes into general revenue, is that effective for promoting tire recycling?				
POST-CONSUMER				
Design and build a microwave-based demonstration system to treat scrap tires and industrial rubber waste in southern Ontario. Multi-partner demonstration plant will process 1500 tires/day and provide data leading to full-scale implementation. Products will include carbon black, hydrocarbon fuel oils and steel. Extensive studies on by-product quality and handling, energy efficiency, energy recovery, material handling and system control will be undertaken. (A project sheet has been submitted)	Environmental Waste International	• Reduce stockpiles of post-consumer tires • Prevent future stockpiles of tires	$ 4.5 to 5 million (3 year project)	Waste material suppliers, provincial government, first nations, carbon black users, micro-turbine manufacturer, CRRS/ NRCan, municipality, Federation of Canadian Municipalities (FCM), North American Recycled Rubber Association, Recycling Council of Ontario, Municipal Waste Integration Network and Canadian Association of Recycling Industries
Test feasibility of new and emerging technologies to address post residuals representing 40% of municipal waste (thermal technologies, gasification, financing)	City of Toronto			Need funding for feasibility study
"Take-it-back" Toronto. Implement product stewardship (return to the original producer of the product at the end-of-life) with the participation of retailers that sell automotive, garden, health/pharmaceut-ical, household and electronic products. (A Project sheet has been submitted.)	City of Toronto	• Development of reuse and recycling networks, infrastructure and end-markets • Divert materials from landfill • Education & awareness	Year 1: $300,000 (NRCan:33-50%) Years 2 & 3: $205,000 (NRCan: 33%)	Great Lakes Sustainability Fund (GLSF) of Environment Canada, Recycling Council of Ontario (RCO)

Project	Sponsor	Impact	Cost	Potential Partners
Enhanced Integrated Waste Management model (IWM) for Canadian municipalities. Existing model is designed to help municipal officials understand environmental impacts of waste management activities. Planned enhancements include user friendly interface, database upgrade, compatibility and links to related models in the marketplace, and enhanced teaching tools. (A project sheet has been submitted)	Corporations Supporting Recycling	• Could help reduce greenhouse gas emissions • Divert material from landfill, save natural resources	~$250,000 (12 months) $200,000 requested from CRRS.	EPIC, Environment Canada (National Office of Pollution Prevention), University of Waterloo, City of London, City of Markham, City of Toronto
Technical and economic feasibility study of a centralized facility using thermal technology (plasma, pyrolysis, gasifier) to serve several municipalities.	City of Ottawa	• Could address issue of economies of scale		Municipalities, FCM, MWIN, WDO, CRRS
Establish a demonstration material separation plant for post-consumer electronics.		• Addresses lack of separation infrastructure	~$5 million	
Develop a system for recovering fast food litter.				
INSTITUTIONAL				
INDUSTRIAL				
Collection/recovery of Basic Oxygen Furnace (BOF) off gases to burn in reheat furnaces. (A project sheet has been submitted.)	Lake Erie Steel Company (LESC)	• Energy recovery saves natural resources • Reduces greenhouse gas emissions (68,000 tonnes/year)	$32 million (18 months)	LESC, Demag
Inventory of construction/demolition wastes	Peter Klaassen Consulting			

