CREATING A BRIGHTER FUTURE:

A REVIEW OF ELECTRICITY REGULATION, RATES AND SUBSIDY PROGRAMS IN THE NORTHWEST TERRITORIES

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LETTER OF TRANSMITTAL

September 2009

Mr. Minister,

We are pleased to present to you the report of the Electricity Review Panel, titled *Creating a Brighter Future: A Review of Electricity Regulation, Rates and Subsidy Programs in the NWT*. The report has been prepared following a series of public forums, meetings with individuals and organizations, and the review of a number of written comments. As well, in preparing our report we have reviewed and researched information related to electricity from the Northwest Territories and across Canada.

By our estimation, well over 350 northerners participated in the Review by providing their ideas, suggestions and advice on a wide range of topics. Throughout the review process we have found people to be both interested and passionate in their views. There have been topics on which many residents are in agreement. As well, there are also areas in which there is little or no consensus. One thing has, however, been very clear. Residents are interested in working with their government in the development of a long-term vision for electricity and the presentation of a plan that will, through incremental action, result in safe, reliable and affordable power for all.

In carrying out our work, we came to understand that it would be difficult to address all of the challenges created by the size of the territorial population and the nature of the geography and climate. Solutions to some issues may just not be affordable for electricity customers or the government. We believe, however, that bold action, initiated now, can provide the foundation for an electrical system that will address current needs and be responsive to future demands.

In completing this report we would like to extend our thanks and deepest appreciation to all of those who took the time to provide comments, point out useful documents and make suggestions. Their assistance was fundamental to our recommendations.

Gerry Forrest / Doug Matthews / Mark Cleveland

NWT Electricity Review Team

EXECUTIVE SUMMARY

The Review of the Electricity Regulation, Rates and Subsidy Programs in the Northwest Territories was initiated with the publication of a discussion paper in December 2008. The discussion paper outlined the interest of the Government of the Northwest Territories (GNWT) in seeking comments, advice and recommendations regarding the future of the electricity system that serves the residents of the Northwest Territories (NWT).

The discussion paper provided a broad framework and posed a number of key questions for consideration during the Review. The paper also asked residents to help define a vision for the future of electricity in the NWT. To frame the discussion the paper asked two questions:

- What should be our vision for the future of electricity in the Northwest Territories?
- What problems must we overcome to make this vision a reality?

During the Review, over 350 northerners participated in providing their ideas, suggestions and advice on a wide range of topics. This occurred through their participation in public forums, meetings and the provision of written submissions and comments. Throughout the review process we have found people to be interested and passionate in their views. There have been subjects in which many residents are in agreement. As well, there have also been topics on which there is little or no consensus. One thing has, however, been very clear. Residents are interested in the establishment of a long-term vision for electricity and the presentation of a plan that will, through incremental action, result in safe, reliable and affordable power for all.

The Need for Change

Based on input from the public and the examination of data and information, the Review Team has concluded that it is time to establish a vision to guide decision-making related to electricity. The vision must be supported by a comprehensive plan of action that, over the next ten to twenty years, will reshape the electricity sector.

The vision for the future must be based on the fact that electricity has become an essential service. Electricity now touches on almost every aspect of life in the home, schools, hospitals and the workplace. Communications are powered by electricity and electricity is essential to supporting commerce. The availability of safe, reliable and affordable electricity is fundamental to the social and economic growth and development of the people of the Northwest Territories. Based on the views received by the Review Team a draft vision statement was developed to help describe what the future state of the electricity system should look like. The Team proposes, based on what was heard from people throughout the NWT, the following vision statement.

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The electricity system will provide safe, reliable and affordable electricity to customers in all NWT communities. Its operations will be cost effective, innovative and seek to limit environmental impacts while demonstrating a "customer first" approach to providing services. In addition, the system will meet current needs while being flexible enough to respond to future requirements and opportunities.

The current system of electricity regulation, rates and subsidy programs has developed over many years, but it has not benefitted from a comprehensive plan. As a result, the electricity system is not as well suited as it should be in meeting the needs of northerners. The system has been created with good intentions and the best of efforts, but based on what the Review Team has heard and seen, it now contains fundamental flaws that need to be addressed.

In preparing this Report, the members of the Review Team recognize that we are not starting from a "blank sheet of paper", but rather must suggest ways to improve a complex system of existing, inter-related elements. Changes being proposed will be challenging and the creation of a new a stronger electricity system will take a number of years to achieve. But, action is required now if northerners are to be well served in the future.

Recommendations for Change

The Report calls for a renewed focus by utility companies on customer service. It also recommends a series of changes to:

- The structure of the electricity system;
- The rate structure used to establish electricity prices for customers;
- Programs that make electricity affordable in high cost communities;
- The current regulatory processes; and
- The roles of the Government of the NWT.

The Northwest Territories provides a unique and challenging environment for utility companies. A small number of customers, living in thirty-three communities, many located hundreds of kilometres apart, in harsh climatic conditions, creates an environment where providing effective services is quite difficult. Only a limited number of communities can take advantage of existing hydroelectric power generation, the rest must be served with stand-alone diesel or natural gas fueled electricity generators. Communities for the most part are not served by an electricity grid system and so they must each receive their power from their community-based generation system. This situation results in higher costs and unless there is substantial industrial and population growth can be expected to continue well into the future. Within this context, the Review Team has developed its recommendations.

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Electricity System Structure

The number of customers in the NWT is limited. Given the dispersed generation system required to serve the Territory, basic system costs are high. This situation impacts on utility company costs and is, ultimately, reflected in the prices paid by customers or the Government through subsidy programs. The Report recommends that the vision for the future be built on consolidating elements of the electricity system to increase the economies of scale in the system. To support this perspective the Report recommends that the publicly owned Crown agency structure, including the NWT Hydro Corporation and the Northwest Territories Power Corporation, be strengthened by:

- Reconfirming NTPC's "duty to serve" within the municipal boundaries;
- Providing the NWT Hydro Corporation with the "right of first refusal" on all franchise requests outside of municipal boundaries; and
- Committing to GNWT ownership of all transmission capacity in the NWT.

As well, the Report recommends that, over time, elements of the electricity system – generation, transmission and distribution - be consolidated so as to maximize opportunities for economies of scale. Specifically, GNWT ownership of NWT transmission capacity is recommended.

The Report also observes that there are opportunities, over the long-term, for the production of electricity for export to southern Canada. It notes that if decisions are made to pursue projects to produce electricity for export, customers of northern utilities must be protected from project risk and that such projects are likely only possible if partnerships are developed with Aboriginal governments and the private sector.

Rate Structure

The present rate structure is based on community-level costs. Established in the early 1990's, it is a highly complex system that has had the unfortunate result of creating hard feelings and acrimony between communities. Recognizing the essential nature of electricity services, the Review Team believes that a revised rate structure should reduce the very large gap in prices that currently exists between communities with the goal of levelizing rates across the NWT.

The Report recommends that a new rate system be developed which groups communities into three cost of service zones – The Thermal Zone, for those communities served solely by diesel and natural gas-fueled generators; the Taltson Hydro Zone for communities linked to the Taltson Hydroelectric Generation Plant

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and the Snare Zone for the communities linked to the Snare Hydroelectric system. Each class of customers within a zone, regardless of the community in which they live, would be charged the same energy rate for their electricity.

The Report recommends moving away from the rate base rate of return model of costing for communities in the Thermal Zone served by NTPC as the method for calculating revenue requirements and replacement with a cost of service costing model. This will eliminate the "profit" aspect that is currently present in revenue calculations for the Crown agency. As well, the Report recommends allocation of current headquarters, operational support and regional office costs on a kilowatt hour basis instead of the current approach.

The Report recommends additional changes to the rate structure including:

- Establishment of the Thermal Zone rate as equivalent to that of the community of Inuvik (currently about $ 0.525);
- The GNWT set the rate of return on the rate base for NTPC's assets in the hydroelectric zones;
- Elimination of the annual dividend paid by NTPC to the GNWT;
- The use of rate riders be reduced and that a Territorial rider be established for all cost of service zones to share increased costs related to fuel purchase (thermal) and low water (hydro).

The Review Team believes these changes can be expected to result in reduced electricity prices in thermal communities, modest increases in hydro communities and a reduction in the cost of the GNWT's power subsidy programs.

Affordability

Many members of the public identified the cost of electricity as a critical issue. The Review Team believes that some actions can be undertaken to reduce utility company costs and ultimately electricity prices, and the GNWT's role in helping to ensure affordability of electricity in higher cost communities will need to continue.

The Review Team heard many suggestions for change to the Territorial Power Support Program (TPSP). On balance, the case for some adjustment to the program's residential usage thresholds can be supported. However, it is important to continue to encourage conservation through the presence of higher pricing in thermal communities for higher usage levels. The Report recommends that the threshold levels for subsidies be increased to 850 kilowatt-hours (kWh) for the six-month period October to March each year and be reduced to 600 kWh for the period April through September.

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The Report also recommends that the NWT Housing Corporation review its subsidy program for residents of public housing units and increase tenant charges from the current level of six cents per kWh, while aligning the subsidy more closely with the GNWT's existing income security policies.

The Review Team examined the matter of a commercial component of the TPSP. The Team could find little agreement as to the purpose and goals of a commercial subsidy program. The Team did, however, hear a number of comments about ways in which the GNWT might better focus its efforts on supporting businesses to reduce their power usage. As a result, the Report recommends the elimination of the commercial component of the TPSP and its replacement with targeted programming specifically designed to assist businesses in conservation efforts.

Regulatory Changes

The legislation that defines the regulatory structure in the NWT was put in place in the late 1980's. The elements of the legislation were based upon directions taken in the provinces decades earlier. Since the legislation was put in place, views regarding the roles and responsibilities for the regulation of electricity have changed. In this light, the Report recommends that changes to regulation are needed in the NWT.

The Report recommends that the Public Utilities Board (PUB) structure be continued as an arms-length body tasked to provide oversight for the electricity sector. The value of an objective third party in carrying out these tasks is broadly supported. This being said, the Report also recommends that the *Public Utilities Act* undergo a comprehensive review and that it be amended to permit the GNWT to provide policy direction to the PUB. At the current time, this authority is unclear and in the view of the Review Team this matter needs clarification. The Report also recommends some narrowing of the scope of responsibility of the PUB in areas such as the definition of the rate of return for NTPC.

The Report outlines a series of changes to the processes and procedures being used by the PUB so as to streamline activities and make the processes more accessible to northerners. As well, these recommendations are also targeted at reducing some of the costs that result for General Rate Application (GRA) processes. Recommendations in this area include: establishment of minimum filing requirements for utilities to standardize documentation during GRA processes and limiting financial support for intervention into the GRA processes to non-profit and non-tax-based municipalities.

The Report also recommends a strengthening of accountability of the PUB by expanding the scope of its annual reporting requirements.

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The Role of the Government of the NWT

The Report suggests that GNWT needs to continue to work with residents to define a vision for electricity and based on that vision, an action plan to redesign and refocus the electricity sector. It notes that the GNWT has a number of tools that it can use to strengthen the electricity sector including regulation, ownership of the NWT Hydro Corporation and NTPC and its various subsidy and conservation programs. The Report emphasizes the importance of GNWT leadership in making changes with the goal of reorganizing the sector over the next ten to twenty years.

To help clarify and focus the GNWT's actions, the Report recommends improving the lines of authority and accountability for various electricity related matters. Specific recommendations include:

- Assigning responsibility for NTPC and PUB to identified departments;
- Assigning the responsibility for testing new electricity related technologies to a specific department or agency;
- Developing and periodically updating multi-year plans for testing of new technologies; and
- Objectively reporting the results of this testing.

The Report emphasizes the critical role of the GNWT and suggests that an increased focus on electricity matters is necessary to lead the necessary change processes required to ensure that the system effectively serves the needs of northerners well into the future.

Timeline for Actions

The Report states that immediate action is needed to begin the changes required to strengthen the electricity system. It notes that many of the proposed changes are linked and will require careful planning and, in some cases, some difficult choices. Four phases for action are outlined in the Report. A number of immediate actions to demonstrate commitment to change including:

- Confirmation of a vision and action plan;
- Direction to NTPC to structure future proposals regarding rates in a manner that is consistent with the Report's recommendations;
- Initiation of legislative review and amendment of the *Public Utilities Act;*
- Changes to the Territorial Power Support Program and Housing Subsidy Programs; and
- Clarification and assignment of responsibilities for NTPC and the PUB.

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The Report also notes that some interim steps may be required to support the proposed changes. In all cases the Report suggests that such transition activities should take place over specific periods of time.

Concluding Comments

In its concluding comments the Report notes the commitment and interest of northerners in electricity. It suggests that the timing for change has become critical and that action is needed. As well, the Report thanks all those that participated in the review process.

1.0 INTRODUCTION

The *Review of Electricity Regulation, Rates and Subsidy Programs in the Northwest Territories* began with the release of a Discussion Paper in December of 2008. The paper was authorized by the Ministerial Energy Coordinating Committee (MECC) that is composed of four Territorial Ministers including Minister Bob McLeod, Committee Chair and Minister of Industry, Tourism and Investment; Minister Michael Miltenberger, Minister of Environment and Natural Resources; Minister Michael McLeod, Minister of Public Works and Services and Premier Floyd Roland, Minister Responsible for the Northwest Territories Power Corporation.

Based upon directions established in the Government of the Northwest Territories' (GNWT) *Energy Plan* and *Greenhouse Gas Strategy* and the recommendations of legislators and the public, the Review was established to examine a range of issues related to the generation, transmission and distribution of electricity in the Northwest Territories.

The discussion paper provided a broad framework of issues surrounding electricity in the NWT and posed a number of key questions for consideration during the Review. The discussion paper also sought the involvement of northerners in defining a vision for the future, and in identifying the problems that must be addressed to make the vision a reality.

The discussion paper highlighted the need to:

- Reduce costs where possible;
- Distribute costs equitably; and
- Ensure affordability of electricity power for customers.

The paper described the GNWT's intention to examine all aspects of activity related to electricity and invited residents, utilities, regulators, organizations, businesses and governments to provide their thoughts and advice during the review process.

The Government of the Northwest Territories appointed three individuals to carry out the review. Mr. Gerry Forrest, Mr. Doug Matthews and Mr. Mark Cleveland were appointed by MECC Chairperson Mr. Bob McLeod to serve as Review Panel members.

This final report from the Electricity Review Team, *Creating a Brighter Future,* summarizes the work that has been completed over the last eight months. It examines questions posed in the discussion paper, existing policies and the key issues which frame electricity related activities. The report also highlights current conditions and seeks to reflect the vision for the future of electricity that the Review Team heard from northerners. Finally, it recommends a range of actions, to be taken over time, to provide an environment in which efficiency and innovation can be matched with affordability.

2.0
PROCESS OF THE NWT ELECTRICITY REVIEW

The Electricity Review was initiated in December 2008 with the publication of a Discussion Paper entitled *A Review of Electricity Rates, Regulation and Subsidy Programs in the Northwest Territories.* The paper, issued by the Ministerial Energy Coordinating Committee (MECC), was widely circulated and asked northerners to consider a number of key questions.

In February of 2009, the Chairperson of the MECC appointed a three-person panel to conduct the Electricity Review based upon the themes and questions raised in the Discussion Paper. Mr. Mark Cleveland, Mr. Gerry Forrest and Mr. Doug Matthews were selected to conduct the review and provide comments and reports on the results of their work.

The initial phase of the Review process included a series of public forums, as well as meetings with a range of other groups and agencies. An invitation was extended to all communities to have the Review Team visit and hold a meeting. As a result, public forums were held in Inuvik, Norman Wells, Fort Simpson, Hay River, Fort Smith, Fort Resolution, Behchoko and Yellowknife. The attendance at the public forums was between 30 and 40 people in the larger communities and 15 to 20 in smaller communities. All of the meetings were extensively advertised at the community level using newspaper advertisements, local radio and television announcements as well as posters. Prior to each public forum the team also met with local media representatives to provide information on the Review process, as well as the agenda and schedule for the public sessions.

The Review Team also attended a workshop on electricity sponsored by the Northwest Territories Association of Communities (NWTAC) that included representatives of seventeen non-taxed based communities, as well as observers from all the NWT tax-based communities.

In addition to public forums and workshops, the Review Team conducted nearly 50 meetings with individuals and organizations. Meetings were held with representatives of utility companies, the Public Utilities Board, social agencies, environmental organizations, community and territorial government staff, legislators, businesses and business organizations and a range of other interested individuals. The public forum and other meetings involving the Review Team occurred during the period March through May 2009.

To provide additional communications mechanisms for the public, the Review Team also established an electronic mail address, in addition to an office mailing address, to permit individuals to send comments and suggestions directly to the Team members. An open offer was made to the public to forward thoughts and ideas, and the offer was also extended to organizations and companies to make written submissions to the Review Team. A total of twenty-five written comments were received, including formal submissions from twelve organizations and individuals.

2.0 PROCESS OF THE NWT ELECTRICITY REVIEW

Overall, more than 350 people contributed to the public phase of the review process.

A summary of what the Review Team heard during the public phase of the Electricity Review was consolidated in the document titled, *A Discussion with Northerners about Electricity*. This report was issued in July 2009 and was widely circulated to community governments, interest and business groups, legislators and other interested residents. As well, the report was made available on the GNWT's Department of Industry, Tourism and Investment web site.

Following the public phase of the review process, the Review Team examined the themes and comments from the public and undertook a detailed examination of a number of key issues. This examination included research and analysis of data, reviewing references and documentation from other jurisdictions and consulting with individuals possessing specific knowledge and skills.

This report summarizes the results of the Review Team's work including both the public and analysis phases of the review process. It serves as the final report of the Review Team.

3.0

BACKGROUND AND HISTORY OF ELECTRICITY SERVICES IN THE NORTHWEST TERRITORIES

The history of the provision of electricity in the Northwest Territories is a story involving governments, resource development industries and utility companies.

Initially, mines and the Government of Canada, through its Crown agency, the Northern Canada Power Commission (NCPC), played primary roles in the development, operation, transmission and distribution of electricity. More recently, the Government of the Northwest Territories, its agency, the Northwest Territories Power Corporation (NTPC), and the private company, Northland Utilities, have been primary players in the electricity sector.

The sections below outline some of the highlights of the electricity services history in the NWT.

Electricity Sector Structure

Prior to the establishment of a public utility in the NWT, industry played the dominant role in the generation, transmission and distribution of electricity power. The primary purpose of the companies involved in the generation of electricity was the production of power to support mining development and production. For example, the Bluefish hydroelectric facility, located on the Yellowknife River just upstream from Prosperous Lake and operated by Consolidated Mining and Smelting, was commissioned in 1938 to supply power for its nearby mining operations.

Government participation in electricity matters can be traced to the actions of the Government of Canada in the late 1940's. In 1948, the federal government, recognizing the rapid growth that was then occurring in the mining sector, established the Northwest Territories Power Commission through an act of Parliament. This Commission, later renamed the Northern Canada Power Commission (NCPC) when the corporation became responsible for service delivery in the Yukon in 1956, was tasked with the construction and operation of power plants in the two territories.

Private utility development began in the early 1950's. Northland Utilities (NWT) was awarded the franchise to produce and distribute electricity to the community of Hay River by the Government of Canada effective August 1, 1951. Over time, Northland Utilities (NWT) extended its services by generating and distributing electricity in several NWT communities: in Fort Providence and Enterprise in 1972 and in Wekweeti in 1987. In addition, the utility company also constructed a transmission line between the old Pine Point mine and town sites and the community of Hay River. Private sector interests have held electricity distribution for the residential and commercial customers in Yellowknife for a number of years. In 1993, Northland Utilities (Yellowknife) purchased the electricity distribution system in the City of Yellowknife from Centra Power.

3.0 BACKGROUND AND HISTORY OF ELECTRICITY SERVICES IN THE NORTHWEST TERRITORIES

In 1988, the GNWT, on behalf of the citizens of the Northwest Territories, purchased the shares and assets of the Northern Canada Power Commission from the Government of Canada. In support of this action, the NWT Legislative Assembly passed legislation establishing the utility as a Crown Agency and defining its purpose. The utility was renamed the Northwest Territories Power Corporation (NTPC). Since that time, NTPC has been a Crown corporation, wholly owned by the GNWT. The corporation has a board of directors appointed by the GNWT and, in the past, has provided annual dividends resulting from the corporation's activities to the GNWT.

The most recent change to utility structures was the passage of the *NWT Hydro Corporation Act* by the NWT Legislative Assembly in 2007. The *Act* established a corporation that holds the shares of NTPC and has the ability to establish other subsidiary corporations or enter into partnership arrangements related to power matters. A key objective of establishing this structure was to clearly separate "unregulated activities" of the Crown agency from the regulated services of NTPC, so that special project costs were not included in electricity rates.

Generation, Transmission and Distribution of Electricity

Historically, there have been two primary methods by which electricity has been generated in the NWT. These are hydroelectric power generation and thermal power (oil and gas) power generation.

During the early period of electricity sector development both industry and the Federal Government provided funding to support the development of hydroelectric facilities and the associated transmission capacity in the Northwest Territories. In addition to the Bluefish site mentioned earlier, the Snare Rapids hydro facility, commissioned in 1948, provided power to both the Giant Mine and the Yellowknife town site. The development of hydroelectric generation on the Taltson River system (1965) supplied power to the Pine Point Mine, as well as the town of Fort Smith. Fort Resolution and Hay River were added to the distribution system at a later point in time.

Diesel powered generation, provided by NTPC and NUL (NWT), provides electricity in most small, or isolated, communities. As well, in two locations, Inuvik and Norman Wells, natural gas fired generators provide the primary generation source.

Distribution of electricity within communities is carried out by both NTPC and NUL. The NUL companies currently distribute electricity that it purchases from

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NTPC in the Hay River area and Yellowknife areas. It also generates and distributes power in several smaller communities. NTPC distributes power to customers in the remaining NWT twenty-five communities.

Role of the Government

With the purchase of NCPC by the GNWT in 1988, the GNWT assumed the lead role in both directing the operation of the utility Crown Corporation as well as carrying out its responsibility to provide the regulatory framework that ensures effective and efficient utility company cost oversight.

The GNWT decision to assume these responsibilities can be seen as consistent with the roles adopted by provincial jurisdictions across Canada. The GNWT's purchase of NCPC and the establishment of a regulatory framework can be seen as adding a critical "tool" to the government's "tool kit". This "tool" allows the GNWT to direct the provision of an essential service to its residents as support for economic development activities.

In the past, the GNWT has initiated reviews of elements of the electricity sector with the goal of establishing a longer-term plan for guiding its development. In 2000, the GNWT commissioned *A Review of Electricity Generation, Transmission and Distribution in the Northwest Territories: A Design for Tomorrow*. The report included nearly 30 recommendations for action. Only a limited number of these recommendations were actioned and a comprehensive GNWT plan for the sector was never developed.

This present review, coupled with the two concurrent but separate reviews, one examining the operational aspects of NTPC and the second analyzing the unsolicited proposal from ATCO to merge ATCO and NTPC operations, illustrates the GNWT's current actions develop a broad understanding of the circumstances faced by the electricity sector and develop a clear plan for future electricity activities.

Regulation and Rate Structures

Rate structures for electricity produced in the NWT have changed over time. In the early years of NCPC operation, the Government of Canada set the rates with different rates for government and non-government customers. Rates paid by government were considerably higher than those in other customer classes. In 1975 the Government of Canada amended the *Northern Canada Power Commission Act* to permit the establishment of two rate zones – one for the NWT and one for the Yukon.

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BACKGROUND AND HISTORY OF ELECTRICITY SERVICES IN THE NORTHWEST TERRITORIES

With the acquisition of the NCPC in 1988 the GNWT also established a regulatory structure with oversight for utilities. In 1989, under the recently approved *Public Utilities Act*, Northwest Territories Public Utilities Board (PUB) was assigned partial responsibility for regulation of the electricity system with its mandate being limited to overseeing utility revenue requirements and the terms and conditions of service. Rates continued to be prescribed by government regulation. By 1992 the PUB assumed responsibility for full regulation of utility operations. The rate structure, however, remained the one inherited from the NCPC (pre-1988).

Revenue requirement reviews for NTPC were conducted before the PUB in 1991/93 and 1993/94. The results were "across the board" increases that raised the existing rates by fixed percentages. In 1994, as a result of PUB observations, a differential rate structure, community-based rates, was developed and subsequently implemented. This overall framework for rates continues to be in place at this time.

Several proposals to change the existing rate structure have been presented to the PUB over the years, however none have been implemented. This being said, the PUB has, in the past, noted the importance of GNWT direction if any decisions are to be made to move towards, for example, the levelizing of rates across the NWT.

Trends and Directions

Over the years, activities associated with electricity services have developed and changed. Service levels have been enhanced, generation capacity has grown as load demands have increased, efficiency and effectiveness of associated technologies have improved, technology transfer from a southern-based Federal Crown utility company (NCPC) has been made to the northern-based NTPC, and the government and regulatory authorities have developed extensive experience and a better understanding of the challenges and opportunities that electricity services provide.

As the cost of fuel has received greater and greater public profile and as rates for electricity have increased, public interest and concern regarding electricity matters have also been raised. This has placed considerable pressure on the public utility companies as well as elected officials to examine, discuss and address electricity issues.

This process of the evolution and development has been beneficial to northern residents – electricity services now are offered in all communities, service is increasingly reliable and programs are in place to improve the affordability of electricity. But a primary question remains: Will the current system support the continued growth and development of the NWT? If not, what changes are needed, and what steps should be taken to make those changes?

4.0

THE CURRENT SITUATION

Examining the NWT electricity system requires attention to a number of conditions and issues. Before concentrating on the issues, though, it is important to understand how the electricity system is organized. This section provides a short overview of the current situation. A more detailed discussion of the current electricity system and its activities is included as an appendix to this report.

The Operating Environment

As we all know, the NWT has a very large land mass. The Territories includes nearly 1.18 million square kilometres. Long distances separate communities - in many cases, it is hundreds of kilometres between one community and the next. Because of the distances involved it is not possible, in most cases, to share utility infrastructure between communities.

At the present time, there are just under 43,000 residents living in 33 communities in the NWT. This is about 5 percent higher than the population a decade ago. Overall population growth has been quite slow. As well, population trends demonstrate a pattern of population stagnation in smaller communities, with slight growth in regional centres and Yellowknife. This "cautious urbanization" trend is not dissimilar to trends seen in the provinces of Canada.

Public Utilities

The current electricity system includes two key providers – the Northwest Territories Power Corporation (NTPC) and Northland Utilities Limited (NUL). Northland Utilities is composed of two sister companies, Northland Utilities (NWT) operating out of Hay River and Northland Utilities (YK) operating in Yellowknife.

NTPC is a publicly owned Crown corporation. It provides service to 8,500 customers. NTPC generates 97 percent of the regulated electrical power in the Territory. In addition, it distributes electricity in 25 Territorial communities.

