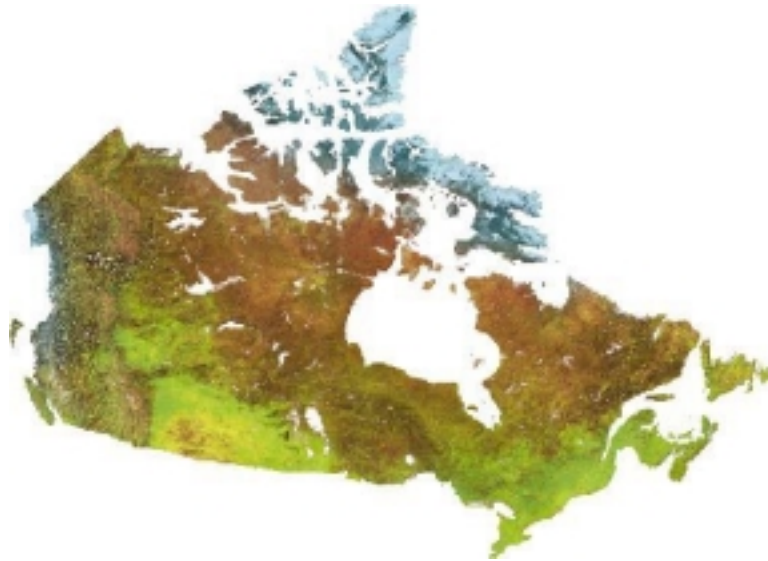


Consultations on a Canadian Resource Recovery Strategy



Summary of Iqaluit/Nunavut Consultation Held at Iqaluit, NU on June 14, 2002



Natural Resources
Canada

Ressources naturelles
Canada

Canada

Consultations on a Canadian Resource Recovery Strategy Summary of Iqaluit/Nunavut Consultation Held at Iqaluit on June 14, 2002

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 were held in seven locations: Vancouver, Yellowknife, Edmonton, Toronto, Halifax, Montreal and Iqaluit. Representatives from industry, non-governmental organizations and all levels of government were invited to participate. The objectives of these sessions were 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 Iqaluit Consultation, the day began with a traditional prayer, led by Inuit elder, Geosa *Uniqsaraq*. This was followed by round-table introductions by each participant. Mike Clapham (NRCan) presented an overview of the Canadian Resource Recovery Strategy (see Background Paper, Attachment I). Matthew Hough (City of Iqaluit), Bob Patrick (Nunavut Power; see also Nunavut Power presentation, Attachment II), Michael Hine (Qikiqtaaluk Corporation), and Barbara Armstrong (Inuvik Recycling Society and AB Salvage) provided introductory comments about resource recovery issues, priorities, barriers and opportunities.

The participants then discussed resource recovery issues in Iqaluit and Nunavut, barriers to addressing these issues and the roles of different stakeholders in the development and demonstration of resource recovery initiatives. Several potential resource recovery projects that could be implemented with some co-funding from NRCan were identified. Mike Clapham closed the session with an explanation of the next steps for developing the Strategy.

A copy of the agenda and the list of participants at the session in Iqaluit are attached (Attachments III and IV). In addition to the two facilitators and Mike Clapham and Roy Sage from NRCan in Ottawa, 20 participants attended the session representing Inuit elders, resource recyclers and recycling associations, the City of Iqaluit, the Government of Nunavut, local representatives of Environment Canada and NRCan, industry and industry associations.

Several participants noted that the Department of Indian Affairs and Northern Development (DIAND) did not participate in the session. (Note: Of the three DIAND representatives invited to the workshop, two had scheduling conflicts and the third, who had accepted the invitation, was unable to attend due to illness.) Subsequent to the June 14 session, DIAND has indicated its support for the Government of Nunavut Climate Change Strategy and reiterated that DIAND funds the Aboriginal and Northern Climate Change Program. Proponents of demonstration

projects for Nunavut that are energy/climate change-related could contact John McEwen (McEwenJ@inac.gc.ca or 819-997-3109) or Valerie Hume (HumeV@inac.gc.ca or 819-997-9480) in the headquarters office (Indian and Northern Affairs Canada or INAC) to discuss the possibility of co-funding.

