NORTHWEST TERRITORIES POWER CORPORATION
GREENHOUSE GAS REPORT
2001/2002

NORTHWEST TERRITORIES
POWER
CORPORATION

TABLE OF CONTENTS

Message from our President and Chief Executive Officer

We are pleased to submit our Northwest Territories Power Corporation (Corporation) report to the Voluntary Challenge and Registry (VCR) Inc. In 1999, the Corporation submitted to the VCR and was awarded Gold Champion Level Reporting Status. Following our 2000/01 submission to the VCR, the Corporation maintained its Gold Level Reporting Status and was also awarded the Leadership Award for the Electricity Sector. The Corporation is again submitting this 2001/02 Progress Report illustrating our continued commitment to regular reporting and initiatives to reduce GHG emissions.

In 2001/02, the Corporation produced 61,291 Tonnes of CO_2 equivalent GHG emissions, a successful decrease of 54% from 1990/91 (Baseline). The Corporation also increased total generation by 8,725 MWh over 2000/01 while increasing GHG production by only 8 tonnes. This means that the Corporation successfully reduced emissions intensity by 0.004 tonnes/MWh. To achieve this, the Corporation maximized hydro and less GHG intensive natural gas generation while reducing diesel generation to an all time low of 15% of total generation.

Although the Corporation has been successful in decreasing our greenhouse gas emissions below the 1990 Baseline levels and the Corporation's internal target levels of 10 per cent below 1996/97 levels, the Corporation will strive to further reduce emissions. Through programs to increase Corporate-wide fuel efficiency, reduce our own station service demands, promote public awareness to reduce customer demands and carryout research into alternative sources of power generation, we will continue to reduce our production of greenhouse gases.

Through regular reporting to the VCR, we will monitor our progress in reducing greenhouse gas emissions and annually assess our success and initiatives to reduce greenhouse emissions in the north.

Yours truly,

Leon Courneya
President and Chief Executive Officer

Introduction

The Voluntary Challenge and Registry (VCR) Program challenges Canadian business and government to voluntarily limit and reduce GHG emissions. In 1999 the Northwest Territories Power Corporation (NTPC) submitted to the VCR and was awarded Gold Champion Level Reporting Status. Following our 2000/01 submission to the VCR, NTPC maintained its Gold Level Reporting Status and was also awarded the Leadership Award for the Electricity Sector. NTPC is submitting this 2001/02 Greenhouse Gas Report illustrating our continued commitment to regular reporting and initiatives to reduce GHG emissions.

Corporate Profile

The Northwest Territories Power Corporation is a Crown corporation wholly owned by the Government of the Northwest Territories. NTPC was created in 1988 when the Territorial Government purchased shares of the federally owned Northern Canada Power Commission. Today, we are the primary power producer in the Northwest Territories. We distribute electricity to the end use consumer in 27 communities, and supply electricity on a wholesale basis to two distributing utilities, that in turn retail electricity to customers in the Yellowknife and Hay River areas. As a Crown corporation, we have a mandate to operate as a viable business enterprise.

NTPC operates 31 power plants, including the standby diesel generation facilities within the Snare and Taltson hydro systems, and the Inuvik and Norman Wells natural gas systems. NTPC facilities include hydroelectric, diesel and natural gas generation plants, transmission systems, and numerous isolated electrical distribution systems. NTPC also owns and operates alternative energy assets used for the supply of residual heat. We also receive greenhouse gas-free hydroelectric power from the Bluefish hydro facility and natural gas generated power in Norman Wells.
NTPC serves a population of approximately 42,000 people located in an area of 1.2 million square kilometers. Approximately 67% of the population lives in the North and South Slave regions while the rest of the population resides in small communities widely dispersed throughout the Northwest Territories. The total electrical load is approximately 65 MW with isolated power systems having generating capacities ranging from 59.6 MW at Snare/ Yellowknife to 190 kW at Colville Lake. As these systems are isolated and unconnected, each must be planned for and operated independently.

Commitment and Internal Practices on Climate Change

NTPC operates within a Corporate Strategic Plan that was developed in 1997 and is reviewed regularly by Senior Management and the Board of Directors. The following initiatives are outlined in the Strategic Plan to maintain or further decrease our production of greenhouse gas (GHG) emissions:

- We will reduce GHG emissions on a per kilowatt hour basis by 10% from 1996/97 levels in 10 years.

- We will endeavour to increase our supply-side energy efficiencies. By increasing our use of technology such as the Internet, Turtle meters, more fuel efficient engines, Programmable Logic Controllers (PLCs) and more efficient street lights, to reduce our costs, improve plant efficiencies and reduce GHG emissions.

- We will also strive to increase our own energy efficiencies through efforts to decrease station service at our plants and offices and increase the use of residual heat within our own facilities.

- We will develop residual heat projects in as many communities as economically feasible. While this does not directly reduce our GHG emissions, it reduces the amount of diesel fuel

required for heating within a community as well as transportation of the fuel to that community.

- We will assist in the development of natural gas infrastructure independently and in joint ventures to ensure a supply of gas for power generation and to decrease the production of GHG emissions.

- We will pursue additional hydro opportunities for the NWT and strive to provide additional hydro for the mines.

- We will monitor the development of alternate technologies such as wind, solar power generation and fuel cells.

- We will encourage conservation of energy through customer education programs. Through demand-side energy conservation, we reduce the amount of energy required by customers. Especially in our remote communities, this results in less diesel fuel burned to meet community electricity demands. There is an added, indirect, GHG savings to reducing diesel fuel consumption in remote communities. The less fuel required in the community translates into GHG emissions reductions transporting fuel to the community.

We have already achieved the target to reduce GHG emissions by 10% of 1996/97 levels by 2005/06. Regardless, we will continue to maintain or further decrease our production of GHG emissions where feasible to do so.

In 2002/03, NTPC will begin development of an ISO 14001 compliant Environmental Management System (EMS). The EMS will include a review of current climate change practices being implemented by NTPC and will develop and monitor new targets.

In 2002/03, NTPC will begin development of an ISO 14001 compliant Environmental Management System (EMS). The EMS will include a review of current climate change practices being implemented by NTPC and help manage and monitor new targets.

Management System

Our GHG emissions are monitored at the most senior levels of NTPC; the Board of Directors and the President and CEO. The Minister in charge of NTPC is also kept advised of major issues regarding NTPC, including our GHG programs. Beginning in 1998/99, our VCR submission became the method of analysing and monitoring our success in GHG reductions. Corporate data from the Environmental, Financial and Engineering departments is compiled, analysed and reviewed at a management level to generate the VCR report. The President and CEO reviews the report prior to submission to the VCR. Once submitted, NTPC's status on GHG emissions is reported to both the Board of Directors and the Minister.

The President and CEO and the Board of Directors also review and approve any GHG initiatives through the annual capital and financial plan process as well as the annual review and approval of NTPC's Strategic Plan.

External Verification

External verification of NTPC data, including fuel consumption and generation statistics, are annually reviewed by the Auditor General of Canada.

Through the Public Utilities Board (PUB) process for setting power rates, all aspects of our operations, including our GHG initiatives and their associated costs and benefits, are reviewed publicly and by the PUB.

Base Year Quantification

Canada has made a commitment, under the Kyoto Protocol to reduce its GHG emissions by six percent below 1990 levels by 2012. In keeping with this initiative, NTPC utilized its 1990/91 fiscal year to create a Baseline of emissions against which to compare subsequent years.