The Northland Utilities companies are privately owned. ATCO, a large Alberta-based corporation is the major shareholder in Northland Utilities Enterprises that, in turn, owns the two Northland companies. The Denendeh Development Corporation is a minority shareholder in Northland Utilities Enterprises. Northland Utilities provides service to about 10,400 customers, 55 percent of the total territorial population, by distributing electricity in Yellowknife and Hay River area as well as generating and distributing electricity in four other communities.

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In total, hydroelectric generation accounts for about 77 percent (2006) of the residential and commercial power generation in the NWT. Diesel and natural gas (thermal generation) accounts for the remaining 23 percent of generation. Circumstances are a bit different with respect to mine sites and other resource extraction projects (industrial generation). All industrial generation is produced using thermal means, fueled by either diesel or natural gas.

Thermal power generation is used in most of the smaller territorial communities. All of these communities have one or more generation units as their primary power source. In addition, thermal generators are used as backup units in communities that are primarily served by hydroelectric generation. The size of thermal generation units is dependent upon the load demand in the community. Generation units range in size from 70 kilowatts in Jean Marie River to 5180 kilowatt (backup) generators in Yellowknife.

Backup capacity is a critical feature of the electricity power generation system in the NWT. Given the extremes of northern weather, the isolated nature of many of the communities and the fact that all electricity, whether generated by hydroelectric or thermal means, comes from a single source, it is very important that there is access to a separate standby power generation unit that can produce electricity when the primary system fails.

There is limited use of excess heat from power generation facilities in communities. A co-generation (producing heat and power) system exists in the Town of Inuvik. As well, waste heat from the thermal power plant is collected by means of heat exchange systems and is piped into adjacent buildings in several communities. An example of this approach is in Fort McPherson, where the excess heat is used to offset heating requirements in the nearby school.

Regulation of Electricity

Under existing Territorial legislation franchise agreements can be approved to permit a utility to operate within a municipality. Under the legislation, utilities wishing to operate within a municipality must obtain a franchise from the Public Utilities Board. Outside of municipal boundaries, a Minister of the GNWT approves all utilities franchises.

The GNWT established a Public Utilities Board (PUB), in the early 1990's, to regulate the operation of utilities in the NWT. The Board is accountable to a Minister of the GNWT and must report annually on its activities. That report is tabled in the NWT Legislative Assembly. The PUB presently includes five members. The PUB serves as a proxy for competition in that it reviews applications from utilities

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THE CURRENT SITUATION

and makes judgments as to the validity of operating and capital costs. In addition, it approves the rate structure and rates for services provided by utilities. Rates must be based on "the property of the public utility used or required to be used to provide service to the public," (Section 49, *Public Utilities Act*). The PUB has a wide range of authority to review, set hearings, negotiate, analyze and make decisions related to costs and electricity rates.

Currently, the PUB operates a General Rate Application process that includes two phases. The first assesses the proposed costs of a utility company's operation and the second reviews and confirms the cost of service methodology, the results and the rates to be charged. As well, the PUB has, in some instances, approved negotiated settlement recommendations/agreements with the utilities.

Electricity Usage

The electricity system currently includes just over 19,000 customers. The number of customers obtaining electrical power from the system has grown somewhat, but remains relatively stable. The mix of industrial, commercial and residential requirements has changed over the past decade. Changes have occurred for a number of reasons including changes to industrial production, increased usage of personal electronic equipment, increased use of higher efficiency appliances and conservation efforts by businesses, families and individuals.

At the residential level, statistical information suggests that the average electricity use is relatively low. Average usage by residential customers is illustrated using selected communities in the table on page 19. Those communities selected are "typical" and provide useful references in discussions of usage.

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TABLE ONE – AVERAGE MONTHLY RESIDENTIAL USAGE BY COMMUNITY

COMMUNITY	AVERAGE MONTHLY CONSUMPTION	COMMUNITY	AVERAGE MONTHLY CONSUMPTION
Colville Lake	352	Hay River	539
Deline	464	Inuvik	558
Dory Point/Kakisa	412	Norman Wells	616
Fort McPherson	463	Sachs Harbour	406
Fort Providence	444	Tuktoyaktuk	502
Fort Simpson	470	Wrigley	419

Source: NTPC and NUL Billing Data

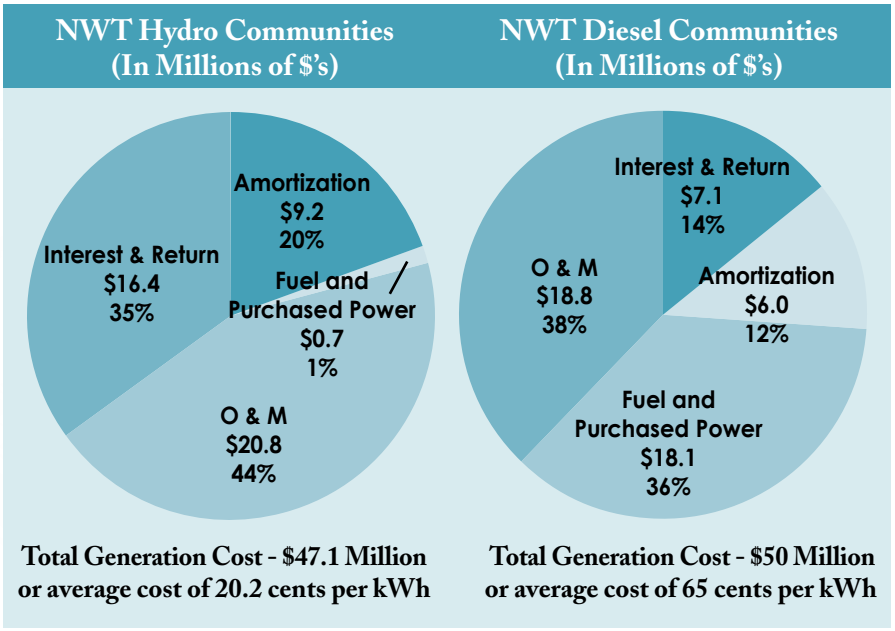
It is important to note that the Review Team was unable to determine, based on existing data, what the typical usage might be for different kinds of housing. For example, it was not possible to determine an average usage for a family of four, in a single-family dwelling.

System Costs

The total cost of the electrical system is just under $100 million (2007/2008). These costs cover the generation, transmission and distribution of power. Cost components vary considerably based on the type of generation. Hydroelectric costs are significantly weighted to amortization and interest costs resulting from the high cost of the initial construction of hydroelectric generating plants. For thermal generation, on the other hand, the highest cost categories relate to fuel purchases and operations and maintenance costs. An illustration of the cost categories for hydroelectric and thermal generation is shown in the chart on page 20.

4.0

THE CURRENT SITUATION



Source: Northwest Territories Power Corporation
and Northland Utilities Ltd.

For the 2007/2008 year, it cost about 20 cents to produce a kilowatt hour of electrical power from hydroelectric generation. At the same time it cost an average of about 65 cents to produce a kilowatt hour using thermal generation. It is important to note, however, that these costs can be significantly influenced at the community level by a number of factors such as new equipment installation and fuel costs.

Reliability of Service

Given the isolated nature of many communities and the extreme weather conditions that occur, reliability of electrical power is particularly important. If the power supply fails at minus 30 degrees, it takes only a few hours before homes and businesses begin to freeze up and residents who are at risk, whether due to illness or age, may then be threatened by the elements. Unlike areas of southern Canada where the failure of a single generation station can be offset by increasing distribution from other generation sources through the electrical grid, all NWT communities must depend on their local primary and back-up generation capacity.

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Recent improvements in technology have helped the utilities to identify and manage outages and voltage change with greater speed and accuracy. The implementation of monitoring systems that permits operators in a central location to monitor a number of generation plants have been essential to these efforts.

Rate Structures

The Northwest Territories has a rate structure that is based on the cost of service in each community. As a result, rates have been identified for each community and for each customer category in each of the communities. This results in a complex system of over 200 rates. The rate structure was developed in the mid 1990's and has been in place, with minor variations, since that time.

Affordability

The Territorial Power Subsidy Program (TPSP) is intended to support residential and commercial customers. Residential customers whose price of power exceeds that paid in Yellowknife have their bills reduced to the Yellowknife rate for the first 700 kilowatt hours used each month. The difference between the community rate and the Yellowknife rate is then billed directly to the GNWT by the utility. Qualifying customers then pay the community rate for all usage over 700 kilowatt hours.

Commercial customers, with annual sales of less than $2 million, can apply for reimbursement to the Yellowknife rate for power usage up to 1500 kilowatt hours per month. Qualifying commercial customers pay the full community rate for all monthly usage over 1500 kilowatt hours.

Costs for the TPSP have been growing steadily over the past decade. In the year 2000, the cost of the TPSP was about $4.4 million. This has increased steadily to a cost of $9.5 million in the 2008/2009 fiscal year. Over 95 percent of the total cost of the TPSP is for the program's residential component.

A second subsidy program is provided by the NWT Housing Corporation to its tenants. The NWTHC owns about 2200 housing units across the NWT. Tenants of NWT Housing Corporation units are charged 6 cents per kilowatt hour, regardless of the community power rate. The balance of electricity power charges regardless of usage levels is charged to the NWTHC. In recent years, this subsidy has cost about $5.2 million annually.

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A VISION FOR THE FUTURE

The NWT Electricity Review began with a public phase that provided an opportunity for people to express their views, their vision and their values with respect to electricity. What we heard during those discussions was that NWT residents are interested in seeing a long-term vision for electricity developed and implemented. We also heard that the Government of the Northwest Territories should take on an expanded role in working with the public to realize this new vision.

People have a wide variety of views regarding the vision and values that should shape the future electricity system. Some views were conflicting and some were based on personal interests or circumstances. A number of people suggested immediate actions to address issues and problems. Others took a longer-term view suggesting that the electricity system must be formed to serve not only those living in the NWT today, but also to respond to the future needs of the Territories.

The current situation in the electricity sector has been created over the past fifty years. The successes and the challenges that presently exist relate to past decisions of governments, electricity utilities and customers. In examining the current situation and thinking about the future, it is important to understand that any significant changes will require difficult choices, time and resources in order to be fully implemented.

In preparing this report, the Review Team recognizes that in making our recommendations we are not starting from a "blank sheet of paper", but rather suggesting ways to improve a complex system of existing, inter-related elements. The challenge before us is framed by two questions that were stated in the initial Discussion Paper. These are:

- What should be our vision for the future of electricity in the Northwest Territories?
- What problems must we overcome to make this vision a reality?

In the view of the Review Team, a vision for the future must be founded on the importance of electricity to individuals, families and communities. Most NWT residents believe electricity is an essential service – and the Review Team agrees. Having access to electricity is a requirement for nearly every aspect of life whether it is in the home, at work, in schools, in stores or at the health centre. Heating, communications and food preparation all now depend upon access to electricity. Indeed, as we look ahead, it seems certain that electricity can only become increasing important. New applications of technology in transportation, household and business equipment and communications suggest that future demands for electricity will, over time, increase.

Of course, strides have been made to increase the efficiency of electricity use. Individuals and businesses are using new equipment and practicing conservation

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to manage their electricity use. Utility companies are installing modern generation, transmission and distribution systems that increase the efficiency, the safety and the reliability of electricity systems.

This perspective leads the Review Team to our first recommendation.

Recommendation 1 – Establishment of a Long-Term Vision for Electricity

> **A long-term vision for electricity be established, one that will be implemented over the next ten to twenty years. The vision should reflect the interests of citizens of the NWT and be supported with specific short, medium and long-term actions that lead to the achievement of identified goals.**

The Government of the Northwest Territories is well placed to help develop a long-term vision and has the authority and the responsibility to take a leadership role in establishing, implementing and reporting on steps taken to achieve the vision. A vision must grow from listening to residents, talking to the utility companies and regulators and examining the issues that currently exist and are likely to exist in the future.

The vision for electricity should encompass a ten to twenty year period and serve as a reference for both present and future Legislative Assemblies. The contents of the vision should clearly describe to customers, members of the public, businesses and the utilities the directions that are to be taken and results that are expected from supporting actions. When finalized, the vision will also provide a platform on which to measure progress and establish accountability.

Because of this complexity and interrelationship between the various elements of the electricity system, it is important to identify the principles that will support the establishment of a vision for the future. The principles can serve as the foundation for building a vision and supporting the establishment of priorities and actions to be carried out.

The Review Team recommends that the principles supporting the vision should include the following:

Recommendation 2 – Describe Principles for a Vision

- **Electricity is an essential service.**
- **Every customer should have access to a safe and reliable electricity service at a reasonable price.**
- **The price for electricity paid by the customers should not be unduly affected by the community of residence.**
- **The current range in the prices paid by customers in different communities should, over the next decade, be narrowed with a goal of levelizing rates.**

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- **Actions to improve the electricity system should be taken in a transparent manner.**
- **Electricity rates should include proper price signals to encourage wise usage.**
- **The vision should address the current and future needs of NWT residents.**
- **Actions related to electricity must balance the needs of customers with those of the utility companies and the tax-payer.**

These principles propose a foundation for a vision that is focused on recognition of the importance of electricity to the personal and business life in the Northwest Territories. The principles suggest that electricity is fundamental to sound social and economic growth. Further, they suggest that the pricing of electricity should be structured to reduce, over time, the price differentials that currently exist. In the view of the Review Team, a goal of a new vision should be to eventually eliminate the pricing gap that currently exists among our communities.

The principles also suggest that the vision must be built to respond to changes in needs in the future. Current projections suggest only limited growth in demands on the existing electricity systems over the next decade. However, this situation could change and a vision must be structured to respond should this occur.

Based on what we heard, and have discovered, the Review Team has prepared a draft statement for use in the preparation of a long-term vision and plan. We recognize that some adjustments to this vision statement may be required as plans are finalized, but we feel that it reflects the values and the vision expressed to us during the Review. The statement expresses how the electricity system would be structured and how it would operate once the proposed changes have been implemented.

> **The electricity system will provide safe, reliable and affordable electricity to customers in all NWT communities. Its operations will be cost effective, innovative and seek to limit their environmental impacts while demonstrating a "customer first" approach to providing services. In addition, the system will meet current needs while being flexible enough to respond to future requirements and opportunities.**

The Review Team believes that the vision and associated plan of action should reflect the understanding that the current mixture of hydroelectric and thermal generation equipment can be expected to continue to provide the bulk of electricity power in NWT communities over the next twenty years. These are proven technologies that will continue to serve the needs of communities in a safe, reliable and cost effective manner. At the present time, there are no other generation technologies that provide the level of reliability for the same price as diesel or natural gas generation.

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However, during the next two decades, the advent of new technologies such as those related to improvement in the efficiency of diesel generation, alterative generation technologies, and increased efficiency of household and business equipment, may all have an impact on the electricity system. These potential, and in some cases expected, changes need to be considered for inclusion into the electric system once they prove to be functionally viable and economically feasible. The vision for the future should reflect this approach.

The vision and its associated action plan must demonstrate a commitment to building an electricity system that responds to the interests of its customers and the northern public. As the Review Team heard on many occasions, the electricity system, the utility companies, the regulators and legislators must put the interests of northern residents and northern businesses, first. These interests include ensuring that system costs are kept under control, system efficiency and improvement receives constant attention, jobs and related training are available to residents and business growth and development are supported.

The Review Team also believes that a vision and action plan should discuss "who pays". It should clearly outline which system costs will be borne by the customer, which will be borne by the tax payer and which costs are expected to be covered by others such as the utility companies, businesses or other governments. Each of these parties has an important role in supporting the operation of the electricity system.

For example, we believe that utility companies must be accountable for aggressively managing system costs. As well, we expect that consumers will cover the direct and indirect costs of system operation. Further, we believe that the government has a role in determining affordability, funding innovation where technologies are unproven or uneconomical, promoting conservation, supporting economic growth and development and managing comprehensive social policy initiatives for which they are accountable to the public.

The vision must also describe the role for regulation of utility companies. Regulation plays an important role in ensuring effective oversight of system activities, particularly in situations where there are a limited number of utility companies. This being said, regulation must be impartial, include objective analysis and transparent decision-making processes at a reasonable cost for the government, the utility companies and the customers. As well, the vision should be clear as to the role of government in providing overall direction to the regulators while maintaining an appropriate distance from their day-to-day decision-making.

Finally, the vision needs to balance the interests of customers, utility companies and the public. The interests of these parties can and do differ on occasion. For example, customers may be interested in seeing increased electricity subsidies, but the public, those paying taxes, may not accept tax increases (or related program / service

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decreases) to pay these costs. On the other had, utilities may seek higher rates to cover operational costs for which the consumer does not wish to pay. A vision must balance these interests and ensure that the balance does not inappropriately favor any one interest group.

The vision for the future and its action plan are required to build public confidence and to transparently outline the steps that will be taken to strengthen the electricity system. Planning for the future includes understanding the past, as well as building on existing strengths; effectively addressing the issues and respecting the circumstances that lie ahead.

During the remaining sections of this report, the Review Team will discuss the actions that we believe are required to address the current problems and make this vision a reality.

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ASSESSING THE CURRENT SITUATION

During the Review people expressed concern about aspects of the current electricity system and many expressed the belief that substantial changes are necessary to improve electricity services. As well, as we noted in our first report, people are frustrated and are looking for improvements and efficiencies.

To rebuild public support and confidence in the electricity system, it is important to assess the current electricity system in terms of the future vision. We need to determine whether the current system will satisfy the needs for the future. As well, we must determine how the current system needs to be changed to make it consistent with the vision and principles that will guide future activities.

The electricity system in the Northwest Territories is operated in a unique environment, one that includes a number of challenges that must be understood and addressed if a brighter future is to be assured.

Challenges faced by the NWT electricity system include:

- A small customer base;
- Isolated communities;
- Harsh northern environment;
- High fixed and operating costs;
- Limited economies of scale; and
- A complex regulatory process.

These factors have a profound impact on the structure and the cost of operation of electricity utilities as well as on the rates that the customer pays. They are, in fact, the primary characteristics of the system and will continue to impact the operation of the system well into the future. Understanding the impact of these characteristics is essential to understanding the current system and the reasons that change is required. The sections below discuss each of these characteristics.

The Customer Base

The customer base served by NWT electricity utilities has remained relatively stable over the past decade with the exception of the closure of mines in Yellowknife and the subsequent loss of two large industrial customers. The population in the NWT has grown only marginally over the past decade and the growth that has occurred has been primarily in Yellowknife and to a lesser extent in the other regional centres. There are few large industrial customers being served by the utilities at this point in time. The largest industrial users of electricity power, such as operating mines, generate their own electricity through the use of diesel generators.

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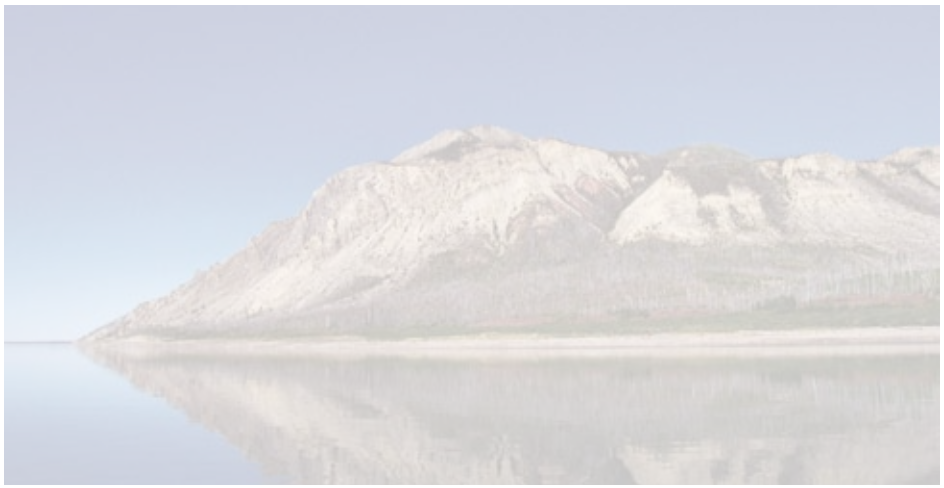
Population growth projections for the NWT suggest that, barring a major resource development project that results in an in-migration of a number of new residents, there will be only limited increases in the number of electricity customers over the next decade. The growth that will occur is likely to be served, in most cases, by the existing electricity load capacity. As a result, there is limited potential for the development of growth related improvements to economies of scale that might assist in reducing unit costs for electricity. Indeed, particularly in smaller communities, electricity customers face the prospect, given the current trends, of having to pay increasing prices as operating costs continue to grow while population stagnates or decreases.

Isolated Communities

At the present time, an electricity transmission grid only links a few NWT communities. With the exception of the Taltson system serving Fort Smith, Fort Resolution and the Hay River area and the Snare system serving Behchoko and the Yellowknife area, the communities of the Territory are served by local, standalone, diesel (or natural gas) electricity generation systems. This situation is a factor of geography. Large distances between communities and the relatively small number of customers in each community cause significant technical challenges to transmission line construction. As well, high costs of such construction limit the feasibility of grid development. Thus, in order to ensure that electricity services can be maintained, utilities must install primary as well as backup generators in each community (including those served by hydraulic generation) to provide services. This system structure has a profound impact on costs of operations and ultimately, the price paid by consumers.

These circumstances are similar to those faced in the northern parts of many of the provinces. Utility companies serving communities in northern Saskatchewan, Newfoundland and Labrador, Nunavut and Manitoba all face similar financial and technical challenges in providing electricity to isolated communities. For the most part, the utilities serving isolated communities in these other jurisdictions use diesel generation to address communities' electricity requirements.

Any future vision must respect the fact that utilities will need to continue to operate standalone generation systems for the foreseeable future in many NWT communities. As reliability and maintainability is the utmost concern in communities, there are only a few options that could be considered for reducing or eliminating the use of diesel for generating electricity. Since landline grid connections are not economically, technically or physically possible, diesel is expected to be the main generation source. Some additional generation from mini-hydro may also occur, but the feasibility of mini-hydro projects is somewhat limited by economics. While wind generation,



6.0 ASSESSING THE CURRENT SITUATION

solar photovoltaic, hydrogen, biomass and biodiesel may be possible in the future, integrating most of these technologies with existing diesel generators in our harsh northern environment presents some interesting and significant challenges – some of which, from the literature, have not been technically resolved at this point.

Harsh Northern Environment

The environment and weather in the NWT is particularly harsh, when compared to other parts of Canada. While we all joke about the "banana belt" in the Deh Cho, all regions of the NWT experience extreme weather. Long, cold winters put a strain on equipment and personnel. The "wear and tear" is considerable and some equipment simply fails earlier than it would if it were used in warmer climates. As well, long periods of darkness, which is a considerable challenge in the higher latitudes, makes working outside difficult and, at times dangerous. These circumstances simply increase the importance of safe and reliable electricity services – so that residents can be protected from the challenges of the environment.

For the utility companies, the darkness and cold weather are only two of the challenges that the harsh environment provides. There is limited road access to many communities and in a number of cases the only land access occurs in the winter months once ice roads have been constructed. It is then, during the most extreme weather, that the resupply of equipment and fuel for the community's generators must be transported to the communities. Further, limited road infrastructure also impacts on the construction of, for example, transmission lines. As a result, marshaling of equipment must frequently occur using expensive aircraft.

The extreme climatic conditions will continue to be significant influences on the electricity system's operating environment. Utility companies and customers alike will need to cope with the harsh environment.

High Fixed and Operating Costs

The expense of operating in northern Canada is well known. All businesses operating in the NWT are faced with high costs for transportation of goods, challenges in recruiting skilled workers or contractors, limited markets and high living costs for their staff. In this respect, electricity utilities are no different.

The generation of electricity requires investment in expensive generation equipment. Investments in equipment and the cost of running and maintaining the electricity infrastructure fixes the price of producing electricity considerably higher in the

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Northwest Territories than it would in an urban or even rural southern Canada. While utilities can make every effort to get the best price for equipment and construction, they are limited in the degree to which than can influence these costs. This circumstance is further complicated by the relatively small amount of annual capital infrastructure spending that occurs in the NWT electricity system. As an example, NTPC currently spends about $17 million per year on capital infrastructure while Manitoba Hydro and SaskPower spend as much as $1 billion annually.

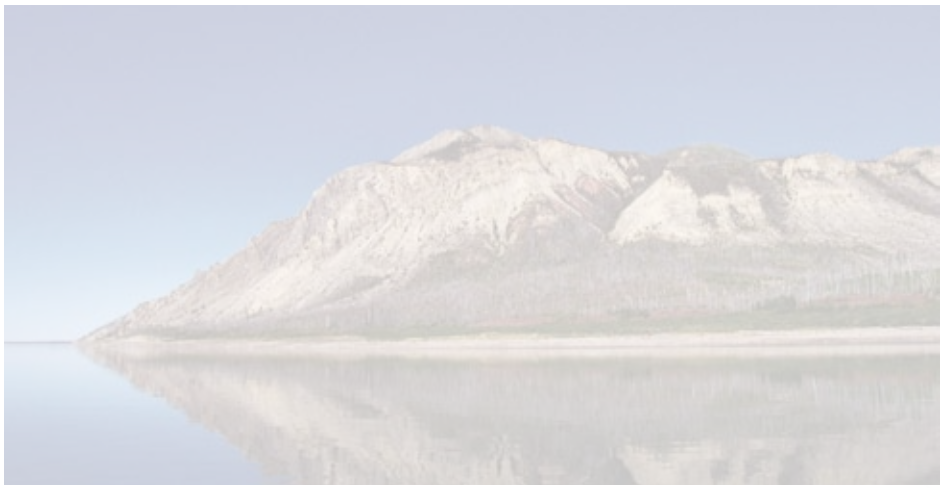
Costs associated with the operation of the electricity system are also substantial. In addition to the cost for debt associated with purchasing equipment for the system, the costs of fuel and staffing are primary concerns. Fuel pricing for diesel-powered generation has experienced significant fluctuations over the past few years with oil prices reaching a high of over $140 a barrel, while currently being priced at about the $65 to $70 range. While the price of fuel has moderated somewhat from last year's peak, there is no expectation that we will see a long-term return to $50 per barrel levels – so higher cost fuel can be expected to continue into the future.

Staffing of technical positions in the utility industry is becoming increasingly difficult as retirements from the various technical and management professions increase with aging populations. This is creating a significant "cost" for northern utility companies. A recent international study conducted by PricewaterhouseCoopers of utility executives indicates that 75 percent see the ageing of the utility workforce as a key issue over the next five years (PricewaterhouseCoopers. *A World Beyond Recession: Utilities Global Survey 2009*. Pg 34). The Canadian Electricity Association has echoed this view in their publications. In the NWT, this issue has been of concern to utility companies for a number of years as they have struggled to find ways to attract employees to live and work in an area where the cost of living is high.