2. Items of Note in the Discussion

- Iqaluit is a rapidly growing community (current population 6,300). It is the capital of the territory of Nunavut, established only two years ago. The rapid growth is straining the city infrastructure, including water, sewage, roads and solid waste. The community and territorial government do not have the resources (human and financial) to adequately address all these issues.
- The population of Nunavut is also growing rapidly. As a result, electricity needs are growing. Electricity is costly because it is usually generated with diesel fuel, imported from the south. There are opportunities to recover heat from electricity production and use it for district heating, aquaculture and greenhouses. Several attempts to use wind energy for electricity production have generally proved unreliable because of the very high winds and extremely cold temperatures in Nunavut. (Note: There are reported to be new technologies for wind energy which are reliable at 69° latitude.)
- The population of Iqaluit includes both Inuit people and peoples from the rest of Canada and abroad. The community does not view resource recovery as a priority. Some community groups support the need for resource recovery and some initiatives to recycle aluminum beverage containers and paper have just been launched. Resources are needed to establish and maintain programs and to develop and deliver programs for education and awareness of the benefits of recycling.
- Iqaluit is facing several serious environmental issues, including; emissions from the continuously burning refuse at the city dump, a poorly functioning sewage treatment plant due to inadequately mixed concrete used in its construction, debris from local households blowing into the roads and harbour, expansion of housing impinging on a local lake used by the Inuit as a water supply, leaching of contaminants from a 'metals' dump located on glacial till draining into a stream leading to the local water supply, and dust during the summer emitted from unpaved roads. A household recycling program to separate plastics and metals from the refuse being burnt at the landfill is underway. A hazardous materials separation program is about to be implemented. These materials will be isolated from the refuse burning location, but there are currently no plans to recycle them. A small number of approved incinerators are used to produce heat from waste motor oil. Some waste crude oil has been used for asphalt production.
- Debris, e.g., plastic bags and tires, from hunting and trapping activities in Nunavut and from transient populations is creating operational and driving hazards for the snowmobiles used to travel between communities and for hunting and fishing in the long and dark winter. The elders noted that old animal bones used to be the only waste on the tundra, which is now littered with shopping bags, plastic bottles, cans, etc. Sewage is an issue in smaller communities as well as in Iqaluit. The elders also are concerned that metals and chemicals from old mines that operated in the 1960's and 1970's may be leaking into water and affecting the health of wildlife.

- Transportation costs due to remoteness from recycling markets are not as much of a barrier as might be expected because airplanes require ballast for the return trips south. Most supplies are transported from the south and few goods are shipped south. A major barrier to sending by-products south for recycling is accessing the variable markets for these materials.
- Participants noted that resources and capacity are lacking to access government funding programs and that criteria for funding that may be appropriate for southern locations often represent a major barrier for funding projects in the north. For example, northern communities cannot be successful for funding that is allocated on a per capita basis. They also argued strongly for territorial projects that address the very small northern communities rather than focussing on the relatively larger communities like Iqaluit.
- The group identified projects that addressed post-consumer, cross-sectoral, institutional and industrial resource recovery needs. Most of the projects addressed either post-consumer or cross-sectoral needs.
- Suggested projects cover policy and regulatory and education needs in addition to infrastructure support for networking and collection and separation centres, as well as implementation projects needed in the north. Provision of portable facilities was suggested as a way of serving communities that produce relatively small quantities in the north.
- Mike Clapham noted that the next steps in developing a Canadian Resource Recovery Strategy include: preparation of the session report in English and Inuktitut, preparation of a final report synthesizing the feedback from the consultations in all seven locations in the three languages, submission of a proposal for funding to senior government officials, and if the program is approved, funding commencing in fiscal year 2003-2004. Participants were encouraged to submit project sheets providing more detail on the projects suggested during the June 14 session by June 28.

3. Resource Recovery Issues

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

Table 3-1: Resource Recovery Issues in Nunavut

Issue	Industrial	Institutional/ <u>Commercial</u>	Post- <u>consumer</u>
Plastics, paper and household hazardous waste			v
Construction demolition materials and furnishings from mine reclamation and DEW line sites	v		
Tarpaulins used as packaging for construction wood	v		
Beverage containers			v
PCB contaminated materials from DEW line sites	v		
Metals and other wastes (some hazardous) at 'metals' dump	v		
White goods, e.g., refrigerators			v
Used vehicles	v	v	v

4. Barriers

Participants identified the following barriers to resource recovery in the territory:

- Government funding criteria are not applicable in the north. Also some government funds have been diverted from resource recovery efforts to greenhouse gas emission reduction planning.
- Lack of local resources and capacity to apply for funding.
- Lack of funding for community volunteers. (For example, should the Ocean's Day clean-up, an initiative formerly funded by Department of Fisheries and Oceans and focused on cleaning debris from the harbour and shoreline in Iqaluit, have to depend on volunteerism?)
- Variable markets for by-products in the south.
- Liability issues impede establishment of a salvage area at the dump.
- Small, distributed quantities of by-products that make collection expensive and require interim storage facilities
- Lack of awareness in the general population of resource recovery benefits.
- Lack of space at landfill to store by-products until they can be transported south.
- Lack of information on waste composition of materials disposed at the dump.
- Need for local entrepreneurship.
- Many bottle containers get shipped from the south directly to the user, so establishing a bottle deposit-refund program would be difficult.
- Lack of clarity between the City of Iqaluit and the territorial government is hampering the repair work on the broken paper shredder and bundler.
- An attitudinal change was also cited as a major barrier. The difficulty lies in keeping such resource recovery issues at the forefront of people's minds year round. For example, garbage debris and litter is a visible problem for only 3 months of the year. During the remaining 9 months, however, all is hidden by the snow, and therefore, may not be perceived to be an urgent issue.