Baseline Quantification

In 1990/91, NTPC produced 140,767 Tonnes of $C0_2$ equivalent emissions in the production of electricity. Table 1 illustrates our 1990/91 emissions according to GHG type.

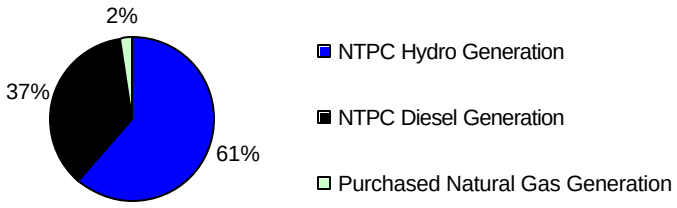
Table 1
Baseline Emissions Estimates by Gas Type

	Tonnes			
Fiscal Year	$C0_2$	CH_4	N_20	$C0_2$ Equivalent Total Emissions
1990/91	134,564	13	19	140,767

Due to additional historical information made available during this reporting year, NTPC updated its emissions from those reported in the 2000/01 Greenhouse Gas Report. As a result, emissions for the Baseline year rose from 114,710 tonnes to 140,767 tonnes of CO_2 equivalent emissions. Emissions for subsequent years, and emissions savings, have also been updated.

Hydro, diesel and purchased natural gas generated power accounted for 61%, 37% and 2% of our total generation in 1990/91, respectively. Figure 1 illustrates our per cent generation according to source.

Figure 1
Power Generation by Source for 1990/91



Direct and Indirect Emissions

Direct GHG emissions result from the combustion of fossil fuels to generate electricity. Only generation from our Corporation owned diesel and natural gas facilities are considered direct emissions.

Indirect emissions are those created or saved by operations not under direct control of NTPC but which are affected through Corporation business decisions. These include emissions from purchased natural gas generated power and emissions saved as the result of residual heat projects provided to buildings not owned by NTPC.

In 1990/91, NTPC did not own any natural gas generating facilities. All natural gas generation emissions at that time were therefore indirect emissions resulting from the purchase of natural gas generated power in Norman Wells. Table 2 illustrates NTPC's emissions according to source for 1990/91.

Table 2
Baseline GHG Emissions by Source

	CO_2 Equivalent Tonnes		
Fiscal Year	Diesel Generation	Gas Generation	Total Emissions
1990/91	136,663	4,104	140,767

Emissions Calculations

Greenhouse gas emissions to date have been calculated using NTPC's actual fuel consumption data for the periods covering 1990/91 to 2001/02. Combusted fuel is then converted to GHG emissions using the emissions factors provided in the *1999 VCR Registration Guide* (VCR Guide) as follows:

Table 3
Emissions Factors by Gas Type

Source	$C0_2$	CH_4	N_20
Natural Gas Industrial Boiler	1,880 g/m3	0.048 g/m3	0.02 g/m3
Diesel Motor	2,730 g/l	0.26 g/l	0.40 g/l

When measurements of greenhouse gases are expressed as carbon dioxide equivalents, the following equivalency factors provided in the VCR Guide were utilized:

Table 4
Carbon Dioxide Equivalency Factors

Greenhouse Gas Type	Factor
CO_2	1
CH_4	21
N_20	310

Emissions produced from oil-fired furnaces in Corporation owned housing, Corporation office buildings, etc. are not reported. However, Corporation buildings heated by residual heat or electricity directly from Corporation power plants are included in emissions estimates.

Due to the low volume of Corporation owned vehicles (61 in total), and limited distances driven annually, GHG emissions produced from vehicles are not included in this report.

Forecasted Emissions

Forecasted emissions are based on predicted future power generation for 2002/03 to 2007/08 divided by three-year weighted averages for plant efficiencies. This method of forecasting incorporates previous year improvements to fuel efficiencies, upgrades to streetlights and transmissions lines and reductions to station service to forecast additional years.

Average hydro generation (assuming normal precipitation levels as most water comes from snow melt) was used to determine the amount of diesel generation required for those communities where diesel generation supplements hydro generation.

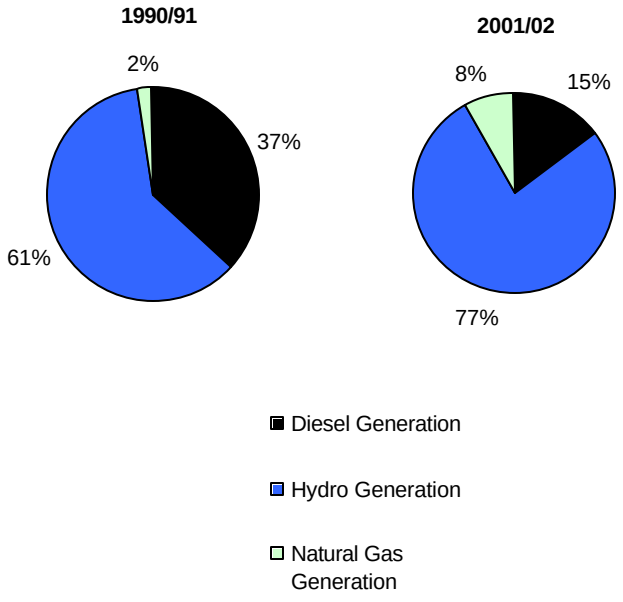
2001/02 Greenhouse Gas Emissions

Diesel combustion for the production of power generation is our major source of GHG emissions. Since 1990, diesel generated emissions have accounted for an average 94% of our total GHG emissions. The following section illustrates our production of GHG emissions and what efforts we have taken in the last year to reduce our reliance on diesel-generated power to once again successfully reduce our overall production of GHG emissions.

Hydropower Generation

At the current time, hydropower is the cleanest power NTPC can provide its customers in the Northwest Territories. As diesel generation is utilized as backup power generation for the hydro systems, the more hydropower we are able to produce, the more diesel generated power we displace. Figure 2 shows our average power generation by source for 1990/91 and 2001/02.

Figure 2
Average power generation by source for 1990/91 and 2001/02.



In 2001/02, our Snare and Taltson hydro systems produced 189,248 MWh and 61,351 MWh of power, respectively. In the absence of hydropower, all this power would be generated from diesel. As such, hydropower generation accounted for 77% of our total generation for 2001/02, a 0.14% increase over 2000/01 and 16% increase over 1990/91 levels.

Diesel Generated Power

NTPC's consumption of diesel fuel for generation purposes, our major source of GHG emissions, has decreased dramatically over the years. In 1990/91, 37% of total generation came from diesel-generated power. Last year, 2001/02, diesel generated power accounted for only 15% of NTPC's total power generation, an all time low. Our decreased reliance on diesel-generated power has allowed us to reduce our diesel-generated CO_2 equivalent emissions from 136,663 tonnes in 1990/91 to 47,780 tonnes in 2001/02. Table 5 shows our CO_2 equivalent emissions from all sources, both direct and indirect.