An additional cost related issue that cannot be neglected is the cost of subsidies provided by the GNWT to support the electricity system. The Territorial Power Subsidy Program (TPSP) has grown substantially over the past decade. The primary reason for the growth appears to relate to an increasing gap in electricity prices between Yellowknife and the thermal communities. While the GNWT may elect to continue to provide this funding to help consumers offset costs, finding a mechanism to manage the growth of the costs of this program is needed.

A Relatively Simple Market – Limited Economies of Scale

There are limited economies of scale within the existing electricity system in the NWT. The small customer base, dispersed and isolated communities and the high



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operating and fixed costs all play a role in limiting the potential for economies of scale. In order to provide safe, reliable service to communities, electricity utility companies have to ensure that each location is sufficiently equipped to stand alone in the event of an emergency. There is little potential to share equipment, although, through the use of technology, some actions have been taken to reduce the requirements for staff.

The situation is further complicated by the nature of the electricity system that has evolved within the NWT where two utilities exist to serve a small customer base. The Northwest Territories Power Corporation (NTPC) generates well over 95% of electricity power for residential and commercial customers in the NWT. Distribution is, however divided between NTPC and the NUL companies, with NTPC generating electricity and then selling it to NUL for resale to customers in the NWT's largest communities. This circumstance would not be unusual in southern Canada, as markets are considerably larger – where utility companies may specialize in generation, transmission or distribution, but in a small jurisdiction like the NWT, some of the potential economies of scale that might be found through using a single provider are lost.

Under the current electricity rate structure, utility companies are required to develop rates based on allocation of costs to each community. This results in different rates for each of the thirty-three communities. In addition to the additional administrative burden placed on utilities as a result of this structure, the rate structure also severely limits the ability of utilities to be responsive to sudden changes in cost structures at the individual community level.

The effect of the current rate structure has also resulted in deep divides and considerable acrimony between various communities, residents and elected officials – each arguing for their particular case with respect to their individual as opposed to the collective needs. The Territories and communities would likely find greater benefit in conditions where all were working together with the utilities to find the best solutions for the lowest costs.

Complex Regulatory Structure

Across Canada there are a range of approaches used to regulate electricity. Regulatory structures are established to provide oversight and ensure that utilities, many of which are single suppliers to a customer base, provide safe, reliable and affordable power. Regulators are asked to balance the interests of the customer with those of the utility.

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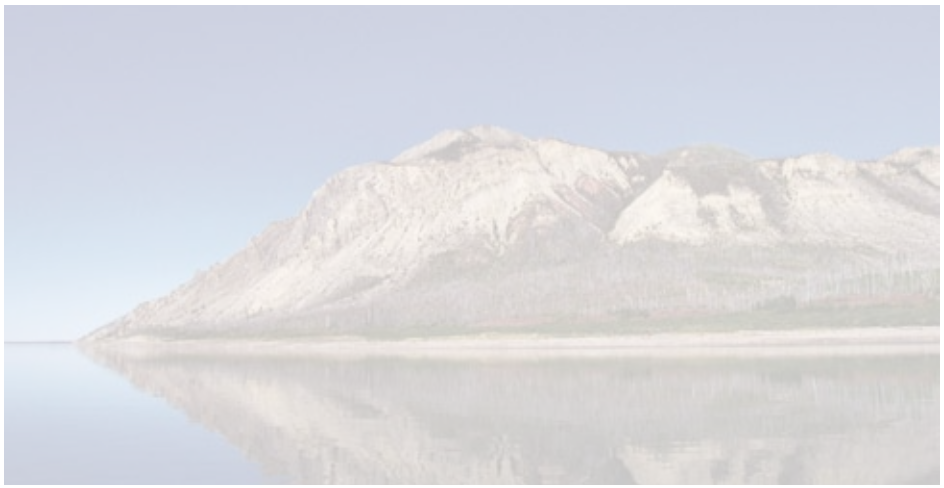
ASSESSING THE CURRENT SITUATION

In the NWT the PUB has "exclusive jurisdiction in all cases and for all matters in which jurisdictions is conferred on it by this *Act*…." (Section 17 (1), *Public Utilities Act)*. Made up of members of the public, the PUB is similar in structure and operations to a number of the electricity regulators with comparable mandates elsewhere in Canada. The *Public Utilities Act* is now over twenty years old and while there have been minor amendments to the legislation, the *Act* remains firmly grounded in the concepts and procedures that provincial jurisdictions developed decades before they were included in the NWT legislation.

Over the past decade, the roles and responsibilities of regulators and governments have been debated across Canada. These discussions continue today. Historically, regulators have been seen as playing a quasi-judicial role, undertaking tasks such as setting the terms and conditions for services, analyzing and reviewing cost information and confirming rate structures. As governments look to effectively utilize Crown utility corporations to achieve specific government goals such as economic growth, increasing green power sources or extending electricity grids to isolated regions, questions about the level of authority and decision-making of regulatory bodies are being raised. This discussion is only just beginning in the NWT and at the present the current legislation leaves little room for the government to advance its interests or direct attention to specific policy needs and outcomes.

The processes and procedures of the PUB are complex and are seen by many people as difficult to understand. While the Board has a mandate to balance the interests of customers and utility companies, many members of the public fail to see the benefit of what they perceive as an expert driven, legalistic series of processes. Smaller communities and residents, particularly those faced with particularly high electricity costs, feel isolated from the regulatory process and are also unsure of its benefits. Larger communities, and those better placed to obtain the services of experts to provide advice and give evidence in hearings, are more comfortable with the processes but also express concern about the sometimes confrontational nature of the current regulatory processes.

Many members of the public view the costs of NWT regulatory processes as being extraordinarily high given the size of the NWT's customer base. In particular, costs associated with the General Rate Application (GRA) process, which occur periodically, result in considerable spending by utilities, almost all of which makes its way back into the rates charged to the consumer. Identifying mechanisms to ensure an effective regulatory process at reasonable costs should be a focus of attention.



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A Way Forward

The NWT electric system has developed over time. It has been built by efforts of governments, industry, utility companies and regulators. Each has made important contributions. Unfortunately, but perhaps not surprisingly, the system has not been developed based on a plan, and decisions that have been made have not reflected clear goals and objectives for the system as a whole. While changes to various aspects of the system have been made over time, they have been incremental in nature. Some previous attempts were made to "take a step back" and develop a broad approach to management of the overall electricity system, but these efforts were unsuccessful. As a result, systemic challenges have not been addressed and continue to influence both costs and operations across the system.

The Review Team's view is that substantial and profound action needs to occur in order to establish a firm foundation for the future. We believe that the public, the utility companies and elected leaders want to see change. This being said, making changes to the electricity system will not be easy. There are some difficult choices to be made in order that an effective foundation can be established for the future.

7.0 RECOMMENDATIONS FOR IMPROVEMENT

The sections above provide context that is important as we begin to build a framework for the utility system of the future. The sections that follow examine key elements of the electricity system and discuss how they could be improved through change. As well, the sections below include the recommendations of the Review Team for specific actions.

7.1 ELECTRICITY GENERATION, TRANSMISSION AND DISTRIBUTION

Generation, transmission and distribution are all elements of a single electricity system. While the functions differ, each of the elements is required within a utility system. The elements must "fit together" in an integrated manner. Power generated from a plant must be introduced into the transmission and distribution systems and then into homes and businesses using the necessary equipment and technology to ensure that the customer can depend on its availability when required and use it safely.

During the Review, the structure of the electricity sector was a topic that received considerable interest and attention. Participants commented on related matters including service and reliability levels, costs, innovation and risk, the companies involved in the system, the role of Crown corporations, ownership of utilities and a number of other topics. In the sections of this chapter we will discuss what the Review Team heard, what we believe and what we feel should be done to position the sector to effectively respond to current and future power demands.

Generation of Electricity

Total electricity generation in the Northwest Territories is about 654 (GWh) on an annual basis (2006). Generation is just about evenly divided between that produced for residential and commercial customers and that produced to support industrial activities.

In the NWT, NTPC is responsible for most of the generation of electricity for residential and commercial customers. Of the just over 320 gigawatts currently used in the 33 communities across the NWT, NTPC generates about 97% of the total electricity with the balance being produced by NUL. Electricity generation by NTPC is divided between that produced by hydroelectric plants and that provided by thermal (diesel or natural gas) fired plants. The *Draft NWT Hydro Strategy (2006, pg. 17) indicates that* 77 percent of total electricity generation is provided to NWT residents from hydroelectric generation, 16 percent from diesel thermal plants and 7 percent by power plants fueled by natural gas.

7.1

ELECTRICITY GENERATION, TRANSMISSION AND DISTRIBUTION

Industrial users in the NWT, given their distance from existing generation facilities and transmission grids, are, for the most part, supported by their own generators. Generation is thermal, with about 66 percent of 2006 industrial generation coming from diesel generators and the remainder from natural gas.

Annually about 1.5 megatonnes of greenhouse gas emissions are created in the NWT. Of this amount, electricity generation, including greenhouse gases produced by mine site electrical generation plants, contributes about 15 percent of the total (217 kT) with community electricity generation contributing about 4 percent or 53 kilotonnes of our annual greenhouse gas production (*Draft NMWT Hydro Strategy, pages 18-19, 2008)*.

Any significant future growth in electricity generation will be highly dependent upon industrial growth. Additional industrial sites (e.g. mine or pipeline development) could result in increases in electricity demand. As well, any interest by industrial customers in shifting from thermal to hydroelectric generation may alter both the percentage of overall hydroelectric power generated and the level of greenhouse gas emissions emitted at industrial sites.

In most communities, the public utility companies have, over time, been able to "right size" the generation capacity. All locations have multiple power generation units that can be run individually or can be operated in combination with other generators if there is the requirement to do so to meet load demands. Capacity calculations for each community include both that required for primary generation and that required for back up power.

It is important to recognize that primary electricity generation in every community is from a single power source, either hydro or thermal, as opposed to being fed into the community from a large electricity grid. In other parts of Canada where electricity grids exist, multiple generation sources feed electricity into the grid. In the grid environment, increasing the output of other generation can compensate for the loss of any single generation source. However, because a grid system does not exist in the NWT, every community, even those that use hydroelectric facilities as a primary source of electricity, must have thermal generators as backup.

Hydroelectric generation sites require a very large initial investment with payback, in many cases, being measured over decades. Of course, the fact that many hydroelectric sites are at a distance from the communities they serve, thus requiring the construction of transmission lines, also influences the overall cost structure of hydroelectric facilities operations. However, following construction, operational costs for hydroelectric sites are relatively low. In the NWT only 44 percent of the annual cost for power in communities served by hydroelectric facilities is related to operational costs – the rest relates to interest, amortization and return (*A Review of Electricity Regulation, Rates and Subsidy Programs in the NWT: A Public Discussion*

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Paper, page 8, 2008). It is also important to recognize that the life of a hydroelectric site may be fifty to hundred years without the requirement to replace the water control features of the facility.

On the other hand, thermal power generation has quite a different cost profile. Thermal generation requires limited investment upfront. However, operational costs for thermal generation are proportionally higher than is the case with hydro generation. The costs of fuel and operations and maintenance costs for the thermal communities make up 74 percent of the annual cost to produce electricity for thermal communities in the NWT (*A Review of Electricity Regulation, Rates and Subsidy Programs in the NWT: A Public Discussion Paper, page 8, 2008)*. Many generators can be used as backup generators for many years after their useful life as primary generation units has passed. The Yellowknife Jackfish Lake power plant still maintains and operates, in a backup role, generators that were originally put into service in the 1960's and 1970's.

Current standards require that at isolated thermal generation sites, plant capacity must be able to produce 110% of the forecast peak load when the largest generating unit is out of service (subject to engineering judgment). In dual fuel communities, where hydro and thermal electricity supplies are available, plant capacity must be able to produce 105% of the forecast peak load when the primary generation is out of service (subject to engineering judgment). This means that the utility companies must invest in and maintain generation capacity, which is required infrequently, to ensure that communities are protected in the event of a primary equipment failure or other disruption.

The Review Team saw an example of the importance of backup generation during a visit to Norman Wells where electricity is purchased by NTPC from Imperial Oil Limited and is then distributed throughout the community. However, because of the backup requirements, NTPC maintains diesel generation units in the community. The Team queried representatives of Imperial Oil about the need for backup given the quality of the service provided by the company's gas turbines. Imperial Oil noted that NTPC generators had been required twice in the past year as a result of an interruption in service from the Imperial plants and that without NTPC generators there could have been a prolonged outage that might have had significant impact on both Imperial Oil's operations and the community. Instead, the backup units provided the required power to the community and also helped Imperial Oil get their generation units restarted.

In addition to maintaining back up equipment in the community, NTPC also maintains access to emergency generation equipment that can be flown to communities in the event of catastrophic circumstances – such as the fire a few years ago that destroyed the Fort McPherson power plant. On such occasions mobilization of the emergency equipment can result in power being re-established within hours rather than days.

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During its deliberations the Review Team considered whether reducing the amount of backup generation capacity in communities could lower the cost of the NWT electricity system. The Team concluded that given the essential nature of electricity and the relatively limited financial benefit that could be found from reducing backup requirements it could not recommend moving away from the back up standard currently in place in the communities.

During the Review a number of comments were made about the potential for increasing the use of technologies to reduce generation from diesel and natural gas. The Team heard suggestions and comments that proposed the use of a range of approaches including expanding the use of renewable energies such as wind and solar power.

At the same time, a number of times during the Review, people suggested that it wasn't all that important to conserve energy because the utility companies would still need to meet their revenue requirements and thus would raise their rates if usage goes down.

For many people, this situation was deeply frustrating as they seemed to be caught in a situation where, despite their best efforts to reduce their electricity use, their bills still seemed to increase. While this is not exactly the case, there is some truth to the point that utility companies must be able to recover their costs and that reduced usage may simply impact on avoided costs (e.g. fuel costs for a thermal plant) as opposed to fixed costs (generator maintenance, staffing, etc.). This situation becomes particularly difficult in the circumstance where utility companies must face restricted economies of scale and an inability to distribute costs over the widest possible customer base.

Interestingly, the Team also heard from a number of people that while examination of technologies is important, they were not prepared to pay a significant premium for installation or use of new technologies – generally, the view was that if the new technologies cost more and there was some broader purpose for the use of such technologies (e.g. the reduction of greenhouse gas levels), then the additional costs should be covered by the government as opposed to the electricity system customers. Several technologies are currently being examined to determine whether they can significantly contribute to electricity generation in the NWT. While it is too early to speculate on the results of these projects, the importance of developing detailed data on effectiveness and efficiency of the technologies, prior to the introduction of the technology into a role as part of the primary generation option, seems prudent.

The potential to increase the efficiency of thermal power generation by utilizing excess ("waste") heat produced during the generation process or installing co-generation plants (producing both heat and electricity) was also suggested. Co-generation and heat recovery systems are used at the present time in a few communities (e.g. Fort McPherson and Inuvik) to heat specific facilities such as schools and recreation

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centres. Future use of excess heat or co-generation sites will depend, to a considerable extent, on the location of the power plant within municipalities and whether a cost effective manner for heat distribution can be identified and implemented given the specific circumstances and conditions in the community.

As stated elsewhere in this report, there are only a few options available today for reducing or eliminating the use of diesel for generating electricity in isolated communities. As reliability and maintainability are the cornerstones of generating electricity in these northern isolated communities, and since diesel generators in these communities have been quite reliable, it is expected, given current technologies, that diesel generation will be NTPC's main generation source in remote communities for sometime in the future.

Transmission of Electricity

Electricity transmission from generation sites located at a distance from communities only occurs within the Taltson and Snare hydroelectric systems. In the South Slave Region, transmission lines have been constructed from the Taltson hydroelectric plant to the towns of Fort Smith, Fort Resolution and those in the Hay River area. In the North Slave Region, a transmission line connects the Snare hydroelectric sites with Behchoko and the Yellowknife area. Consideration is currently being given by the GNWT to extending the transmission lines from the Hay River area to Kakisa, Dory Point and Fort Providence. This would be an addition of 122 kilometres of transmission line to the NWT transmission network should the line be built. In addition, there is a proposal for the construction of a transmission line from the Taltson Hydro Expansion Project to the diamond mining area in the Slave Geological Province.

Costs for the construction of transmission lines are quite high. Construction prices vary depending upon the terrain to be crossed. In the Northwest Territories, the current cost estimates for transmission line construction range from $150,000 and $300,000 per kilometre. These estimates would be lowered somewhat if transmission lines were to follow developed and cleared rights of way, such as along highways.

Given the high cost of construction and transmission line operating requirements, transmission capacity in provincial jurisdictions is generally structured as a monopoly. Companies generating power, if they do not own the transmission system, sell power into the transmission grid.

Recommendation 3 - Ownership of Transmission Systems

> **The GNWT own, either directly or through a Crown corporation, all transmission capacity in the NWT.**

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Going forward it would be for a variety of reasons including the economies of scale and scope, in the best interests of the GNWT to own and operate all inter-tie or transmission capacity in the Territories. The Crown currently owns all transmission except for that between Pine Point and Hay River, which is owned by Northland Utilities.

Given the high costs of development and the low load requirements of most GNWT communities, the potential for transmission line development, on an economic basis, between territorial communities is unlikely. For such development to occur there would need to be large capital investment by governments. On the other hand, transmission line development to support large industrial users is more likely to be feasible and economically viable.

Even so, technical limitations, such as loss of power during the transmission process, could limit the number of potential projects.

Distribution of Electricity

Distribution of electricity is governed by the issuance of franchises. Franchises within municipal boundaries come under the authority of the PUB, while a Minister of the GNWT awards those outside municipalities. However, in many communities franchise agreements are not currently in place. When franchises are not in place, the present electricity provider simply continues to offer service. Initially, when the *Public Utilities Act* was first proclaimed (1988), NTPC was given the exclusive franchise in all areas in which it provided energy. This authority expired in 1991. Currently, there are 15 municipal franchises in place and 3 franchises for electricity provision outside of municipal boundaries.

Franchise fees are determined by the municipal government in tax-based communities and are paid by utility companies to the municipal government. The monies paid to a municipality for the franchise fee becomes an element of the cost of service for community and the utility company recovers this cost through the rate structure. Franchise fee levels can be significant. Current fee levels are about $220,000 per year in Hay River and about $790,000 in Yellowknife.

During the public forums and in discussions with municipal leaders there was the suggestion that municipalities should make increased use of the franchise structure to secure alternative utility suppliers for communities. The view expressed suggested that this could result in increased competition and reduced costs for community residents. However, in considering the matter, the Review Team came to the conclusion that further reducing the economies of scale for utility distribution operations would likely have the opposite impact on overall utility costs and rates

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across the NWT resulting in increased costs and prices. In the view of the Review Team, given the size of the NWT, even the current division of distribution services limits economies of scale and this does not benefit the end use customer.

This being said, it is not easy to reverse past franchise decisions. To do so would be expensive and time consuming. However, it is our view that, going forward, any and all future franchises should be awarded to NTPC and, in the long term, the consolidation of electricity distribution should be carefully considered.

The Crown Agencies – The NWT Hydro Corporation and NTPC

The GNWT purchased the Northwest Territories portion of the Northern Canada Power Commission (NCPC) on behalf of the residents in 1988. At the time, the NWT Legislature passed legislation that identified NTPC as a Crown corporation by serving as an "agent" of the GNWT (*Northwest Territories Power Corporation Act, 1988).* The "objects" of the corporation – its purpose include "to generate, transform, transmit, distribute, deliver, sell, supply energy on a safe, economic, efficient and reliable basis...to ensure a continuous supply of energy adequate for the needs and future development of the Territories….", (*Northwest Territories Power Corporation Act,* Section 5 (1) (a) and (c), 1988*).* These clauses remain in place and assign to the corporation the "duty to serve" in the provision of electricity within the NWT.

NTPC reports to an assigned Minister of the Government and files an annual report with the Minister. The Minister, in turn, tables the report in the Legislative Assembly for review, should the Members of the Legislative Assembly so wish. The Report includes the audit report that is completed by the Auditor General for Canada. As well, the Public Utilities Board regulates NTPC operations. The PUB has an oversight role in reviewing and approving the Corporation's costs and revenue requests as part of the GRA process.

In recent years the structure of NTPC's relationship with the GNWT has changed somewhat as a result of the creation of the Northwest Territories Hydro Corporation. Created through legislation in 2007, the NWT Hydro Corporation now serves as the parent company for NTPC. It too is a Crown agency responsible for ensuring "a continuous supply of electricity for the needs and future development of the Northwest Territories….", (*Northwest Territories Hydro Corporation Act,* Section 5 (1) (c), 2007) – with the added role of the expansion of Twin Gorges Hydroelectric Generating Facility on the Taltson River. The NWT Hydro Corporation may also establish subsidiaries with the approval of the Executive Council of the GNWT.

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Crown Agencies are generally put in place to achieve specific goals of the government, while permitting the organization to operate in a business-like manner. This structure is particularly effective when revenues for the operations of the agency are primarily from non-government parties. The structure of Crown agencies also places the organization at arms length from the political environment helping to ensure that political involvement is limited to the provision of broad direction, appointment of board members and monitoring of activities. Crown utilities are relatively common across Canada, even in larger provincial jurisdictions, as they provide a primary tool for the government to influence the direction of energy policy.

The Review Team heard complaints about the Corporation's operations in just about every meeting we attended. Concerns were focused in several areas with public frustration regarding customer service and issue resolution being foremost in the discussions. Individuals highlighted the difficulties in resolving issues when they had to call from their community to a central service desk in Hay River. They suggested that staff taking calls were at times, non-responsive, unhelpful and lacked the concern required to successfully address the customer's concerns. Others felt that they should be able to receive support in resolving issues in their own communities without having to call an unknown person, far away. Still others suggested that NTPC procedures, such as notification of the intention to cut off power, were done in a manner that causes confrontation as opposed to seeking a solution to outstanding bill payments.

A large number of people also expressed concern that NTPC does not effectively control its costs. Members of the NWT Association of Communities noted that their organization had called for a "value for money" audit in 2008 and felt that the GNWT had not effectively responded to the request. Many expressed anger at the "at risk" or "pay for performance" system used by NTPC as part of its salary package for senior management. Even when the Review Team provided information to participants on the financial review processes conducted by the PUB with respect to NTPC costs, members of the public remained highly skeptical.

The Review Team notes that the GNWT has responded to some of the concerns expressed regarding NTPC's activities. The GNWT has initiated an operational review of NTPC that is currently underway and is expected to be completed later this year.

A final area of confusion and frustration related to the nature of Crown agencies and the purpose of establishing them at arms-length from governments. There was very little clarity in the minds of many of those to whom the Review Team spoke about the current organizational structure of the NWT Hydro Corporation or NTPC. This situation has likely arisen from a misunderstanding of the purpose

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and advantages of the establishment of a Crown agency, and how the current Crown structure can be used to protect the consumer in the event the agency enters into higher risk ventures.

For example, a view that was repeatedly expressed during the public forums suggested that a large bureaucracy has been developed for the NWT Hydro Corporation and that associated costs are being borne by NTPC customers through the rate base. These perceptions are inaccurate, but the failure to correct them has led to a distrust of both the GNWT and NTPC leadership.

The NWT Hydro Corporation and NTPC are important tools of the GNWT and through the GNWT, the residents of the NWT. Over the past number of years the importance of these corporations to the current and future development of the NWT appears to have been lost. This may be because the concerns in recent years have been primarily focused on cost issues as opposed to the broader view of how the electricity system should be developed for the longer term. While there is no question that costs of operations of all Crown corporations need to be controlled, the current oversight mechanisms provide a solid framework for ensuring that NTPC is held accountable for its decisions. The greatest challenge is to build greater economies of scale into the Corporation's operations so that it may be as efficient as possible.

Recommendation 4 - Role of Crown Agencies

> **The current Crown corporation structure be maintained, and actions be taken to increase public understanding and appreciation for the importance of both the regulated and unregulated activities of these agencies.**

Recommendation 5 - Role of NTPC

> **NTPC be strengthened to ensure economies of scale and scope are provided for its future operations.**

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The Public Private Sector Mix

At the present time, the GNWT is examining a proposal from ATCO, the parent company of NUL, to combine the operations of NUL with those of NTPC in some manner. While the details of these discussions are not specifically a part of the work of this Review, the Team did receive many comments from the public and from organizations on the matter of the private sector / public sector mix and the advantages of each type of utility corporation.

In general terms, the Review Team heard the view that the private sector must, because of its nature be efficient in the delivery of services. Some people argued that the private sector focus on the "bottom line" meant that there is little or no surplus expense built into organizational structures and activities. Many businesspersons and business organizations shared this view. Others suggested that private sector firms may have access to expertise and financing that would not to be available to Crown corporations. Still others argued that the orientation of staff of a private sector firm is more firmly rooted in service than staff working in the public sector or for Crown agencies.

But the Review Team also received a number of negative comments regarding the Northland Utilities' companies. Many expressed the view that the "for profit" orientation of private sector firms is inconsistent with the view of community service and support. Others suggested that private sector firms are less sympathetic to individual circumstances and are more focused on rules, procedures and profit. Still others were concerned about the way that private sector firms deal with unions and unionized employees.

With respect to Crown Agencies, many of the specific views that were heard by the Review Team are outlined in the above section on utility companies. Concerns were numerous and focused on issues of cost escalation and limited customer service.

When asked to balance their views on private sector versus public sector, most participants favoured maintaining Crown Agency dominance in the electricity field. Their support was based on the importance of northern public ownership, the legislated purpose of the Crown agencies and concern that there was a greater likelihood that private sector participation would, over time, lead to higher electricity rates. While remaining adamant that there are many issues to be addressed and resolved within NTPC's operations, most believed that the long-term commitment of NTPC to the provision of service should be promoted and supported.

The Review Team concurs with this view and suggests that careful consideration is required to address current concerns with NTPC while highlighting the long-term value of the Corporation to the residents.

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Community Level Ownership of Generation and Transmission

The Review Team heard very little on the topic of community ownership of elements of the electricity system during the public phase of the Review. In a few cases, individual municipal leaders suggested that there is potential to find savings in community ownership and pointed to examples in southern Canada where municipalities have become involved in generating and distributing electricity. However, the Team members also heard the view that municipal governments are presently faced with a wide variety of operational challenges, including providing existing services within limited budgets, staffing of technical positions and limiting tax increases on residents.

There was strong interest in the testing of new technologies such as mini-hydro, bio-mass co-generation and wind power to reduce dependence on diesel and natural gas electricity generation. Some suggested that communities might play a role in such activities, but an equal number questioned whether municipal governments should expand their focus into these areas where they have limited expertise or have limited or no funds to support such activity.

The discussion of ownership of generation and distribution was expanded somewhat through a discussion of the potential for individuals or businesses to generate to meet their own personal needs and to possibly sell any extra energy back into the local power grid. During its work the Review Team became aware of one business within a municipality that is currently generating its own electricity separate from the local power grid. However, the Team was unable to identify any other businesses that were at an advanced stage of planning to generate their own power within a community.

Two points frame the Review Team's views on the issue of community ownership of generation and distribution. These are: economies of scale and "who pays".

