



**NT Energy**

**Strategic Plan  
2012 - 2014**

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# 1. Introduction

The Northwest Territories Energy Corporation (03) Ltd. (NT Energy) is a subsidiary of Northwest Territories Hydro Corporation (NT Hydro), a Crown Corporation wholly owned by the Government of the Northwest Territories (GNWT).

**Figure 1 - NT Hydro Group of Companies**



NT Energy is funded from outside of the NWT’s regulated electricity rate payers to explore ways to develop local, affordable, and ideally renewable energy projects in the NWT. Displacing imported diesel with local sources of energy supply is important for our economy and critical to the long term sustainability of NWT communities.

Most of the existing hydro infrastructure in the NWT is a direct result of federal and private sector investment to support resource development in the north. This investment created a legacy of renewable power that continues today. NT Energy is working to build on this legacy through the development of the NWT’s extensive hydro and renewable energy potential. Our history may be hydro but our future needs to include solutions that work across the north. Wind energy in the north, biomass potential in the southern portion of the NWT, geothermal energy, and even solar need to be a part of the solution for NWT communities.

Working with communities and Aboriginal governments to explore local energy solutions is our key priority. It takes time to understand the costs, benefits and challenges to develop small scale community energy projects. We’ve started this process by gathering information to help residents and communities understand their options and participate actively in the discussion.

NT Energy will also work to develop larger projects for industry as well as transmission links to communities. Becoming the “energy supplier of choice” for industry can provide opportunities to leverage infrastructure investment that will benefit communities. Developing these opportunities in partnership with Aboriginal governments can provide for local wealth creation and the opening of an entire new business sector in the NWT.

This Strategic Plan has been developed to propose a vision for NT Energy and further define our role in promoting and developing the NWT’s hydro and renewable energy potential. The vision and goals we aspire to are high. They will be achieved through excellence in project management, partnerships with communities, industry and Aboriginal governments, and our collective desire to develop our energy infrastructure for the benefit of residents today, and for future generations.

## NT Energy Vision, Mission and Values

Our vision, mandate, values and guiding principles are...

### Vision

*"NT Energy (is) aspires to be a centre of excellence, leading in the development of local and renewable energy sources in the NWT for the benefit all residents, communities and Aboriginal governments".*

### Mandate

*"To plan and develop safe and environmentally responsible energy projects to serve existing and new energy requirements in the NWT."*

### Values

- Acting ethically and honestly, treating employees, partners, and others with fairness, dignity and respect;
- Respecting and protecting the environment in all our activities to ensure a sustainable environment for the NWT and northerners; and
- Operating in an economically efficient manner.

### Guiding Principles

In achieving our Vision and Mandate, we will:

- Communicate in an open and timely manner;
- Work in partnership with communities and Aboriginal governments to assess and develop local and renewable energy sources in the NWT;
- Be a source of expertise in project management, environment, engineering and economics in relation to hydro and renewable energy development;
- Work to develop hydro and renewable energy resources in an environmentally responsible manner; and
- Prioritize developments that aid in extending NWT transmission to link more NWT communities.

## **2. Strategic Goals**

To realize NT Energy's vision, four Strategic Goals have been identified:

1. Assess and develop community power projects that utilize local and renewable sources of energy;
2. Promote and develop alternative energy solutions for NWT communities;
3. Develop a comprehensive NWT Power System Plan; and
4. Develop partnerships with Aboriginal governments and industry and become the power supplier of choice for industry and new resource developments.

Achieving these goals will require working closely with all governments and the development of partnerships with Aboriginal corporations and industry. These goals provide the basis for NT Energy's key business areas, discussed below:

### **1. Local and Renewable Community Power Supply**

This area is focused on moving NWT communities to a more sustainable electricity system – one which makes greater use of local and renewable sources of energy supply. The first option is always renewable. However, local supplies of natural gas can also be significantly less expensive and are much less greenhouse gas emission intensive than the imported diesel used to generate electricity in many of our communities today.