Table 5
GHG Emissions Produced Relative to Generation Source

	Direct		Indirect	
	Tonnes			
Fiscal Year	Diesel Generation	Natural Gas Generation	Natural Gas Generation	CO_2 Equivalent Total Emissions
1990/91	136,663	-	4,104	140,767
1991/92	130,202	-	4,152	134,354
1992/93	132,328	-	4,180	136,508
1993/94	136,045	-	4,405	140,450
1994/95	177,848	-	4,379	182,227
1995/96	178,276	-	3,901	182,177
1996/97	123,736	-	3,697	127,433
1997/98	104,896	-	4,125	109,021
1998/99	93,582	-	4,149	97,730
1999/00	54,340	6,509	3,884	64,733
2000/01	49,331	11,120	3,832	64,283
2001/02	47,780	12,683	3,828	64,291

Natural Gas Generated Power

The Corporation continues to replace diesel-generated power with less GHG intensive natural gas generated power. In 1990/91, the Corporation's only source of natural gas generated power was purchased power in Norman Wells. In 2001/02, the Corporation produced 8% of its total generation from natural gas generated power. This is a 6% increase over 1990/91 levels and a 0.54% increase over 2000/01 levels.

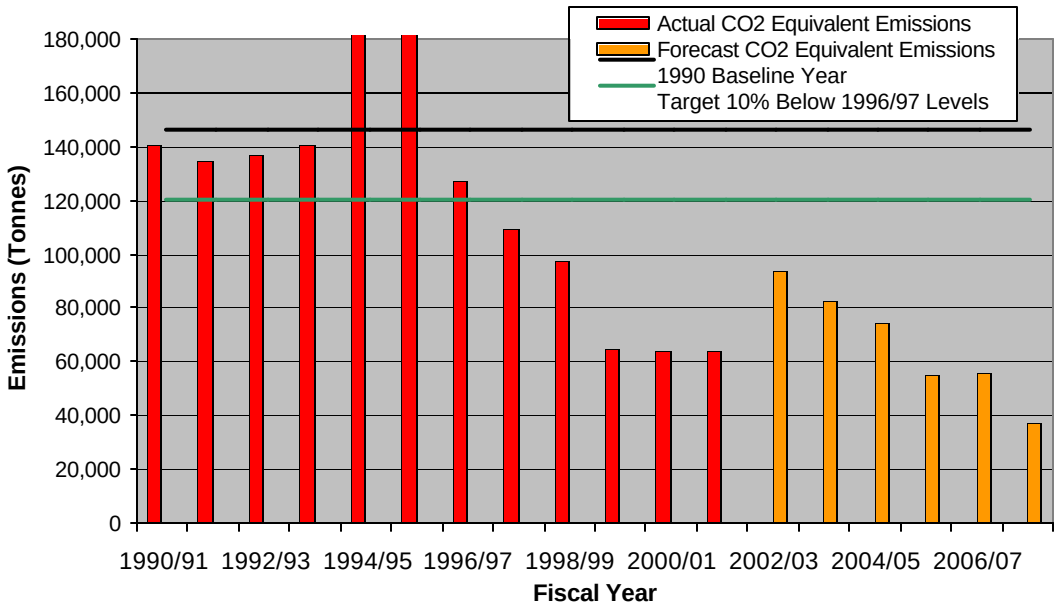
Actual Emissions for 2001/02

In 2001/02, the Corporation produced 64,291 tonnes of CO_2 equivalent emissions; a decrease of 54% over 1990/91 levels. The Corporation's GHG emissions remain well below the 1990/91 Baseline levels and the Corporation's target to reduce emissions to 10% below 1996/97 levels. Figure 3 illustrates the Corporation's GHG emissions from 1990/91 to 2001/02.

Although NTPC's GHG emissions rose by 8 tonnes in 2001/02 over 2000/01, NTPC generated an additional 8,725 MWh of electricity. NTPC was able to produce more electricity while producing fewer emissions per MWh produced. This was accomplished by maximizing hydro and natural gas generated power over the more GHG intensive diesel generation. NTPC generated and purchased an additional 7,233 MWh more hydropower and 2,771 MWh more natural gas generated power in 2001/02 than in 2000/01. This translates into an emissions intensity of 0.163 tonnes/MWh for 2001/02 as compared to 0.377 tonnes/MWh in 1990/91.

Table 6 (page 10) illustrates our GHG emissions according to gas type and emission intensity from 1990/91 to 2001/02.

Figure 3
Total CO_2 Equivalent Emissions Between 1990/91 to 2001/02



Fiscal Year	Tonnes				Percent Change from 1990/91	Total Generation (MWh)	Emission Intensity
	$C0_2$	CH_4	N_20	Total CO_2 Equivalent Emissions			
1990/91	134,564	12.53	19.16	140,767	0%	373,446	0.377
1991/92	128,443	11.94	18.26	134,354	-5%	378,044	0.355
1992/93	130,501	12.14	18.56	136,508	-3%	401,861	0.340
1993/94	134,274	12.48	19.08	140,450	0%	414,566	0.339
1994/95	174,158	16.28	24.93	182,227	29%	407,224	0.447
1995/96	174,090	16.31	24.98	182,177	29%	426,066	0.428
1996/97	121,817	11.34	17.35	127,433	-9%	421,206	0.303
1997/98	104,257	9.64	14.72	109,021	-23%	414,303	0.263
1998/99	93,478	8.61	13.13	97,730	-31%	369,885	0.264
1999/00	62,233	5.21	7.71	64,733	-54%	384,828	0.168
2000/01	61,993	4.87	7.06	64,283	-54%	385,882	0.167
2001/02	62,761	4.76	6.86	64,291	-54%	394,607	0.163

Table 6
GHG Emissions by Gas Type

Emissions intensity is a product of the CO_2 equivalent emissions produced in relation to our total power generation from all sources (Tonnes/MWh). As diesel generated power is our major source of GHG emissions, the lower our emissions intensity percentage the more successful we are at meeting our power generation demands from other sources.

Forecast Emissions

The Corporation's forecasted GHG emissions range from 33% to 74% below the 1990/91 Baseline levels for the period of 2002/03 to 2007/08. Figure 4 illustrates forecasted CO_2 equivalent emissions to 2007/08.

Emissions appear to trend slightly upwards for the first three forecast years (2002/03 to 2004/05), although still remaining significantly below 1990/91 levels. The main reason for the initial slight upwards trend is the result of forecasted hydro generation being based on a long-term average water level allowing production of 177,000 MWh of hydropower per forecasted year. Therefore, depending on the actual amount of water available for hydro generation in each forecasted year, actual emissions will vary regardless of initiatives taken to reduce GHG emissions. Thus, as we have had high water years for the last few years, our GHG emissions forecast will appear to increase.