First, the size of the electricity system in the NWT limits the economies of scale that can be captured. The existing utility companies currently struggle to find economies of scale that can be applied to reducing their operating costs. An expansion of this problem by increasing the number of owners of generation and distribution systems has the likelihood of increasing costs for electricity customers not only in the community which decides to "go it alone", but also in other communities that remain on the existing system. In addition, adding additional owners will result in the requirement for all utility companies and their staff to dedicate time and resources to developing and maintaining working relationships between the various providers. This will take away from the focus on providing the best service for the most reasonable price.

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The Review Team believes that it is important to consolidate the responsibility for generation and distribution of electricity to the extent possible. In our view this is best done by re-emphasizing the objects of the existing legislative mandate held by NTPC.

Recommendation 6 - Ownership of Community Generation and Distribution

> **NTPC be the primary owner of future community generation and local distribution systems.**

In the view of the Review Team, this recommendation does not prevent the potential for partnerships in community generation and distribution, but such arrangements should be structured in a manner that clearly demonstrates northern public ownership by NTPC, as well as NTPC's current and future responsibility for the operation of the system.

The second key issue is one of investment – who pays? This question is particularly significant when considering the role of individual customer decisions to generate their own electricity and possibly sell any excess electricity back into the local electricity grid. The Review Team's view is that while innovation and the use of new technologies should be promoted in communities, such activities should not result in additional expenses for the utility company or other electricity customers. As a result, we believe that an individual residential or commercial customer should be able to generate their own electricity as long as there is no additional burden or cost for system operation, equipment or technology that would negatively impact rates.

The current system was planned and sized to meet the total needs of the isolated communities. For that sizing decision there was a cost. Should a customer wish to disconnect from the system, that is the customer's choice. If a customer wishes to generate his/her own electricity but have the utility as backup supplier, the utility should impose a fee for the demand or standby service to compensate for the sizing decision cost.

Future Electricity Projects – Territorial and Extra-Territorial Markets

The Review Team heard a number of comments from residents on the importance of "growing the pie", a reference to finding ways to increase revenues for utility companies, build increased economies of scale and ultimately reduce rates to residents. These comments were directed at both increasing the domestic (NWT) market as well as possibly expanding electricity sales through export of electricity power to southern Canada. While the Review Team does not believe that there

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is an immediate potential to reduce costs through such efforts, in the long-term there might be benefits for utility companies and customers. In this light, the Review Team looked at directions that could be useful in a comprehensive vision, both related to increasing the market for electricity within the NWT, as well as the potential for export markets.

The greatest growth potential for electricity, within the NWT lies with supplying future resource development projects. While residential and commercial electricity use is likely to grow slowly, industrial development, in the form of resource development projects, could demand significant new electricity generation. The Gahcho Kue, Tamerlane, NICO and the Mackenzie Valley Pipeline, provide examples of projects that could result in the requirement for considerable electricity generation depending upon their viability, location and project design. To this point, recent industrial users have utilized thermal generation (privately-owned) to produce electricity and the generation plants have been located at the mine sites. However, there is the potential for some of the existing resource development projects to be served by replacing some of their thermal production with hydroelectric power.

Electricity generation and distribution to support industrial customers can be a high-risk activity. It is an open question as to whether such generation and distribution best occurs within the regulation of the Public Utilities Board or, in cases where the generation is not linked into the public utility system, outside the regulatory structure. In the case of the Taltson Hydroelectric Expansion Project, the GNWT has elected, through legislation, to exclude from the PUB's authority consideration of all aspects of the supply and sale of energy from the Taltson Hydro Expansion Project that is generated solely for customers not linked to the current transmission system. This has the effect of reducing the financial risk to the current customers while transferring risk to the GNWT and the taxpayer. The Review Team believes that it is appropriate that risk from such projects be assigned in this manner. With this approach the current utility customers will not suffer financial hardship should the decision to proceed with a project of this nature not meet its expectations in terms or costs and/or revenues.

Recognizing the risks associated with such projects, additional electricity generation, transmission and distribution to industrial projects in the NWT have the potential to benefit territorial utility companies. The benefits of such activities may not be immediately available to existing customers receiving regulated services. But, the development of greater economies of scale and access to modern and emerging technologies supported by the industrial customer could, over the longer term, provide a direct benefit to northern owned utilities and NWT customers as has been the case with a number of "legacy" hydroelectric generation plants left by earlier mines and now forming the core of the hydro networks in the southern areas of the NWT.

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The GNWT, through use of the existing Crown Agencies, could maximize the potential benefit of these opportunities. This could be done under the existing objects of the NWT Hydro Corporation and through Ministerial decision that the NWT Hydro Corporation receives the right of first refusal on all electricity projects and franchises in areas outside of municipal boundaries. The GNWT could also elect to go further and clarify this responsibility in the *NWT Hydro Corporation Act*, The *Northwest Territories Power Corporation Act* and the *Public Utilities Act.* Such direction would also leave open the potential for the NWT Hydro Corporation or its subsidiaries to partner with industry, Aboriginal organizations and/or other private sector utility companies in such efforts.

Recommendation 7 - Franchises Outside of Municipal Boundaries

> **The NWT Hydro Corporation or NTPC be given the right of first refusal on electricity power generation and distribution projects proposed outside community boundaries.**

A second potential area of interest in power generation and transmission is the development of large sites that could produce sufficient electricity for export to southern Canada or the United States of America (USA). The GNWT is currently developing a long-term hydro strategy that could include consideration of the development of such sites at some time in the future. This strategy has not been completed at this time. However, it is clear that there is some interest in such developments, at least from utility companies operating in southern Canada.

Large-scale hydroelectric development is a complex and high cost undertaking. Projects are undertaken only after extensive examination of current and future economic models, and frequently, developers do not expect to see a direct financial payback in their efforts for decades. Estimates of ten years or more for completion of phases of site exploration, pre-project assessment, planning, preliminary design work, economic analysis and environmental assessment are not unusual. Construction may take several years as well. The NWT does contain a number of sites that, under the right economic conditions, might be suitable for development – but from what the Review Team heard during its work, any consideration of such activities is well into the future.

This being said, it makes sense to give some thought as to how such activities could be supported should a future decision be made to proceed. As the financing of such projects is likely well beyond the means of the GNWT or its Crown agencies, the involvement of other parties with special expertise and with access to substantial financing, would be necessary. Other interested parties looking to invest might include Aboriginal development corporations, private sector utility companies or the Government of Canada. The Review Team is of the view that any decision to support such future development would require the support of both the GNWT and involved Aboriginal governments.

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While the GNWT might elect to have the NWT Hydro Corporation or NTPC participate in such projects in some manner, care should be taken to ensure that customers are not at risk in any such venture. Shielding those receiving regulated service, by ensuring that projects of this nature cannot negatively impact utility company costs, should be a fundamental principle of planning the involvement of either the NWT Hydro Corporation or NTPC.

Reliability

One of the areas in which the Review Team received considerable comment was that of system reliability. Specific concerns were raised with respect to the number and length of power outages, the length of outages and the occurrence of "brown outs" when the power fades. A number of participants in the Review suggested that they had lost appliances and electronic equipment as a result of poor electricity reliability. As well, customers in Yellowknife expressed the frustration that they could not determine whether an outage was the result of a power generation problem by NTPC or an equipment failure by the power distributor, NUL.

The Review Team heard a number of complaints, and talked with one person who indicated that they had been compensated for loss related to the electricity system. However, when we checked with the NWT Housing Corporation, the property managers for some 2200 units across the NWT, they indicated that they did not receive a large number of complaints or concerns regarding equipment loss related to electricity.

The terms and conditions of service issued by the Public Utilities Board to the utility companies require companies to reimburse customers when the companies are negligent in the provision of electricity. This being said, the companies are not liable when they are not negligent.

The electricity companies pointed out some of the challenges that they face in the provision of electricity which are useful to consider when thinking about reliability.

As discussed earlier, backup power generation units are required in all communities. While this does not prevent failures from occurring, it does limit the length of outages, thereby reducing damage that might occur if power were out for an extended period. The start up and the bringing "on line" of the backup generators generally takes a bit of time, but power can be made available relatively quickly.

Another point that is helpful to consider is that, as noted in the discussion of generation, all primary electricity power in all communities comes from a single power source. If there should be a sudden power requirement within the system, or a sudden reduction in load – then the utility must bring the overall electricity load back into balance. This

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explains why the utility companies ask that people reduce demand after a major outage – there is the need to reduce demand until the generation can match the overall demand. The utility companies have addressed this issue by applying new technologies to load balancing and, overall, this has led to reduced variation in amperage and associated "brown outs".

A final note related to reliability addresses the question of "early warning". Historically, utilities conducted routine maintenance to ensure that the potential for the "loss" of a generator from the system was minimized. Now, with the implementation of newer technologies, utility companies are able to remotely monitor power plant operation and on occasion receive information that warns them of a pending problem. This permits the utility to take early action to address the situation. The implementation of remote sensing, used extensively by NTPC, permits electronically and staff monitoring 24 hours a day, 365 days a year. It also provides the ability to notify plant staff of issues before or immediately after a problem develops. This is a significant advancement over the system operation of fifteen to twenty years ago.

Reliability is a concern for utility companies across Canada. To measure reliability a standard methodology has been established. This methodology requires that utilities determine the total number of hours that electricity should be available within the system during the year and then dividing this number by the number of hours it was actually available to determine reliability. In discussing this matter with the NWT utility companies and the PUB, it was clear that reliability is seen as a very important issue. NTPC reports its reliability information to the PUB on a regular basis and reports the reasons for its power outages on its website.

To provide an example of reliability data, the following information is useful. During the year April 1, 2007 through March 31, 2008 NTPC experienced a total of 269 outages. Of this number 68 were in the hydro zones and 201 were in thermal communities. The average length of the outages was just over 12 minutes in the communities served by hydro and about 15 minutes in those served by thermal generation. Of these outages 40 were caused by lightening, adverse weather or external causes unrelated to the utility companies. A further 16 were from unknown causes. The greatest reason for outages was "loss of production", which are failures or breakdowns of generation equipment or supporting plant and services. There were 150 outages in this category, 131 of which were in thermal communities. When all of the time associated with these disruptions is totaled the electricity system operated by NTPC had an outage total of 65.34 of a total possible 201,480 hours. This equals a reliability factor of 99.97 percent that is as good as or better than of other utilities providing diesel generation across Canada.

Overall reliability levels for electricity in the Northwest Territories remain quite high. Given the isolated nature of many communities and the unlikelihood of the development of an electricity grid, continued outages that will be disruptive and frustrating can be expected. The importance of reliability needs to remain a focus of utility companies, as it is a fundamental concern of customers.

7.2
RATE STRUCTURES AND RATES

Rates are set by the Public Utilities Board as part of a process that first examines and approves utility company costs and then establishes rates to ensure that the companies can earn the revenue required to offset the cost of providing the electricity service to the customer.

At the present time, the NWT has a complex rate structure of 33 rate zones – one for each of the NWT's communities. This system has been in place since the early 1990's when regulation of the electricity industry was first established in the NWT. Within each zone, there are a number of customer classes – those most familiar are those for residential and commercial customers. The result of this structure is more than 200 rate codes for only 19,000 customers.

On the one hand, this approach to rate structure has a number of advantages in that it provides a high level of specificity with respect to cost oversight – requiring utility companies to allocate all aspects of their operating and capital expenditures to each rate zone. The structure is rooted in the Bonbright Principles of Public Utility Regulation (See Appendix 12.6) that are generally accepted by Canadian regulators for guiding the establishment of rates for services provided by public utilities. These principles describe the primary considerations for regulators when approving rate structures.

On the other hand, the establishment of rate zones for each community requires utilities to operate, to a great extent, as though each community is a separate and distinct entity. Some argue that it is as if there are really thirty-three utility companies operating across the NWT. This influences how utility companies can manage their operations and serves to limit the potential for companies to find economies of scale in employing capital and services in their operations.

In talking with residents, the Review Team heard many views on the subject of rate structures and rates. Some suggested that the current structure works well and should be continued. Others argued that the current structure penalizes those living in isolated communities and benefits those living in communities that happen to be located near past resource development projects. Still others suggested that changing the structure would be too difficult or have significant consequences to undertake.

In some ways, the existing community-based rate structure has served a purpose. It has provided a framework through which the Public Utilities Board has assessed the costs of utility company operations and established customer rates. Its use is well established and the Public Utilities Board has practices and procedures that are used by utility companies to apply for rate adjustments within the established structure. Those wishing to intervene and question utility company submissions are familiar with the rate structure. However, the structure also has a number of weaknesses.

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First, the rate structure requires utility companies to maintain complex and detailed accounting structures to document their costs. In addition, when filing for rate adjustments, companies are required to detail and defend cost expenditures at each community level, even when an examination at a regional or territorial level might provide a better picture of the impact of expenditures. As well, the current rate structure has had the effect of stimulating acrimony and competition between communities, rather than resulting in a collective focus on system-wide issues and their potential for a cost effective resolution. Finally, customers, faced with the complexity of a combination of customer charges, energy charges, franchise fees and riders are frequently frustrated and confused in their efforts to understand their bills, manage their electricity usage and reduce their costs.

In other jurisdictions across Canada, rate structures have been developed to share the expense of service high cost locations across the entire electricity system. In recognition of the fundamental nature of electricity services to all residents, Manitoba, Yukon, Saskatchewan, Newfoundland and Labrador, Alberta and British Columbia all have rate structures that permit the sharing of utility company costs in high cost areas across the remainder of the province. As an example, the Manitoba government in 2001 passed specific legislation reducing the rate zones to a single zone by stating, "The rates charged for power supplied to a class of grid customers within the province shall be the same throughout the province" (Section 39(2.1) *Manitoba Hydro Act)*.

The rate structure in the NWT is unique in its design in this regard. None of the provinces have rate zones based at the community level. All have rate zones which group communities with similar circumstances and many are structured so that high cost areas - frequently rural and remote communities - have rates that approximate, to a considerable degree, those of lower cost areas of the province.

Whichever way one looks at the question of rate structure and rate setting it is clear that the structure that is used will profoundly influence customers, utility companies, businesses and governments. As a result, selecting the rate system that will best serve the long-term interests of customers, utility companies and the public is a critical component to a long-term positive vision for the NWT.

Selecting a Rate Structure to Serve a Territorial Vision

After discussing the rate structure with individuals, businesses, elected officials and companies, the Review Team concluded that the current rate structure, while theoretically following the cost causation principles, it is unduly complicated given

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the size of the territory served and the limited number of customers. As well, it is difficult to analyze and thoroughly understand. Finally, the Team believes that the structure results in significant unnecessary cost and conflict between individual communities. In our view the current rate structure is simply too complex for the small customer base in the NWT.

To address the development of a rate structure for the future the Review Team looked at a number of factors. These include the number of rate zones; the approach to setting rates and adjustments that can be made to utility costs to reduce the companies' requirements for revenues.

The first matter for discussion is the establishment of rate zones. We believe that the reduction of the number of rate zones would result in a number of benefits to utility companies, regulators, customers and regulators. Such action would simplify the requirements for documentation and reporting by the utility companies. Indeed, it is likely to provide the companies with an opportunity to treat communities with similar circumstances in a similar manner, thereby providing a broader framework for industry planning. A reduction in the number of rate zones will also significantly simplify the regulatory process. Finally, administrative efficiencies found through the resulting simplified structure may well lead to some modest regulatory cost savings that can, in turn, be passed along to the customer.

Recommendation 8 - Rate Structure Simplification

> **The rate structure utilized in the Northwest Territories should be simplified by reducing the number of rate zones.**

In the immediate future, the Review Team recommends that three costs of service zones be established. In making this recommendation the Review Team was conscious of bringing together communities that faced similar cost structures and cost pressures. As well, the Team also reflected on the need for the utility companies to have the flexibility and responsibility to plan and operate in order to meet the electricity needs of the larger zone structure.

Recommendation 9 - Establishment of Three Cost of Service Zones

Three Cost of Service Zones be established including:

1. **Taltson Hydro Zone – Communities connected to Taltson Hydro system;**
2. **Snare Hydro Zone – Communities connected to the Snare Hydro system; and**
3. **Thermal Zone – Communities supplied by diesel and natural gas fired generators.**

Within each zone the rates charged in each community, to each customer class, should be the same.

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In the longer term, should a transmission grid be developed to connect a community in the thermal zone to one of the hydro zones, that community should immediately be assigned to the appropriate zone and its rates should be adjusted to reflect those of the zone that the community has joined. As well, in the event that the two proposed hydroelectric zones are linked by transmission, it is recommended that the two zones be combined into one zone.

Recommendation 10 - Linking of Hydroelectric Zones

> **As and when the two hydroelectric zones become linked by a transmission grid, a single cost of service zone should be established.**

Movement towards a single rate zone should become a goal for the electricity system. However, such a decision is likely to be some time in the future and will depend to a considerable extent on a number of factors such as electricity pricing and transmission grid development.

Rate Development

Linked to the proposed alteration of the rate zones is the question of how rates should be developed. The Review Team believes that there are opportunities for changes to the current model that would reduce costs to the consumer while more accurately reflecting the circumstances that exist in the Northwest Territories.

Costs in the proposed hydroelectric zones are relatively low in comparison to those in the thermal zone. While overall reductions in the prices consumers pay would be a goal, the biggest issue, in the view of the Review Team, is to find ways to reduce the price to consumers in the thermal zone without creating undue pressure on those living in the hydro zones.

Without focused attention on the issue of price in the thermal zone, there remains a potential for continued growth of the gap between the price paid by consumers in the hydro zones and those in the thermal zone. The Review Team believes that the gap creates a fundamental problem and be addressed if a new vision for electricity is to be achieved.

Recommendation 11 - Thermal Community Pricing

> **As a measure, costs in the thermal zone should be generally reflective of costs in similar types of communities in isolated regions of the Yukon, northern Manitoba and Newfoundland and Labrador.**

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Given the geographic circumstances of the thermal zone communities and the essential nature of electricity, the Review Team believes it is necessary to alter the approach to the financing of electricity services for the thermal zone communities. Most of the communities in the thermal zone are supplied with service by NTPC. For NTPC, the Team recommends moving away from a rate base rate of return costing model (a "for profit" model) for the calculation of revenue requirements to one that is based on the cost of service. This would mean that NTPC would not receive a rate of return on its investments in the thermal communities, but would rather receive revenues based on its costs, including those costs associated to meet an interest coverage ratio of between 1.10/1.15 associated with its thermal debt obligations. The costs of service related to interest charges could be set to ensure that revenues are more than sufficient to meet NTPC's capital requirements and debt obligations.

Recommendation 12 - Rate Regulation - Thermal Zone Communities

> **Thermal Zone communities served by NTPC be regulated on a Cost of Service rather than a Rate of Return Basis.**

Implementation of a Cost of Service regulatory structure would essentially remove the "profit" (rate of return) in this high cost zone. Manitoba Hydro is regulated on this basis. Operating and capital costs would be directly indicated in revenue requirements submitted by NTPC to the PUB. As well, the implementation of a Cost of Service model should reduce a key area of conflict, especially for the thermal zone, at future regulatory hearings, thus reducing costs associated with the regulatory processes for NTPC and, ultimately their customers.

For the limited number of communities served by NUL in the thermal zone continuation of the current rate base rate of return model is recommended.

The Review Team noted that there are several approaches that could be used to achieve the direction established in the above Recommendation 12. If it is determined that legislative change is required to the *Public Utilities Act* in order to alter the current approach to rate regulation, and that such a change would take a significant time to effect, consideration could be given to setting the rate base rate of return for NTPC communities in the thermal zone to zero until the necessary legislative changes can be made.

During the Review the Team discussed approaches that could be used to categorize communities within the Thermal Zone. Suggestions such as grouping communities by "degree days" (temperature), regional location or population levels were all discussed. In the end, the Team decided that it would be best to examine the revenue requirements and financial flexibility within the current system. Following

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examination of the various alternatives, the Review Team recommends that the rate for the energy charge for the thermal zone should be established at the rate currently being paid in the Town of Inuvik.

Recommendation 13 - Energy Charge in the Thermal Zone

> **An equivalent of the Inuvik energy charge, under a Cost of Service Regulatory Model, be used as the rate for the Thermal Zone.**

In the longer term it may be reasonable to also move to a Cost of Service Regulatory model for NTPC services in the hydro zones. However, for the present, a continuation of usage of the rate base rate of return model should be continued.

Recommendation 14 - Rate Regulation - Hydro Zones

> **For the present time, the Taltson and Snare Hydro Zones continue to be regulated on a Rate Base Rate of Return Model.**

Establishment of the rate of return for NTPC has, historically, been the responsibility of the PUB, under sections 49 and 50 of the *Public Utilities Act*. However, NTPC is a Crown corporation, an agent of the government, and, as such, the GNWT should have a strong interest in ensuring the Corporation's success, effectiveness and efficiency. As well, the public's expectations that the GNWT should play a leading role in providing the direction to NTPC is quite strong and suggests that the GNWT might wish to take a more direct responsibility for setting the framework within which the Corporation operates. In response to this, the Review Team is of the view that the GNWT should play a direct role in determining NTPC revenues by setting the rate of return for the Corporation.

Recommendation 15 - Setting the Rate of Return for NTPC

> **The rate of return target for NTPC be set by the Government of the NWT.**

Government involvement in the establishment of rates of return for Crown utilities is not uncommon. Currently, the governments of Saskatchewan (for all Crown Utilities), Newfoundland (for thermal communities) and Quebec (on electricity generation) set a variety of targeted rates of return. In adopting this recommendation, the GNWT could use several different methods for determining an appropriate rate of return. These might include averaging the rates of return found in other jurisdictions with the inclusion of a "risk" factor related to northern operations or some combination of identifying suitable rate of return based on long term bonds plus some other risk premium. In setting the rate of return, the GNWT may also wish to consider how it could use its role, as an "owner" to stimulate corporate efficiencies.

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Other Actions Influencing Rates

In examining the question of cost reduction the Review Team notes that there are a number of actions that could be taken by the GNWT to directly influence NTPC costs. One such action would be for the Government to cease its call for an annual dividend from NTPC.

NTPC is a Crown corporation, owned by the GNWT on behalf of residents. While initially, a number of years ago, it was argued that the dividend paid for the Territorial Power Subsidy Program (TPSP); this is no longer the case. The current dividend, and the subsidies provided by the TPSP, is separate budget items in the GNWT accounts and one activity has no direct relationship to the other.

At the present time the dividend paid by NTPC to the GNWT is about $3.5 million or about one third the annual cost of the TPSP. As the dividend is raised based on revenues obtained through the rate structure, removing this cost would allow NTPC to maintain its equity position and may ultimately allow a reduction in the cost of rates to customers.

Recommendation 16 - Annual NTPC Dividend

> **It is recommended that the GNWT forgo the annual dividend to which it is eligible under the *Northwest Territories Power Corporation Act*.**

Rate Riders

An integral part of the rate setting system is the establishment of rate riders to address unexpected and specific changes to the revenue requirements of utility companies. The review process for establishing the amount of additional revenues to be recovered through riders is rigorous and decisions to approve riders are made with care and deliberation by the PUB. Customers see a reflection of these additional costs in the listing of riders on their power bills.

In some cases, for example at the present time in Yellowknife, customers may see multiple riders listed on their monthly bill in addition to their energy charge. In some cases, these costs are a significant percentage of the total energy costs. For the customer, riders are difficult to understand and, frequently, confusing. As well, unless the customer combines the cost of the riders that are being paid with those found in the energy charge and the customer charge then s/he can have a false understanding of the overall costs of her or his electricity usage.

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During the Review, the Review Team heard from many residents suggesting that they were confused and irritated by riders. It was unclear to many electricity customers why the riders are in place and a number of people were suspicious of the purpose of various riders. Time and again, we heard the view expressed: "just tell me what I have to pay per kilowatt hour"!

While the purpose for riders is clear from a utility regulation point of view, the confusion that they cause for the customer is significant. Finding ways to reduce the number of rate riders and, where possible, consolidate similar revenue requests in a single rate rider would help the consumer and reduce the confusion. Assuming the acceptance of our recommendation to move away from community-based rates to three rate zones, the benefit of improving the presentation and understanding of rate riders becomes increasingly important.

Recommendation 17 - Reducing and Consolidating Rate Riders

> **Reduce the number of rate riders and where possible consolidate riders. Provide the customer with an "all in" figure showing the total cost per kilowatt-hour in a prominent manner on the monthly bill.**

The Review Team recognizes that there are a number of existing riders in place that reflect legitimate revenue requirements for the utility companies. Even with a revised zone structure, the existing riders will need to be continued until the revenue requirements that they are in place to address are met.

Recommendation 18 - Treatment of Existing Rate Riders

> **Existing rate riders, that were the result of previously authorized revenue requirements, be continued at the community level until they are completed.**

Over time, bringing the electricity rates in thermal and hydro communities closer together is an important goal to encourage growth and development in all communities. To this end, and recognizing that the largest variable cost faced by utility companies is the cost of fuel in the thermal zones and reduced water flows resulting in increased thermal generation in the hydro zone, the Review Team believes that it is important that any future increases in diesel and natural gas costs or additional costs associated with low water in the hydro zone, over and above a level established by the GNWT, be shared across the entire electricity system. To do this in a transparent manner, a Territorial Fuel and Low Water Rate Rider is recommended. The current costs associated with fuel and low water could be used as the threshold for establishment of the rider – or some other calculation might be used to set an appropriate rate rider level.

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Recommendation 19 - Establishment of a Territorial Fuel and Low Water Rate Rider

> **Fuel and low water costs, over and above established thresholds, should be identified and a rate rider should be applied to rates across the electricity system.**

The Review Team identified one additional rate area in which greater transparency would be useful. A significant portion of utility company costs is associated with general and headquarters administration costs. Under the current rate structure, these costs are allocated to individual communities by a formula based on community labour costs with a proxy for the number of customers throughout the system. The Review Team believes that it would be no less accurate, simpler and more appropriate that the regulator to direct that these costs, aside from costs directly attributable to an individual community, be dispersed on a kilowatt hour basis. By allocating these costs on a kilowatt hour basis, recognition is being given to the fact that a considerable portion of these costs cannot be effectively tracked or be accurately allocated to specific communities.

Recommendation 20 - Allocation of Administrative and General Operational Costs

> **Allocate administrative and general corporate operating costs on a kilowatt-hour basis.**

The Review Team's examination of this issue is described in greater detail in Appendix 12.8.

Establishing Conservation or Run-Off Rates

During the Review there was considerable discussion of the importance of "price points" and having prices sufficiently high in order that excess usage of electricity is discouraged. Many people felt that current pricing in the thermal communities already encourages conservation. Others felt this matter is of limited importance as long as the demand for electricity does not become greater than the current supply.

The Team did see considerable evidence that individuals, families and businesses are taking steps to conserve and reduce their electricity usage. Examples provided to the team included everything from changing light bulbs and installing timers on car block heaters to comprehensive technological change programs by a major retailer.