The NWT has a legacy of hydro development in the North and South Slave regions that continues to pay dividends today. Expansion of hydro is often the most attractive option. For many communities, other renewable solutions will be more viable, including wind, solar, biomass, and geothermal. These solutions may add to energy costs in the short term and require some support from government, but done strategically, they will enhance the sustainability of our communities in the long term.

### **2. Alternative Energy Solutions**

This area builds upon key business area 1 to include heating solutions for residents and businesses. Community power supply projects can often generate heat as well as electricity. The Northwest Territories Power Corporation already utilizes residual heat from diesel generators in communities such as Fort Liard and Fort McPherson. Biomass and geothermal options, for example, are well suited to supplying power as well as heat.

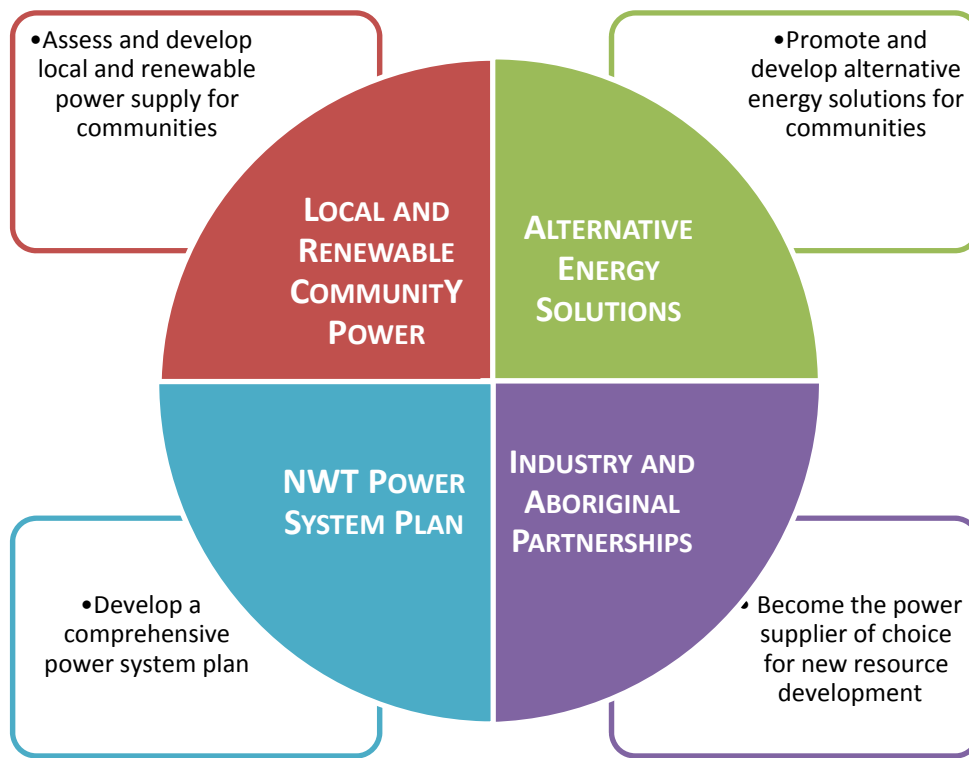
### **3. NWT Power System Plan**

The power industry and the economics of investment are all about scale. Larger customers and more demand leads to improved economies of scale. Economies of scale lead to lower power prices and the opportunity for wealth creation. Identification of future opportunities for expansion, including a grid to link communities and future electricity generation developments needs to be outlined in a thirty year NWT Power System Plan. Power is a fundamental requirement to grow our economy and ensure the sustainability of communities for future generations. It's time to develop a comprehensive plan to achieve this.

#### 4. Partnerships with Industry and Aboriginal governments

The NWT is currently benefiting from legacy hydro infrastructure, but industry cannot support legacy infrastructure on its own. For example, a 10-15 year mine cannot pay for 100 year infrastructure, but it can help. The challenge is to find ways to bridge the gap between short term savings from remote diesel and the long term energy infrastructure we need to grow our economy sustainably. Becoming the power supplier of choice for resource development and industry is one way to address timing issues of development. An NT Energy partnership could provide diesel power in the short term with a view to bridging to renewable energy in the longer term.