5. Roles

The following roles for the federal government and other sectors in enhancing resource recovery were identified (see Table 5-1):

Table 5-1: Roles of Stakeholders in Enhancing Resource Recovery

Role	Federal	Territorial	Birthright Organizations/ Councils	Industry
Communication of information about resource recovery programs and initiatives and funding sources especially for small communities with no internet access	v	v		
Provide a local presence in small communities	v	v		
Leadership and funding from the Department of Indian Affairs and Northern Development in resource recovery initiatives	v			
Leadership and support from birthright organizations and councils for solutions to resource recovery including funding			v	
Develop policy/regulations for individuals and industry that encourage resource recovery, e.g., tax or price rebates	v	v		
Provide disincentives for not recycling	v	v		
Retailers and manufacturers have responsibility to take back packaging and products at end-of-life				v
Manufacturers should design products with environmental impact in mind				v

6. Opportunities

Group discussion revealed the following opportunities for resource recovery in Iqaluit and Nunavut:

- Building materials and contents from mine site reclamation and abandoned DEW line sites could provide materials and furnishing for homes.
- Discarded tarpaulins from wood for new housing construction could provide weather protection for some housing.
- Glacial till currently covered by materials in the 'metals' dump in Iqaluit could provide needed aggregate for road construction and replace the need for blasting of mountains to create aggregate.
- A 'niche' paper mill could be established to make paper from recovered paper in the north to serve local needs.
- New electricity projects could be designed to provide aquaculture, agriculture and/or district heating.

- Resources from different agencies could be coordinated to optimize resource recovery efforts. Note: Elizabeth Sherlock, Government of Nunavut, volunteered to draft a list of resource recovery initiatives currently underway in Nunavut to append to this summary (see Appendix V).
- Organic by-products could potentially provide fuel for electricity production.
- Learn from Greenland and develop a territorial program to put an incinerator in every community and use the energy for district heating.
- Recover energy from sewage for district heating.
- Generate bio-diesel fuel from gasification of local organic by-products and use as fuel substitute for diesel in electricity generation.

7. Projects

Participants identified a variety of possible resource recovery projects in Nunavut. These are presented in Table 7-1 under the headings of crosscutting, post-consumer, institutional and industrial projects. 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?

Projects identified by participants ranged from fully developed with clear scopes, budgets and potential partners, to ideas generated from the discussion and needing further definition. All project ideas suggested by participants have been reported below. Details have been included where available.

Project submissions received after the June 14 consultation are listed in Table 7-2.

Table 7-1: Potential Resource Recovery Projects

Project	Sponsor	Impact	Cost	Potential Partners
CROSS-CUTTING				
Provide sustainable funding for local recycling businesses.	City of Iqaluit	<ul style="list-style-type: none"> - Divert materials from landfills - Reduce environmental hazards of emissions from burning 		CRRS, Federation of Canadian Municipalities (FCM), federal funding for small business, cold weather technology projects
List current resource recovery initiatives underway in Nunavut.	Nunavut Government	<ul style="list-style-type: none"> - Education about current initiatives - Opportunity to coordinate resources 		Iqaluit Recycling Society, Environment Canada, NRCan, Peterson & Auger, Nunavut Power
Implement paper recycling in Iqaluit, specifically acquire an additional paper baler, shredder, coordinate collection system and partners.	Iqaluit Recycling Society	<ul style="list-style-type: none"> - Divert materials from landfill - Potentially harness energy from paper or establish a local paper manufacturing facility 	~\$30 to 50k	Environment Canada, Government of Nunavut, First Air, City of Iqaluit, FCM
Study the feasibility of establishing a paper plant using recycled paper as feedstock.		<ul style="list-style-type: none"> - Could provide local jobs - Divert material from landfill 		Nunavut Power
Develop local education and awareness programs for producing less paper waste, build on existing programs, focus on successful case studies and how to deliver messages in the north.	Iqaluit Recycling Society			
Recover steel and other demolition materials from Polaris mine site, package and deliver materials to local communities for reuse.		<ul style="list-style-type: none"> - Provides needed beds, mattresses, computers, building materials to local communities 	~\$1 million	Department of Indian Affairs and Northern Development (DIAND), Government of Nunavut
Use mine disposal sites as location for disposing of metals and other wastes from communities.				