We also heard about the importance of government programs, providing both technical support and a financial "kick start" for families and businesses wishing to reduce their electricity use.

Generally, even in communities where electricity costs are relatively low, recent rate increases seem to have caught the attention of consumers and heightened interest in conservation. These efforts are positive, customers are increasingly informed and there is no reason to believe that this attention to limiting usage growth will lose the momentum that it has gained over the past few years.

In the end, the Review Team concluded that conservation rates may be important in future, but with current price points there is already considerable incentive to manage power usage. Accordingly, we believe the requirement for inverted rates; time of use rates or similar mechanisms do not exist at this point in time.

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The Review Team heard numerous comments and concerns from the public with respect to the rising cost of electricity. In large communities and small communities alike, individuals and families suggested that electricity is now a significant cost as a percentage of their monthly expenditures – a greater expense than in the past. Businesses and municipal governments have echoed this concern. In one community, elected representatives pointed out that electricity costs were one of the highest cost elements in their municipal budget. Customers of all kinds are clearly aware of the impact of electricity costs for many customers.

Many people assume that affordability is just a question of the customer's ability to pay her or his bill, but in fact, many customers in the NWT only pay a small portion of their actual electricity charges. Subsidy programs are a fundamental source of revenue within the NWT electricity system. During the 2005/2006 fiscal year nearly 4,100 of the total of 19,000 electricity customers received financial support for the electricity bills from two GNWT programs – the Territorial Power Support Program and the Housing Support Program offered to tenants of the NWT Housing Corporation. Of the annual electricity system revenues of just less than $100 million, nearly 15 percent, is paid through government subsidy programs. Given this significant proportion of financial support provided by third party payers, the question of affordability takes on a slightly different focus. Additionally, a number of employers also provide support to their employees' household expenses either through direct payment of costs or the provision of "northern allowances".

Over the past decade, GNWT funding to subsidize customers through the TPSP has grown nearly 140 percent from $4.4 million in 2000, to about $10.5 million in 2008. If the rate of growth within the TPSP were to continue, the GNWT would expect to spend over $200 million over the next twenty years just on electricity

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subsidies. Whether it would be possible for the GNWT to continue the subsidy at the current levels, in the face of competing budgetary demands, will be a key issue for the government and legislators. In addition to the TPSP payments figures for the NWT Housing Support Program suggest a further annual subsidy of about $5.2 million per year.

Virtually all of the current subsidy payments benefit residential customers. The commercial element of the TPSP has very limited uptake and accounts for only a few hundred thousand dollars per year in expenditures.

Across Canada various approaches have been tried in an attempt to ensure the affordability of electricity in rural and remote areas. Some jurisdictions, such as the Yukon and Nunavut, use subsidy programs, but most try to address affordability through rate structures. This is achieved through the sharing of utility costs across the entire electricity system and/or through differential funding of "blocks" of energy, where the first level of usage, for example, usage of less than 1000 kilowatt hours per month, is priced at a "postage rate", which is very similar to that in all areas of the jurisdiction. Usage over and above this initial block of electricity is charged at higher rates.

A number of those we spoke to expressed the concern that if subsidies are too high and the cost of power too low, then subsidized customers may be less concerned about conservation, using additional power and increasing the costs of subsidy programs. The documentation of electricity usage was unclear as to whether this concern is valid, but the importance of price in stimulating conservation is a reasonable assumption to make in considering the affordability question.

During the Review, the Team heard a very wide range of views on the existing subsidy programs. Some felt that the residential component of the TPSP works well. Other individuals believed that the current monthly threshold of 700 kilowatt hours is too low – given the increasing requirement for electricity in homes and the dark, cold environment in which we all live much of the year. Still others argued that the threshold is too high with the result that subsidized customers may be less concerned about energy conservation. As a middle ground, some people suggested that there might be advantages to having a higher threshold in the winter and a lower threshold in the summer.

While virtually everyone felt that the TPSP is effective in making electricity more affordable, there were concerns raised regarding the subsidy support provided to occupants of public housing units. During the public forums a number of participants suggested that a more reasonable rate should be established for those living in public housing units, one that would encourage conservation and place limits on electricity usage.

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It is clear that the issue of affordability is a fundamental concern to the users of electricity power services. As an essential service, affordability needs serious consideration and careful attention. It is unreasonable to expect that government can cover all price changes, but ensuring that those in greatest need do receive necessary support should be a cornerstone of the future vision for electricity.

In implementing a vision for the future, two possible approaches to financially assisting northerners with their electricity costs could be considered. The first is through subsidy programs and the second is by supporting actions that will lead to reductions in customer demand.

Subsidy Programs

Shortly after the Government of the NWT became responsible for what is now NTPC, it also became responsible for the subsidy program previously funded by the federal government. The GNWT established the Territorial Power Subsidy Program, "in support of the development of northern business and the encouragement of private home ownership…the Government of the Northwest Territories will provide for equitable power rates throughout the Territories," (Policy 11.78 *Power Subsidy Contribution Program*, 1988). The intent of the subsidy was to provide equitable power rates throughout the Territories so that no citizen would be disadvantaged by virtue of where she or he chose to live in the NWT.

The policy outlines the Government's intentions to reduce customer costs to a level equivalent to Yellowknife rates up to a specified usage level. The program serves customers regardless of their utility supplier. Although adjustments to the Program have been considered over the past twenty years, the policy establishing the TPSP has not been significantly altered since it was established.

At the present time the subsidy program provides a significant benefit to those receiving it. For example, an individual living in private accommodation in Aklavik, a community where the cost of electricity is 65 cents per kilowatt hour, and using 900 kWh during a month, would pay $329 rather than a bill of over $600, which would be the case if there was no subsidy.

In seeking a balance between the obvious importance of the subsidy program to residents and the need to address the increasing costs of the current programs, the Review Team did note that the TPSP's residential component could be improved to reflect the current conditions faced by residents.

The establishment of a reference rate for eligibility to subsidy programs is an essential element of the subsidy program design. In the past, the reference rate has been

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the Yellowknife electricity charge. With the redesign of rate zones, decreasing the number of cost of service zones from 33 to 3, it is necessary to reassess the reference rate that will be used for the TPSP. After examining the alternatives, the Review Team recommends that the reference price for the program be the electricity rate paid in the Snare Hydro Zone.

Recommendation 21 - Reference Rate for TPSP Program

> **The reference rate for the TPSP be established as equivalent to the rate paid in the Snare Hydro zone.**

The TPSP was established, in part, to ensure that NWT residents would not be unduly disadvantaged by virtue of where in the NWT they chose to live. Currently, residents of the two proposed hydro zones have the advantage of being able to benefit from legacy assets constructed may years ago, to support resource development projects in the southern portions of the NWT and they will continue to do so for years to come. Given this situation the Review Team is of the view that the TPSP should only be paid to communities that are located in the higher cost thermal zone.

Recommendation 22 - Limit Access to TPSP to Communities in the Thermal Zone

> **Payments of the TPSP should be limited to communities located in the thermal rate zone.**

As a GNWT Program, one would expect that the benefits of TPSP would be applied in the same manner to all those eligible for the subsidy. This appears not to be the case. NTPC and NUL apply the program differently and while both argue that their customers receive the full benefit of the subsidy it would seem appropriate that both apply it in the same manner.

Recommendation 23 - Establish Standard Requirements for Administration of the TPSP

> **The GNWT establish standard delivery requirements for the TPSP Residential Subsidy and direct both NUL and NTPC to follow these requirements.**

Recommendation 24 - Prorating of the TPSP Subsidy for Longer/Shorter Billing Periods

> **The calculation of the TPSP benefit should be prorated, on a daily basis, for electricity bills that are either longer or shorter than 30 days.**

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Recommendation 25 – All Customers be Required to Pay the Customer Charge (System Access Fee)

> **The TPSP Residential Subsidy should be applied to energy and rider costs and not to the monthly customer charge (system access) fee paid customers.**

The Review Team also noted that the TPSP does not prevent tax-based municipalities from implementing franchise fees that increase the cost of the Program. The Team suspects that this is an oversight in the initial design of the Program – one that has not been addressed.

Recommendation 26 – Franchise Fees Not be Permitted to Increase TPSP

> **The franchise fee should not be an allowable cost for the purposes of calculation of the TPSP paid on behalf of residents of communities in which a franchise fee makes up a portion of the electricity charges.**

The Review Team gave considerable thought to the matter of electricity usage threshold levels for the TPSP. Many people view the current threshold of 700 kilowatt-hours as being out of date, given the requirements of modern household appliances and equipment. However, a good case can be made that the figure serves to cause homeowners to watch their usage carefully and conserve where possible. The Team was unable to find data that describes, "average usage" by an "average family" in an "average home" – but we were persuaded that some increase in the current threshold, particularly during the winter months, would be a reasonable action by the GNWT.

At the same time, the public's suggestion that a reduced threshold be applied during the summer months also seems reasonable, given the vastly reduced requirement for lighting and heat during that period.

Recommendation 27 - Subsidy Usage Thresholds

> **The TPSP residential usage threshold be 850 kilowatt hours per month during the October to March (inclusive) period of each year and 600 kilowatt hours during the remainder of the year.**

The electricity subsidy program currently offered by the NWT Housing Corporation to its rental tenants is very generous and is not structured to encourage conservation. NWT Housing Corporation tenants include a number of families with limited incomes, as well as some with sufficient income to cover a larger portion of their own electricity costs. Redesign of the current program to support a conservation ethic and to have higher income residents cover a greater portion of their own electricity expenses would help limit the growth of the subsidy paid by the NWT Housing

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Corporation and could "free up" funding that could be applied to installation of new energy conservation technologies or conservation programs.

Recommendation 28 - Redesign NWT Housing Corporation Electricity Benefit Component of the Housing Support Program

> **Redesign the existing electricity benefit portion of the Housing Support Program to increase the portion paid by tenants in a manner consistent with the GNWT's existing Income Security Policies.**

Commercial Subsidy Programs

In establishing the TPSP the GNWT intended one component to support business activities across the NWT. This element of the program is currently structured as a "reimbursement" program. The program is not well used. Last year, NWT businesses received about $250,000 under the TPSP. This was less than three percent of the total amounts paid out by the program. Last year's commercial subsidy payments were fairly typical of the program's performance over the past ten years.

In discussions with businesspersons across the NWT, the Review Team heard many criticisms of the current program. Some suggested that it is simply too difficult to access and that subsidies should be applied directly to the businesses electricity bills. Others suggested that the limitation of access to businesses with less than $2 million in annual sales should be changed and still others suggested substantial increases to the subsidy levels. In addition, the Review Team also heard an opposing view indicating that the program is not that difficult to access.

In attempting to better understand the purpose behind the commercial component of the TPSP, the Review Team asked the public, businesspersons and government officials "What is the problem that this program is trying to solve?" The answers to this question were diverse and sometimes contradictory. Some said that the program is intended to reduce the cost of living to customers of community-based businesses. Others suggested that it was really a program to make businesses more economically viable in high cost operating areas of the NWT. In addition, some people argued that the commercial component of the TPSP is intended to help persuade larger community businesses to remain on the community power grid and discourage any interest they might have in generating their own power to the detriment of other community customers.

It was not possible for the Review Team to identify documentation that demonstrated effective achievement of any of the perceived goals of the program. Given the lack of evidence of success and the low "uptake" on the program for many years, the

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Review Team is recommending that it would be more appropriate and effective for the GNWT to use some other approach to supporting businesses with their operational costs.

The Team heard several good suggestions, including building a program that could be targeted at supporting businesses during their first years of operations or expanding support for current programs that would assist businesses in reducing their demand for electricity.

Recommendation 29 - Replace the Commercial Component of the TPSP

> **The current TPSP (commercial) component be replaced by a government program that is targeted to achieve specific business or energy conservation goals.**

Programs to Reduce Electricity Demand

A second broad approach to affordability is to assist customers, in all rate classes, to reduce their demand on the electricity system. While reducing usage is not currently critical as a mechanism to avoid high cost investment in new plants and equipment, the development of a conservation ethic could help reduce use of diesel fuel in thermal communities. As well, such efforts would help to shape the attitudes and actions of the current and future residents in energy usage.

Many residents in many communities suggested that government could play a substantial role in supporting reduced electricity demand. At the present time, the Government of Canada and the GNWT fund programs that support residents who take action to purchase and install energy efficient appliances (see Appendix 12.9 for additional information).

The use of the existing conservation programs is substantial – however the Review Team heard a number of comments suggesting that they could be improved. Specifically, the Team heard comments from smaller communities expressing the view that information regarding the programs is not readily available. Some noted that access to the technically skilled personnel to assist with, for example, installation of new appliances and conservation measures is difficult. Finally, the Team heard suggestions that programming to improve consumer awareness of tools that could be used to monitor personal household electricity usage should be expanded.

Businesspersons also suggested that expanded programming to help them install equipment that would reduce their electricity demand would be beneficial. A number suggested that they have already begun to take actions to reduce their power costs,

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but that additional financial support could immediately benefit their businesses by improving their overall fiscal position. Alternative approaches to enhancing support for installation of efficient electricity equipment could form the basis of an expanded conservation program, or as noted above, serve to replace the existing commercial component of the TPSP.

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The regulation of electricity is a key component of the overall electricity system. Across Canada, regulators serve several roles including ensuring that costs charged by utility companies are effectively substantiated, that rates are "just and reasonable" and that the terms and conditions of utility operation are established and fixed. Regulatory bodies frequently have quasi-judicial authority, meaning that within the scope of their authority they make the final decision with respect to electricity matters.

Except in jurisdictions with a very large customer base, the electricity sector has only limited competition between utility companies. In smaller jurisdictions there is simply not enough of a market to support the necessary investment and operational costs of multiple utility companies. In these cases, the regulator serves as a "proxy" for competition. In other words, through utilization of their power and authority the regulator places operational and access obligations on the utility company that it would have to face if it were in active competition with others.

In the Northwest Territories the Public Utilities Board (PUB) serves as the regulator. Currently the Board is composed of five members, who are appointed by the Minister on the recommendation of the Executive Council of the GNWT.

The Board has wide ranging authority to request information, hold hearings, negotiate agreements, authorize operations and actions by utilities, and approve rate schedules and franchises as well as other associated activities. The Board meets on an "as and when needed" basis. A part-time chairperson presides over its work and serves as the chief executive officer. The Board has one full-time employee. Expenditures are paid from a budget authorized by the Legislative Assembly. The Board files an annual report with the responsible Minister who, in turn, must table the report before the Legislative Assembly at the first opportunity.

The NWT PUB regulates seven utilities. Four of the seven are distributors of natural gas; three are electricity utilities. Last year, 2008, was the busiest in the history of the PUB with the Board issuing 33 decisions. Decisions issued included General Rate Applications from all of the electricity utility companies. Between the year 2000 and 2008 the PUB made 136 decisions averaging about 17 decisions per year.

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Across Canada, jurisdictions utilize several approaches to the regulation of utilities. Most provinces utilize an arms-length, quasi-judicial body to regulate utilities, although in Saskatchewan and Nunavut the governments, through an assigned Minister, play a more direct role seeking advice from a mandated board or panel. Over the past decade there has been a trend to increase the ability for governments to provide broad and detailed direction to their utility regulator. Such direction has been given through legislation and government policy statements and is focused on the achievement of a variety of government goals, such as increasing the use of renewable energy sources in electricity generation.

The Public View

During the review the Review Team heard a number of comments regarding the work of the Public Utilities Board. These were focused on a number or areas including purpose and mandate, operating procedures, costs and results. Comments were received from the general public, municipal governments, many of which had participated as interveners in past PUB hearings, legislators and representatives from the utilities.

Many we spoke to indicated that they were unclear as to the roles and responsibilities of the PUB. Specific comments suggested confusion as to the authority of the Board and how it operates, the role of the Board in approving utility costs and rates, frustration at the complex and "legalistic" processes which depend to a considerable extent on utility experts and the view that the Board is distanced from the conditions faced by customers. Regardless of the accuracy of these comments, they demonstrated that there is presently an information gap with respect to the PUB's authority and operations.

There was considerable discussion of the costs associated with the activities in which the PUB is involved. Specifically, concerns were expressed about the costs of the recent General Rate Application (GRA) processes. Many members of the public recognized that most of the costs paid by the utilities during the GRA process end up as revenue requirements that must be recovered by the companies through power rates charged to their customers.

From the utilities, we heard strong support for the value of the PUB as an external, objective, "check" on utility costs and rates. The utilities expressed the view that, for the most part, the PUB is effectively focused on balancing the interests of the customer and the utilities. However, the utilities did express some frustration with the existing processes and suggested that there might be ways to reduce the time and cost associated with the review of applications.

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A fourth area in which comments were made related to the relationship between the GNWT and the PUB. There was general consensus that the existence of the PUB at arms-length from the government was useful and important. However, a number of comments suggested that it is important that the GNWT be able to provide policy direction to the PUB on some matters. This view was expressed by a number of individuals and groups from across the NWT.

The Public Utilities Act and the Public Utilities Board

The PUB's focus, in its quasi-judicial functions of assessing and directing action with respect to utility matters, is a role that can effectively be carried out at arms length from the GNWT. While there are other approaches to regulation that could be used, such as the assignment of regulatory functions to the GNWT Cabinet, or combining the regulatory functions in a multi-purpose board, the Review Team believes that continuation of a PUB, operated in an effective and efficient manner, would provide the most focused attention to the electricity matters.

Recommendation 30 - Continued Operation of the Public Utilities Board

> **The Public Utilities Board continue to be responsible for the regulation of electricity utilities under the authority of the *Public Utilities Act*.**

This being said, the Review Team recommends that some adjustments be made to the *Public Utilities Act* that would change the mandate of the PUB to some extent. Areas of change are discussed below.

The ability of the government, as the elected representatives of the public, to provide policy direction to the PUB is important. Should the GNWT wish to advance specific interests, such as a new approach to electricity rate determination, or a particular emphasis on renewable energy technologies, it should be able to do so. At the present time the authority for this to occur is unclear. In the view of the Review Team, changes to the *Public Utilities Act* should be made to expressly describe this authority and define the procedures that must be followed by the Minister and Cabinet, should there be a wish to provide such direction.

Two approaches to provision of direction could be considered. The first could entail a public letter from the Minister to the PUB outlining the policy direction being given. A second alternative approach would be to alter legislation and define procedures that would permit the responsible Minister and Cabinet to issue regulations defining the Government's policy direction. Either approach could be used effectively.

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Alteration of the current legislation to permit direction to the PUB from the Government would provide transparency to the process and prevent the perception of important decisions being kept from the public or utility companies. As well, it will ensure that an appropriate accountability framework, with respect to any direction given, is maintained between the Minister and the PUB.

Another area for legislative attention is the need for specificity related to the requirement for the Board to file an annual report with the Minister. This requirement is currently followed by all parties and the public can access the annual reports of the PUB on its website (www.nwtpublicutilitiesboard.ca). Reviewing the reports indicates that they include basic information regarding the PUB, its authorities, activities and decisions. However, the annual reports would be more useful to the public and legislators if they were expanded to include financial information related to the cost of PUB operations including hearing costs, intervener costs and expanded information as to plans of the PUB for future years. As well, legislators may wish to take the opportunity of the report's receipt to meet with the Minister responsible and discuss both GNWT direction related to the PUB as well as the activities of the regulator.

The current *Public Utilities Act* is highly prescriptive in most areas. While this specificity is useful, it also permits little flexibility for the PUB to adjust its activities and processes as conditions or circumstances change. Adjusting the *Act* to provide mechanisms that would permit some, limited, flexibility would permit PUB to make adjustments when it is necessary to do so. Any changes of this nature should not in any way diminish the accountability of the PUB to carry out its mandate or move away from its specific role of oversight of the sector.

A third area of legislative change, discussed in the section on rates, would permit the GNWT to establish the target rate of return for NTPC for its assets in the hydro zone.

Recommendation 31 - Review and Amend the *Public Utilities Act*

> **A comprehensive review of the *Public Utilities Act* be conducted to "modernize" the regulatory framework. Recommended changes to the legislation should include:**
>
> - **Increase the Government authority to issue policy direction to the PUB;**
> - **Permit the PUB to utilize additional approaches to rate setting;**
> - **Permit the GNWT to establish the rate of return target for NTPC (within the hydro zones); and**
> - **Strengthen reporting requirements for the PUB by outlining specific elements to be included in annual reports.**

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PUB Operational Processes

As noted above, the existing practices and procedures of the PUB have served the regulatory process for a number of years. While the practices have worked, they have also created an environment that is adversarial in nature. As a result, considerable time and expense is required by proponents, interveners and the Board, hiring experts to analyze and argue their views on behalf of specific interest groups. Further, the dependency on expert support can limit the interest and willingness of small communities or residents to become engaged in the process even if they have an interest in doing so. Finding ways to increase the public access to the PUB's work, increasing public involvement and focusing efforts on collaborative problem solving, could strengthen public understanding and sense of value of the work of the PUB.

The regulatory process both requires and results in large quantities of information. When we asked utilities how they knew what to prepare and present during a General Rate Application they responded that they developed their documentation based on previous submissions to the PUB and then adjusted the materials as required by the Board or as a result of interventions. This approach appears inefficient. The establishment of minimum filing standards for utilities, that include standard account classifications, would appear to be a reasonable action. All utility companies should be required to utilize the same framework. This approach would have the benefit of permitting all involved to compare and contrast information offered by utility companies.

Recommendation 32 - Establish Minimum Filing Requirements for GRAs

> **The PUB should establish minimum filing requirements that specify the information to be provided in a General Rate Application, the account classifications to be used and a standard format for the presentation of information.**

Implementation of minimum filing requirements would increase the consistency and comparability of information received from utility companies. As well, a standard format would assist the utility companies and the Board itself in training of staff and board members.

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Regulatory Costs

The operation of a regulatory process will result in costs. There are two primary types of costs associated with the regulatory process - those that are incurred by the PUB for its own operations and the costs of the utilities in preparing, submitting and defending applications. The funding for the operation of the PUB is allocated through the Main Estimates process of the Government of the Northwest Territories. The annual budget is reviewed and approved by the Legislative Assembly. During the review process the Minister Responsible may be asked questions by legislators regarding the costs of operation and associated details. For the 2009/2010 fiscal year the budget for the PUB is $423,000 and is included in the budget of the Department of the Executive. The budget may be somewhat higher in years when the PUB is handling multiple GRA. Calculated on a per customer basis this amounts to just less than $24 per year.

The second category of costs relates to those incurred by utility companies to prepare, submit and defend their applications. These costs are significant when a GRA is prepared. During the most recent application by NTPC, costs associated with the process totaled just under $2.2 million. NUL spent about $900,000 for its two companies. While these expenditures do not happen every year they do demonstrate that the cost of filing a GRA can be substantial. Costs associated with the preparation, submission and defense of an application must be recovered by the utility and, as a result, are included in its revenue requirements. In other words, the consumer ends up paying for the costs through the power rates.

The PUB has the authority under the *Public Utilities Act* to cover the costs of those that intervene in the application process. Generally, costs of interveners include those related to the hiring of experts to prepare questions, submissions and sometimes to appear on behalf of the intervener. The intervener totals its costs and applies to the PUB to be reimbursed. If the PUB is in agreement with the value of the intervention and the appropriateness of the costs, it directs the utility that initiated the application to pay the intervener's costs and collect its expenses through power rate adjustments. NTPC reported intervener costs of just over $300,000 for the 2006/2008 GRA process. As well, NTPC was asked to respond to more than over 1000 information requests as part of the process. Information requests stimulate the requirement for utility companies to spend time and effort either referring the party who submitted the request back to existing documentation or creating additional information to respond to the request. Interventions and information requests are significant expenses to the GRA process and these costs are passed on the customer through the rates.

The present costs related to GRA preparation and the associated interventions appear high for the small size of the NWT utility companies and the number of customers

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being served. The Review Team believes that changes can and should be made that will reduce costs while still permitting appropriate interventions to occur – the most direct approach would be to make interveners, with the capacity to assume their own costs for intervention. This would ensure that these interveners are both timely and rigourous in keeping their interventions focused, in the interests of their clients and targeted at priority areas. Secondly, this process would also restrict the transfer of those costs to consumers in other communities in the system.

Recommendation 33 - Cost Awards in the Regulatory Process

> **Cost Awards during the regulatory process should be limited to non-tax-based communities and non-profit organizations.**

8.0 CUSTOMER SERVICE

Throughout the four months of public discussions the Review Team has heard about customer service in virtually every community that we have visited. Concerns were expressed about every organization that makes up the electricity sector including the utility companies, the PUB and GNWT. People expressed their opinions, offered examples of conflicts and identified what they felt would be solutions that could improve customer service.

In the broadest sense, customer service is about the relationship between the people, those working in the industry and those served by it. Customers want to be treated in a considerate manner, want to be heard and would like to receive answers to their questions on a timely basis. In addition, when problems arise, customers are looking for someone to suggest alternatives, advice and to provide support or solutions.

Of course, it isn't quite that easy. People are people. Utilities told us that some of their customers are demanding, unfair, rude and unreasonable – and sometimes just plain nasty. But on the whole, customers just want to resolve the issues they face and move on.

On the other hand, some people working in the electricity sector, while having solid technical skills, often aren't well equipped to be of much assistance to the customer. They may lack the interest, the motivation, the relationship skills or the "soft hands" necessary to take on what can be stressful and emotional situations and resolve them positively. For many customers, the offices of utilities are located in distant communities and the staff member providing service is only a voice on the phone – sometimes one with little understanding of the customer's personal circumstances, the community being served, or the conditions that have given rise to the issue that is being presented.

For those in the electricity sector, customer service must be a fundamental principle of business. Regardless of the issue, the stresses and strains of the day – service staff must be able to deal with customers, collect the facts and describe the choices the customer has to address their circumstances.

Utilities, governments and their agencies across Canada face similar issues and are equally challenged to build solid reputations for customer service. It is not an easy task and in many cases utility companies struggle to be successful in building solid customer rapport and satisfaction.

All of this being said, there are many activities that the utility companies are already doing to improve customer relations. These efforts need to be profiled so that the

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companies can communicate to their customers how much they value their business. Some of the activities that are currently in place include:

- Conducting customer satisfaction surveys;
- Arranging meetings between senior utility company staff and elected community leadership;
- Sponsoring community activities;
- Providing information through pamphlet "stuffers" included with monthly bills;
- Including additional usage information on power bills to permit the customer to monitor and assess their household usage;
- Listing of reasons for power outages on web-sites; and
- Making web sites available to customers that describe company activities and provide useful information on such topics as energy conservation.

Based on what we have seen and heard over the past few months, the Review Team would encourage the utility companies to increase their efforts to let their customers know what they are doing to improve customer service. In addition, we would encourage the utility companies to look carefully at their operations and consider how they might improve their customer service and provide better support on a timely basis.