**Figure 2 - NT Energy's Strategic Goals and key Business Areas**



### 3. NWT Energy Sector and NT Energy's Role

The environment in which the Corporation operates has a significant impact on how business strategy is developed and pursued. Like any company, issues such as the general performance of the economy, competitive pressure in the market, and the political environment must be considered when evaluating potential strategic opportunities and threats. The following is a brief overview of the key external factors facing NT Energy.

#### NWT Renewable Energy Sector

Development of hydro and other renewable and alternative energy sources has been identified by the Government of the Northwest Territories (GNWT) as a major priority for the NWT. The GNWT released the draft Northwest Territories Hydro Strategy in 2008 and NT Energy has been tasked with implementation of the Strategy. NT Energy is a recently formed crown corporation and has been focusing its efforts on implementation of the draft hydro strategy but its mandate extends beyond hydro and transmission development.

NT Energy is also providing technical support on other renewable energy sources and projects. Research and development of renewable and alternative energy sources in the NWT is done by a wide variety of territorial and federal government departments and non-profit organizations which include:

- Department of Environment and Natural Resources (ENR) - GNWT
- Department of Industry, Tourism and Investment (ITI) - GNWT
- Arctic Energy Alliance (AEA)
- Arctic Research Institute (ARI)
- Canadian Northern Economic Development Agency (CanNor)
- Aboriginal Affairs and Northern Development Canada (AANDC)
- Natural Resources Canada (NRCAN)
- NWT Energy Corporation (NT Energy)

Other departments are also involved with construction and project management (e.g. Department of Public Works) in the construction of renewable energy projects.

In the NWT, research and development of renewable and alternative energy sources is most actively being done by AEA, ENR, ITI and NT Energy. AEA focuses on delivering programs and expertise to make residential and commercial buildings more energy efficient. ENR has taken an active role in researching alternative energy technologies and supporting communities and the private sector to develop renewable projects in the north (e.g. Tuk Wind Project, Fort Liard Geothermal). Although this is positive for developing renewable and alternative energy in the NWT, more can be done to define roles and responsibilities, improve communication and collaboration in the NWT energy sector to advance initiatives more effectively. NT Energy is well positioned to support and in some cases lead these efforts.

#### Electricity and Heat

To date, NT Energy has focused on developing electrical generating sources, and modest investigations into heat. Throughout this report, use of the word "power" generally indicates electricity, whereas "energy" is used in the broader sense to mean either electricity or heat. Many forms of renewable energy sources provide cogeneration of heat and electricity, making them ideal for providing heat to a district heat system. NT Energy will continue to focus on