Project	Sponsor	Impact	Cost	Potential Partners
Establish a demonstration project for a central compost facility for organic matter, possibly a beehive shelter, compost could be used to grow plants, as dust control, to mix with sewage sludge.				
Cleanup outpost camps in Baffin Region.	Qikiqtani Inuit Association, Qikiqtaaluk Corporation			Qikiqtani Inuit Association, CRRS (if materials returned to the economy)
Study feasibility of establishing a centrally located material exchange facility (salvage area) and provide funds for its implementation.		<ul style="list-style-type: none"> - Diverts material from landfill - Reduce hazardous emissions from landfill burning - Replaces need for natural resources to produce the products that are reused 		
Provide permanent shredder, chipper, baler for aluminium cans, tires in Iqaluit and portable equipment for smaller communities.				
POST-CONSUMER				
Re-establish Oceans Day Cleanup on an annual basis.	Qikiqtani Inuit Association	<ul style="list-style-type: none"> - Improve appearance of area - Reduce hazards of snowmobile operation 		CRRS, Department of Fisheries and Oceans
Acquire a perforator and baler for by-product plastics.	Iqaluit Recycling Society			Environment Canada, City of Iqaluit, Government of Nunavut, FCM
Study market for products from recycled plastics, e.g. for sled runners and life cycle impacts for potential uses of the plastics.	Inuit Elders			
Establish a raven control/deterrent program to prevent ravens from tearing into garbage containers and spreading debris, maybe raven proof containers.	Inuit Elders			

Project	Sponsor	Impact	Cost	Potential Partners
Establish equipment and collection infrastructure for recycling #1 and #2 plastics into interlocking paving stones for use in northern community sidewalks, parking lots, etc. The goal will be to reuse all PET containers. Program to gather plastics, grind, melt and mix and pressure mould (up island shredders and moulding machine needed). A project sheet has been submitted.	Peterson & Auger	<ul style="list-style-type: none"> - Divert material from landfill - Prevent emissions from burning of plastics at landfill - Replaces need for extraction and processing of natural resources (to make concrete and asphalt). 	\$690k (one year to complete). \$340 k requested from CRRS.	City of Iqaluit, Solid Waste Committees, and Nunavut Government.
Implement a charge for plastic bags to discourage discarding them.		<ul style="list-style-type: none"> - Reduces debris in streets - Reduces emissions from burning at dump - Diverts material from landfill 		
Establish a bottle deposit-refund program.	Canada-Nunavut Geoscience Office (NRCan - Nunavut)			
Develop incentives for use of recyclable containers for groceries, perhaps a school contest, etc.				
Retrofit toilets with water reducing toilets.	Iqaluit Recycling Society	<ul style="list-style-type: none"> - Will extend life of current water facility 	~\$1 to 2 million	City of Iqaluit
INSTITUTIONAL				
Develop a long term waste management/resource recovery strategy and facilities for Iqaluit.	City of Iqaluit		\$11 to 12 million	
INDUSTRIAL				
Clean up 'metals' dump and recover granular material for use as aggregate from underlying glacial till.		<ul style="list-style-type: none"> - Will avoid or defer need to blast mountains to obtain aggregate 	\$1 to 2 million	
Clean-up of DIAND DEW line sites. Clean-up DEW line sites in Nunavut that have not yet been cleaned up; find and fund a solution for the PCB contaminated materials.	Nunavut Association of Municipalities	<ul style="list-style-type: none"> - Inject \$100 million into Nunavut economy over 10 years - Capacity building - Protect environment and residents' health 		Department of National Defence, DIAND, Environment Canada

Table 7-2: Project Submissions received after June14, 2002

Project	Sponsor	Impact	Cost	Potential Partners
CROSS-CUTTING				
Recycling Programs in Nunavut. Nunavut communities have dumpsites and metal waste sites that contain refrigerators (freon), aluminum cans, scrap metal and old vehicles such as trucks and heavy equipment. Nunavut communities do not have the financial resources to implement recycling programs. Find solutions that will assist Nunavut municipalities to implement affordable and practical recycling programs without placing additional financial burden on municipalities.	Nunavut Association of Municipalities	<ul style="list-style-type: none"> - Protect the environment and town sites for future generations by reducing the amount of metal in dumpsites and metal waste sites. 		Government of Nunavut, Federal Government, CRRS
INSTITUTIONAL				
Safe Drinking Water. Upgrade all aging water delivery infrastructure and systems in Nunavut to meet or exceed Health Canada guidelines.	Nunavut Association of Municipalities	<ul style="list-style-type: none"> - Safe, clean drinking water for Nunavut municipalities - Provide certified water testing training in each community in Nunavut 		Government of Nunavut

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 60th 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 and contact information by e-mail, Fax and telephone.)