In addition to concerns, we heard a number of suggestions regarding customer service during the Review. Some participants simply suggested the need for additional care by utility company staff – such as ensuring that front line staff use a positive tone of voice and display a "problem solving" attitude. Others suggested that there should be clearly articulated processes, which all utility company staff is aware of, for customers to seek assistance or options from supervisory personnel if they can't resolve their questions with front-line service personnel. Many suggested training for new customer service staff, as well as cross cultural sensitivity training. In addition, several people made the recommendation that the utility companies should make a commitment to quick follow-up when questions are posed that front-line staff are unable to answer and that utilities should provide clearly written materials that are easy to understand. We think all of these suggestions are good ones and should be considered and implemented when they are found to be appropriate.

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Another concern that was expressed a number of times related to the bills provided by the utility companies. There was considerable frustration regarding the complexity and, from some customers' point of view, lack of clarity on the electricity bills. We also heard many complaints about the lack of consistency in the billing periods – for example, 30 days during one period, 32 the next and then 27 the following period. Customers expressed frustration at not being able to compare and contrast their usage month over month or the same month during several different years, because the billing periods are different. The utility companies were helpful in explaining the challenges of collecting information for billing purposes – but it seems to the Review Team that there should be ways to address these challenges, thereby limiting or removing this frustration for the customer.

Another idea that was presented was that utility companies might want to consider developing a customer "bill of rights" that lays out the company's commitment to service, defines the standards that will be met in providing service and clearing outlines how customers can seek resolution to issues, should they arise. While some might argue that the terms and conditions of service provide the necessary framework for utility company activities, a direct commitment from the companies to their customers could go a long way to establishing the foundation for improved customer service in the NWT.

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Across Canada, governments play a major role in the electricity sector. All provincial and territorial governments have direct and indirect roles in any number of activities including the passing of legislation to regulate the industry, providing tax incentives, loans and loan guarantees for major projects, promoting research and assessment of new technologies, protecting consumers and encouraging conservation. As well, many governments also play a role as stakeholder/owners of utility companies. Companies such as BC Hydro, SaskPower, Newfoundland and Labrador Hydro and Manitoba Hydro, are Crown corporations established and maintained by governments to serve as important tools for economic and social development.

As the customer base has increased, many provincial governments have encouraged private sector involvement in electricity generation, transmission and distribution as a complement to the activities of the Crown agency.

The government's role in the evolution of electricity services in the Northwest Territories has, in many ways, followed a pattern similar to that in other jurisdictions across Canada. Development of a Crown agency, now NTPC, the establishment of the regulatory authority, financing of major energy initiatives, consumer education and energy conservation programming and investigation of new technologies have all been features of the GNWT's roles.

The Public View

During the public forums and in meetings with individuals and organizations, the Review Team repeatedly heard that the GNWT should expand its leadership role in a number of areas within the electricity sector. These areas included working with the public to develop a long term vision, an increased definition, clarity and coordination with respect to its many roles, exercising its authority, on behalf of residents, as the shareholder/owner of NTPC; modernizing the *Public Utilities Act* and associated regulations, strengthening consumer education and protection and supporting the objective testing and development of new energy technologies.

As well, there was a strong interest in increased accountability at both the political and the operational level of the GNWT. People wanted to know what was happening in the electricity sector, how the GNWT's actions are important to them and what the results of Government action could be expected to be. As well, they wanted to know that the GNWT was putting the interests of the consumer high on its list of priorities.

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Leadership of a Long-Term Vision

As the GNWT has a strong interest in sustainable growth in all communities, ensuring the availability of reliable and affordable electricity is a critical factor, an element of the foundation, if you will, to support economic activity in communities and the Territory. Making sure that the GNWT is in a position to support and direct matters related to electricity is, therefore, important.

The GNWT currently has a very strong position in respect of the electricity sector. It sets the rules for its operation; it owns over 95 per cent of the electricity generation through NTPC; directly pays for over 15 per cent of electricity rate charges; and it has an active interest in key issues such as affordability, conservation, environmental impacts (greenhouse gas emissions) and implementation of new technologies. Such active involvement places the GNWT in an excellent position – it has the "tools" with which to act and needs only to determine how to most effectively use these tools in support of residents and the long-term future of the north.

As discussed previously, the electricity sector in the NWT has evolved over time – without a carefully considered long-term plan. This has led to a system that, while functioning, has a number of inherent flaws that will limit its potential for continued growth and improvement. While we do have the option of continuing to let the system simply "evolve" by taking a "hands-off" approach the risks of doing so are high – ours is a small system with limited customers and high costs.

Rather we should seize the opportunity to agree on a carefully developed vision, identify the immediate and long-term actions needed to realize this vision and build a system that has the best potential to result in benefits for the north now and in the future.

Organizing to Perform its Roles

Because of its diversity of roles, the GNWT is often challenged to prioritize and coordinate its actions. Recent governments have taken actions that have both supported increased coordination of energy matters and made it more challenging. There are currently three different GNWT departments with significant roles in energy policy and programs – Industry, Tourism and Investment (energy policy), Environment and Natural Resources (energy conservation and environmental matters) and the Department of the Executive (regulatory). In addition, the GNWT has established and funds the Arctic Energy Alliance to support energy awareness program delivery and consumer information distribution. Further, the Public Utilities Board presently reports to the Minister of Industry, Tourism

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and Investment and NTPC reports to the Premier. The GNWT coordinates its efforts through the Ministerial Energy Coordinating Committee and an associated committee of Deputy Ministers. This framework of responsibility and accountability touches on most aspects of the diverse roles of the Government, but it is complex and includes some gaps that limit the GNWT's effectiveness in energy matters.

It is clear to the Review Team that the existing structure, and its associated functions, would benefit from clarification.

First, the most fundamental issue is the lack of any clear definition of authority and responsibility in the establishment documents for the departments holding key roles related to electricity. The Establishment Policies for the Departments of the Executive and Industry, Tourism and Investment make no mention of the roles required of the two departments in support of the regulatory function (PUB) or in supervising of the Crown agencies (NWT Hydro Corporation and NTPC). As a result, there is a lack of clarity as to the responsibilities of these departments in supporting the Minister in his/her role as defined by legislation. While one must assume that functional support will be provided should the Minister request it, greater clarity would improve the understanding of the roles, responsibilities and accountabilities of all concerned.

These responsibilities should be clear and should be assigned, on an ongoing basis, to the Minister and Department that have the policy and program responsibilities for each function. It is important that the functions of regulation and supervision of the Crown Agency be separated to provide balance in discussions of issues as they arise – but certainty and effective departmental support of the responsible Minister is also essential.

The second issue concerns the ongoing role of NTPC and the PUB providing policy advice directly to Ministers and Cabinet. These organizations have extensive experience in their respective areas of responsibility and their advice can be very useful. However, neither organization should be the sole contributor to the setting of policy direction for the government. Each organization has its own unique responsibilities and interests and at times these interests may differ from those of the Government as a whole. As a result, it is important that Ministers and the government have the resources to analyze and assess the advice it receives from these groups. This means that the GNWT needs to have access to experts of its own that can review, assess and provide advice to senior management and elected officials about electricity and regulatory issues. The GNWT should ensure that adequate resources are available to allow it to objectively review and analyze requests for action and advice provided to it by NTPC and the PUB.

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Recommendation 34 - Specify Responsibilities for PUB and NTPC in Departmental Establishment Policies

> **The assignment of responsibility and accountability for PUB and NTPC should be outlined in the Establishment Policy of the assigned department.**

Recommendation 35 - Maintain Policy and Ministerial Support Functions for Electricity Related Organizations within the GNWT Structure

> **The GNWT should develop and maintain policy and Ministerial support capacity separate from arms length organizations and agencies such as NTPC and PUB.**

The third area for attention is that of coordination. The GNWT can decide to continue its current approach of coordinating the functions through various committees or it could elect to consolidate some of the functions and reduce the complexity of coordination requirements. While not making a specific recommendation on this matter, the Review Team would suggest that the GNWT consider whether it is possible to assign a Minister and department with permanent responsibilities for coordination of all of the matters related to electricity and/or combine some of the existing functions so as to reduce the complexities of coordination and thereby allowing a greater focus on program and service delivery.

Ownership of the Crown Agency

The Review Team heard many comments regarding the role of the GNWT with respect to NTPC during the Electricity Review. Many of these comments were critical of NTPC's efficiency, some were related to the reliability of the power supply and almost all commented on costs and affordability. Of particular note, though, was the frustration that was expressed regarding the GNWT's seeming lack of overall direction to NTPC and the failure of the GNWT to articulate how the corporation fits into its plans for ensuring affordable, reliable electricity in the future.

It is the Review Team's belief that many of these matters could be substantially resolved with the establishment of a clear vision for the electricity system and the improved GNWT coordination of the electricity system's many activities.

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Regulation

The role of the GNWT in setting the regulatory framework for the electricity sector is discussed in other sections of this report. Here we need only note that one of the fundamental roles of the GNWT is to establish the necessary regulatory framework and to ensure that the framework continues to be relevant in the changing environment. While each Act has been occasionally amended, neither the *Public Utilities Act* or the *Northwest Territories Power Corporation Act* has been subject to a serious review for many years. We believe that such a review, while requiring considerable time and resources, would be timely given the degree of change that has occurred in the NWT and in electricity governance across Canada.

Consumer Education, Protection and Conservation Programs

The GNWT fulfills several roles with respect to the consumer. At the present time some of these roles are being conducted by government departments, some by GNWT funded agencies and still others by the PUB. Based on comments from the public and an assessment of information on existing programs and services, improvements in consumer supports may be an area that would benefit from further investigation.

Over the past few years, activities of the Arctic Energy Alliance have increased public information on electricity related matters. As well, the AEA operates several government programs targeted at the purchase of energy efficient appliances. These efforts have been well received, but residents in smaller NWT communities appear to have limited understanding of the availability of some of these programs and services and how they might be accessed. Identification of approaches to expanding understanding and increasing access to the information and programs offered may be useful.

The utility companies also provide information related to electricity usage, but it appears that many consumers do not fully utilize it. There is potential for collaborative efforts between utility companies and the GNWT and its agencies to strengthen the benefit of existing information and identify additional areas of information that might be helpful to the consumer.

Consumer protection is also an important area in which some additional consideration would be useful. At the present time, the Public Utilities Board, under Section 52 of the *Public Utilities Act,* provides an avenue through which customers can

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make complaints. This avenue is not used frequently, but it has been a successful mechanism for dispute resolution.

In any discussion of the role of the PUB, consideration should be given as to whether having the regulator continue to examine individual consumer complaints is appropriate or whether some other approach to addressing complaints, separate from the regulator role, would be preferable. The Review Team is of the view that this issue needs attention and would suggest that the GNWT undertake such an examination as it considers how it wishes to ensure consumer protection.

Subsidy Programs

The GNWT continues to have a role in ensuring the affordability of electricity to residents. The present support programs – the Territorial Power Subsidy Program (residential and commercial programs), Housing Support Program (for those living in NWT Housing Corporation Units) and the Income Assistance Program (which pays electricity costs for low income northerners) provide over $15 million per year in financial assistance). Public comment and the cost structure of power services in the NWT suggest that the GNWT will continue to have a role in this area for some time to come.

As discussed in an earlier section of this report, one of the questions the GNWT may wish to consider in the future is whether consolidation of at least some of the existing electricity subsidy programs meets the overall goals of the government. If some of the existing programs duplicate efforts of other programs, or if program criteria and goals are contradictory, then making some adjustments in this area may help to clarify the Government's intentions, policies and procedures.

Testing of New Technologies

Considerable attention is currently being given to the implementation of new technologies as part of overall efforts towards reducing environmental impacts, reducing energy usage and improving the overall efficiency of energy activities. This is an emerging area of attention and the GNWT has emphasized the importance of taking action in this area by committing $60 million over a three year period to energy related projects, many of which will ultimately impact on electricity generation, transmission, distribution and use. In regard to the testing of new technologies the Review Team received advice that selecting any such technologies for testing must be done prudently. The Review team agrees with these comments

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and recommends that the GNWT establish a set of criteria that will be used to assess which technologies will be tested.

Recommendation 36 - Selection of Technologies for Testing

> **Decisions related to selection of technologies for testing should be based on cost, the likelihood of project success and the feasibility of actual implementation of the new technology, should it prove to be viable.**

The public continues to express the view that the testing of new technologies is important. During the public forums, the Review Team heard suggestions of expanding proven technologies such as mini-hydro, and other technologies that have not yet been fully tested in the NWT such as wind power, biomass and solar energy. But it was also interesting to note that participants were cautious in the willingness to see NTPC, as the primary generator of power, take financial risks in these areas as failure might impact on customers' power bills. People who participated in the Review were, for the most part, not enthusiastic about the utilization of new technologies that could significantly increase the price of electricity.

Recommendation 37 - Testing of New Technologies

> **There is a recognized need to test new technologies, and such testing should occur outside the rate base and the results of the testing should be objectively recorded and widely reported.**

The GNWT has a leading role in determining, in collaboration with the electricity industry and others, technologies that could and should be tested to determine their suitability and cost effectiveness. The Review Team's view is that it may be useful to expand the view of new technologies to include examination of advanced diesel technologies.

Recommendation 38 - Include Testing of Technologies that can Reduce Greenhouse Gases from Current Power Generation Plants

> **New technologies should include not only those related to alternative energies, but also those that can reduce greenhouse gases from the current power generation plants.**

In addition, the Review Team believes that testing of new technologies should be coordinated in a transparent manner, through a single department or agency, which is given the tools to plan, coordinate, manage, analyze the results and report to the public on the results of testing. Financial accountability for technology testing should remain with the GNWT until it is determined that the technology is ready to be put into production. To ensure that technology transfer and associated skills

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are developed with the testing of new technologies, northern utilities should be directly involved in their testing, even in cases where a third party is managing the project.

Recommendation 39 - Responsibility for Testing New Technologies

> **Responsibility for testing new technologies should be assigned to a specific government department or agency and there should be a requirement for the department/agency to report annually on the investments made and the results of all, new, technology testing.**

Finally, it is also important that northern utilities be encouraged to innovate within the scope of their current facilities and equipment. This has been the case in the past and it has resulted in some positive results. Setting the expectation that this will be the case in the future will support the overall goals of improving efficiency and effectiveness as new technologies are developed and implemented.

10.0 TIMELINE FOR ACTION

Undertaking comprehensive change is challenging. It requires a clear vision, established principles to guide decision-making, careful planning and decisive action.

This Report proposes comprehensive change and recognizes the inter-related nature of a number of elements that must be changed if the electricity system is to be effective well into the future.

In considering the challenge of change, the Review Team came to the view that it would be useful to look at change in the context of a series of phases. Actions within each phase will help to set the foundation of the activities of the following phases and will help establish expectations both within the electricity sector as well as with the public.

Four phases are proposed.

- Phase I - Establishing the Direction for System Improvement
- Phase II – Adjusting the Regulatory Environment
- Phase III – Strengthening the Electricity System
- Phase IV – Building for the Future

Each phase includes defined actions. The initial two phases can be completed over the next two to three years. Further actions, associated with Phases III and IV can be expected to occur over a longer timeframe.

Phase I - Establishing the Direction for System Improvement

The initial phase is focused on taking early action to establish a framework for long-term change. It demonstrates to the public, customers and the public utility companies the direction that is being taken and the government's commitment to make change. The initial phase is expected to begin immediately and may take as much as twelve to eighteen months to complete. Specific actions during the phase should include:

- Formal acceptance of recommendations to be actioned and the schedule and plan for implementation;
- Completion and confirmation of a long-term vision;
- Commitment to principles to guide actions, including movement towards levelization of rates;
- GNWT confirmation of commitment to the role of the Crown corporations;

10.0 TIMELINE FOR ACTION

- Public utility company actions in support of improved customer relations;
- Implementation of revised TPSP (residential);
- Adjustment of the NWT Housing Corporation's Housing Support Program (electricity);
- Planning of new business support program to replace TPSP (commercial);
- Direction from the GNWT to NTPC to use new approach to rate proposals reflecting the recommendations of this report;
- Initial research related to review and examination of the existing *Public Utilities Act* and other related Territorial legislation (as required); and
- Clarification and designation of roles related to direction to NTPC and PUB, Ministerial and Departmental authority, responsibility for new identification and testing of new technologies.

Should there be an interest to move more quickly, additional activities could be planned and implemented.

Phase II - Adjusting the Regulatory Environment

The second phase will result in changes to the environment in which the utility companies and the regulators operate. Actions during this phase will require the attention of legislators, the PUB and utility companies, as well the GNWT itself. The actions in the phase can be expected to take about eighteen months. Some of the actions in this phase could be initiated prior to the completion of Phase I. Activities in Phase II should include:

- Complete revisions to the *Public Utilities Act* and other related acts (if required);
- Implement revised processes and procedures related to treatment of GRAs;
- Revision to annual reporting requirements for the PUB;
- Revision of cost of service zones and implementation of new rate structure;
- Creation of territorial rider for costs associated with fuel and low water;
- Allocation of head office costs for NTPC by kilowatt hour;
- Issuance of GNWT direction related to franchises;
- Elimination of NTPC dividend payments to GNWT; and
- GNWT establishment of rate of return for NTPC hydro assets.

As this phase is essential to the long-term structure and stability of the new approach to the electricity sector, it will require focused attention so that tasks are not delayed.

10.0 TIMELINE FOR ACTION

Phase III – Strengthening the Electricity System

The third phase is focused on continuing to strengthen the electricity system over time. This phase includes continuing to test technologies and innovation – actions that have in some cases already begun. The phase is likely to continue for a number of years. Actions included in the phase include:

- Continued testing of new technologies to improve efficiency, strengthen consumer management of electricity usage;
- Piloting of new technologies and integration of proven technologies into the electricity system; and
- Further consolidation of rate zones and subsequent adjustment of rate structures.

Phase Three is important in that it is during this period that the vision's principles will be particularly tested as new challenges become apparent and must be addressed.

Phase IV – Building for the Future

The timing of the fourth phase will depend, at least to some extent, on environmental factors. The timing of the occurrence of these factors is not known at this time, but the required actions for the phase can be seen as distinct.

There is the potential that some of the actions in phase four will need to begin at an earlier point.

During Phase Four actions will include:

- Consolidation of generation, transmission and distribution systems; and
- Development of partnerships to support large scale hydroelectric projects for the export of electricity.

These actions are important in that they can be expected to have some specific long-term benefits to the electricity system customers, as well as general benefits to all northern residents in supporting economic growth and development.

10.0 TIMELINE FOR ACTION

Getting the Planning and Actions Right

The finalization of a vision and action plan is a critical step to successful change. This Report provides the basis for action, but it is the GNWT that must define how it will proceed, when it will take action and how it will report on actions to the residents. Establishing a plan of action using the phases outlined above will assist in ensuring that the electricity system in the NWT is renewed and strengthened.

11.0 CONCLUDING COMMENTS

The Review of Electricity Regulation, Rates and Subsidy Programs in the Northwest Territories has provided an opportunity for northerners to describe a vision for the future of the electricity system. With considerable interest and enthusiasm, over 350 residents contributed. Individuals, businesspersons, elected officials, government personnel and representatives of utility companies all stepped forward to make their views known. And while frustration has been evident throughout the Review, many people have expressed their excitement about the opportunities that exist to change and strengthen the electricity system.

Over the last fifty years, electricity has become an essential aspect of life for northerners. As technologies have developed and changed, the requirement for access to electricity has become increasingly important. This Review has highlighted this fact and has emphasized the importance of developing a long-term, comprehensive vision for the future of the electricity system in the NWT.

Establishment of a vision for the future is, however, not enough. Action is required to restructure aspects of the electricity system to ensure that the elements of the system effectively support the generation, transmission and distribution of safe, reliable and affordable electricity. The Review Team believes that this is best achieved by making substantial change to the current regulation, rate structures and subsidy programs.

The transition, from the present model of activity to a new, more effective, approach will be challenging. Achievement of a new vision can occur only with dedication and commitment. Some difficult choices and decisions will need to be made. It is clear, however, that change is needed and beginning to make change is overdue. By taking action we can, over time, establish an electricity system that will meet the needs of all northerners and establish a framework that will permit all of us to move forward together.

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APPENDICES

APPENDIX 12.1

SUMMARY OF RECOMMENDATIONS

To assist the reader in reviewing the recommended directions for the electricity sector, this appendix lists all of the recommendations from the report. The recommendations are divided into sections based on the chapter of the report in which they appear.

Vision for the Future

Recommendation 1 - Establishment of a Long-Term Vision for Electricity

Recommendation 2 - Describe Principles for a Vision

Generation, Transmission and Distribution

Recommendation 3 - Ownership of Transmission Systems

Recommendation 4 - Role of Crown Agencies

Recommendation 5 - Role of NTPC

Recommendation 6 - Ownership of Community Generation and Distribution

Recommendation 7 - Franchises Outside of Municipal Boundaries

Rate Structures and Rates

Recommendation 8 - Rate Structure Simplification

Recommendation 9 - Establishment of Three Cost of Service Zones

Recommendation 10 - Linking of Hydroelectric Zones

Recommendation 11 - Thermal Community Pricing

Recommendation 12 - Rate Regulation - Thermal Zone Communities

Recommendation 13 - Energy Charge in the Thermal Zone

Recommendation 14 - Rate Regulation - Hydro Zones

Recommendation 15 - Setting the Rate of Return for NTPC

Recommendation 16 - Annual NTPC Dividend

Recommendation 17 - Reducing and Consolidating Rate Riders

Recommendation 18 - Treatment of Existing Rate Riders

Recommendation 19 - Establishment of a Territorial Fuel and Low Water Rate Rider

Recommendation 20 - Allocation of Administrative and General Operational Costs

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Affordability

Recommendation 21 - Reference Rate for TPSP Program

Recommendation 22 - Limit Access to TPSP to Communities in the Thermal Zone

Recommendation 23 - Establish Standard Requirements for Administration of the TPSP

Recommendation 24 - Prorating of TPSP for Longer/Shorter Billing Periods

Recommendation 25 - All Customers be Required to Pay the Customer Charge

Recommendation 26 - Franchise Fees Not be Permited to Increase TPSP

Recommendation 27 - Subsidy Usage Thresholds

Recommendation 28 - Redesign NWT Housing Corporation Electricity Benefit Component of the Housing Support Program

Recommendation 29 - Replace the Commercial Component of the TPSP

Regulation of Electricity

Recommendation 30 - Continued Operation of the Public Utilities Board

Recommendation 31 - Review and Amend the *Public Utilities Act*

Recommendation 32 - Establish Minimum Filing Requirements for GRAs

Recommendation 33 - Cost Awards in the Regulatory Process

The Role of Government

Recommendation 34 - Specify Responsibilities for PUB and NTPC in Departmental Establishment Policies

Recommendation 35 - Maintain Policy and Ministerial Support Functions for Electricity Related Organizations within the GNWT Structure

Recommendation 36 - Selection of Technologies for Testing

Recommendation 37 - Testing of New Technologies

Recommendation 38 - Include Testing of Technologies that can Reduce Greenhouse Gases from Current Power Generation Plants

Recommendation 39 - Responsibility for Testing New Technologies

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TERMS OF REFERENCE

REVIEW OF ELECTRICITY REGULATION, RATES AND SUBSIDY PROGRAMS IN THE NORTHWEST TERRITORIES

Introduction

The following Terms of Reference provides the purpose, scope and objectives for the Review of Electricity Regulation, Rates, and Subsidy Programs (Electricity Review) being undertaken by the Government of the Northwest Territories (GNWT).

Authority for the Review

In December 2008 the GNWT's Ministerial Energy Coordinating Committee (MECC) issued a public discussion paper titled *A Review of Electricity Regulation, Rates and Subsidy Programs in the Northwest Territories.* The Ministerial Discussion Paper establishes the framework within which this review is being conducted.

The Electricity Review Team, appointed by Minister Bob McLeod, as Chair of the Ministerial Energy Coordinating Committee, will be responsible for fulfilling this Terms of Reference.

Review Purpose

The Electricity Review will review the current approach in the NWT to electricity regulation, rate-setting, and subsidy programs and develop options and recommendations for change. Recommendations for change are to take into account the values of NWT residents with respect to the type of electricity system residents envision for the future. As well, they should be designed to reduce overall costs and improve the efficiency and effectiveness of the processes related to electricity regulation, rates and subsidy programs.

Background

The *NWT Energy Plan (2007)* issued by the GNWT included a discussion of electricity issues and determined that a thorough review of electricity matters would benefit residents of the Northwest Territories. The *NWT Energy Plan* concluded

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that reliable, affordable electricity should be available in all communities. In pursuit of this goal, the *Plan* outlined the need to examine cost reducing opportunities related to electricity regulation and rate structures, as well as review the effectiveness of the current subsidy programs.

The 2008 Discussion Paper built upon the *Energy Plan*, premised by the question:

"What should be our vision for the future of electricity in the NWT?"

People generally agree that the NWT electricity system needs to be reliable and the environmental impacts of our energy use should be minimized, but the high cost of electricity is an issue of much discussion.

Perhaps more than any other part of Canada, the north has to be concerned about the reliability of its electricity supply. An extended winter power outage in any of our northern communities could result in the most extreme hardship for that community and its residents. Infrastructure could be irreparably damaged, and the safety of residents and the future sustainability of that community could be jeopardized.

The north has been experiencing the impacts of climate change more acutely than most other parts of the world. While science continues to search for a more complete understanding of all causes, environmental changes are occurring. It is incumbent on NWT residents to make best efforts to decrease greenhouse gas emissions.

Electricity in remote NWT communities is expensive. Given the trend of rising costs, most notably oil prices, and the nature of our small, widely dispersed market, this electricity will likely remain relatively expensive for years to come. This problem is particularly acute in NWT communities served by diesel generation. Communities served by hydroelectric power have rates that are not much in excess of a number of locations in North America.

The Public Utilities Board (PUB) is a quasi-judicial board that has broad powers in reviewing and establishing electricity rates and has sole jurisdiction over the regulatory process in the NWT. Electricity rates are established through a lengthy General Rate Application (GRA) process that typically occurs once every three years. GRA hearings are open, invite public involvement and deal with a tremendous amount of information regarding utility's assets, operations and financial affairs. The average annual cost to operate the PUB is approximately $500,000. The funding for this is provided by the government budget process and has no impact on the cost of electricity in the NWT. There are, however, significant costs for the utilities to take part in the General Rate Application process. For example, recent applications from Northland Utilities Limited NWT (NUL (NWT)) and Northland Utilities

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Limited (YK) (NUL (YK)) spent a combined $900,000 on their recent applications before the PUB and the Northwest Territories Power Corporation (NTPC) spent $2.2 million on its application. The challenge is to try to reduce costs of regulation on the utilities, while maintaining the appropriate degree of regulatory oversight.

The NWT is served by three electrical utility companies. Two private sector companies (NUL (NWT) and NUL (YK)), are regulated utilities that distribute power to 55% of the population, but do relatively little of their own generation. The NTPC is a regulated public utility that is owned by the GNWT. This company provides most of the electricity generation for the Territory and distributes power to about 45% of the population.