Project	Sponsor	Impact	Cost	Potential Partners
Development of Inorganic Mineral Binders from Surplus Industrial Mineral By-Products (A project sheet has been submitted)	Michael P. Sudbury Consulting Services Inc.	• Saves natural resources • Reduces volumes of landfilled/stored industrial inorganics • Reduces greenhouse gas emissions • Could be used for brownfield remediation, cement production, etc.	$100,000 for feasibility study, $6 million over 5 years	Federal, Provincial and Municipal Governments, Resource and Mineral Industries through Associations, Universities; Canadian Institute for Advanced Research, Engineering Consultants
Demonstration plant for recovery of metals from industrial (mining) effluents using chelating agent to remove metals and concentrate metals for recovery. Field-scale project will be conducted to demonstrate an innovative approach to using a waste by-product of the pulp and paper industry for metal recovery. (A project sheet has been submitted.)	SAIC Canada	• Recovers by-product metals for reuse • Saves natural resources • Reduces heavy metal contamination of water effluents.	$250,000 (18 months)	NRCan (Mining and Mineral Sciences Lab), Environment Canada (Environmental Technology Centre) and Tembec.
Recovery of Hydrogen from Coke Oven Gas. Demonstration of an improved, lower cost technology, resulting in a higher value product (4 years to complete). Demonstration plant will use 1000 cubic feet per minute gas, operate for 1 year. (A project sheet has been submitted.)	Kinectrics	• Recovers energy • Produces a higher value energy stream • Barriers: already using technology; tried in the past, reluctance to try it again	~$6.8 million (four years) $2.9 million requested from CRRS/NRCan.	Project partners: Hatch, McMaster University, QuestAir and steel company (to be identified). Co-funding from: Sustainable Development Technology Canada (SDTC), CRRS, Steel industries and Steel Association
Develop project to address communication barrier (silos) between manufacturers and recyclers; manufacturers are unaware of disposal issues/costs, possibly a lifecycle task force, case studies; could be used as a model to address communication between manufacturers and recyclers in different countries.	Noranda	• Landfill diversion • Saves natural resources • Reduces environmental impacts		CRRS, Noranda, electronic manufacturers, electronic design schools

Project	Sponsor	Impact	Cost	Potential Partners
Technical and economic feasibility study of thermal expander to recover energy from compressed gas (pipelines in Ontario) to compete in open market, Sarnia is a potential location.		• Recovers by-product energy • Saves natural resources • Greenhouse gases		
Technical and economic feasibility study of recovering flare gas and running a turbine to generate electricity in Sarnia (5 MW).		• Recovers by-product energy • Saves natural resources • Greenhouse gases		
Capture by-product sulphur dioxide and convert in phosphate and fertilizer for remote markets, e.g. China and India.				
Study/develop alternative methods of handling sulphur dioxide gases.				
Recover energy in form of carbon monoxide from Basic Oxygen Furnaces.				
Test dezincing process (alkaline leaching and solvent extraction) to recover zinc from galvanized scrap metal. The demonstration project will test the feasibility of scaling up.	Process Research ORTECH Inc.	• Technology can be transferred to address Electronic Arc Furnace Dust, and potentially, post-consumer galvanized scrap.	Phase I: $400,000 (1 yr); Phase II: $3.4 Million (2yr)	Private partners, and potentially steel manufacturers and zinc producers

Project	Sponsor	Impact	Cost	Potential Partners
Establish an ongoing By-Product Synergy network for Ontario to find outlets for industrial by-products. Government funding is required to retain facilitators for meetings, to promote and advertise meetings to attract participants, provide logistical support for the effort. These meetings would generate a significant number of project ideas for implementation or further study, and potentially contribute to the diversion of significant quantities of materials from landfill. Participating companies will pay an annual membership fee to participate. The cost of entry has been a significant barrier for many companies in previous efforts such as the Hatch By-Product Synergy Project. (A project sheet has been submitted.)	Dofasco	• Attract a broad participation from all industries in Ontario • Reduce cost of membership for industrial partners (who cannot count on a guaranteed return on this investment). • Identify industrial uses for by-products that could potentially divert significant quantities of material from landfill.	$200,000/year Minimum three years for a time-limited project.	Government of Ontario, Industries.