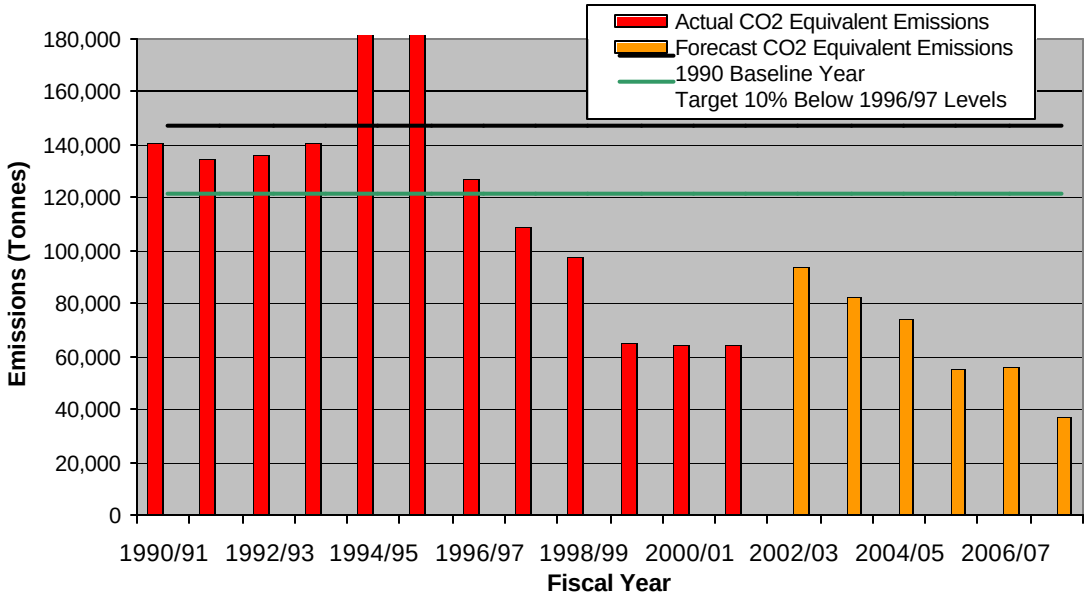
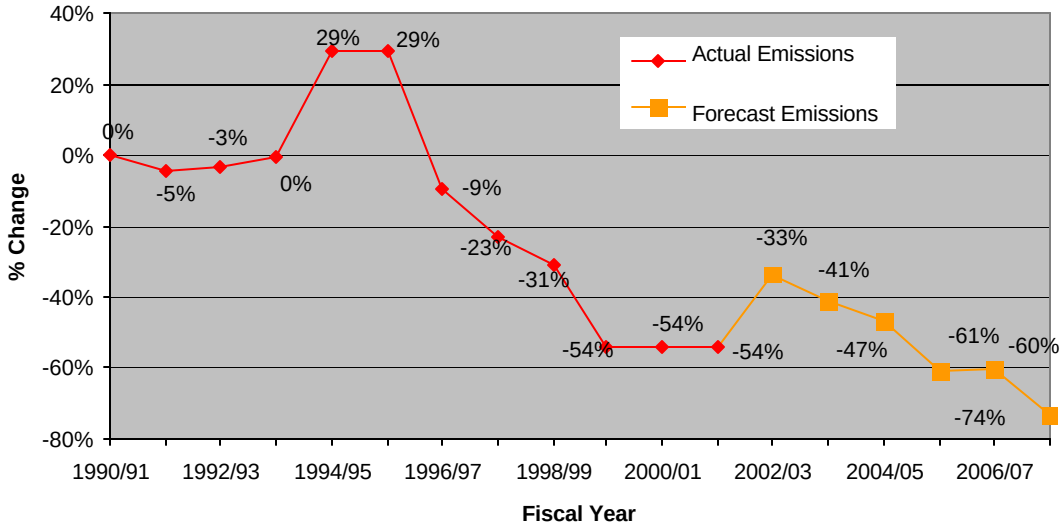


Figure 4
Forecast CO_2 Equivalent Emissions as a Product of Total Generation

Future Hydro Developments

The last three years of forecast show a definite decrease in emissions, despite forecasting hydro generation at average water levels. The purchase of Bluefish hydro by NTPC and the closing of Con Mines is responsible for this decrease in emissions. By December 2004, it is expected that Con Mines will essentially close, requiring electricity only for reclamation as opposed to full-scale operations. As NTPC is in the process of purchasing the Bluefish hydro facility from Miramar, we anticipate that the excess hydro no longer required by the mine will be available to meet Yellowknife demands. As such, we expect to halve our diesel fuel consumption in Yellowknife in 2004/05. Overall emissions will continue to decrease, as the mine requires less electricity making more hydropower available to meet Yellowknife demands. By 2007/08, it is expected that our emissions production will decrease to 74% below 1990/91 levels. Between 2005/06 (first full year without the mine) to 2012/14, we anticipate using only 267 KL of diesel fuel annually to meet Yellowknife demands. This will produce only 765 tonnes of CO_2 equivalent emissions per year compared to the 55,976 tonnes that were produced in 1990/91. Figure 5 illustrates Corporation emissions relative to 1990/91 levels for actual and forecast years.

Figure 5
GHG Emissions Per Cent Change Relative to the Baseline



Natural Gas Generation Developments

Work also continues in the Inuvik area leveraging the availability of natural gas. As a result of converting the Corporation's main generating station in Inuvik from diesel to natural gas in 1999, the Corporation made it feasible for the producers and distributors of natural gas to expand their local market and in doing so stimulate new opportunities such as fuel cell technology and gas fuelled micro turbines. The Corporation is working with the Town of Inuvik to install and operate two micro turbine units to supply electricity and heat to the Town's recreation complex.

Although the GHG savings for the electricity are negligible because natural gas generated power is currently available to the community centre, displacing a separate heating source would result in significant GHG savings from combined electricity and heat production from the micro turbine.

When natural gas becomes more readily available to northern communities, we will consider the economics and GHG reduction benefits of retrofitting existing diesel power plants to natural gas.

Improved Fuel Efficiency/Residual Heat Projects/Station Service

Past projects that have resulted in GHG reductions are reflected in our forecasted emissions for the period between 2002/03 and 2007/08. Using techniques such as three-year weighted averages for fuel efficiencies and using the most recent year's data to forecast future years, captures trends that result in GHG reductions and represents them in forecasts. This is how we develop our "Business As Usual" forecasts to include existing efforts to improve our supply-side management through improved diesel engine efficiency programs, reduced station service, upgraded streetlights and reduced line losses from transmission and distribution systems.

We are implementing education programs aimed at improving demand-side management through decreasing customer demand this year. The benefits of this program cannot be predicted this early in the venture. However, we will monitor and report on our progress in future reports.

Emissions Reductions Targets

As NTPC has successfully decreased its emissions below the 1990 baseline and our own internal target of 10% below 1996/97 levels, we feel our business as usual forecast, capturing improved trends in our existing initiatives, is sufficient for the time being. Any major changes to our operating infrastructure will be undertaken if they represent an economic benefit as well as a savings in GHG reductions.

Results Achieved and Measures to Achieve Targets

The Corporation has successfully reduced GHG emissions through a number of programs since 1990/91. The following section describes individual initiatives taken in 2001/02 that have contributed to GHG reductions and/or their impacts on future reductions.

The Corporation is continuously trying to improve its overall efficiency. By improving our operating efficiency, the Corporation reduces its reliance on fossil fuels to generate and distribute energy to its customers. The benefits of improving efficiency reaches beyond the Corporations direct emissions.

The vast geographic area and remoteness of the region means that significant resources and energy must be expended in order to transport fuel to each of the Corporations' sites. If the Corporation can reduce the volume of fuel it requires, it also reduces the overall energy (derived from fossil fuels) required to transport the fuel to site. All of the Corporations' sites have fuel delivered via truck tanker or tug and barge.

Examples of individual projects undertaken by the Corporation to reduce its dependence on fossil fuels and reduce GHG emissions during 2001/02 follow below. Table 7 summarizes the cumulative aggregate savings for all initiatives from 1990/91 to 2001/02. The table in Appendix 1 shows actual and forecast GHG emissions savings by gas type as well as total CO_2 equivalent emissions for all initiatives from 1990/91 to 2007/08.