Total costs to operate the NWT electrical system are about $98,000,000 per year.

Scope

The scope of the Electricity Review is reflected in the discussion paper *A Review of Electricity Regulation, Rates and Subsidy Programs in the Northwest Territories (2008)* and can be further defined through the examination of key questions, including:

- *Electricity sector structure* – can changes to the public/private structure of our electricity sector reduce costs?
- *Cost of electricity generation* – the GNWT is undertaking a number of initiatives to reduce costs – with energy conservation and efficiency being the first response – what are other opportunities to reduce costs?
- *Community ownership and operation of local generation and distribution* – Could community-owned and operated electricity companies reduce costs with the same degree of safety and reliability?
- *Cost of regulation* – is the current regulatory structure too onerous, given the size and nature of the NWT electricity market? Are there efficiencies to be achieved?
- *Government role in regulation* – should the GNWT be able to issue policy direction to the Public Utilities Board?
- *Simplified / levelized rate structure* – should the GNWT move towards a more simplified, levelized rate structure?
- *Territorial Power Subsidy Program* – is the current program effective in achieving its goals?

To achieve the purpose, scope and objectives of the Electricity Review the Team is not constrained by these key issues, but rather, the Team should reflect these issues in the development of options and recommendations.

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Links with Other GNWT Reviews

The GNWT is currently undertaking two other reviews that relate to the work being carried out by the Electricity Review Team. The Review Team is not directly involved in these reviews, but the work of the Electricity Review Team may inform these other processes. The other reviews currently underway are:

Review of the ATCO Proposal – the GNWT is currently reviewing an unsolicited proposal from ATCO to merge its operations with the Northwest Territories Power Corporation (NTPC).

NTPC Review – the GNWT is committed to undertake a review of the structure and the efficiency of the NWT Power Corporation.

To ensure maximum benefit from these concurrent processes, the Electricity Review Team will have access to the information and findings of these reviews as it becomes available.

Administrative Support for the Review

A staff member from the Energy Planning unit of the Department of Industry, Tourism and Investment will be seconded to the Electricity Review to provide administrative and logistical support.

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Detailed Objectives of the Review

The objectives of the Review are as follows:

1. To help improve public knowledge and understanding of the NWT electricity sector through the conduct of a series of public forums and meetings with individuals and organizations.

2. Consider the current public/private structure of the NWT electricity sector. Based on an overview of electrical sectors in other jurisdictions, as well as discussions with NWT residents, governments and organizations identify options and provide recommendations for change that consider both short and long-term cost implications to the NWT consumer.

3. Review the current NWT legislation, regulations and regulatory structures as well as those in other jurisdictions. Identify options and make recommendations for legislative and regulatory models that could provide cost effective, fair rate setting processes and oversight tools so as to maintain an appropriate level of procedural fairness, transparency and accountability.

4. Examine the current approach of cost of service, community-based electricity rates and recommend alternative approaches to rate setting aimed at reducing overall system complexity.

5. Examine the GNWT Territorial Power Subsidy Programs (TPSP), including both the residential and commercial components. Review the effectiveness of the programs in ensuring that NWT residents and businesses have access to affordable power. As appropriate, develop options and provide recommendations for change.

6. Examine the public policy issues that the GNWT may wish to address in the provision and regulation of electricity in the NWT.

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Deliverables and Timeframe for Completion of Tasks

During the period of the Review the following deliverables will be produced. The estimated timeframes for completion of each deliverable is provided for reference. The specific timeframes for completion of various aspects of the work may vary somewhat depending upon the completion of public forums.

1) Solicit comments and suggestions from the public and interested parties on the current electrical sector structure, regulatory framework, rate structure and subsidy programs (estimated completion - April 30, 2009).

2) Submit a Report on information collected from public forums and other contacts – "Key Issues and What We Heard" (estimated completion May 15, 2009).

3) Submit a Final Review Team Report including comments and recommendations regarding the direction for the GNWT's future approach to the electrical sector, electricity rates, regulation and subsidy programs in the NWT (estimated completion date June 30, 2009).

Following completion of the three primary deliverables, and the vetting of the Final Report on the Review by decision makers, the Electricity Review Team may be called upon to support the development of a detailed Implementation Plan.

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THE CURRENT SITUATION – A MORE DETAILED VIEW

The current electricity system in the Northwest Territories is the result of years of "organic growth" unfettered by comprehensive long-term plans and goals. The system is a product of contributions by governments, industry and the private sector, all of which took action to address varying specific interests and objectives. In addition, the large geographic area, limited population size and cyclical nature of resource development have also been critical factors in determining how the current system is structured and how it operates.

Examining the current situation is important in that it helps clarify the critical conditions that affect the provision of electricity as well as demonstrating what has worked over the past fifty years. As well, the assessing of the current situation also helps to identify issues that currently exist and need to be addressed if safe, reliable and affordable power is to be provided to customers in the immediate and long-term future.

In terms of the overall context for electricity power generation, some key geographic and demographic information are important.

As we all know, the NWT has a very large land mass. The Territories includes nearly 1.15 million square kilometres. Long distances separate communities – in some cases there are hundreds of kilometres between one community and the next. As a result, many communities served by utilities are not connected by a electricity transmission grid as they would be in southern Canada. Instead, the NWT has for the most part, a dispersed generation capacity with generators located in each community.

In addition to the geographic challenges, the NWT experiences some of Canada's harshest environmental conditions including extreme cold and extended darkness in the winter resulting in difficult conditions for equipment, infrastructure and repair crew access.

At the present time, there are just under 43,000 residents living in 33 communities in the NWT. This is about 5 percent higher than the population a decade ago. Overall population growth has been quite slow at about one half a percent per year. As well, population trends demonstrate a pattern of population stagnation in smaller communities, with slight growth in regional centres and Yellowknife. This "cautious urbanization" trend is not dissimilar to trends seen in the provinces of Canada.

There are four active mines, all producing their own electricity power, and two oil and gas fields, Norman Wells and Ikhil (near Inuvik) are currently in production. Industrial growth during the past twenty years has been primarily the result of resource extraction activities. Diamond mines have replaced gold and base metal mines as the focus of the resource industry. Three diamond mines are currently operating with a fourth in development.

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The System

The current electricity system includes two key providers – the Northwest Territories Power Corporation (NTPC) and Northland Utilities Limited (NUL). Northland Utilities is composed of two sister companies, Northland Utilities (NWT) operating out of Hay River and Northland Utilities (YK) operating in Yellowknife. It is also useful to note that the Imperial Oil Company provides primary power generation for the community of Norman Wells, under contract, with backup generation capacity being supplied by NTPC.

NTPC is a publicly owned, Crown corporation. Established under an act of the NWT Legislative Assembly, NTPC is the primary generator of power, generating 97 percent of the electricity power in the Territory used by residential and general service customers. The company generates and distributes electricity in 28 of the 33 Territorial communities. NTPC employs 185 full and part-time staff. Of this number about 30 are located in the corporation's head office in Hay River. The remaining operational staff includes about 115 staff in regions outside of the Hay River area.

The Northland Utilities companies are privately owned. They employ approximately 40 employees, about sixty percent of whom are located in Yellowknife. ATCO, a large Alberta-based corporation, is the major shareholder of Northland Utilities Enterprises that, in turn, owns the two Northland companies. The Denendeh Development Corporation is a minority shareholder in NUL. Northland Utilities, serves 10,400 customers, about 55 percent of the total territorial population, by distributing electricity in Yellowknife and Hay River area, as well as generating and distributing electricity in four other communities (Fort Providence, Kakisa, Trout Lake and Wekweeti).

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TABLE 12.3.1 - SERVICE PROVIDER AND GENERATION TYPE

SERVICE PROVIDER	COMMUNITY	GENERATION SOURCE
NTPC (GENERATION AND DISTRIBUTION)	Dettah, Fort Resolution, Fort Smith, Behchoko	HYDRO (8 Communities)
NUL (DISTRIBUTION)	Hay River, Hay River Dene Reserve, Enterprise, Yellowknife	
NTPC (GENERATION AND DISTRIBUTION)	Aklavik, Colville Lake, Deline, Fort Good Hope, Fort Liard, Fort McPherson, Fort Simpson, Jean Marie River, Lutselke, Nahanni Butte, Paulatuk, Gameti, Sachs Harbour, Tsiigehtchic, Tuktoyaktuk, Tulita, Ulukhaktok, Whati, Wrigley	DIESEL (23 Communities)
NUL (GENERATION AND DISTRIBUTION)	Kakisa, Fort Providence, Trout Lake, Wekweeti	

Adapted from: *A Review of Electricity Regulation, Rates and Subsidy Programs in the Northwest Territories: A Public Discussion Paper, GNWT, 2008, page 4.*

Electricity is generated by two primary methods – hydroelectric generation and diesel powered community generators. In two cases, Inuvik and Norman Wells, electricity generators are powered by natural gas. In total, hydroelectric generation accounts for about 77 percent (2006) of the residential and commercial power generation. Diesel and natural gas (thermal generation) accounts for the remaining 23 percent of generation. Circumstances are a bit different with respect to industrial generation (mine sites and other resource extraction projects). All industrial generation is produced using thermal means, either diesel or natural gas.

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Hydroelectric generation in the NWT occurs at six sites. A total of four of these sites are located on the Snare River system north of Behchoko. In addition, hydroelectric sites are also located on the Yellowknife and the Taltson River systems. Many of the hydroelectric sites are aging with the oldest having been commissioned over sixty-eight years ago. The Chart below indicates the locations, size and age of hydroelectric sites in the NWT.

TABLE 12.3.2 - OPERATING HYDRO PLANTS IN THE NWT – 2007

PLANT	CURRENT CAPACITY	YEAR BUILT	ORIGINAL DEVELOPER	BUILT TO SUPPLY	CURRENT OWNER
Bluefish	7.2 MW	1941	Cominco	Con Mine	NTPC
Snare Rapids	8.0 MW	1948	Government of Canada	Giant Mine (Yellowknife)	NTPC
Snare Falls	7.5 MW	1960	NCPC	Giant Mine (Yellowknife)	NTPC
Taltson	18.0 MW	1965	NCPC	Pine Point Mine and Fort Smith	NTPC
Snare Forks	9.0 MW	1976	NCPC	Snare/ Yk system, including mines	NTPC
Snare Cascades	4.3 MW	1996	Dog Rib Power Corp (DPC) / NTPV	Snare/ Yk system, including mines	DPC (Leased to NTPC)

Adapted from: *Draft NWT Hydro Strategy*. GNWT. Page 16. 2008

As the generation of hydroelectricity occurs at sites that are at a distance from customers, transmission lines have been constructed between the hydroelectric sites and the communities served. Lines stretch from the Taltson hydroelectric facility to Fort Smith, the Hay River area and Fort Resolution. As well, lines connect the Snare hydro facilities with Behchoko and Yellowknife. Most of the operation of the transmission system is carried out by NTPC.

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Thermal power generation is used in most of the smaller territorial communities. All of these communities have one or more generation units as their primary power source. In addition, thermal generators are used as backup units in communities that are primarily served by hydroelectric generation. The size of thermal generation units is dependent upon the load demand in the community. Generation units range in size from 70 kilowatts, in the community of Jean Marie River to 5180 kilowatt backup generators in Yellowknife.

Backup capacity is a critical feature of the electricity power generation system in the NWT. Given the extremes of northern weather, the isolated nature of many of the communities and the fact that all electricity, whether generated by hydroelectric or thermal means, comes from a single source, it is very important that there is access to a separate backup power generation unit(s) that can produce electricity when the primary system fails. Current standards require that at isolated thermal generation sites, plant capacity must be able to produce 110% of the forecast peak load when the largest generating unit is out of service (subject to engineering judgment). In dual fuel communities, where hydro and thermal electricity supplies are available, plant capacity must be able to produce 105% of the forecast peak load when the primary generation is out of service (subject to engineering judgment).

There is limited use of excess heat from power generation facilities in communities. A co-generation (producing heat and power) system exists in the Town of Inuvik. As well, waste heat from the thermal power plant is collected by means of heat exchange systems and is piped into adjacent buildings in several communities. An example of this approach is in Fort McPherson, where the excess heat is used to offset heating requirements in the nearby school.

There are currently no small-scale generating units, operated by private citizens, connected to a community distribution system.

Under existing Territorial legislation franchise agreements can be approved to permit a utility to operate within a municipality. Under the legislation, utilities wishing to operate within a municipality must obtain approval of a franchise agreement from the Public Utilities Board. There are a limited number of municipal franchise agreements in place. Fifteen franchises are currently in force within municipalities. Utilities operate in the remainder of the NWT communities without franchise agreements.

Outside of municipal boundaries, a Minister of the GNWT approves all utilities franchises. At the present time, three franchises are in place for electric services outside of the municipal boundaries. Mine sites are not required to obtain franchises as they are producing power only for their own usage.

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Regulation

The GNWT established a Public Utilities Board (PUB), in the early 1990's, to regulate the operation of utilities in the NWT. The Board in accountable to a Minister of the GNWT and must report annually on its activities. The report, after the Minister receives it is tabled in the NWT Legislative Assembly. The PUB presently includes five members. The PUB serves as a proxy for competition in that it reviews applications from utilities and makes judgments as to the validity of operating and capital costs. In addition, it approves the rate structure and rates for services provided by utilities. Rates must be based on "the property of the public utility used or required to be used to provide service to the public," (Section 49, *Public Utilities Act*). The PUB has a wide range of authority to review, set hearings, negotiate, analyze and make decisions related to costs and electricity rates.

The PUB operates a General Rate Application (GRA) process that includes two phases. The first phase assesses costs of utilities; the second sets the rate structure and the rates to be charged. As well, in the past, the PUB has, in some instances, approved negotiated settlement recommendations/agreements with the utilities in a number of cases.

Power Usage

The electricity system currently includes approximately 19,000 customers. The number of customers obtaining electricity power from the system has grown somewhat, but remains relatively stable. The table on page 103 indicates the number of customers currently purchasing power from NWT utilities.

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TABLE 12.3.3 - CUSTOMERS BY TYPE AND UTILITY

UTILITY	TYPE	RESIDENTIAL CUSTOMERS	GENERAL SERVICE CUSTOMERS	TOTAL CUSTOMERS
NUL	Hydro	8,461	1,606	
	Thermal	388	137	
	TOTAL	8,849	1,743	10,592
NTPC	Hydro	1,845	414	
	Thermal	4,769	1,507	
	TOTAL	6,614	1,921	8,535
TOTAL CUSTOMERS		**15,463**	**3,664**	**19,127**

Source: NTPC and NUL Billing Data

Industrial, commercial and residential electricity requirements have all changed over the past decade. Changes have occurred for a number of reasons such as changes to industrial production, increased usage of personal electronic equipment, increased use of higher efficiency appliances, building standards, technology and conservation efforts by businesses, families and individuals.

The number of customers accessing the NWT electricity system is, based on examination of the electricity industry standards, quite small. For example, the province of Saskatchewan has approximately 460,000 customers, or over 20 times as many customers as the NWT, spread over an area less than half the size of the NWT.

Electricity usage and customers in the NWT is quite stagnant, with minimal growth in the overall market.

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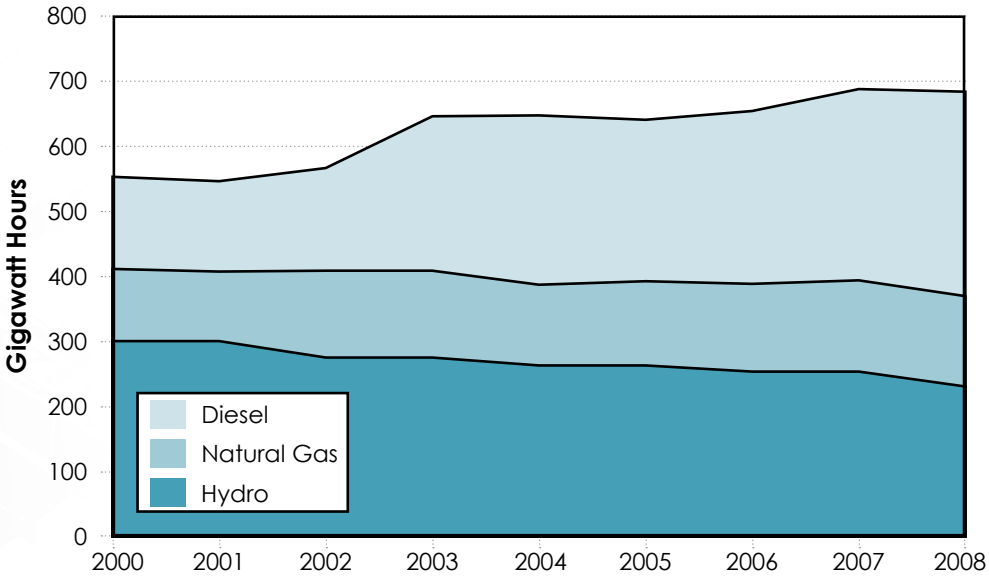
TABLE 12.3.4 - ELECTRICITY USAGE OVER TIME



Source: NWT Statistics Bureau

At the residential level, statistical information suggests that electricity utilization is relatively low. Average usage by residential customers is illustrated using selected communities in the table on page 105. Those communities selected are "typical" and provide useful references in discussions of usage.

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TABLE 12.3.5 – AVERAGE MONTHLY RESIDENTIAL USAGE BY COMMUNITY

COMMUNITY	AVERAGE MONTHLY CONSUMPTION	COMMUNITY	AVERAGE MONTHLY CONSUMPTION
Colville Lake	352	Hay River	539
Deline	464	Inuvik	558
Dory Point/Kakisa	412	Norman Wells	616
Fort McPherson	463	Sachs Harbour	406
Fort Providence	444	Tuktoyaktuk	502
Fort Simpson	470	Wrigley	419
Fort Smith	804	Yellowknife	727

Source: NTPC and NUL Billing Data

It is important to note, that the Review Team was unable to determine, based on the existing data, what the typical usage might be for different kinds of housing. The available information includes usage from a range of sources including apartments, garages, workshops as well as homes. For example, it was not possible to determine an average usage for a family of four, in a single-family dwelling.

Forecasts for future electricity usage show limited growth over the next few years. With the exception of power required to serve the customers in Yellowknife, anticipated growth appears, for the present, to be within the current excess capacity of the electricity system. This situation will change slowly, over time, unless additional industrial developments result in increased demands on existing hydroelectric generation sites.

System Costs

The total cost of the electricity system is approximately $100 million (2007/2008). These costs cover the generation, transmission and distribution of power.

While nearly 77 percent of electricity generated in the NWT for residential and commercial use is from hydroelectric generation, overall costs for hydroelectric power generation make up on about 47 percent of the overall system costs. System costs can be divided into key cost components as shown in the illustration on page 106.

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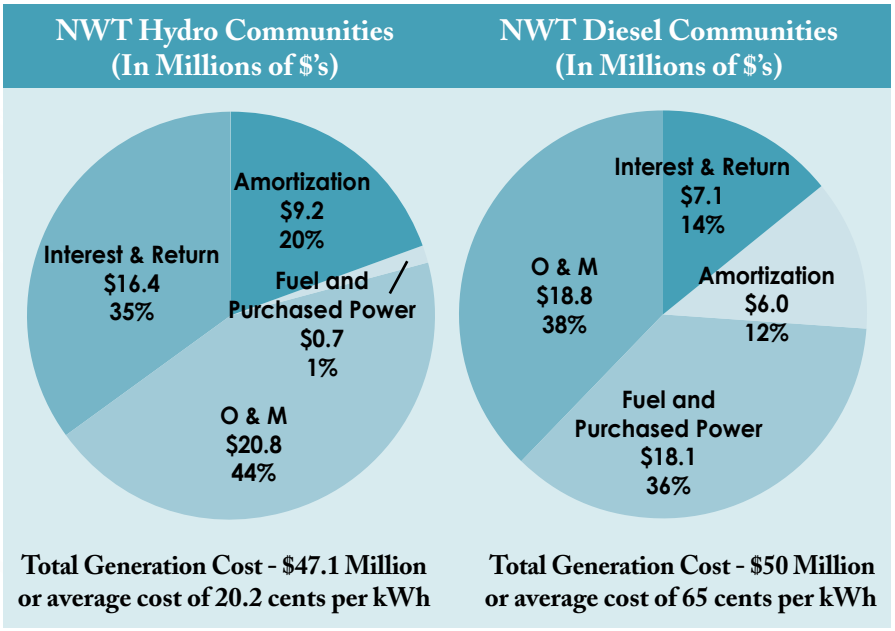
Cost components vary considerably based on the type of generation. Hydroelectric costs are significantly weighted to amortization and interest costs resulting from the high cost of the initial construction of the generating plants. For thermal generation, on the other hand, the highest cost categories relate to fuel purchases and operations and maintenance costs. Illustrations of the cost categories for hydroelectric and thermal generation are shown in the chart below.

FIGURE 12.3.1– HYDRO AND DIESEL COSTS



Source: Northwest Territories Power Corporation
and Northland Utilities Ltd.

For the 2007/2008 year, it cost about $.20 to produce a kilowatt-hour of electricity power from hydroelectric generation. At the same time it cost an average of $.65 to produce a kilowatt-hour using thermal generation. It is important to note, however, that costs in individual communities can be significantly influenced by a number of factors such as new equipment installation and fuel costs.

A further aspect of system cost that is useful to consider is that of the production of Greenhouse Gas Emissions (GHG's). Discussions at the national and international levels are currently occurring which could well result in a direct cost to utilities for the GHG's produced. In addition, Canada has established international commitments to reduce its GHG's.

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Presently, community electricity generation produces approximately four percent of the total NWT GHG's – or about approximately 53 kilo-tonnes on an annual basis. This is a marked reduction for the past, primarily because of the reduced requirement for thermal generation associated with industrial activity, served by the NWT utilities and increasing use of hydroelectric generation. Currently, industrial electricity generation operations, those not served by the public utilities, generate approximately 164 kT of GHG's annually (*Draft NWT Hydro Strategy, 2008)*.

Reliability

Given the isolated nature of many communities and the extreme weather conditions that occur, reliability of electricity power is particularly important. If the power supply fails, at minus 30 degrees, it takes only a few hours before homes and businesses begin to freeze up and residents who are at risk, whether due to illness or age, may then be threatened by the elements.

In southern Canada when there is the failure of one electricity generation station, the loss can be offset by increasing distribution from other generation sources within the utility structure through the electricity grid or by importing electricity from other jurisdictions by means of the inter-tie transmission grid. In the NWT all communities must depend on their on site local primary and backup generation capacity.

In addition to outages, concerns are also expressed about "brown outs" – or the changes to electricity voltage. Customers have complained that such events damage household appliances and equipment including electronics. Utilities note that variations in power levels do occur, given the nature of the existing system, but note that generally these variations are within established tolerances. During the Review the Team was advised by the utilities that significant efforts have been undertaken to address this concern.

Reliability information is tabled by NTPC with the PUB on a regular basis. Overall reliability for NTPC during the 2007/2008 operating year is shown as 99.97 percent. This figure is derived from recording of 269 outages, for a total of 65.34 of a possible 201,480 hours. The average outage was about 15 minutes. NUL does not produce similar reliability data, so it is difficult to examine reliability in communities where NUL purchases power from NTPC (i.e. Yellowknife and Hay River).

Details related to NTPC's 2008 reliability information can be found in the chart on page 108.

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TABLE 12.3.6 - NTPC 2007/2008 OUTAGE STATISTICS

DESCRIPTION	HYDRO COMMUNITIES	THERMAL COMMUNITIES	TOTAL
Percentage of Outages	25%	75%	100%
Number of Outages	68	201	269
Average Duration of Outages (Hours)	0.21	0.25	0.24

Source: Northwest Territories Power Corporation

Recent improvements in technology have helped the utilities to identify and manage outages and voltage change with greater speed and accuracy. The implementation of monitoring systems permits operators in a central location to monitor a number of generation plants and have been essential to these efforts.

Rate Structures

The Northwest Territories has an established rate structure that is based on the cost of service in each community. Rates are established for each individual, community, and customer category in each of the communities. This results in a complex system of over 200 rates. The rate structure developed in the mid 1990's and has been in place, with minor variations, since that time. In comparison, SaskPower (Saskatchewan) serving in excess of 460,000 customers currently has 60 rate codes and is hoping to reduce this number to about 40.

The rate structure and rates were developed based on the Bonbright Principles. These principles were first published in Bonbright's book, *Principles of Public Utility Rates,* and are broadly accepted and used across Canada as useful principles to guide the development of utility rate structures. Given the small size of many communities and the limited number of customers, changes in the utility's cost structure can have a marked impact on community rates. With the small population on which to spread system costs, the upward pressure on power rates, even with modest expenditures, can be quite pronounced. This has proven to be a challenge for the utilities, and to limit abrupt adjustments, efforts have been made by utilities and the PUB to "phase in" increases in rates over time. This has meant that some community's rates are, in fact, lower than would be required by the current cost of service. Or, to put it another way, the revenue generated is less than the full cost of supplying the service.

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Affordability

The affordability of electricity is seen as a key issue across the Northwest Territories. Individuals, businesses, social organizations and elected officials repeatedly raise the question of affordability for public discussion. To address affordability several programs have been developed by the GNWT and the utilities.

The Territorial Power Support Program (TPSP) is currently in place to support residential and commercial customers. Residential customers whose price of power exceeds that paid in Yellowknife have their bills reduced to the Yellowknife rate for the first 700 kilowatt hours used each month. The difference between the community rate and the Yellowknife rate is then billed directly to the GNWT by the utility. Qualifying customers then pay the community rate for all usage over 700 kilowatt hours.

Commercial customers, with annual sales of less than $2 million, can apply for reimbursement to the Yellowknife rate for usage up to 1500 kilowatt hours per month. Qualifying commercial customers pay the full community rate for all monthly usage over 1500 kilowatt hours.

Costs for the TPSP have been growing steadily over the past decade. In the year 2000 the cost of the TPSP was about $4.4 million. This has increased steadily to a cost of $9.5 million in the 2008/2009 fiscal year, over $5 million during the last ten years. Over 95 percent of this cost is for the residential portion of the TPSP.

A second subsidy program has been put in place by the NWT Housing Corporation. The NWTHC owns about 2200 housing units across the NWT. Tenants of NWT Housing Corporation units are charged $.06 per kilowatt hour, regardless of the community power rate. The balance of electricity power charges, regardless of usage levels, is charged to the NWTHC. In recent years, this subsidy has cost about $5.2 million annually.

Analysis of electricity usage by customers accessing either the TPSP or the program offered through the NWT Housing Corporation suggests that the majority of those living in communities with higher rates receive subsidies. Our current estimates suggest that about 73% of overall residential usage in thermal communities is subsidized to some extent.

To assist their customers with affordability issues NUL has established budgeting plans that permits the customer to pay a fixed amount each month. This amount is dependent on the prior year's average usage. Customers then "top up" or are credited at the end of the annual billing cycle depending on actual usage.