Table 8-2: Project Submissions received after May 7, 2002

Project	Sponsor	Impact	Cost	Potential Partners
CROSS-CUTTING				
Development of an economically and ecologically sustainable prototype land based fish farm in a closed out open pit as a prototype to develop a beneficial system for natural lakes. Organic by-products (bio-solids) from the fish farming will be suitable for anaerobic digestion (natural gas produced can be used for winter heating). Nutrients in effluents can be used to produce algal species suitable for harvesting and processing to fish food to further improve project economics. Proof of concept proposed through 10,000 kg/year pilot production facility. (A project sheet has been submitted.)	Michael P. Sudbury Consulting Services Inc.	• Encourage mining companies to consider constructive use of open pits in closure plans. • Revenue from fish farming likely to be supplemented by potential by-product energy, algae as fish food, etc. • Primarily industrial project, with post-consumer and institutional aspects • Rural and Northern.	$500,000 capital cost; three years to develop prototype 75% government; 25% other.	Federal and provincial governments, mining industry, machinery manufacturers, fish farming association and universities (aquatic biology/limnology).
Improving Access to Northern Resources. Develop prototype airship with light lifting gas from anaerobic digesters. Prototype airship will be capable of transporting 20 tonnes of cargo over 500 km at 50 km/h. (A project sheet has been submitted.)	Michael P. Sudbury Consulting Services Inc.	• Low cost, energy efficient and rapid transportation to remote northern communities • Reduce Northern dependence on high cost oil and gasoline	$500,000 capital cost; three years to develop prototype. 75% government; 25% other.	Federal and Provincial governments, mining companies, machinery and textile manufacturers, Fish Farming Association and Universities;
Pyrolysis - Waste Rubber, Municipal Solid Waste, Bio-solids, Cow Manure. Pilot trials for four different feedstocks for 1 month each; a total project period of 5 months including start-up and shut-down. (A project sheet has been submitted.)	Impex Canada	• Industrial and post-consumer in rural as well as urban areas. • Reduce landfill • Recover energy	$1,850,000 (5 months) $750,000 requested from NRCan	IRAP, NRCan, FCM, City of London, City of Toronto, Agriculture Canada, Ontario Ministry of the Environment.

Project	Sponsor	Impact	Cost	Potential Partners
Electronics Diversion Program. One-year pilot project to provide alternatives to disposal of electronics to determine the feasibility of banning these items from landfill. Options to reuse, return to vendor, and recycle will be investigated. Quantities of materials collected, and the efficiency and effectiveness of the alternatives will be monitored to establish permanent facilities. (A project sheet has been submitted.)	City of Hamilton	• Divert 50 to 100 tonnes of electronics from landfill annually. • Urban and rural • Institutional (municipal), industrial and post-consumer	$500,000 (1 year)	Federal government (Natural Resources, Environment Canada, Industry Canada), Ontario Ministry of Environment, Private Sector (electronics manufacturers, electronics recyclers, consulting services), Industry Organizations, and Non-Governmental Organizations (AMRC).
Pilot demonstration plant for the thermal conversion of post-consumer waste tires and industrial rubber wastes into marketable by-products and energy, via pyrolysis and gasification. The Phoenix Carbon process will produce prime carbon black, which will replace ASTM carbons currently produced from hydrocarbon feedstock. Partnerships will be sought to capitalize on the by-product energy -- power generation and/or utilization as fuel in manufacturing plant. (A project sheet has been submitted.)	Christopher George / Phoenix Carbon Canada Ltd.	• Reduce landfill • Conserve natural resources (by-product carbon, fuels, steel will replace virgin materials) • Help reduce stockpile of waste tires in Ontario • Facilitate development of full-size plant	$480,000 (6 months to build pilot demonstration plant) Funding required: $80,000	Aboriginal Community (plant will be on Indian Reserve Land), Venture group, industry partner (either cement or ethanol plant), federal government (IRAP/NRC; CRRS/NRCan) and provincial government.

Project	Sponsor	Impact	Cost	Potential Partners
POST-CONSUMER				
Rigorous analysis of process emissions to air, land and water from the gasification of unrecyclable plastic residues to provide "synthesis gas" for use as chemical feedstocks or clean burning fuels. These measurements will be carried in during a large-scale experiment trial utilizing a Canadian designed gasifier located in Sherbrooke, Quebec. The concentrations of dioxins, furans, polyaromatic hydrocarbons in the emissions will be determined. (A project sheet has been submitted.)	The Environment and Plastics Industry Council (EPIC)	• The primary focus will be to deal with post-consumer residues from large urban communities. • Results will be applicable to residues from the industrial, commercial and institutional (ICI) sectors. • Applicable to other waste feedstocks (biomass, sewage sludge, etc.) from smaller municipalities	$220,000 (during 2002-2003) $100,000 requested from CRRS/NRCan	Municipalities, Sol Plastics, NRCan
INDUSTRIAL				
Acid Regeneration Oxide (ARO) as a raw material for the production of pigments. New application has to be developed for these oxides due to declining demand for their traditional use (polybonded magnets). Development work is required to establish processing requirements for the new application. (A project sheet has been submitted.)	Dofasco	• Continue to divert 25,000 to 40,000 tons/year oxides from landfill • Value addition to by-product	$50,000 (1 year) 50% government; 50% industry	Stelco, Canadian Pigment producer.
Plastic (poly) strapping recovery and reuse initiative. Commercialisation of a new technology that would allow the recovery and reuse of used plastic (poly) strapping (destined currently for landfill after a single-use). Other aspects to be tackled include the development of transportation Infrastructure to pick-up and sort used strapping, education of industrial users, development of human resources, etc. (A project sheet was submitted after attending the May 16 Halifax consultation.)	Kasar Equipment Industries	• Reduce landfill. • Extend the lifecycle of plastic (poly) strapping. • Potential energy savings from the re-use of strapping. • Mainly industrial in impact, the project also has an institutional (educational) aspect.	$400,000 (start-up cost for the strap recovery and reuse program) Kasar has invested nearly $1 Million in the past three years in technology development.	All levels of Government (CRRS, Green Municipal Funds, etc.), Waste collection industries, Plastics recyclers, Strapping industry (may be difficult for obvious reasons), and the private sector.