Table 7
Cumulative Aggregate Emissions Savings from All Initiatives Since 1990/91

1990/91 to 2001/02	CO_2 Equivalent Reductions (Tonnes)			
	Alternative Generation/Fuels	Station Service Reduction/Residual Heat Projects	New Engine Upgrades/PLCs	Streetlight Upgrades
	473,951	5,277	38,770	740

Fuel Efficient Engine Upgrades

In recent years, diesel engine technology has improved the overall fuel efficiency of engines while reducing emissions. Engine selection analysis is based primarily on life cycle costs. The most significant of those life cycle costs is fuel. Fuel accounts for 85-90% of the capital and operating costs of a diesel engine over its life. Therefore it is extremely important to the Corporation to replace its aging equipment with the most fuel-efficient units that are available.

In 2001/02, the Corporation installed seven new diesel engines in six remote communities in the Northwest Territories. Table 8 shows which community plants received new engines and a comparison of each plant's fuel efficiency after only a partial year of operation in 2001/02 compared to 2000/01.

Table 8
Fuel Efficiency Improvements as a Result of New Engine Installations

Community Plant	Plant Efficiency (kWh/L)	
	2000/01	2001/02
Colville Lake	2.26	3.17
Fort McPherson	3.41	3.52
Jean Marie River	2.48	2.81
Lutsel K'e	3.79	3.88
Nahanni Butte	2.28	2.70
Tsiigehtchic	3.27	3.35

In 2001/02, a new 90 KW Isuzu engine was installed in Colville Lake. Prior to the new engine installation, the Colville Lake power plant was operating at a relatively low efficiency. An immediate improvement in fuel efficiency was achieved with the new engine installation. Figure 6 illustrates the plant efficiency for Colville Lake from 1990/91 to 2001/02. Between 2000/01 and 2001/02 a 40% fuel efficiency increase was realised resulting in a savings of 137 tonnes of CO_2 equivalent emissions in one year.

Figure 6
Colville Lake Plant Fuel Efficiency from 1990/91 to 2001/02.

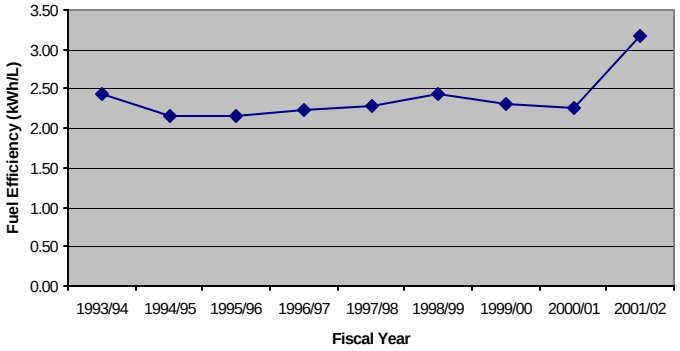
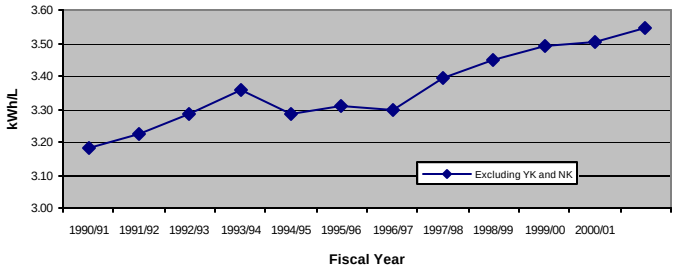


Figure 7 illustrates our Corporate efficiency trend which is improving with time. The Yellowknife and Inuvik plants have been excluded from this graph as they skew the data. Yellowknife and Inuvik are two of our largest diesel generating plants, which run as backup diesel generators now in the event that hydro or natural gas generation, respectively, is unavailable. Due to the low frequency with which these plants now operate, their fuel efficiencies have decreased accordingly.

Figure 7
Corporate Fuel Efficiencies Excluding Yellowknife and Inuvik



In 2001/02, NTPC'S overall fuel efficiency (excluding standby plants) improved by 11.4% since 1990/01 and by 0.05 kWh/L over 2000/01. Fuel efficiency savings for 2001/02 resulted in a decrease of 3,657 tonnes of CO_2 equivalent emissions over 2000/01.

Our day-to-day operations, maintenance and capital planning are focussed on maintaining or improving our fuel efficiency. Therefore, our upward trend in fuel efficiencies are reflected in our forecasts for fuel consumption, and hence, our forecasted GHG emissions.

Programmable Logic Controllers (PLC)

Programmable Logic Controllers automate power plant diesel engines and help ensure that the appropriate engine is operating to most efficiently service the current loads. This contributes to improved diesel fuel efficiency. However, as it is impossible to separate PLC improvements to efficiency from those improvements gained by more efficient engine upgrades, the benefits of PLCs and new engines have been calculated together in the previous section.

Automation of the Fort Simpson plant is currently underway. The new Fort Resolution diesel standby plant will be fully automated when it is constructed in 2003/04. To date, all but three plants currently have some level of PLC automation. The three remaining plants will be automated by 2004/05.

Reduction in Station Service/Residual Heat Recovery

The Corporation is continuously investigating ways to reduce its own consumption of energy. As each remote diesel plant is unique, measures to conserve energy at each plant are investigated differently. Some of the areas identified to reduce station service at our plants include: replace in-plant electric space heating with residual heat from engine jacket water systems, replace engine electric block heaters with residual heat circuits utilizing jacket water heat from operating engine(s), replace inefficient lighting, install separate lighting circuits so that only specific lights are on at certain times, install variable frequency drives (VFD) on radiators, and install photosensors on all outside lighting.

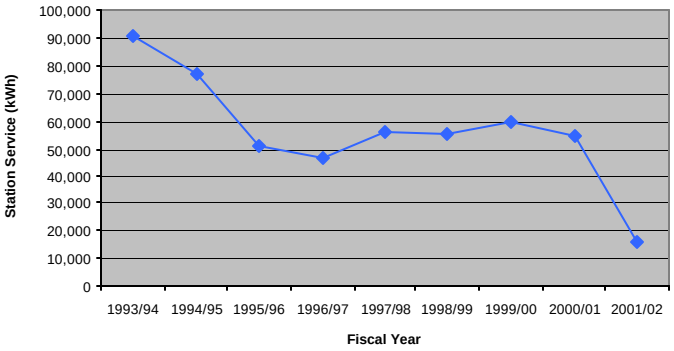
Some station service reductions have also come through education and awareness. Plant personnel are made aware of ways to reduce station service. Small measures like turning off lights when plants are unattended, turning heaters down or off when not required and ensuring that any pipes or other appurtenances that require heat tracing during winter months are shut-off during spring and summer months.

Colville Lake Residual Heat Project

In recent years the corporation has been a leader in a number of projects to recover and distribute waste heat from its diesel engines to external customers and for its own purposes. The most recent project involved upgrading the heating system at the Colville Lake diesel generating station in 2001/02.

Prior to 2001/02, heating at the Colville Lake facility was supplied by electric heat. As such, station service for this facility ranged from 20% to 37% of annual gross generation. This was well in excess of Corporation acceptable levels of 5%. As such, in 2001/02 a retrofit of the modular plant was completed which included a plant hydronic system that provides block heating for the engines, controlled heat for the switch gear room, cabinet type heaters for the office/warehouse and base board heating for the crew trailer. This resulted in a decrease of 38,763 kWh in the first partial year following installation and a decrease of 12 tonnes of CO_2 equivalent GHG emissions. Figure 8 illustrates the Colville Lake facility station service since facility construction in 1993/94.

