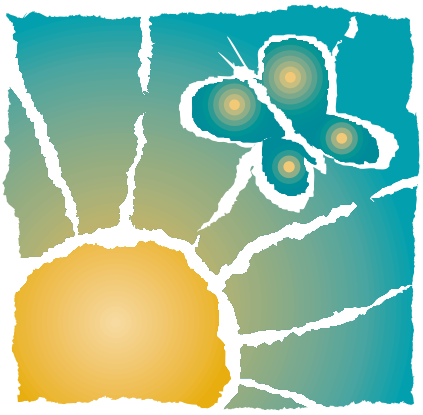
1998-1999 Year-End REPORT

of Activities Under the Renewable Energy Deployment Initiative

REDI

This report describes some of the activities by the Renewable and Electrical Energy Division (REED) of Natural Resources Canada (NRCan) under the Renewable Energy Development Initiative (REDI) during fiscal year 1998-99. Where appropriate, this report also reports on other renewable energy initiatives not related to REDI that REED carried out under NRCan's Efficiency and Alternative Energy program. Launched April 1, 1998, REDI is a three-year program aimed at stimulating market demand for commercially reliable and cost-effective renewable energy systems for space and water heating and cooling, such as solar water heating systems, solar air heating systems, ground-source heat pumps and high-efficiency/low-emissions biomass combustion systems. The program outline was released by the Minister of Natural Resources, the Honourable Ralph Goodale, during a speech in Montreal at the Renewable Energy Technologies in Cold Climates Conference on May 4, 1998.

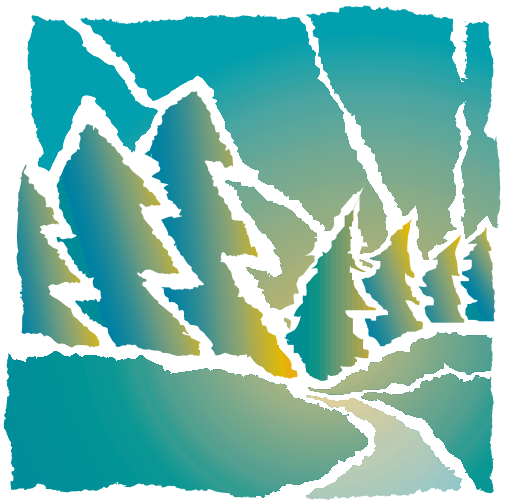


1 Marketing Strategies and Campaigns

In cooperation with renewable energy industry associations and other partners, REED

- **undertakes market development activities, including performing market assessment studies to identify promising niche markets;**
- **develops and implements marketing strategies for each technology to help overcome barriers; and**
- **undertakes information campaigns to raise awareness of renewable energy systems.**

During consultations in 1997 on the design of REDI, representatives from the ground source heat pump (GSHP) industry requested that the technology be excluded from the financial incentive component of the program. The industry preferred marketing assistance over incentives. For this reason, no incentive is provided under REDI for GSHP technology. To assist the industry, REDI undertook the first of a series of renewable energy market development strategies with the posting of a request for proposal for a study on ground source heat



pumps on the government open bidding system. Marbek Resource Consultants of Ottawa was selected as the successful bidder. The GSHP industry provided valuable comments during the development of the study. *The Ground Source Heat Pump Market Development Strategy* was finalized, in March 1999 and will be released in early summer.

Similarly, NRCan posted a request for proposal for a market development study on commercial biomass combustion systems. SGA Consulting was the successful bidder. The final report for this study will be released this summer.

Buyers' guides, brochures, information leaflets and technical case studies are some of the tools used to increase consumer knowledge and comfort with renewable energy technologies.

The department also issued a request for proposal to assess the market potential of solar heating for outdoor residential swimming pools. Enermodal Engineering of Kitchener, Ontario, was the successful bidder for the project. At year end, the study was nearly completed. It will be ready for distribution during the summer of 1999.

Buyers' guides, brochures, information leaflets and technical case studies are some of the tools used to increase consumer knowledge and comfort with renewable energy technologies. NRCan is developing a series of renewable energy buyers' guides aimed at residential and small commercial customers. Guides for wood heating, photovoltaics and solar water heating are already available and distributed through the toll-free line of NRCan's Office of Energy Efficiency: **1-800-387-2000**.