Project	Sponsor	Impact	Cost	Potential Partners
INSTITUTIONAL				
Green Procurement in Canada - Current state and Opportunities for Growth. The nature and prospects of public-private collaborations on procurement will be the primary focus of Phase 1 of the project. Phase 1 will address the question "what is currently happening on the green procurement front in Canada within the public and private sectors?" The objective of Phase 2 will be the development of a strategy and action plan for advancing improved procurement policies, in consultation with key stakeholders. The key question to be explored in Phase 2 will be "how can the public and private sector collaborate on the future supply and demand of green procurement choices?"	Corporations Supporting Recycling (CSR) and Recycling Council of Ontario (RCO)	• Demonstrate that an opportunity exists to build a sustainable and effective public-private partnerships to support green procurement as a key element of a comprehensive resource recovery strategy for Canada • Primarily institutional in nature, the project is expected to have consumer benefits. • Increased availability of green products for large consumers, and to the general public. • Help build higher value markets for materials that are collected through residential recycling programs across Canada.	$200,000 for Phases 1 and 2 (each phase will take 6-8 months to complete, at a cost of about $100,000).	Terra Choice Program, Environment and Plastic Industry Council and Canadian Association of Recycling Industries (supporting partnerships pending confirmation).

Attachment I

CONSULTATIONS ON A CANADIAN RESOURCE RECOVERY STRATEGY

- A Background Paper -

April 12, 2002

1. Introduction

Resource recovery seeks to recover materials and energy at the end of product life in an economic, social and environmentally sustainable manner. Natural Resources Canada (NRCan) wishes to identify potential demonstration resource recovery projects that are reflective of Canada's unique circumstances. These projects will form the basis of a Canadian Resource Recovery Strategy.

NRCan is undertaking a consultative process with all interested partners to solicit their views and ideas in a series of discussion fora to identify resource recovery priorities and recommend economic and environmentally sustainable demonstration projects for co-funding. Your input to this process is being sought.

NRCan is targeting to identify projects, funding partners and levels that can be incorporated in a resource recovery strategy that reflects the needs of all regions across Canada. From these consultations a business case will be developed and presented to federal senior management in the fall of 2002.

2. The Process

Consultations are planned during April and May in the following locations:

- Vancouver, B.C. covering B.C. and the Yukon
- Edmonton, Alberta covering Alberta, Saskatchewan and Manitoba
- Yellowknife, N.W.T. covering the North West Territories
- Toronto, ON covering Ontario
- Montreal, QC covering Quebec
- Halifax, N.S. covering Atlantic Canada
- Iqaluit, Nunavut covering Nunavut

The objectives of the consultations are to identify:

- resource recovery priorities in urban and rural communities across Canada;
- resource recovery priorities north of Canada's 60 th parallel;
- barriers to resource recovery in each region;
- potential resource recovery demonstration projects in industrial, post-consumer and institutional sectors;
- estimated levels of project funding and co-funding partners.

Participants are requested to come to the meeting with one or more of the following:

- local resource recovery issues and opportunities;
- sectoral resource recovery issues and opportunities, i.e. industrial, institutional, post-consumer;
- barriers encountered in addressing the above issues and opportunities;
- potential demonstration projects that need co-funding to implement.