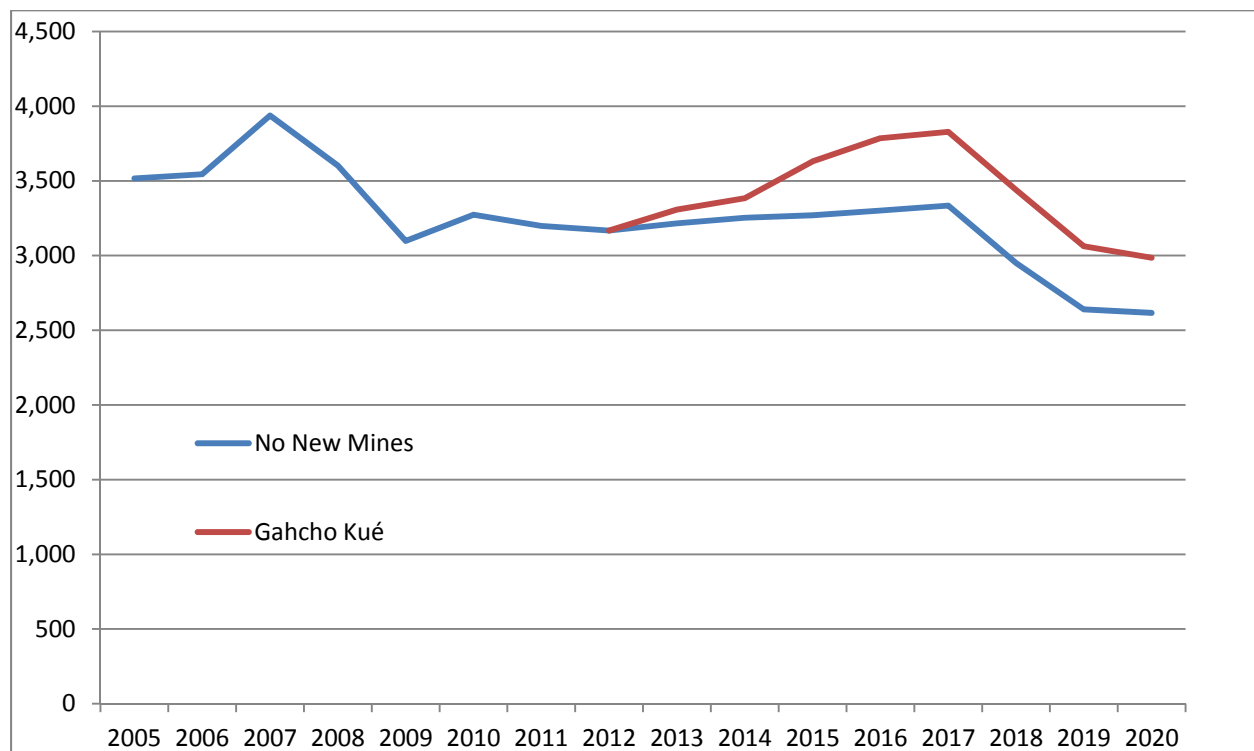
electrical generation, but will support efforts to assess the heat potential from various energy technologies and sources.

### Economy

A key barrier for resource development, the foundation of our NWT economy, is access to reliable energy supply. NT Energy is working to change that.

The NWT is largely a resource-based, trading economy with exports representing 65% of the total GDP. Over 90% of exports are two goods: diamonds and oil. Between 1999 and 2005, the NWT benefited from rapid economic growth and investment primarily in the mining and oil and gas industries. In 2007 the resource sector accounted for 75% of all investment. Over the last few years, economic activity has been steady or declining with limited new growth prospects, as shown by a number of economic indicators. For example, NWT population growth has been minimal, increasing only 1% since 2006 compared to 7% growth in the Yukon, 9% in Alberta and 8% in Nunavut. Below is projected Gross Domestic Product from the NWT Economic Impact Model is a tool supported by Industry, Tourism and Investment and the Department of Finance.