- Brief description of proposed project

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

- Geographical Emphasis: north of 60th 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

Energy, Environment and Development

A Community Based
Approach

Concepts

- NPC Current Initiatives
- Ecotourism
- Cultural Tourism
- Energy Projects
- Community Development

NPC Current Initiatives

- Installation of energy efficient engines for replacement
- Installation of two small electronic engines in Resolute - saved \$22,000 monthly in fuel
- Participating in test trials of Detroit tier II engines - EPA emissions specs will be in effect in October 2002. One going into FED Plant with residual heat system to replace heating boiler
- Tier II engines have smokeless load pickup characteristics

NPC Current Initiatives cont'd

- Fuel economy on newer electronic engines is 14% better than on older engines
- Residual heat systems have been in place for a few years on a limited basis in many communities
- Newer designs including exhaust heat recovery and water jacket heat recovery are now being designed for Cambridge Bay, Iqaluit, Rankin Inlet, Baker Lake, Cape Dorset

Nunavut Power Corporation Presentation

NPC Current Initiatives cont'd

- One of our engineers is in Sweden taking a post graduate degree in energy systems - European technology more advanced than North American technology
- Another engineer being trained in the design of the five comprehensive systems by working with a consultant
- Hiring an energy management technician

Ten Year Tentative Project Plan						
Note: This plan is a tentative one and has not been approved by the Board of Directors. All projects subject to availability of funds						
Engine Replacements/ Additions based on avg. 4000 hrs/yr running time						
Year	Plant	Make	Model	Capacity	Cost	Comments
2002	Gjoa Haven	CAT	D398	540KW	\$ 650,000.00	small capacity increase
2002	Rankin Inlet	CAT	D399	700KW	\$ 2,500,000.00	2000 KW engine
2002	Cape Dorset	CAT	D398	540KW	\$ 850,000.00	1000 KW engine
2002	Iqaluit FED Plant				\$ 400,000.00	New Series 60 for residual Heat of plant
2004	Coral Harbour	CAT	D398	540KW	\$ 675,000.00	
2005	Arviat	CAT	D398	540KW	\$ 675,000.00	
2006	Cambridge Bay	CAT	D399	720KW	\$ 900,000.00	
2006	Pangnirtung	CAT	D398	540KW	\$ 900,000.00	Capacity Increase 720 KW
2006	Cape Dorset	CAT	D398	540KW	\$ 675,000.00	
2008	Rankin Inlet	CAT	3516	950KW	\$ 1,200,000.00	
2008	Kimminut	CAT	D353	270KW	\$ 375,000.00	
2008	Clyde River	CAT	D353	270KW	\$ 375,000.00	
2009	Pond Inlet	CAT	D398	540KW	\$ 675,000.00	
2010	Rankin Inlet	CAT	D3516	950KW	\$ 1,200,000.00	
2010	Kimminut	CAT	D353	270KW	\$ 375,000.00	
2011	Coral Harbour	CAT	D353	270KW	\$ 375,000.00	
New Plants						
Year	Plant				Cost	
2003	Baker Lake				\$ 9,000,000.00	
2005	Broughton Island				\$ 4,000,000.00	
2007	Sruse Fiord				\$ 4,000,000.00	
Residual Heat Installations						
Year	Plant				Cost	Tonnes Carbon Dioxide Eliminated
2003	Rankin Inlet				\$ 2,200,000.00	8,585.00
2004	Cambridge Bay				\$ 2,100,000.00	4,597.00
2006	Iqaluit				\$ 5,000,000.00	33,113.00
2007	Iqloolik				\$ 650,000.00	3,173.00
2008	Baker Lake				\$ 2,700,000.00	4,081.00
2009	Gjoa Haven				\$ 1,900,000.00	2,286.00
2010	Cape Dorset				\$ 1,900,000.00	3,140.00
2011	Broughton Island				\$ 579,000.00	1,415.00
2012	Resolute				\$ 1,100,000.00	2,324.00