A draft format for identifying potential demonstration projects is attached for your consideration (see Appendix I). One form for each potential demonstration project should be completed and taken to the consultation meeting.

The priorities, barriers and demonstration projects identified over the course of the consultations will be compiled in notes that will be transmitted to all participants. NRCan will use the results of the consultations to recommend demonstration projects for co-funding by the federal government.

3. CONTEXT

3.1 Background

Domestic and global demand for recycling and recycled products has been steadily increasing, and will continue. Both industrialized and non-industrialized economies are being challenged to be efficient and competitive, and to ensure the environmentally sound management of products and materials throughout their life cycle.

The recycling of products is becoming a highly competitive growth industry. Recycling is recognized as being resource efficient and is one of the means of achieving industrial and commercial stewardship together with associated reductions in greenhouse gas emissions. Domestic and international pressure for the adoption of prevention-oriented measures that maximize the material and energy efficiency of products in their design and manufacture is growing. This pressure is creating opportunities for cost-effective and environmentally sound recycling and reuse of products at the end of their planned economic life.

Canada has been blessed with geography and geology rich in naturally occurring resources. Due to the multi-elemental complexity of many ore bodies, the challenges presented in harvesting multiple species of forest resources and oil exploration and extraction, Canada has unique and highly specialized competencies in natural resource management and production expertise. This specialized resource management knowledge base combined with existing infrastructure of modern processes and production facilities, provide a significant advantage in managing complex recyclable resource materials arising from both post industrial and post consumer sectors.

Small and Medium-size Enterprises (SME's) have their own special opportunities, needs and challenges. For them, a typical challenge is to secure access to small-scale technologies and processes for resource recovery that are affordable and cost-effective, and that do not necessarily rely on direct or regular access to more sophisticated centralized recovery facilities. SME's remain the backbone of Canada's economy, responsible for a high proportion of employment, growth.

In absolute terms resource recovery operations are most attractive in urbanized regions, but in relative terms can occasionally be of greater significance in sensitive rural and remote areas. The North would be a particularly significant case in point, as would be valuable farming and tourism areas and regions with delicate ecosystems and valued natural amenities. In communities and regions where haulage of recyclable materials to centralize recovery operations is too costly or impractical, local small-scale recovery enterprises may present an attractive alternative and opportunity.

Canada has an opportunity to establish itself as a global leader in niche areas of resource recovery, with a positive image as a responsible life-cycle manager of products. There is a need to develop and promote Canadian technologies and approaches that can compete in the growing global market for viable and environmentally responsible resource recovery technologies and expertise. In order for this to happen Canada has to remain an active and credible participant in international policy developments affecting both global markets for recyclable materials and the access to foreign markets of Canadian products.

3.2 The Canadian Resource Recovery Strategy

NRCan is facilitating the development of a Canadian resource recovery strategy. Canada needs a strategy for the following reasons:

- to improve material and resource efficiencies,
- reduce environmental impacts of resource use,
- contribute to Canada's plan to reduce greenhouse gas emissions,
- address the unique challenges and opportunities to resource recovery posed by Canada's geography, population distribution and climate,
- position Canada to be a global leader in niche areas of resource recovery.

Resource recovery consists of measures to maximize the economic opportunities and success in - recovering products (and by-products), materials and energy at the end of product life, and putting them back to work in the economy through recycling and reuse.

A resource recovery strategy focuses on the promotion and support of innovative product design and supportive public, private and consumer policies and practices that a.) increase the recoverability of valuable material and energy resources at the end of product life; b.) improve access to recoverable products, materials and energy (including product components and by-products) by those involved in the recycling and reuse sectors; and c.) enhance the efficiency and environmental soundness of recycling and reuse. Cost-effective and environmentally sound resource recovery optimizes the productive use of natural resources, minimizes waste generation and related treatment and disposal costs and supports industrial innovation and competitiveness.

Effective resource recovery efforts involve complex policy, technology, regulatory, and infrastructure issues that transcend traditional industrial, commercial, institutional and consumer sector and inter-jurisdictional boundaries. Strong partnerships with provinces/territories, communities, industry, consumers and public stakeholder groups are vital to successful approaches. The establishment of a consultation process identifying projects that will have an impact on the recovery of materials currently going to waste is an essential start.