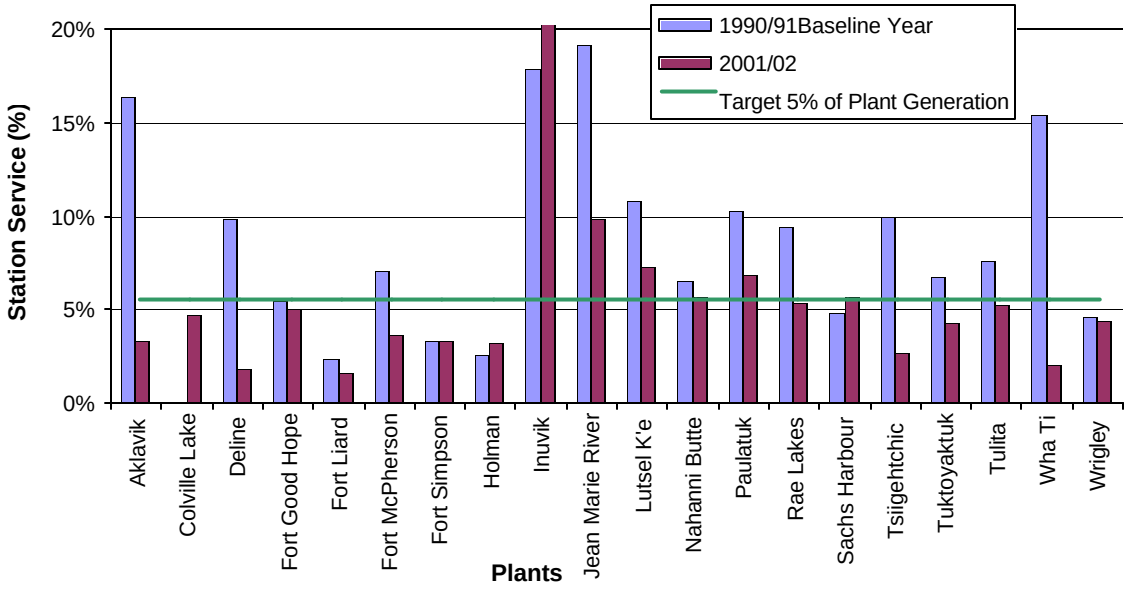
Figure 8
Colville Lake Station Service from 1990/91 to 2001/02.



Since 1990/91, NTPC has successfully reduced overall Corporate station service. Through frequent audits of operations and diligent efforts to implement station service reducing technologies and habits, we will continue to reduce our station service in future years. Figure 9 illustrates station service for NTPC diesel generating facilities (except standby plants) for 1990/91 and 2001/02.

By diligently monitoring facility statistics, the Corporation is able to identify sites where station service requirements are in excess of acceptable levels. The Corporation has determined that each facility should achieve and maintain a station service equal to 5% of its total generation. Following the Colville Lake residual heat project, all but eight plants currently operate in excess of the 5% target. The Corporation will continue to monitor station service and work to reduce station service at the remaining seven sites to less than 5% of their total generation while maintaining the remaining sites below the target.

Figure 9
Station Service for Diesel Plants (excluding standby plants) for 1990/91 and 2000/01



Alternative Generation Fuels / Methods

In recent years NTPC has undertaken a number of initiatives to produce less GHG emissions by utilizing alternative methods or fuel sources to generate power. Some of these initiatives have involved major capital projects such as the Inuvik Gas Project and major changes to our hydro infrastructures. Simpler initiatives included the purchase of additional GHG-free hydropower.

Bluefish Hydro Purchase

The Corporation actively began pursuing the purchase of the Bluefish hydro facility in 2001/02. In the past, the Bluefish hydro facility was used primarily to serve Con Mine. When the mine ceases operations in the future, the Corporation's acquisition of this facility will allow it to displace diesel generation to supply Yellowknife electricity demands. The mine is expected to shut down in 2005.

Additional Snare Hydro

NTPC continues to investigate the feasibility of additional hydro developments on our existing Snare hydro system. We are actively pursuing a joint venture with the Dogrib First Nation to provide hydropower in support of economic development in the NWT. To date, NTPC is primarily targeting the North Slave mining industry as the end use market.

Mini Hydro in Lutsel K'e

Also, NTPC is facilitating discussions with the community of Lutsel K'e that may result in building a mini-hydro plant on the Snowdrift River. This would result in the displacement of approximately 400,000 litres of diesel fuel per annum currently being used to generate electricity. Communications with the community began in December 2001.

Streetlight Replacement

It is up to each individual community to decide whether to convert to High-Pressure Sodium (HPS) lighting from less efficient Mercury Vapour (MV) streetlights. In order to promote the program NTPC informs the communities of the benefits to be gained from the conversion. We began converting community streetlights from MV to HPS during the 1995/96 fiscal year. Five communities, to date, have converted every streetlight in their communities to HPS. These communities include Wha T'I, Rae Lakes, Colville Lake, Nahanni Butte and Jean Marie. As of 2000/01, only one streetlight remains to be converted in from MV to HPS in Fort Simpson. For the remainder of the communities, HPS lights are exchanged following the end-of-life of the existing MV lights.

Unfortunately, streetlight counts were not completed during the 2001/02 fiscal year. So, although additional HPV lights were installed, there is no tallying of how many lights were changed or in which communities. As such, the savings for 2000/01 was carried over to the 2001/02 year and can be seen in Table 7. NTPC did continue with its streetlight replacement program in 2001/02 and will do so again in 2002/03.

Transmission and Distribution Lines

Line losses increase generation requirements, which contribute to increases in greenhouse gases. As required, transmission and distribution systems will be upgraded with new efficient conductors and transformers in order to reduce line losses.

Residential Energy Efficiency Program

A Customer Research Survey was completed at the end of 2000 and confirmed that customers would like more information on how to make their homes more energy efficient. To meet their needs, the Corporation has implemented a new Residential Energy Efficiency Program targeting remote northern communities of the Delta Sahtu region. This program will begin in 2002/03 and will include the following key objectives:

- To conduct comprehensive energy efficiency audits of residential homes;

- Provide customers with information pertaining to energy efficiency solutions and how to obtain them;

- To provide customers with information pertaining to climate change and how energy conservation can make a difference; and

- To discuss with customers any concerns that they may have regarding the service and electricity currently supplied to them by NTPC.