In the fall of 1998, REED worked with the Hearth Products Association of Canada to promote the safe use of high-efficiency/low-emissions wood-burning appliances by developing and distributing three public education folders, a video on how to burn wood wisely, and newspaper articles on wood heating distributed by News Canada. REED and the association also developed an advertising campaign for *A Guide to Residential Wood Heating* that targeted areas in eastern Canada affected by the ice storm of 1998. A second campaign targeted aboriginal remote communities. The advertisement appeared 31 times in daily newspapers, 206 times in community newspapers and 21 times in remote aboriginal community newspapers. Total circulation exceeded 6 million. The department received more than 2500 requests through the 1-800 number for copies of the guide and other information on wood heating. More than 170 000 folders and publications were distributed on wood heating during 1998-99.

REED recently received final comments from industry on the major redrafting of the solar water heating guide; it will be available in summer 1999. The photovoltaic and wood heating guides are also being reviewed. A buyers' guide to stand-alone wind energy systems is currently being developed and should be available by mid-summer 1999. Future plans include the development of buyers' guides for earth energy, solar pool heating and micro-hydro systems.

REED has also begun developing a series of buyers' guides for the commercial sector. A first version of a commercial biomass combustion guide is nearly completed. Plans are under way for a commercial GSHP guide. This will be followed by a guide for active solar systems.

REED is also developing information leaflets and case studies on commercial solar water heating, solar air heating systems and GSHPs. These publications will be used to promote heating and cooling technologies under REDI and will be distributed to building owners, engineers,

property developers, architects and designers.

Another REED initiative was the production of the brochure *Tax Incentive for Business Investments in Energy Conservation and Renewable Energy*. It explains to potential investors the benefits of two business taxation measures: the accelerated write-off under Capital Cost Allowance Class 43.1 and flow-through share financing under the Canadian Renewable and Conservation Expenses.

2 Marketing Incentives

REDI provides direct financial incentives to encourage prospective customers to discover and experience the benefits of heating and cooling systems that use renewable energy sources. Qualifying systems include high-efficiency/low-emissions biomass combustion systems, solar water heating systems and solar air heating systems.

Three types of incentives were instituted under REDI: for businesses purchasing qualifying systems; for federal departments; and, as a pilot, for other markets. As of April 1, 1998, REED had set up an administrative framework to deal with the delivery of these incentives:

- **terms and conditions were developed in consultation with representatives of the Canadian Solar Industries Association (CanSIA);**
- **these terms and conditions were distributed to CanSIA members with samples of the application forms and a promotional brochure;**
- **a Web site was set up to display information about REDI and its incentives (www.nrcan.gc.ca/es/erb/reed); and**
- **an office was set up within NRCan's Office of Energy Efficiency to deal with inquiries and a toll-free line was established (1-877-722-6600).**

To raise awareness of REDI, particularly its business incentive, REED undertook an advertising and media campaign in selected business, engineering, architectural and farming magazines, directories and newspapers. During 1998-99, ads were inserted a total of 63 times in 27 different publications with a total circulation of approximately 2 million people and a reach of around 5 million. As a result, the department received close

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to 600 requests for REDI for Business information packages through its toll-free number, faxes and electronic mail.

Partners such as CanSIA, the Solar Energy Society of Canada (SESCI), Énergie solaire Québec and other federal government departments also made significant contributions in promoting REDI, particularly the REDI for Business incentive component, at trade shows and conferences.

REDI was designed as a financial contribution program in which NRCan can require a certain level of quality in both the hardware and the installation. For example, solar collectors must meet the CSA F378-87 (R1992) and, where appropriate, must follow the requirements for installation of solar water heating systems as per CSA 383-87. Applicants must also provide a commissioning report stating that the system was installed in accordance with good engineering practices, and signed by an engineer or architect with valid certification in Canada.

The National Solar Test Facility (NSTF) reviewed the current REDI quality assurance requirements and proposed specific criteria and requirements. CanSIA is now reviewing the NSTF report. One recommendation is that the department set up a product and/or system acceptance committee composed of government and industry representatives to assess the suitability of proposed solar equipment under the program.

As part of REDI's integrated approach to quality, NRCan will inspect some sites to ensure that systems are properly installed. Meters to monitor and display energy produced by solar air and water heating systems will be installed on some facilities that have received REDI contributions. During the fiscal year, a meter was installed on the solar water heating system at Motel St-Côme, Quebec.

High-efficiency/low-emissions biomass systems must not only achieve low emissions but also verify that emissions levels are appropriate. During the year, NRCan completed a field evaluation of the flue gas characterization techniques for standard combustion products and particulates. The methodology will be evaluated on how it relates these measurements to furnace performance.