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It should also be noted that a number of northern employers also have programs in place to help their employees offset utility costs. These programs vary widely, in terms of benefit.

Rising costs of electricity have had the impact of stimulating conservation efforts by many customers. Efforts have ranged from simple personal actions to reduce electricity usage to adoption of newer technologies such as energy efficient appliances and furnaces. The Government of Canada and the Government of the Northwest Territories have established programs to support northern residents who wish to reduce their demand on the electricity system.

APPENDIX 12.4

SUBMISSIONS TO THE REVIEW AND SCHEDULED MEETINGS

Public Forums

Inuvik – March 4, 2009

Norman Wells – April 1, 2009

Fort Simpson – April 8, 2009

Hay River – April 20, 2009

Fort Smith – April 22, 2009

Yellowknife – April 23, 2009

Fort Resolution – April 28, 2009

Behchoko – May 19, 2009

Workshops

Electricity Workshop (hosted by the NWT Association of Communities) – March 30/31, 2009

Other Meetings

- Annual General Meeting – NWT Association of Communities
- NWT Public Utilities Board
- Ecology North
- M. Vaydik, NWT and Nunavut Chamber of Mines
- Ms. L. Fuller, YWCA
- Ms. A. Hache, Centre for Northern Families
- Inuvialuit Regional Corporation
- Mr. L Voytilla, Chair, Mr. L. Courneya, President, Ms. J. Goucher, NWT Power Corporation
- Mr. J. Babyn, Mr. D. Morgan, Mr. J. Barbutza, Northland Utilities
- Mr. McMullen, Mr. Anderson and Mr. Ross, The Northwest Company
- Peter Retallack, ATCO Midstream
- His Worship P. Guther, Mayor, Town of Norman Wells
- Students and staff, Aurora Campus, Aurora College
- Mr. I. Freemantle, SAO, Town of Norman Wells
- Board Members, NWT Chamber of Commence and J. Curran, Executive Director

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- Mr. G. Pemberton, businessman, Inuvik
- Mr. D. Kaufman, businessman, Inuvik
- His Worship D. Lindsey, Mayor, Town of Inuvik
- His Worship D. Canvin, Mayor, Town of Fort Simpson
- Ms. S. Bassi-Kellett, ADM, Department of Municipal and Community Affairs, GNWT
- His Worship J-M Miltenberger, Mayor, Town of Hay River
- Chamber of Commerce, Hay River
- His Worship P. Martselos, Mayor, Town of Fort Smith
- His Worship G. Van Tighem, Mayor, City of Yellowknife
- Mr. M. Adamchick, businessman, Yellowknife
- Ms. S. Baker, Regional Superintendent, Department of Education, Culture and Employment, GNWT
- Mr. J. Auge, resident, Yellowknife
- Mr. A. Landry, resident, Kakisa
- Mr. J. Larsson, resident, Yellowknife
- Ms. W. Bisaro, MLA , Yellowknife
- Bob Bromley, MLA , Yellowknife
- Mr. G. Abernethy, MLA, Yellowknife
- Mr. J. Jaque, Yellowknife
- Mr. M. Huvenaars, Yellowknife Catholic Schools
- Mr. T. Beaulieu, MLA Tu Nedhe
- Mr. R. Hawkins, MLA, Yellowknife
- Mr. J.M. Miltenberger, MLA, Thebacha
- Mr. D. Ramsey, MLA, Yellowknife
- Ms. S. Lee, MLA, Yellowknife
- Mr. N. Yakeleya, MLA, Sahtu
- Mr. F. Roland, MLA, Inuvik
- Mr. R. McLeod, MLA, Inuvik
- Mr. P. Delorey, MLA, Hay River
- Mr. J. Anderson, President, NWT Housing Corporation
- Mr. M. Aumond, DM, Public Works and Services, GNWT
- Mr. J. Lafferty, MLA, Monfwi

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- Mr. K. Menicoche, MLA, Nahendeh
- Ms. W. Macpherson and Mr. R. Swann, North Slave Service Centre, Education, Culture and Employment, GNWT
- Mr. B. Braden, resident, Yellowknife
- Mr. S. Quigg, Superintendent, Sahtu Divisional Board of Education

Written Submissions and Comments Received

- Northland Utilities
- Northwest Territories Power Corporation
- Arctic Energy Alliance
- Northwest Territories Association of Communities
- Ecology North
- Joint Submission from the City of Yellowknife, the Town of Hay River and the Town of Fort Smith ("Hydro Communities")
- NWT Chamber of Commerce
- Fort Smith Chamber of Commerce
- Mr. P. Kienholz, Hay River
- Mr. John Cournoyea, Inuvik
- Mr. K. Menicoche, MLA, Dehcho
- Mr. W. Heath, Yellowknife
- Mr. H. Blake, Inuvik
- Ms. J. Mercredi, Yellowknife
- Mr. T. Lakusta, Fort Simpson
- Mr. K. Cox, Fort Smith
- Mr. B. Marta, Fort Smith
- Mr. Robert Billard
- Mr. P. Guther, Mayor, Norman Wells
- Mr. J. Rowe, Hay River
- Mr. J. Kelly
- Mr. D. Canvin, Mayor, Fort Simpson
- Ms. G. Burles, Yellowknife
- Mr. T. Pamplin, Yellowknife
- Ms. P. Burnstad, Hay River

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Northland Utilities Enterprises, *Response to the GNWT Report titled: "Towards an Energy Strategy for the NWT"*. Whitehorse, Yukon. 2003.

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Useful Websites

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- ATCO - www.atco.com
- Canadian Electricity Association - www.canelect.ca
- Energy Planning, Department of Industry, Tourism and Investment, Government of the Northwest Territories - www.iti.gov.nt.ca/energy/
- Northland Utilities - www.northlandutilities.com
- Northwest Territories Power Corporation - www.ntpc.com
- Northwest Territories Public Utilities Board - www.nwtpublicutilitiesboard.ca

APPENDIX 12.6

BONBRIGHT PRINCIPLES OF RATE DESIGN

Dr. James C. Bonbright, in his book *Principles of Public Utility Rates,* identified eight principles that he proposed should be used to guide rate design. These principles have been relied upon by many public utility regulators, including by the NWT Public Utilities Board (PUB), to guide rate design considerations for a number of years.

It is important to note that these principles can conflict with one another and the NWT PUB has recognized that it is not possible for any particular rate design to necessarily satisfy all eight of the principles:

1. **SIMPLICITY, UNDERSTANDING, PUBLIC ACCEPTABILITY and FEASIBILITY OF APPLICATION –** The practical aspects of design.
2. **FREEDOM FROM CONTROVERSY –** Clarity as to proper interpretation of rate design.
3. **REVENUE SUFFICIENCY** - Effectiveness in yielding total revenue requirements under the fair-return standard.
4. **REVENUE STABILITY**– Stability for utility companies from year to year.
5. **RATE STABILITY** - Stability of the rates themselves, with a minimum of unexpected changes seriously adverse to existing customers (normalized expenses).
6. **EQUITY** - Fairness of the specific rates in the apportionment of total costs of service among the different customers.
7. **AVOIDANCE OF UNDUE DISCRIMINATION** - In rate relationships.
8. **EFFICIENCY OF RATE CLASSES AND RATE BLOCKS** - Discouraging wasteful use of service while promoting all justified types and amounts of use:
    i. In the control of the total amounts of service supplied by the company
    ii. In the control of the relative uses of alternative types of service (on-peak v. off-peak electricity)

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According to Bonbright, these principles do not carry equal weight. Principles 3, 6 and 8 are the main criteria, which can be summarized as follows.

3. Rates should be sufficient to enable the utility to recover its approved revenue requirement;

6. Rates should divide costs fairly among customers; and

8. Rates should promote optimal use of electricity service, encourage economical justified use and discourage wasteful use.

APPENDIX 12.7

SUMMARY OF RELEVANT GNWT LEGISLATION

It is useful to be aware of the existing GNWT legislation that influences activities in the electricity system. While not exhaustive, the following summary notes relevant legislation and the specific aspects that are relevant to a discussion of establishment of a vision for the future.

Public Utilities Act

The *Public Utilities Act* was initially approved in 1988. The *Act* establishes the regulatory framework for electricity activities in the Northwest Territories. The *Act* provides the authority for the establishment of the Public Utilities Board, specifies the jurisdiction and powers of the Board, defines how members are appointed to the Board and lays out the relationship and accountability of the Board to the Government of the NWT. In addition, the *Act* describes how rates will be established and the role of the PUB in supervising public utilities activities.

In addition to defining the roles and responsibilities of the PUB, the *Act* also describes the duties of and the restrictions placed on public utilities.

Appeal mechanisms are, as well defined.

Northwest Territories Hydro Corporation Act

This *Act* came into force in 2007. It establishes the Northwest Territories Hydro Corporation as a Crown Agency, sets out the purpose of the Corporation (Objects of the Corporation), and defines the ownership of the Corporation by the GNWT and the Corporation's relationship with NWT Power Corporation (NTPC). As well, the *Act* defines how the Corporation's board of directors is appointed, their roles and accountability to the GNWT. The *Act* also establishes the financial framework within which the Corporation must operate.

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Northwest Territories Power Corporation Act

Initially approved in 1988, the *Act* establishes the NTPC as a Crown Agency, sets out the purpose for the Corporation (Objects of the Corporation), defines the ownership of the Corporation and describes the relationship between the NTPC and the NWT Hydro Corporation and the GNWT. As well, the *Act* defines how the Corporation's board of directors is appointed, their roles and accountability to the GNWT. The *Act* also establishes the financial framework within which the Corporation must operate.

The *Act* also discusses the matter of rates and revenue requirements.

Other Legislation

In addition to the acts described above there are several additional pieces of legislation that relate to the operation of the Crown Agencies. While not described in detail here, it is important to be aware of their potential influence on activities. Specific relevant legislation includes:

- *Financial Administration Act* – Describing requirements related to the GNWT and Crown Agency financial operations.
- *Public Service Act* – Describing conditions, duties and responsibilities related to members of the public service working for the Crown Agencies (and the GNWT).
- *Cities, Towns and Villages Act* – Authorizes the involvement of cities, towns and villages in the delivery of utility services.

Access to legislation can be obtained through the GNWT's Department of Justice website (www.justice.gov.nt.ca/Legislation)

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ALLOCATION OF HEADQUARTERS COSTS

The purpose of a utility cost-of-service study is to develop a method for fairly allocating utility costs to different customer classes. The over-riding principle is one of cost causation; that is, costs should be allocated in a manner that reflects the reason for, or driver of why, the cost having been incurred. While it is important for a utility COSS to be technically and analytically sound, there is a degree of judgment involved. Further a COSS must be transparent, replicable, and understood by customers and the utility's regulators or overseers.

A COSS is a general legislative requirement in most jurisdictions, almost universal in the application to Public Utilities operating as monopolies or special franchise holders. Such utilities are under a duty to offer adequate services at reasonable rates. In addition, most legislative statutes require that in its rates or charges, as well as its supply of services, a utility and its regulator must avoid unjust and undue discriminations or preferences among specific customers, or customer classes.

In order to comply with the legislative requirements, utilities and their regulators have adopted the Prospective Cost-of-Service Studies, (also referred to as Cost Causation Studies) to assist them in fulfilling that responsibility, which is determining what, or who, is causing costs to be incurred by the utility.

Once the revenue requirement of a utility is determined through a process traditionally called Phase one (1) process of the Utilities Rate Application, attention is then turned to the Phase two (2) process called Cost of Service and Rate Design.

Prior to outlining the purpose of a Prospective Cost of Service Study, there are a number of published reports (technical economics literature) and decisions of the Court/ Regulatory Commissions that have detailed the attributes to be sought in the development of a sound and just rate structure.

The most quoted, in very general terms, is the United States Federal Energy Regulatory Commission (FERC) decision in Order # 436 of October 1985. FERC stated in that decision that optimal rates should provide clear, efficient, effective, informative and cost effective market price signals about the present and the future costs to buyers and sellers.

Bonbright, a noted author on Utility Regulation, states in his published 1961 and 1988 books, that valuable criterion for a desirable rate structure should include, as noted in part four, pages 383/384:

- Effectiveness in yielding the utility's total revenue requirement, under the fair return standard, without socially undesirable expansion of rate base or socially undesirable level of product quality or safety.

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- Revenue stability and predictability with a minimum of unexpected changes seriously adverse to the utility company.
- Stability and predictability of the rates themselves, with a minimum of unexpected changes seriously adverse to the ratepayers, and with a sense of historical continuity.
- Static efficiency of the use of rate classes and rate blocks in discouraging wasteful use of the service, while promoting all justified types and amounts of use.
- Reflections of all of the present and future private and social costs and benefits occasioned by the service's provision.
- Fairness of the specific rates in the apportionment of total cost of service among the different ratepayers, so as to avoid arbitrariness and capriciousness, and to attain equity.
- Avoidance of undue discrimination in rate relationships.
- Dynamic efficiency in promoting innovation and responding economically to changing demand and supply patterns.
- The related, practical attributes of simplicity, certainty, convenience of payment, economy of collection, understandability, public acceptability, and feasibility of application.
- Freedom from controversies as to proper interpretation.

The purpose of the COSS is to analyze the components of the utility's costs and assign them to the various customer classes. The main purpose of this study or analysis is to then compare the assigned costs of the Utility to the forecasted revenue expected by the various customer classes. The resulting financial relationship from each customer class and sub-class of the assigned costs for that class, and the revenue expected is the resultant cost coverage ratio (CCR) or revenue to revenue relationship (R/RR) or in the NWT it is referred to as Revenue: Cost Coverage (RCC). The customer class where the revenues are equal to the assigned costs would have a Revenue Cost Coverage of one.

A traditional Cost of Service Study usually employs a three to five step cost analysis methodology outlined below:

- **Functionalization** of the costs according to functions (services) performed by the Utility. For an electric utility, these major functions by which costs are assigned are generation, transmission and distribution, and ancillary services.

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- **Classification** of each function's costs according to the system design or specific operating characteristics, which caused those costs to be made or incurred. In the case of electric utilities, costs are generally classified as one of the following:
    - Demand related costs – allocated among the customer classes on the basis of demand imposed on the system during peak hours, and the capacity of facilities required to service the demand of customers.
    - Energy related costs – allocated among the customer classes on the basis of energy that the system must supply to service the customers.
    - Customer related costs – allocated among the customer classes on the basis of the number of customers, or weighted average, or costs per customer.
- **Allocation** of each functionalized and classified cost component to specific customer classes based on each class's contribution to the specific cost driver selected.

The judgments that are made regarding cost of services issues, while reflecting the underlying nature of the utility system's operation, customer characteristics, and planning process, should be considered as being dynamic, not static. It is for this reason that there is a need to file annual cost of service studies with each change in rate application.

In conclusion, judgments are made throughout the COSS process. Arbitrary classifications or allocations should ideally be minimized. Although many methods are available to the cost analyst, they are not all equally appropriate to all systems. It is the application of the cost analyst's knowledge of the system, its customers, and the application of sound judgment, reflecting cost causation criteria that will result in a good COSS. The regulator's task is to test the reasonableness of the judgments made to ensure that the filed cost of service study, when used as a primary criterion to design rates, will provide the appropriate price signals to the utility's customers, and affect the desired customer behaviour.

In the case of NTPC slightly greater than $ 11 million is annually required to fund what is typically categorized as Head Office costs. This category of costs within NTPC covers three sub-sections of costs, firstly, namely all costs associated with the head office in Hay River such as staff employed including officers, accounting, billing, human resources, legal, and administrative support services; secondly, all operational support staff, particularly engineering and professional technical support required to support the total systems generation, transmission and distribution functions (mostly in Hay River) together with the cost of the capital assets used by the total system such as mobile emergency generators that can be moved to wherever and whenever an emergency outage occurs requiring alternative backup. Lastly, the costs

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associated with the area offices in Inuvik, Fort Smith and Yellowknife, which with the consolidated customer service function now in Hay River, currently, there are no true area costs included in the $ 11 million head office cost.

Since this is one category of costs which gets a lot of attention through the public hearing and evidentiary portion of a rate application and it is an area that causes most anguish between communities served by NTPC, we felt it required a more thorough examination. We also wanted to see if there was a simpler and understandable method that could be used or employed to generate a fair reallocation of these Head Office costs. To assist the Team in reviewing what options or what methodology would best meet the fair and just test we examined published literature on allocation options or principles employed elsewhere.

As a basis for determining the current allocation methodology we were referred to Information Request PUB-NTPC 1 from the General Rate Application 2001/2002 & 2002/2003 Phase 11 dated December 16, 2002.

Another source we relied on, perhaps more than others was the *NARUC Electric Utility Cost AllocationManual published in 1992* by the National Association of Regulatory Commissioners located in Washington, DC in the USA. This manual is used by a variety of cost analyst to assist in determining appropriate approaches for specific electric utilities Cost of Service studies.

On page 15 of this manual they discuss the issue of Joint and Common Costs like Head Office Costs. These common costs are incurred when a utility produces several services using the same facilities or inputs. As an example the manual states "The classic examples of joint costs are beef and hides where it is not possible to allocate separate costs of raising cattle to the individual product". They also state, "Overhead expenses such as the President's salary or accounting or legal expenses are examples of costs that are common to all separate services offered by the utility".

The manual further concludes, "The classification and treatment of the joint and common costs requires considerable judgment in an embedded cost study". The real question is "What should that approach be"?

It is our collective view that to try to allocate this cost category by the individual isolated communities requires a second examination as firstly, the current ratio was developed in 1999/2000 using a ratio of customer-related costs and labour related costs at that time. And secondly, since Head Office costs are approximately one third of the total operational costs of NTPC, how these costs are allocated significantly impacts consumers' rates. Thirdly, this complex ratio or cost allocation methodology appears at first glance to penalize the smaller communities for the benefit of the hydraulic served communities.

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This is in the context that 77% of the generation comes from hydraulic sources compared to 16% from thermal diesel and 7% from thermal natural gas.

Additionally, while hydraulic communities operational costs are only 44% of total annual power costs compared to total annual power costs including fuel in thermal communities of 74%. However, without the fuel costs, annual operating costs are 36%. Fuel itself accounts for 38% of the total annual thermal operational costs.

We believe that it is important that given the size of the customer base, and the legacy assets used for the benefit by the grid-hydro communities, that a more fair, transparent, understandable and just approach to the allocation of headquarters' costs should be developed. In our view, the preferred approach is to allocate head office costs on the basis of total kilowatts generated and transmitted by the utility and used by all consumers throughout all communities. A simple methodology should be used. This would remove the requirement for any special judgments to determine how best, and under what conditions, formula or proxies, to allocate portions of the $ 11 million head office costs to each community. Additionally, any efficiencies or reduction in head office or regulatory costs would benefit all customers, including wholesalers, served by NTPC.

This methodology should similarly be applied to NUL (Hay River)

Head Office Expense per NWTPUB Decision 26/08 re-filing, the total $ 11.3 million was allocated as follows on page 125:

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TABLE 12.7.1 - HEAD OFFICE COST ALLOCATION

COST ZONES	CURRENT ALLOCATION	PROPOSED ALLOCATION
SNARE HYDRO	$3.4	$6.5
TALTSON HYDRO	$1.2	$2.2
THERMAL	$6.7	$2.7
TOTAL	$11.3	$11.3

Note: These costs do not include return on Head Office Assets.

While there are financial impacts of this recommendation to the hydraulic inter-tie communities, we believe it would in the longer term be a fairer, more transparent and understandable methodology. As well the approach would remove the angst between communities at general rate applications so parties or communities could focus their collective attention on issues or services required by all those customers served by NTPC through-out NWT.

In order to soften the financial consequences of recommendation we would recommend that a transitional subsidy program be provided to those communities adversely impacted with the saving generated by the other recommendations on the current cost of the Housing Support Program.

APPENDIX 12.9

SUMMARY OF CONSERVATION PROGRAMS OFFERRED BY THE GOVERNMENTS OF CANADA AND THE NORTHWEST TERRITORIES

PROGRAMS OFFERRED BY THE GOVERNMENT OF THE NWT

Energy Efficiency Incentive Program – Provides NWT residents with rebates when they purchase energy efficient products such as refrigerators, boilers and woodstoves.

Borrow a Kill-A-Watt Meter™ - A program where residents can rent a kilowatt metre to measure the amount of electricity used by specific appliances, allowing them to better understand their energy use.

Yardstick Audit – Businesses can receive a free yardstick audit that compares the energy use of its facilities to various standards and other facilities with similar operations to determine if the amount of energy being used is appropriate. These free audits can provide the baseline work for a more detailed energy audit.

Community Energy Plans – The Arctic Energy Alliance has been working and continues to work with all the communities of the North to develop community energy plans. These plans serve to guide the development of future energy projects in communities and help communities to lessen their impact on the environment. All communities are expected to have energy plans completed by 2011.

PROGRAMS OFFERRED BY THE GOVERNMENT OF CANADA

Federal programs for conservation have been mostly rolled out all together under the "ecoENERGY" banner. The following is a summary of the different type of demand side management/conservation programs offered under the ecoENERGY umbrella.

ecoENERGY Retrofit Program - Natural Resources Canada's (NRCan's) **ecoENERGY** Retrofit Program provides financial support to homeowners, small and medium-sized businesses, public institutions and industrial facilities to help them implement energy saving projects that reduce energy-related greenhouse gases (GHGs) and air pollution, thereby contributing to a cleaner environment for all Canadians.

ecoENERGY for Biofuels Overview - The ecoENERGY for Biofuels program supports the production of renewable alternatives to gasoline and diesel and encourages the development of a competitive domestic industry for renewable fuels. The program provides an operating incentive to facilities that produce renewable alternatives to gasoline and diesel in Canada.

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ecoENERGY for Biofuels will invest up to $1.5 billion over nine years in support of biofuel production in Canada. Administered by Natural Resources Canada, the ecoENERGY for Biofuels program runs from April 1, 2008 to March 31, 2017. Recipients will be entitled to receive incentives for up to seven consecutive years.

ecoENERGY for Biofuels Overview - The ecoENERGY for Aboriginal and Northern Communities Program, which began on April 1, 2007, will provide $15 million in new funding over four years to support Aboriginal and Northern communities working on clean energy projects, including the approximately 130 remote communities that rely on diesel power generation. Goals include: catalyzing renewable energy projects, improving energy efficiency, and adopting alternative energy sources to reduce dependence on diesel fuel.

The program will focus on three key areas to address climate change challenges facing Northern and Aboriginal communities: community energy planning and management; renewable energy and energy efficiency projects; and, capacity building, training and tools.

ecoENERGY for Fleets - Canada has one of the best highway systems in the world, an important part of keeping Canada competitive in a fast-paced global economy. The commercial freight moving along our highways keeps the economy rolling, but is also a major contributor to the emissions that threaten environment and health.

The commercial highway freight sector is responsible for close to 10 percent of Canada's greenhouse gas emissions. ecoENERGY for Fleets is a program offered by Natural Resources Canada introducing fleets to energy-efficient practices that can reduce fuel consumption and emissions. FleetSmart is a component of this program offering free practical advice on how energy-efficient vehicles and business practices can reduce fleet operating costs, improve productivity and increase your competitiveness.

Along with the latest developments in fleet and fuel management, ecoENERGY for Fleets will also help ensure fleet vehicle owners and managers are aware of the fuel efficiency benefits of new and developing technologies. On the education side of the initiative, it's expected that more than 200,000 professional drivers of heavy trucks, buses, construction and other vehicles will receive training in energy efficient vehicle operating techniques over the next four years.

ecoENERGY for Personal Vehicles - Canadians have made it clear that the environment is a top priority, but regulations to curb harmful emissions can only do so much. The choices we make about the vehicles we drive and how we drive them are just as important. Personal vehicles, cars, pickups, SUVs and minivans account for more than 12 percent of Canada's greenhouse gas emissions.

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With the launch of the ecoENERGY for Personal Vehicles Initiative, making the right choices is easier. This program offers easy access to information, including fuel consumption guides and other tools, to help Canadians choose the cleanest, most efficient car or truck for their particular needs.

It provides Canadian motorists with helpful tips on buying, driving and maintaining their vehicles to reduce fuel consumption and greenhouse gas emissions that contribute to climate change.

This initiative will also work with communities, provincial and territorial governments and other partners to encourage driving and vehicle maintenance habits that increase fuel efficiency, reduce emissions and save money.

To make sure Canadians continue to enjoy a wide selection of fuel-efficient vehicles, the Government is working directly with automakers to significantly reduce greenhouse gas emissions by 2010. This voluntary effort by automakers is part of the preparation for mandatory fuel-efficiency regulations that will come into force for the 2011 model year as part of the Clean Air Regulatory Agenda announced last fall.

ecoENERGY for Renewable Heat - Using the power of the sun to heat buildings and water not only helps businesses lower costs, but it reduces the amount of emissions produced. The ecoENERGY for Renewable Heat program is a four-year, $36 million investment to:

- Increase the use of renewable thermal energy by industry, commercial businesses and institutions
- Boost the amount of renewable thermal energy created for these sectors
- Contribute to cleaner air by helping Canadian businesses use less fossil fuel-based energy for space and water heating in buildings across the country

The ecoENERGY for Renewable Heat program runs from April 1, 2007 to March 31, 2011. Incentives are offered to the industrial/commercial/institutional sector to install active energy-efficient solar air and/or water heating systems. Eligible projects must be completed and commissioned within nine (9) months of the signing of a contribution agreement with NRCan. Preliminary estimates suggest that, by 2011, the program will have supported installations in about 700 buildings.

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In addition, pilot projects conducted with energy utilities, energy service companies and non-governmental organizations will explore ways of making solar water heating systems more accessible to Canadian homeowners. While the program will not be offering incentives directly to homeowners, these large-scale pilot projects are designed to install solar water heating systems into several thousand homes.

ecoENERGY for Renewable Power – ecoENERGY for Renewable Power will invest $1.48 billion to increase Canada's supply of clean electricity from renewable sources such as wind, biomass, low-impact hydro, geothermal, solar photovolataic and ocean energy. It will encourage the production of 14.4 terrawatt hours of new electricity from renewable energy sources, enough electricity to power about one million homes.

ecoENERGY Technology Initiative - Many of the environmental issues associated with how we produce, transmit, distribute and use energy can only be resolved by developing advanced energy technologies - technologies that do not currently exist or that currently are in the early stages of development.

ecoENERGY Technology Initiative – Will fund research, development and demonstration to support the development of the next-generation clean-energy technologies - to increase clean energy supply, to reduce energy waste, and to reduce pollution from conventional energy sources. Examples are technologies for clean-coal, carbon sequestration, and for reducing oil sands' environmental impact, and new end-use technologies such as hydrogen and fuel cells, and energy efficient buildings and industry. The Initiative will also develop technologies for producing and using renewable energy from clean sources such as wind, solar, tidal, and biomass.

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