Results in Comparison to Targets

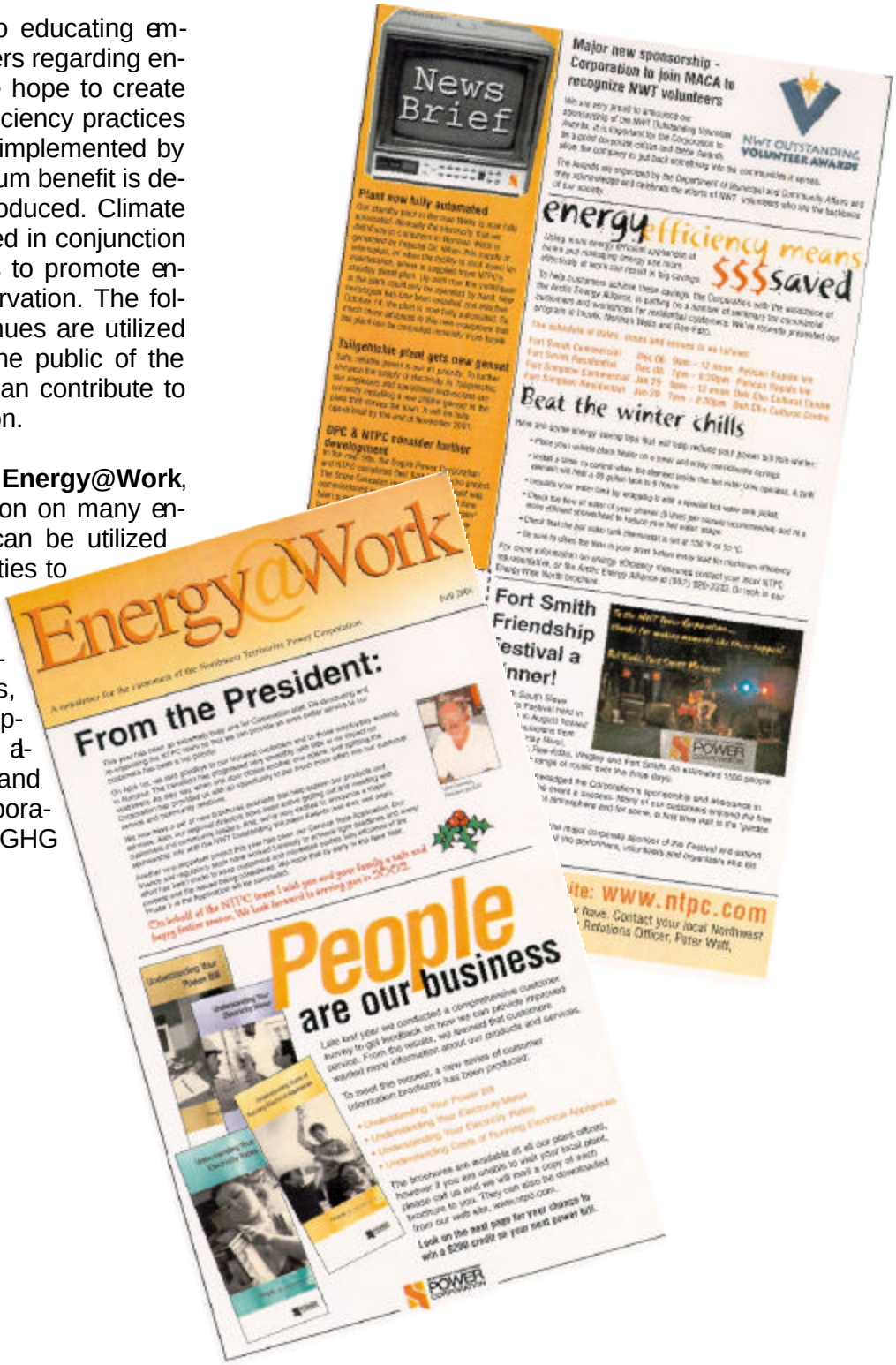
Our internal target to reduce GHG emissions by 10% of 1996/97 levels in 10 years, was achieved by 1998/99. To date, we have reduced our cumulative CO_2 equivalent emissions by 519,477 tonnes and achieved a 54% decrease from 1990/91 levels.

So far, the Corporation has successfully reduced the station service at all but seven facilities to less than 5% of their total generations. The Corporation will continue to monitor station service and, where feasible, implement training and technologies to reduce station service at all diesel-generating facilities to meet the 5% target.

Climate Change Awareness

NTPC is committed to educating employees and customers regarding energy awareness. We hope to create an awareness of energy efficiency practices and measures that can be implemented by all to ensure that the maximum benefit is derived from the electricity produced. Climate Change issues are discussed in conjunction with many of our programs to promote energy awareness and conservation. The following communication avenues are utilized to inform employees and the public of the many ways in which they can contribute to decreases in GHG production.

Our customer newsletter, **Energy@Work**, provides excellent information on many energy-saving methods that can be utilized within homes and communities to reduce energy demands. Some of the topics that we highlighted in 2001/02 included energy saving tips, planning new hydro developments and the benefits of alternative power generation and programs that we as a Corporation employ to reduce GHG emissions.



NTPC was awarded the Leadership Award for the electricity sector by the VCR for our 2000/01 VCR submission. This report was made available on our website and our award was promoted to our customers through our Energy @ Work newsletter and local newspapers.

We are a founding member of the **Arctic Energy Alliance** (AEA). The AEA is a not-for-profit organization established in 1997. The AEA's mandate is to help reduce the financial costs and environmental impacts associated with energy and utility services in the NWT.

In conjunction with the AEA and the local **Chambers of Commerce**, NTPC hosted a series of **Energy Management Seminars** beginning in October 2001. Seminars were held in Inuvik, Norman Wells, Fort Simpson and Fort Smith for our commercial customers. This program provided commercial customers with information and suggestions on how they can improve the energy efficiency of their businesses. As well, **Residential Energy Efficiency Workshops** were provided to employees and residential customers to enhance their knowledge of energy efficiency. These seminars were held in Inuvik, Norman Wells, Rae Edzo, Fort Smith and Fort Simpson. The workshops displayed a number of energy efficiency products at our new corporate booth that promotes energy efficiency. Together with the AEA, we worked to develop a working relationship with the Office of Energy Efficiency, which is a branch of **Natural Resources Canada**.

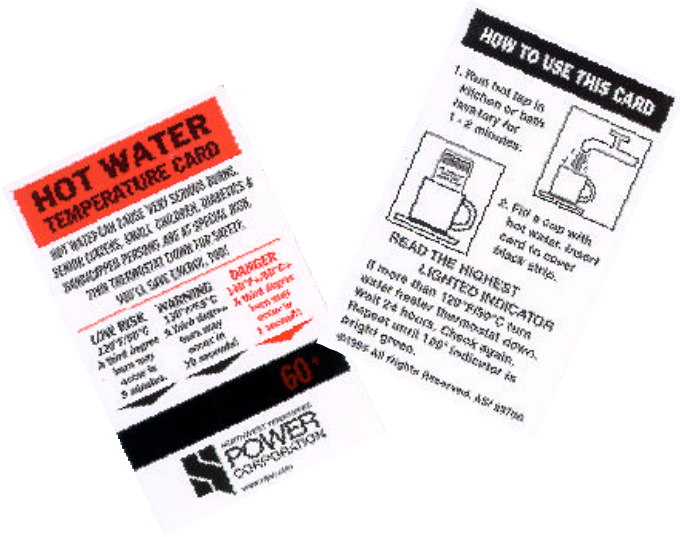
A "**Hot Water Temperature Card**" was developed and circulated to customers attending the Energy Management Seminars and those wanting to learn more about energy conservation. The card allows customers to test their hot water temperatures and determine if they can save energy by turning down temperatures on their hot water tanks.

The Corporation continued to provide informative brochures to customers. Some of the topics included '**Understanding Costs of Running Electrical Appliances**" and "**Energy Wise North – a basic guide to energy conservation for residents of Canada's North**." These were produced to encourage customers to reduce their power consumption and understand how much electricity their electrical appliances really use.

All of our publications are available on our website at www.ntpc.com. The site also promotes one of the Corporation's objectives of working to reduce GHG emissions through reductions of customer's household energy usage.