2.1 REDI for Business

Businesses that install qualifying systems are eligible for a contribution of 25 percent of the purchase and installation costs to a maximum contribution of $50 000. During the first year of REDI, NRCan received 15 applications. One application was rejected for not meeting the terms and conditions and, in two cases, the applicants decided not to proceed with the installation. Thus, 12 applications are proceeding, representing investments of $1.5 million in renewable energy systems.

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Of these 12, eight installations on business facilities were completed during the 1998-99 fiscal year. Half were solar water heating systems. In terms of dollar value, however, solar air and biomass systems accounted for most of the investment. The table below summarizes the eight completed projects.

2.2 REDI for Federal Facilities

REDI provides an incentive for federal departments to install qualifying renewable energy heating and cooling systems in their facilities. Terms and conditions mirror those of the REDI for Business incentive. The objective is to enable departments to gain experience with these systems, which will lead to future market opportunities for the renewable energy industry.

To promote this component of the program, departments were informed of the program and invited to take advantage of REDI. Several departments expressed their interest in evaluating the use of reliable, cost-effective and environmentally friendly renewable energy systems in their long-term strategy. Three applications were received under REDI for Federal Facilities; two installations were completed during the 1998–99 fiscal year (see table on next page).

To demonstrate leadership, NRCan's CANMET Energy Diversification Research Laboratories in Varennes, Quebec, installed a solar air heating system as part of an expansion of its facility. In the second project, the Canadian Coast Guard installed a solar air heating system in a maintenance building in Prescott, Ontario, thanks to a feasibility assessment study commissioned by NRCan. REED also initiated discussions with

Business Name	Building Type	Province	Type of System	NRCan Contribution
Tapis Canmet Inc.	Carpet warehouse	Quebec	Solarwall[TM]	$43 750.00
Ferme M & M Chagnon	Farm building	Quebec	Thermo-Dynamics solar water heating	$1 362.50
Serge Vanne Inc.	Farm building	Quebec	Thermo-Dynamics solar water heating	$4 000.00
Motel St-Côme	Motel	Quebec	Thermo-Dynamics solar water heating	$5 000.00
Shaw Wood Industries	Furniture manufacturing facility	Nova Scotia	Biomass	$50 000.00
Consultex Inc.	Textile manufacturing facility	Quebec	Solarwall[TM]	$20 949.50
Enbridge Inc.	Vehicle maintenance garage	Ontario	Solarwall[TM]	$14 369.45
Glen Bernard Camp Inc.	Summer camp	Ontario	Solcan solar water heating	$1 625.25

1998-99 REDI for Business Projects Completed

On August 19, 1998, the Honourable Ralph Goodale, the Minister of Natural Resources, inaugurated the first installation to receive a financial contribution under REDI, a solar air heating system at Tapis Coronet Inc. in Farnham, Quebec. Each year, the company will save about $35 000 in reduced gas costs, while reducing its carbon monoxide emissions by nearly 500 tonnes. Also attending the ceremony were the President of Coronet Carpets, Mr. Jan Lembregts; the member of Parliament for Brome-Missisquoi, Mr. Denis Paradis; the Mayor of the City of Farnham, Ms. Lyse Lafrance-Charlebois; and the Industrial Commissioner for the City, Mr. Gérard Harbec. The CanSIA President Mr. Brian Wilkinson and other industry, government and media representatives, also attended.

other departments to assess the potential of installing REDI-eligible technologies.

The department also undertook a feasibility study on buildings that it owns to assess the potential of installing solar air and water heating systems under the program. The study was nearing completion at year-end.

2.3 REDI for Other Markets

REDI allows for small-scale pilot projects that promote renewable energy technologies in markets other than businesses and federal facilities. These will help establish the effectiveness of larger undertakings.

In this regard, REED issued a Request for Letter of Interest (RFLOI) in December 1998 for the administration of a pilot project for solar domestic water heating systems. This request was sent to several organizations including electric and gas utilities, municipalities and builders' associations. The purpose of this project is to encourage the installation of solar domestic hot water systems in the residential market. REED is currently assessing the proposals received in response to the RFLOI.