Three key elements need to be addressed when developing a cost-effective, environmentally sound resource recovery strategy than can advance Canada's sustainable development goals:

1. How to inform, influence and engage decision-makers in governments, industry, non-governmental organizations and Canadians generally in taking appropriate action in resource recovery activities. Shifting the paradigm, from considering end-of-life products and materials as a waste to looking at them as valuable resources to be recovered for further economic use, will be crucial to increased recovery activities

2. How to advance technologies, processes and supporting institutional networks and infrastructure so that they better support resource recovery. The availability of cost-effective and environmentally sound technologies, infrastructure, equipment and processes is vital to the growth and development of domestic resource recovery operations. This includes both upstream technologies and approaches for the design of products that are amenable to cost-effective recovery at the end of their planned economic life, and downstream technologies and approaches for the efficient and effective diversion, extraction, separation, reuse and recycling of materials and energy
3. How to create and maintain a policy and regulatory environment that facilitates and reinforces cost-effective and environmentally sound resource recovery. At the heart of a viable resource recovery sector in Canada is a favourable domestic climate for investment in, and operation of, resources recovery operations. The complex array of regulatory and other policy measures affecting the operation and financing of resource recovery operations influence profoundly the overall financial and operational viability of many reuse and recycling initiatives.

4. Project Criteria

Demonstration projects are to be identified that:

- will develop and promote Canadian technologies and approaches that can compete in the growing global market for viable and environmentally responsible resource recovery technologies and expertise;
- inform, influence and engage decision-makers in governments, industry, non-governmental organizations and Canadians generally in taking appropriate action in resource recovery activities;
- advance technologies, processes and supporting institutional networks and infrastructure so that they better support resource recovery;
- create and maintain a policy and regulatory environment that facilitates and reinforces cost-effective and environmentally sound resource recovery.

The projects should:

- be capable of being economically, environmentally and socially sustainable;
- have willing partners from other levels of government, industry, community groups and other interested stakeholders;
- recover products and materials at the end-of-life for industrial, institutional and post consumer levels of society;
- address local priorities and have active local champions,
- be reasonably well-defined
- need co-funding to implement.

5. Conclusions and Next Steps

Following the stakeholder consultation sessions and any written comments submitted by May 31, 2002, a summary of the comments received will be compiled and circulated to interested stakeholders. Taking these comments into account, an overall strategy will be developed. The recommended demonstration projects and funding levels and partners will form the basis of the strategy. It is anticipated that the strategy will be submitted for funding approval in the fall of 2002.

Stakeholder views on these proposals are an important element of the Canadian resource recovery strategy process. Your views are greatly appreciated.

6. Appendix I

Canadian Resource Recovery Strategy

Draft Format to Identify Potential Projects

- Title

- Originator (with address an contact information by e-mail, Fax and telephone.)

- Brief description of proposed project

- Type of project: industrial, post-consumer, institutional.

- Geographical Emphasis: north of 60 th parallel, urban and/or rural.

- Estimated impact on material and/or energy recovery.

- Estimated total cost of the project, and estimated timeframes.

- Potential partners in project.

- Estimated funding sources and levels

Issues

- Economics - it costs the City of Ottawa $25M/year (net) to manage MSW
- Environmental - biosolids and drinking water are top priorities (no local landfill crisis)
- Secondary material markets - 35% drop in revenues from previous year
- Technology - ownership & operation, PPP?

Opportunities

- Markets - green energy and GHG credits re landfill gas recovery project
- Technologies of interest:
  - Gasification (University of Sherbrooke)
  - Plasma arc (Resorption Canada Ltd.)
  - Anaerobic digestion
- Planning - Integrated Waste Mgt. Master Plan (stepping back before moving forward)