Nunavut Power Corporation Presentation

Plant	Annual	Water	Exhaust	Total	Displaced	\$/L	Projected	Carbon
	Generation	Jacket	Gas		Fuel		Annual	Dioxide
	kwhrs	Mwthrsth (Firm)	Mwthrsth (Firm)	Mwthrsth (Firm)			Revenue	Reduction Tonnes
Cambridge Bay - 501	6,585,314	2,784.62	1,445.86	4,230.48	423,047.53	\$0.8010	\$ 304,975	4,597.60
Gjoa Haven - 502	3,274,405	1,384.59	718.92	2,103.51	210,351.26	\$0.9120	\$ 172,656	2,286.06
Taloyoak - 503	2,481,654	1,049.37	544.87	1,594.24	159,424.08	\$0.9560	\$ 137,168	1,732.59
Pelly Bay - 504	1,619,667	684.88	355.61	1,040.49	104,049.15	\$0.9650	\$ 90,367	1,130.79
Kugluktuk - 505	4,563,978	1,929.89	1,002.06	2,931.95	293,194.77	\$0.8010	\$ 211,364	3,186.39
Rankin Inlet - 610	12,297,431	5,200.00	2,700.00	7,900.00	790,000.00	\$0.5681	\$ 403,919	8,585.57
Qamanittuaq (Baker Lake) - 611	5,846,250	2,472.10	1,283.59	3,755.69	375,569.31	\$0.7890	\$ 266,692	4,081.62
Arviat - 612	5,469,473	2,312.78	1,200.87	3,513.65	351,364.74	\$0.5724	\$ 181,009	3,818.57
Coral Harbour - 613	2,746,463	1,161.35	603.01	1,764.36	176,435.69	\$0.7770	\$ 123,381	1,917.47
Chesterfield Inlet - 614	1,484,974	627.92	326.04	953.96	95,396.27	\$0.5774	\$ 49,574	1,036.75
Whale Cove - 615	1,369,452	579.08	300.67	879.75	87,975.03	\$0.7620	\$ 60,333	956.10
Repulse Bay - 616	2,079,690	879.40	456.61	1,336.01	133,601.49	\$0.7980	\$ 95,953	1,451.96
Iqaluit: Main Plant - 720	47,429,333	20,055.61	10,413.49	30,469.11	3,046,910.55	\$0.5430	\$ 1,489,025	33,113.26
Pangnirtung - 721	5,284,481	2,234.56	1,160.25	3,394.81	339,480.66	\$0.6140	\$ 187,597	3,689.41
Cape Dorset - 722	4,498,451	1,902.18	987.67	2,889.85	288,985.26	\$0.6010	\$ 156,312	3,140.64
Resolute Bay - 723	3,329,740	1,407.99	731.07	2,139.06	213,906.02	\$0.6310	\$ 121,477	2,324.69
Pond Inlet - 724	5,012,239	2,119.44	1,100.48	3,219.92	321,991.53	\$0.6230	\$ 180,541	3,499.34
Igloolik - 725	4,544,842	1,921.80	997.86	2,919.65	291,965.48	\$0.4930	\$ 129,545	3,173.03
Hall Beach - 726	2,304,825	974.60	506.04	1,480.64	148,064.43	\$1.0820	\$ 144,185	1,609.14
Broughton Island - 708	2,027,728	857.43	445.20	1,302.63	130,263.39	\$0.6010	\$ 70,459	1,415.68
Kimmirut - 709	1,712,950	724.33	376.09	1,100.42	110,041.75	\$0.6010	\$ 59,522	1,195.91
Arctic Bay - 710	2,191,410	926.64	481.14	1,407.78	140,778.49	\$0.6270	\$ 79,441	1,529.95
Clyde River - 711	2,607,450	1,102.57	572.49	1,675.05	167,505.37	\$0.5950	\$ 89,899	1,820.42
Grise Fiord - 712	969,905	410.13	212.95	623.08	62,307.75	\$0.6690	\$ 37,515	677.15
Sanikiluaq - 713	2,294,408	970.20	503.76	1,473.95	147,395.20	\$0.7860	\$ 104,267	1,601.86
					8,610,005.19			93,571.95

Plant	Capital Cost	Operating Cost	Gross Margin
	(Tri-Ocean Report)	(Tri-Ocean Report)	
Cambridge Bay - 501	\$ 2,100,000.00	\$ 24,500.00	\$ 280,474.97
Gjoa Haven - 502	\$ 1,862,300.00	\$ 17,200.00	\$ 155,456.31
Taloyoak - 503			
Pelly Bay - 504			
Kugluktuk - 505			
Rankin Inlet - 610	\$ 2,200,000.00	\$ 44,600.00	\$ 359,319.10
Qamanittuaq (Baker Lake) - 611	\$ 2,689,000.00	\$ 19,700.00	\$ 246,991.77
Arviat - 612			
Coral Harbour - 613			
Chesterfield Inlet - 614	\$ 810,000.00	\$ 7,000.00	\$ 42,573.63
Whale Cove - 615			
Repulse Bay - 616			
Iqaluit: Main Plant - 720	\$ 5,000,000.00	\$ 47,000.00	\$ 1,442,025.18
Pangnirtung - 721			
Cape Dorset - 722			
Resolute Bay - 723			
Pond Inlet - 724	\$ 1,100,000.00	\$ 95,000.00	\$ 26,477.23
Igloolik - 725			
Hall Beach - 726	\$ 650,000.00	\$ 18,500.00	\$ 111,045.08
Broughton Island - 708			
Kimmirut - 709			
Arctic Bay - 710	\$ 600,000.00	\$ 5,100.00	\$ 65,359.47
Clyde River - 711			
Grise Fiord - 712			
Sanikiluaq - 713			
	\$ 17,011,300.00	\$ 278,600.00	\$ 2,729,722.74

Ecotourism

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- Tourism based on ecological issues
- Energy Efficient hotels
- Appropriate Disposal of waste
- Organized Outdoor Activities
- Managed Fishing Expeditions
- Appeals to Europeans

Cultural Tourism

- Managed tours
- Traditional Cultural displays and activities
- Mythological Explorations
- Crafts made in Traditional Ways offered for sale
- Archaeological sites and tours (Public Archaeology)
- Appeals to Europeans (particularly Germans)