Internal Communications

An employee generated **Powerline Plus** is distributed to all employees on a biweekly basis via email and our internal website. Articles include updates regarding the Corporation's GHG emissions status and various ways to conserve energy.



Appendix 1: NTPC Greenhouse Gas Emissions 1990/91 to 2001/02

	1990/91	1991/92	1992/93	1993/94	1994/95	1995/96	1996/97	1997/98	1998/99	1999/00	2000/01	Actuals 2001/02	Forecast 2002/03	2003/04	2004/05	2005/06	2006/07	2007/08
Alternative Generation/Tools																		
Snare Cascades																		
CO_2							18,036	17,342	17,811	22,093	20,497	18,179	17,216	18,549	18,549	18,549	18,549	18,549
CH_4							1.72	1.65	1.70	2.10	1.95	1.73	1.64	1.77	1.77	1.77	1.77	1.77
N_2O							2.64	2.54	2.61	3.24	3.00	2.66	2.52	2.72	2.72	2.72	2.72	2.72
CO_2 Equivalent							18,891	18,164	18,658	23,130	21,468	19,040	18,033	19,429	19,429	19,429	19,429	19,429
Snare Rapids G2[1]																		
CO_2							2,387	1,864	1,864	1,503	2,551	2,410	-	-	-	-	-	-
CH_4							0.23	0.19	0.19	0.14	0.24	0.23	-	-	-	-	-	-
N_2O							0.35	0.29	0.29	0.22	0.37	0.35	-	-	-	-	-	-
CO_2 Equivalent							2,501	2,047	2,047	1,574	2,672	2,524	-	-	-	-	-	-
Norman Wells Purchased Power																		
CO_2	2,328	2,353	2,369	2,497	2,482	2,211	2,096	2,388	2,362	2,202	2,172	2,170	2,220	2,236	2,233	2,213	2,217	2,245
CH_4	0.51	0.51	0.52	0.54	0.54	0.48	0.45	0.51	0.51	0.48	0.47	0.47	0.48	0.49	0.49	0.48	0.48	0.49
N_2O	0.90	0.91	0.91	0.96	0.96	0.85	0.81	0.90	0.91	0.85	0.84	0.84	0.86	0.86	0.86	0.85	0.85	0.87
CO_2 Equivalent	2,815	2,845	2,863	2,808	2,790	2,485	2,356	2,628	2,649	2,475	2,441	2,439	2,496	2,513	2,510	2,488	2,492	2,523
Inuvik Gas Project																		
CO_2										1,910	3,799	4,165	4,316	4,503	4,687	4,769	4,864	4,919
CH_4										0.83	1.13	1.26	1.33	1.39	1.44	1.47	1.50	1.51
N_2O										1.16	2.06	2.33	2.42	2.52	2.63	2.67	2.73	2.76
CO_2 Equivalent										2,284	4,462	4,914	5,094	5,315	5,532	5,628	5,740	5,806
Bluefish Purchased Power																		
CO_2			18,389	18,902	15,539	24,531	34,228	32,615	27,409	35,331	36,432	38,694	29,654	31,529	31,529	35,089	35,089	35,089
CH_4			1.75	1.80	1.48	2.34	3.26	3.11	2.61	3.36	3.66	3.78	2.82	3.00	3.00	3.34	3.34	3.34
N_2O			2.69	2.77	2.28	3.59	5.02	4.78	4.02	5.18	5.63	5.82	4.34	4.62	4.62	5.14	5.14	5.14
CO_2 Equivalent			19,281	19,820	16,278	25,694	35,851	34,161	28,709	37,007	40,355	41,576	31,080	33,024	33,024	36,753	36,753	36,753
Station Service Reduction/Residual Heat Projects																		
Station Service/Residual Heat Savings																		
CO_2		163	100	242	295	395	319	297	349	194	161	172	161	161	161	161	161	161
CH_4		0.02	0.01	0.02	0.03	0.04	0.03	0.03	0.03	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
N_2O		0.02	0.01	0.04	0.04	0.05	0.05	0.04	0.05	0.03	0.02	0.03	0.02	0.02	0.02	0.02	0.02	0.02
CO_2 Equivalent		170	104	253	309	403	334	311	366	203	168	180	168	168	168	168	168	168
Fort McPherson Residual Heat																		
CO_2								535	423	473	490	482	491	491	491	491	491	491
CH_4								0.05	0.04	0.05	0.04	0.05	0.05	0.05	0.05	0.05	0.05	0.05
N_2O								0.09	0.06	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07
CO_2 Equivalent								560	443	496	471	504	515	515	515	515	515	515
New Engine Upgrades/PLCs																		
Improved Fuel Efficiency Savings																		
CO_2		1,855	1,375	2,907	3,295	3,879	4,169	4,107	5,129	3,880	3,571	3,875	3,677	3,709	3,755	3,761	3,806	3,825
CH_4		0.16	0.13	0.28	0.31	0.37	0.40	0.39	0.49	0.35	0.34	0.38	0.35	0.35	0.36	0.36	0.36	0.36
N_2O		0.24	0.20	0.43	0.48	0.57	0.61	0.60	0.75	0.54	0.52	0.58	0.54	0.54	0.55	0.55	0.56	0.56
CO_2 Equivalent		1,734	1,440	3,045	3,461	4,063	4,340	4,206	5,260	3,685	3,567	3,960	3,668	3,701	3,750	3,777	3,803	3,823
Streetlight Upgrades																		
Streetlights Savings																		
CO_2							26	92	107	137	163	172	172	172	172	172	172	172
CH_4							0.00	0.01	0.01	0.01	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
N_2O							0.00	0.01	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
CO_2 Equivalent							27	96	112	148	173	183	183	183	183	183	183	183
Annual Totals																		
CO_2	2,328	4,171	22,233	24,568	21,610	31,005	61,261	58,279	55,628	67,493	71,795	71,417	57,908	61,349	61,577	65,226	65,349	65,451
CH_4	0.51	0.68	2.41	2.65	2.36	3.22	6.09	5.93	5.68	7.15	7.87	7.95	6.70	7.07	7.13	7.50	7.53	7.65
N_2O	0.90	1.17	3.62	4.20	3.76	5.07	8.46	8.24	8.70	11.30	12.54	12.70	10.80	11.38	11.50	12.06	12.12	12.16
CO_2 Equivalent	2,815	4,549	23,469	25,924	22,625	32,645	64,300	62,173	58,229	71,001	75,695	75,341	61,216	64,848	65,110	68,941	69,084	69,200
Cumulative Totals Since 1990/91																		
CO_2	2,328	6,499	28,730	53,298	74,908	105,913	167,175	225,453	281,081	348,573	421,368	492,785	550,694	611,993	673,569	738,795	804,084	869,535
CH_4	1	1	4	6	9	12	18	24	29	37	44	52	59	66	73	81	88	96
N_2O	1	2	6	10	14	19	28	36	45	56	70	83	94	105	117	129	141	153
CO_2 Equivalent	2,815	7,164	30,633	56,557	79,182	112,027	176,326	238,499	296,728	367,728	443,396	518,737	579,866	644,863	708,913	778,854	847,938	917,138

Note 1. Snare Rapids G2 unit does not operate during average to low water years, as forecasting for the hydro system assumes average water levels, zero G2 generation is also forecast. However, on average, the G2 unit has accounted for approximately 0.02% of the total Snare hydro generatio since installation, so some generation is anticipated even if not forecast.