REED initiated discussions with the Federation of Canadian Municipalities (FCM) to explore ways in which the FCM could help the department access the municipal market in promoting renewable energy heating

Departments	Building Type	Province	Type of System	NRCan Contribution
NRCan	Laboratories	Quebec	Solarwall™	$22 075.00
Canadian Coast Guard	Maintenance building	Ontario	Solarwall™	$8 367.00

1998-99 REDI for Federal Facilities Projects Completed

and cooling technologies. The FCM offers access to an extensive database of municipalities, market research, telemarketing services and broadcast fax services. As a result, the FCM and NRCan are undertaking a market research survey to identify municipal building stocks that could benefit from renewable energy heating and cooling technologies and municipalities that might be interested. Ultimately, REED hopes to develop a pilot incentive for municipal buildings. This initiative would assist the FCM in attaining the target for the greenhouse gas emission levels to which Canadian municipalities are committed.

During the year, the department promoted REDI in the FCM magazine *Forum* and used FCM's mail-out services to develop a database of municipal contacts.

The institutional sector also offers opportunities for piloting the installation of renewable energy technologies under REDI for Other Markets. NRCan is working with the Ottawa-Carleton District School Board to assess the feasibility of installing a solar air heating system in one of its schools. Discussions are under way. Based on this experience, REED will evaluate the development of a pilot incentive for the school sector.

REED has received a certain number of unsolicited proposals under REDI for Other Markets. REED assesses these proposals case by case, considering several factors including whether a proposal meets the following objectives:

- **pertains to heating and cooling from renewable sources;**
- **targets a market with growth potential;**
- **includes criteria to ensure a high-quality installation; and**
- **allows for the incentive to be passed on to the end-user.**

To date, NRCan has issued a favourable prior opinion for a solar pool heating system for a business application. One proposal was rejected because of a potential for bias among competing suppliers in a specific geographical area. Another proposal was rejected because the incentive would not have been passed to the end-user. Acceptance of a project does not imply, however, that NRCan will automatically accept future projects that are similar.

3 Industry Infrastructure Initiatives

Under REDI and the Efficiency and Alternative Energy program, REED works to strengthen the renewable energy industry infrastructure. Funds are provided to develop technical training programs for engineers, architects and building operators; to review and update product standards; and to transfer technical and consumer information to remote communities.

REED has fostered a new approach for cooperation between the division and various associations. In support of the solar energy industry in Canada, REED signed a contribution agreement totaling more than $200 000 with CanSIA on November 17, 1998. The agreement provides funding over two years for 10 projects to stimulate the development and deployment of solar energy systems under REDI. For example, the agreement provides funding for the development of information bulletins and publications, the creation of a new web site, the delivery of technical workshops, the production of a new exhibit, attendance at trade shows, and the development of Phase II of the solar photovoltaic training correspondence program.

The department also signed a three-year contribution agreement with SESCI totaling $92 000. The agreement supports several projects, including the development of the second edition of the *Canadian Renewable Energy Guide*, the production of two new folders (on micro-hydro and earth energy systems), a public exhibit program, a national renewable energy education campaign and a Solar Youth Day.

During the year, NRCan also signed a contribution

agreement with Énergie solaire Québec totaling $15 000 for several projects including improving its exhibit and printing solar energy publications and information bulletins.

NRCan also provided support to the Canadian Wind Energy Association (CANWEA) for the delivery of a wind energy seminar during its annual conference. The seminar entitled *Emissions Trading and Green Power: Profitability for Buyers and Sellers* was held in November 1998. More than 90 people attended. CANWEA also submitted a three-year business plan for funding consideration. The department requested additional information from the association on the proposed projects in the plan. A decision on projects and funding levels should be reached in the 1999-2000 fiscal year.

NRCan is sponsoring three regional one-day commercial GSHP workshops in Halifax, Moncton and Vancouver. The workshops will educate practitioners such as engineers about the technology, application and design using two types of software: GS2000™ and COMPLY. Engineers will receive hands-on experience with both products. The workshop is a collaborative effort between REDI, the Commercial Buildings Incentive Program and regional sponsors. Caneta Research Inc. of Mississauga, Ontario, will deliver the workshops.

4 Green Power Agreement with Enmax

In December 1997, NRCan began purchasing green power from Enmax, Calgary's electric system. Under the 10-year agreement, Enmax is responsible for the production of 10 000 megawatt-hours of green power annually for NRCan's Alberta facilities, choosing the suppliers of green power, and ensuring that the suppliers meet contract specifications. One requirement of the agreement is that the green power suppliers meet and maintain EcoLogo certification under Environment Canada's Environmental Choice Program. To generate the mixed supply of green power, Enmax has chosen Whitecourt Power Limited Partnership to produce 8600 megawatt-hours annually using sustainably produced biomass from wood waste and Vision Quest Windelectric to produce 1400 megawatt-hours annually from wind.