Energy Projects

- Hydraulic Power • Residual Heat
- Wind Power
- Fuel Cells
- Bio Diesel

Community Development

- Hydraulic Power and Aquaculture
- Sewage Treatment and Agriculture
- Fuel Cells and Drinking Water
- Recycling and Paper Production
- Agriculture and Fuel
- Profits from Tourism provides the funding

Partnership

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- University of Stockholm
- Technology much more advanced than ours
- Technology Transfer through Post Grad

Theses Work

- Ecotourism Industry established
- Gateway to European Markets

Arviat Heat Distribution



- Construction June to December 2001

System Details

- Four Customers:
 - Padlei Co-Op Hotel
 - Nunavut Arctic College
 - Qitqliq High School
 - Levi Angmak Elementary School

System Details

- Total 900 metres distribution piping
 - 600 metres buried
 - 280 metres above ground, in building crawlspace
- Design Maximum Flow Rate: 985 litres/min
- Design Thermal Capacity: 1075 kW
- Annual Energy Delivery: 1340 MWh
- Annual Heating Oil Displaced: 174,000 litres
- Annual Heating Oil Value: \$126,500
- Annual CO2 Emission Reduction: 1,891 tonnes



Piping trench between High School and Elementary School

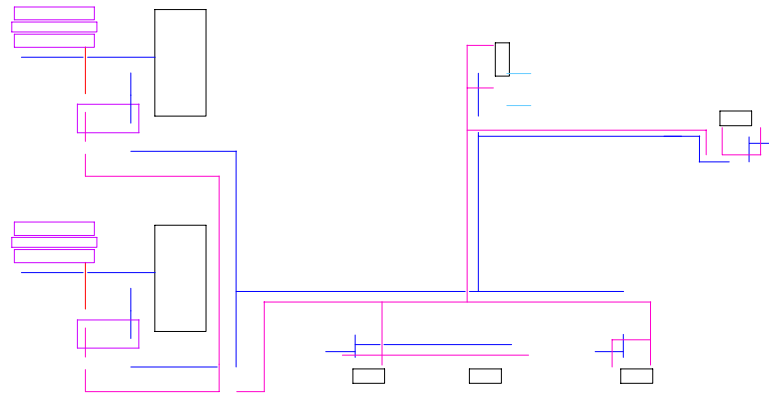


Piping trench crossing the schoolyard

Nunavut Power Corporation
Presentation

Elementary School Space
Heat System Heat
Exchanger

When heat is available,
this unit can do the job of
the boilers in the following
slide



Schematic of Arviat Heat Recovery & Distribution
System

Attachment III
Consultations on a Canadian Resource Recovery Strategy
Iqaluit/Nunavut Consultation - June 14, 2002
Location: Frobisher Inn - Husky Room
Agenda

8:00 am	Registration & Refreshments	
8:30 am	Welcome and Introductions	Roger Yates
8:35 am	Opening Prayer	Geosa Uniqsaraq Elders' Association
8:40 am	Round Table Introductions	All
8:55 am	Overview & Workshop Objectives	Mike Clapham
9:10 am	Panel Introductions	Chair: Roger Yates
9:15 am	Panel Presentations on Priorities and Issues in Nunavut:	Mathew Hough, City of Iqaluit Robert J. Patrick, Nunavut Power Corp. Michael Hine, Qikiqtaaluk Corporation Barbara Armstrong, Inuvik Recycling Society
10:00 am.	Break	
10:15 am	Discussion of Issues raised by Panellists & Plenary	Facilitator: Carole Burnham
12:00 pm	Networking buffet lunch	
1:00 pm	Plenary Discussion Part II Projects Discussion	All
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	Roger Yates
4:30 pm	Adjourn	

Attachment IV

Consultations on a Canadian Resource Recovery Strategy Iqaluit/Nunavut Territory Consultation - June 14, 2002