**Figure 3 - GDP Impacts, Millions of 2002 Dollars**

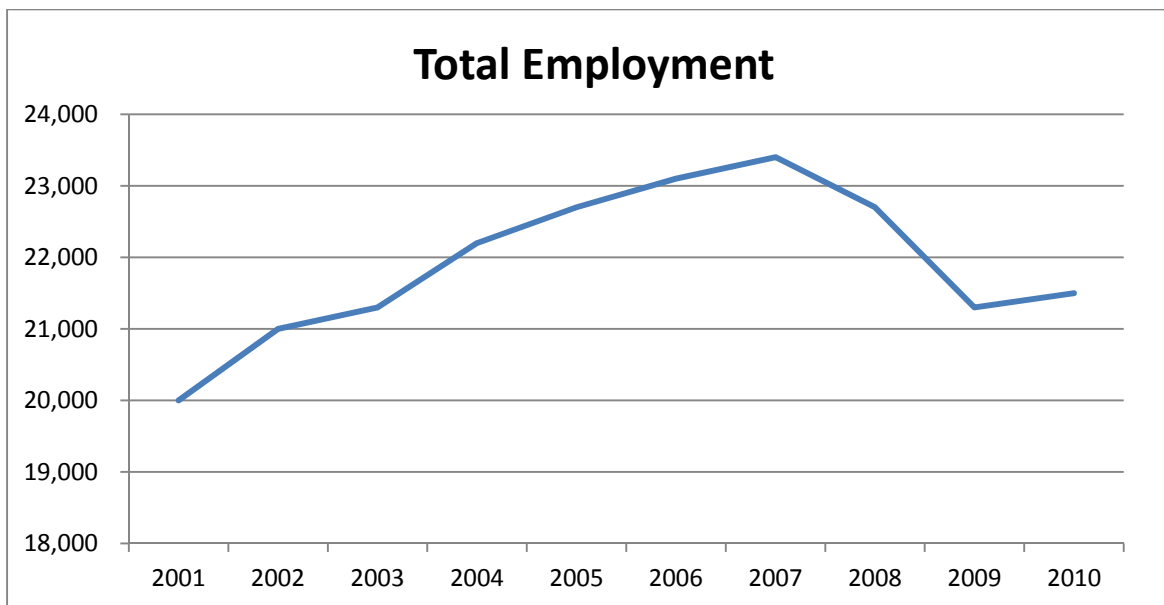


The chart above plots the forecasted GDP under two scenarios, one with no new mines and Ekati closing by 2017, and another with the Gahcho Kue diamond starting in 2013. There would be a huge spike in GDP during the construction but actual production would not offset the closure of the Ekati mine.

As can be seen below, there is a direct correlation between resource development and employment.



**Figure 4 – NWT Employment**



When one considers declining oil and gas production and maturing diamond mines, some would argue that the mid to long term outlook for the NWT economy should be a concern.

In addition to Gahcho Kue there are a number of other potential mining developments on the horizon. New development will be critical to our economy and NT Energy believes that there will be future power opportunities with new development. Development of new energy infrastructure in the NWT can support future development, add value to our economy, and wealth creation for Aboriginal governments.

Capacity and Expertise

NT Energy is a dynamic office with four full-time employees. The unique nature of our role in the energy sector requires a diverse knowledge base at the staffing level that can conduct research and analysis to evaluate the feasibility of renewable energy projects; actively manage projects; and develop effective business structures to achieve success. Skills development, retention and succession planning are important factors that have to be considered going forward. NT Energy relies on NTPC to provide financial and administrative management services.

Environmental Sustainability

NT Energy is committed to developing hydro and renewable energy projects in an environmentally responsible manner. Being responsive to regulator and stakeholder concerns in the development of energy projects is important to address concerns and be proactive.

Some of our high-level sustainability initiatives include maximizing the use of renewable hydropower, evaluating other forms of renewable generation (e.g., solar, hydrokinetic, wind) and reducing the consumption of diesel wherever possible.

## Generation/Transmission Outlook

NT Energy is working to study and harness local sources of energy across the Territory. There are a number of small and medium scale (500kW – 50 MW) opportunities to expand the hydro capacity and the transmission grid in the NWT. Other local, non-renewable sources of supply, such as natural gas already contribute significantly to reduced energy costs and options to maintain it as part of the Territory's energy supply mix need to be considered. Local community energy supply projects would serve to reduce greenhouse gas emissions and diesel fuel consumption in communities and could potentially meet emerging industrial load in the territory. Other community scale renewable alternatives that provide continuous energy supply, such as geothermal and biomass show considerable promise, while intermittent renewables such as wind and solar power are becoming part of sustainable energy production in the North. Smaller scale, renewable generation projects provide immediate environmental benefits, but in most cases do not serve to stabilize or reduce power rates without a government subsidy. More immediate territory wide cost reductions can only be realized by investing in larger scale, proven energy technologies.

There are a handful of larger scale hydro opportunities in the NWT (100 – 1000 MW) that would have a more immediate impact on the cost of living by creating the foundation for a larger NWT grid, reducing power rates and enhancing reliability across the North.