Environment Canada also signed an agreement with Enmax to supply 2000 megawatt-hours of green power to meet all the electrical needs of facilities owned or operated by Environment Canada in Alberta. Together, the NRCan and Environment Canada agreements will displace more than 10 000 tonnes of the greenhouse gas carbon dioxide annually since a corresponding amount of Alberta's existing capacity, mostly coal-fired electricity stations, will not be used.

On September 2, 1998, Enmax launched its Greenmax brand green power marketing program. Enmax is offering wind-generated electricity to its residential customers in Calgary. Enmax customers now have

an option to pay a premium on their monthly bill to ensure that electricity generated by wind power is made available to the Alberta Power Pool.

For its green power purchases, NRCan pays the difference between the price of the power generated by the green power suppliers and the amount the generator receives for the electricity from the Alberta Power Pool. In 1998, NRCan had expected to pay a premium of about 3.5¢/kWh for the green power; however, the Alberta Power Pool electricity prices were higher than forecast, so NRCan will be paying less than expected (exact data were not available at the time of printing this report). NRCan is now reviewing its experience purchasing green power and assessing green power policy options for federal electricity requirements. These options will be presented to the Minister of Natural Resources for consideration.

5 Remote Communities Program

Under NRCan's Renewable Energy Strategy, remote communities constitute a promising market for RETs. The main premise is that if the renewable energy industry is to grow, it will need to focus its attention on these markets, which can potentially increase sales in the short term. At the Renewable Energy Technologies in Cold Climates Conference, Minister Goodale also announced the creation of NRCan's Renewable Energy for Remote Communities (RERC) Program. This program is managed by the CANMET Energy Diversification Research Laboratory (CEDRL) in Varennes and is funded in part by REDI. It aims to accelerate the deployment of renewable energy technologies (RETs) in Canada's remote communities by helping key stakeholders select and implement reliable and cost-effective RET projects. Some of the main activities under RERC include generic tool development; information transfer and technical training; and targeted project implementation. CEDRL will issue a separate annual report on the first year of the RERC Program. Some RERC activities undertaken by CEDRL with the financial support of REDI included:

- the development of two new modules of the RETScreen renewable energy project analysis software: the GSHP and solar water heating. This project included the preparation of the software, web site and manual. Both modules are currently available in beta format and are scheduled to be released to the public at the NorthSun Conference in Edmonton in August 1999;
- the preparation of two guides on the use of forest biomass energy in remote communities. The titles of the reports, to be released by the Canadian Forest Service, are Woodchip Supply System Options for Remote Communities and A Forest Management Planning Strategy for Remote Communities;
- the provision of technical training and information by developing a web site; distributing brochures and reports in collaboration with numerous trade associations; organizing conferences and workshops; contacting stakeholders directly via telephone, fax, e-mail and letter; and publishing articles.

Some policy framework activities of the RERC were delivered by REED. The remote community market, presents equally significant challenges that can discourage investors. REED therefore initiated a study to identify potential barriers to greater development of RETs in remote communities. The report, A Study of the Non-technical Barriers Affecting the Growth of Renewable Energy Options in Remote Communities, focuses on identifying the main barriers

for utilities and private investors to engage in RET projects in Canadian off-grid communities. The August 1998 study identified two primary class of barriers: project risk and market size and distribution. The next step will be to prepare case studies of how investors' choices are influenced when evaluating RET supply systems. This report will be available in fiscal year 1999–00.

Another aim of the RERC Program is to work cooperatively with stakeholders to encourage the implementation of high-profile projects. The Town of Fort Smith, the Northwest Territories Department of Resources, Wildlife and Economic Development, and REED funded the installation of a solar preheated air ventilation system in the town's recreation centre. This cooperative venture was done to increase the visibility of a relatively unknown RET in northern Canada. The system, the first in such a northern location, was installed in May 1998. Energy performance reports of the functioning system are expected after a few heating seasons. The aim is to promote awareness of these systems for economic and environmental reasons, reduce heating costs and develop a self-sustaining market.

6 Studies

REED contracted out a few studies during the 1998–99 period, including:

Tax Treatment of Electricity from Renewable Energy Sources and Energy Efficiency Technologies: An International Comparison, prepared by the Conference Board of Canada for NRCan and Finance Canada, March 1998;

Biomass Energy in Canada with Emphasis on Electricity, prepared by ThermoShare, April 1998;

Opportunities for Wood Energy for the Residential Sector — A Background Document, prepared by Cantera Mining Limited, January 1999.

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