List of Participants

Company	Name	Contact Number	Email Address
Canada - Nunavut Business Service Centre	Robin Stout	867-979-6813	cnbsc@gov.nu.ca rstout@gov.nu.ca
Canada-Nunavut Geoscience Office	John Glynn - Morris	867-979-3539	jglynnmo@nrcan.gc.ca
CANMET, NRCan	Roy Sage		rsage@nrcan.gc.ca
City of Iqaluit	Mathew Hough (Panellist)	867-979-5633	hough@nunanet.com
Elders' Association	Geosa Uniqsaraq	867-979-5626 867-979-5617	Fax: 867-979-3712
Elders' Association	Inuusie Davidee	867-979-5626 867-979-5617	Fax: 867-979-3712
Elders' Association	Sammy Qaumariak	867-979-5626 867-979-5617	Fax: 867-979-3712
Environment Canada	Sid Bruinsma	867-975-4636	sid.bruinsma@ec.gc.ca
Hatch	Carole Burnham (Facilitator)	416-445-0500	cburnham@attcanada.ca
Hatch	Roger Yates (Facilitator)	905-403-4131	ryates@hatch.ca
Inuvik Recycling Society	Barbara Armstrong (Panellist)	867-777-2072	recycle@permafrost.com
Iqaluit Recycling Society	Jonathan Wright	867-975-8500	coord@nunanet.com
NRCan - Iqaluit	David Scott	867-979-3539	djscott@nrcan.gc.ca
NRCan - Ottawa	Mike Clapham	613-992-4404	mclapham@nrcan.gc.ca
Nunavut Government	Colleen Healey (Student)	867-975-5900 867-975-5938	chealey@gov.nu.ca
Nunavut Government	Elizabeth Sherlock	867-975-5912	esherlock@gov.nu.ca
Nunavut Government - Community Government and Transportation	Frank Pearce	867-975-5346	fpearce@nunanet.com
Nunavut Power Corporation	Robert J. Patrick (Panellist)	867-975-3014	rpatrick@npc.nu.ca
Nunavut Research Institute	Guy D'Argencourt	867-979-4660	stsnri@nunanet.com
Nunavut Research Institute	Rick Armstrong	867-979-4660	secnri@nunanet.com
Peterson & Auger	Dave Drepper (for Jack Walker)	867-873-4800	jwalker@yellowknifeinn.com
Qikiqtaaluk Corporation	Michael Hine (Panellist)	867-979-8404	mhine@nunanet.com
Qikiqtani Inuit Association (QIA)	John MacDougall	867-979-5391	johnmac@nunanet.com
Recycling Council of Ontario	Jo-Anne St. Godard	416-960-1025 Ext.13	joanne@rco.on.ca

Did not attend:

Company	Name	Contact Number	E-mail Address
Department of Indian Affairs and Northern Development (DIAND)	Janice Traynor	867-975-4554	traynorj@inac.gc.ca
NRCan - Iqaluit	Brian Helwig	867-979-6444	bhellwig@nunanet.com
Nunatta Environmental Services	Alain Carriere	867-979-1488	Alain.carriere@nunatta.com
Nunavut Government -- Community Government and Transportation	Doug Sitland	867-975-5341	dsitland@gov.nu.ca

Unable to attend but request documentation:

Company	Name	Contact Number	E-mail Address
Indian and Northern Affairs Canada (INAC)	John McEwen	819-997-3109	McEwenJ@inac.gc.ca
Indian and Northern Affairs Canada (INAC)	Valerie Hume	819-997-9480	HumeV@inac.gc.ca
Multi-materials Stewardship Board	Nancy Griffiths	709-757-0782	ngriffiths@mmsb.nf.net
Nunavut Government	Gordon Mackay	867-975-5917	gmackay@gov.nu.ca
Nunavut Government - Environmental Protection	Earl Badaloo	867-975-5910	ebadaloo@gov.nu.ca
Nunavut Tunngavik Incorporated (NTI)	Kathleen Tagoona	867-975-4900	ktagoona@tunngavik.com

Inventory of Resource Recovery Initiatives in Nunavut June 2002

Action	General Description	Partners	Progress to date
Domestic Recycling Program	The City of Iqaluit has started collecting recyclable plastic and metal containers, and domestic hazardous waste. Expanding this program to include commercial recycling and a bottle deposit program are being researched.	City of Iqaluit and Recycling Society of Iqaluit.	Initiated December 2001 and on-going.
Paper Recycling Program	Shredded paper is collected from government offices in Iqaluit for recycling.	City of Iqaluit and Nunavut	On-going.
District Heating Systems	These heating systems use waste heat from the existing diesel generating stations to heat nearby facilities	Nunavut and NPC	District heating systems have been installed in 7 communities. Cape Dorset, Iqaluit and Baker Lake are targetted for future installation.
Energy Management - Retrofitting	Where feasible retrofit, replace and convert to more energy efficient systems	Nunavut	Several communities have had energy audits and energy management <u>workshops conducted.</u>
Water Reclamation Systems - Healthy House	The "Healthy House Water Management System" is designed to collect and treat sanitary waste water for re-use in all non-potable applications in a building.	Nunavut and participating Municipalities	Systems have been installed in Iqaluit, with additional systems planned for Iqaluit and Cape Dorset.
Good Building Practices	<i>Good Building Practices</i> setout provisions for improved energy efficiency and is used in conjunction with the <i>National Building Code</i> .	Nunavut	On-going.
Low Penetration Wind Installations	In low level penetration the wind system augments the existing diesel plant by providing small amounts of power relative to the total system.	NPC	Installation and operation in Kugluktuk, Cambridge Bay and Rankin Inlet.
Photovoltaic Panels - Arctic College	Solar electric (photovoltaics) systems convert light from the sun into electricity.	Arctic College and Nunavut	On-going.
Solarwall® Demonstration Project	This passive solar technology preheats air before it is drawn into a building's heating and ventilation system. In order to assess its use in the North, a test project will be conducted on a school in Rankin Inlet	Nunavut and NRCan	Installation 2001; operation and monitoring on-going.