**Figure 5 – NWT Hydro Potential**

<b>NWT - KNOWN HYDRO POTENTIAL</b>			
<b>NWT River</b>	<b>Developed (MW)</b>	<b>Potential (MW)</b>	<b>Proposed (MW)</b>
Bear	0	568	0
La Martre	0	27	13
Lockhart	0	269	0
Mackenzie	0	10,450	0
Snare	30	33	0
Snowdrift	0	1	1
Taltson	18	200	56
Yellowknife	7	0	0
Petitot	0	35	0
Mountain	0	30	0
Redstone	0	260	0
<b>TOTAL</b>	<b>55</b>	<b>11,873</b>	<b>70</b>

These larger scale projects would also create wealth and long term returns for project owners but are only possible where there is considerable market demand – far beyond current NWT community loads and growth projections. Given the vast distances and widely dispersed population base of the NWT, larger projects are only possible where a substantial power market materializes. This is possible either from the emergence of a major industrial project (like the Mackenzie Gas Project) or through grid connection with the rest of Canada.

Grid expansion within the NWT and inter-connection with the rest of Canada could be done as part of a phased approach to reducing costs for residents and communities as well as

diversifying the NWT economy. Grid connection would expand the customer base, spread costs more broadly and reduce greenhouse gas emissions, while enhancing system reliability. It could also provide a catalyst for sustainable economic development by reducing risk for prospective developers and industry in the North. For example, access to renewable grid connected energy would eliminate the need for stand-alone diesel plants; reduce environmental impacts and the cost of doing business in the remote North.

## Regulatory Outlook

NT Hydro is a Crown Corporation, established in 2007 under the *Northwest Territories Hydro Corporation Act* and is 100 percent owned by the Government of the Northwest Territories (GNWT). NT Hydro owns 100 percent of NT Energy, an unregulated entity established under the *Business Corporations Act* and the Northwest Territories Power Corporation (NTPC), a Crown Corporation established under the *Northwest Territories Power Corporation Act*. This corporate structure has been adopted to facilitate the development of energy projects on an unregulated basis while protecting the GNWT's investment in the regulated activities of NTPC.

Over the past few years, the GNWT has taken a much more active role in promoting the development of renewable energy sources. Developing the draft NWT Hydro Strategy (2009) is an example of the GNWT's focus on the renewable energy sector. This activity has placed increased demand on NT Energy to study and quantify the NWT's renewable energy potential. This level of activity is expected to persist into the future as energy issues and the cost of living are anticipated to remain priorities of the government for the next several years.

More recently NT Energy, through Dezé Energy which is a joint venture between NT Energy and the Akaitcho Government and NWT Métis Nation, has been involved in environmental permitting processes for the Taltson Expansion Project. This process involved multiple regulatory bodies, a comprehensive application, consultation and hearing processes that helped to build internal capacity in navigating hydro projects through the NWT approval process and also exposed regulatory agencies, accustomed to mining developments, to the unique aspects of hydro development projects. It is expected that large projects undertaken by NT Energy are likely to require a similar level of environmental review and oversight in the future and internal experience will inform and improve the processes in the future.

## **4. Long-term Objectives for NT Energy**

NT Energy continues to exist because it provides value to customers and its shareholder (GNWT) by carrying out GNWT energy initiatives and programs and leading and supporting energy projects. NT Energy will work to clarify the path forward by proposing options, engaging with residents, communities and governments and proposing what the future NWT Power system should look like, now and in the future.

### **A Strategy for Achieving NT Energy's Long-term Objectives**

Much of NT Energy's work will be exploratory in the near term, continuing to quantify and define available renewable energy resources, educate about opportunities and work in partnership with stakeholders to examine local and regional options for electrical generation at a community and regional scale. A five year plan is being developed for the shareholder that builds on the principles of the NWT Hydro Strategy, NWT Energy Plan, The NWT Water Stewardship Strategy, The Greenhouse Gas Strategy, the Biomass Energy Strategy and others to provide a

vision for electrical generation and transmission. This plan proposes to continue important exploratory work and to identify a host of potential options for the NWT as part of an energy map for the future. The long term vision is to harness cost effective, local energy supply sources and where possible to integrate this energy supply into an expanded grid system in the NWT.

These objectives are specific statements describing the actions needed to meet the strategic goals outlined in Section 3.