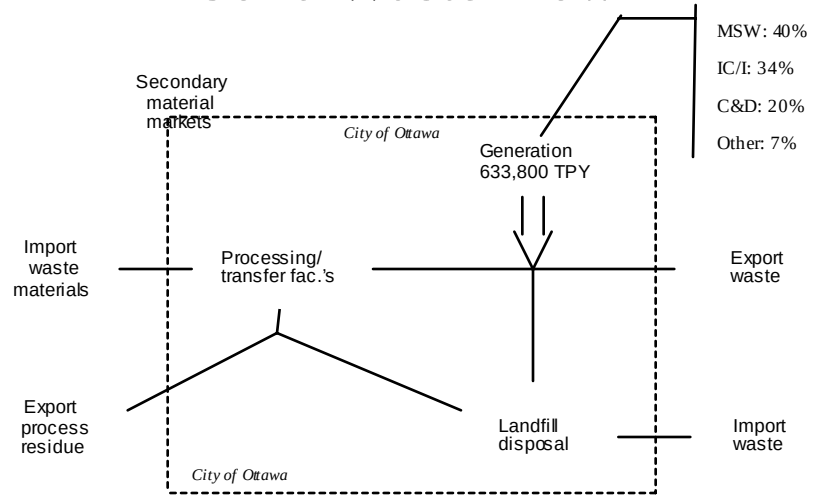
Barriers

- Financial - landfill is still lowest cost option
- Markets - secondary material markets "secure" except glass and #3-7 plastics
- Regulatory environment - looking for backdrop legislation to support WDO initiative

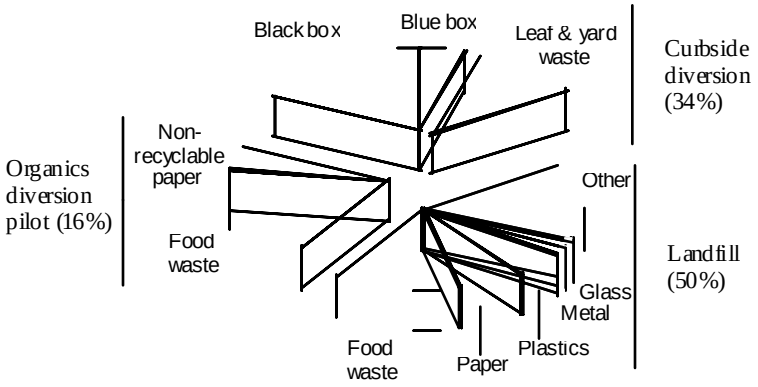
Recommendations

- Support trials and due diligence reviews of new technologies
- Conduct cost/benefit analyses for central, shared facilities to treat hard-to-market or hard-to-recover municipal waste resources

Solid Waste Flow



Solid Waste Composition



Average curbside household = 1,089 kg. of total solid waste per year
(196,000 TPY of garbage; 64,000 TPY recyclables; 26,000 TPY yard waste)

Attachment III

Consultations on a Canadian Resource Recovery Strategy

Toronto/Ontario Consultation - May 7, 2002

Location: Hatch Offices - 2800 Speakman Drive, Mississauga, Ontario

Agenda

8:00 am	**Registration & Refreshments**	
8:30 am	**Welcome and Introductions**	**Roger Yates**
8:40 am	**Opening Remarks**	**Mike Clapham**
8:50 am	**Round Table Introductions**	**All**
9:05 am	**Overview & Workshop Objectives**	**Mike Clapham**
9:20 am	**Panel Introductions**	**Roger Yates**
9:30 am	**Panel Discussion on Priorities, Issues in Urban and Rural Areas:** ä Industrial ä Institutional ä Post-consumer	**Invited Regional Representatives** **Robert Sinclair, City of Ottawa** **Howard Holt, Dofasco Inc.** **Cindy Thomas, Noranda Inc.** **Leonard G. Shaw, CARI**
10:30 a.m.	**Break**	
10:45 am	**Plenary Discussion**	**All**
11:45 pm	**Introduction of Issues to be addressed by breakout Groups**	**Carole Burnham**
12:00 pm	**Networking buffet lunch**	
12:40 pm	**Breakout Groups**	
2:45 pm	**Groups Report to Plenary/Group Discussion**	**Chair: Carole Burnham**
3:00 pm	**Break**	
3:15 pm	**Round Table Closing Comments/Issues**	**All**
3:45 pm	**Next Steps**	**Mike Clapham**
4:15 pm	**Summary/Thank you's**	**Roger Yates**
4:30 pm	**Adjourn**	

Attachment IV

Consultations on a Canadian Resource Recovery Strategy
Toronto/Ontario Consultation - May 7, 2002

List of Participants

Company	Name	Contact Number	E-mail Address
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