### **Strategic Goal #1: Local and Renewable Community Power Projects**

#### **Goal: Assess and develop renewable power projects for communities**

##### *Objectives:*

1. *Build a strong relationship with governments (GNWT, Federal and Aboriginal)*

##### *Actions:*

- a. Develop a communication / marketing plan
  - b. Engage / implement the communication / marketing plan
  - c. Maintain relationships / follow-up / monitor feedback loop
  - d. Develop marketing materials
- 
2. *Carry out a renewable resource assessment study for each region (This assessment would build on and enhance the existing Community Energy Plans developed by the Arctic Energy Alliance).*

##### *Actions:*

- a. Complete a Regional Hydro Assessment for Gwichin and Inuvialuit Settlement Area
- b. Complete a Regional Hydro Assessment for Dehcho
- c. Complete a site-specific study for hydro in the Sahtu
- d. Share findings with / engage specific communities in the Regions
- e. Review Geothermal favourability for Regions
- f. Review Solar Potential by Community
- g. Review Wind Potential by Community
- h. Determine potential costs for each technology by community
- i. Determine marginal costs for diesel generation by community
- j. Compile a comprehensive study

### **Strategic Goal #2: Alternative Energy Solutions**

**Goal: Understand and assess cost-effective alternative fuel opportunities for communities**

1. *Understand biomass markets for the NWT*

Actions:

- a. Review the GNWT Biomass Energy Strategy and related studies, working with NTCP and ENR Forestry
- b. Produce a brief discussion paper on the economics of district heating for biomass for funding discussion
- c. Develop Terms of Reference (RFP) for studies on district heating for biomass
- d. Develop a final report on the economics of district heating for biomass

2. *Continue to support ENR's Biomass Energy Strategy*

Actions:

- a. Provide input as required, dedicate human resources

3. *Understand markets for geothermal district heating*

Actions:

- a. Review literature on geothermal heat potential in the South Slave
- b. Produce a brief discussion paper on the economics of district heating for geothermal for funding discussion
- c. Develop Terms of Reference (RFP) for studies on district heating for geothermal
- d. Develop a final report on the economics of district heating for geothermal

4. *Continue to support ENR as the lead for Geothermal Projects*

Actions:

- a. Continue to provide technical and economic due diligence as requested

**Strategic Goal #3: NWT Power System Plan**

**Goal: Develop support from key stakeholders for a long term Power System Plan**

Objectives:

1. *Build a strong relationship with the GNWT to explore long term energy options*

Actions:

- a. Gain support from the Minister of NTPC and from the Ministerial Energy Coordinating Committee (MECC)

2. *Develop a Long-term NWT Power System Plan*

Actions:

- a. Develop a work plan to complete the NWT Power Plan
- b. Develop a framework (Table of Contents) for the NWT Power Plan
- c. Estimate the cost for the study component of the Plan
- d. Draft Terms of Reference for studies (Pre-Feasibility Desktop Study)
- e. Award contracts
- f. Review the reports (study results)
- g. Produce the final Long-term NWT Power Plan
- h. Develop Stakeholder Engagement Plan

#### Strategic Goal #4: Industry and Aboriginal Partnerships

**Goal: Be the power developer of choice for industry and aboriginal partnerships.**

Objectives:

1. *Build strong relationships with industry and aboriginal governments*

Actions:

- a. Develop a communication / marketing plan
- b. Engage / implement the communication / marketing plan
- c. Develop marketing material for industry
- d. Update website for Marketing (ability to download brochures)
- e. Share information / study results

2. *Understand private sector needs (technical and qualitative (i.e. customer service issues, response times))*

Actions:

- a. Dialogue with Industry (plus research)

3. *Build a strong alliance with aboriginal governments*

- a. Build awareness of environmental and economic benefits
- b. Present case studies where First Nations have benefited from power development
- c. Ongoing dialogue through consultation

4. *Build a strong alliance with vendors / suppliers*

Actions:

- a. Identify a market of vendors (list)
- b. Dialogue with vendors

***It is critical to achieving NT Energy's Goals and Objectives that this document and the actions herein are reviewed, monitored and updated, annually.***