



⚡ Energy Strategy Discussion Guide

OCTOBER 2016



English

French

Cree

Tłuchó

Chipewyan

South Slavey

North Slavey

Gwich'in

Inuvialuktun

Inuktitut

Inuinnaqtun

Department of Public Works and Services: 867-767-9047 ext. 32028 or 867-767-9047 ext. 32083

Contents

Introduction	4
The Objectives	5
Energy Use by Sector	6
Where We Put Government Resources	7
The Issues	8
1. Reducing Energy Costs and Emissions	9
Energy Efficiency Programs and Services	9
Government Leading by Example	9
Reducing Heating Costs and Emissions	10
Reduce Transportation Costs and Emissions	11
Alternative and Renewable Energy Solutions for Electricity	11
Carbon Pricing	12
2. Making the Electricity System Work for Northerners	13
Independent Power Producers (IPP) and Net Metering	14
3. The Vision: A Long Term Approach	17
Thermal Communities	17
Hydroelectricity Expansion	18
Leveraging External Funding	19
Action Planning	19
The Discussion	19



Introduction

Having access to affordable, reliable and environmentally sustainable sources of energy is important to Northerners. Energy is used to heat and light our homes and businesses, and to transport goods and people. Northwest Territories (NWT) is remote, large and sparsely populated, which makes providing reliable and affordable access to energy more challenging in the NWT than other places. We have long, cold and dark winters that increase the amount of energy we need to stay safe and comfortable. Transmission and transportation of energy products over large distances to small markets greatly increases costs. Because of these factors the cost of energy is a significant contributor to the cost of living and doing business in the NWT.

The Government of the Northwest Territories (GNWT) plays a role in how energy is used, produced, supplied and regulated in NWT communities. In terms of energy use, the GNWT uses a large percentage of the NWT's total electricity, heat and transportation energy in government operations. In terms of energy supply, the GNWT's Petroleum Products Program provides close to ten percent of the liquid fuels used for heating, electricity and transportation in the NWT. Through its Crown Corporation, NWT Power Corporation (NTPC), the GNWT is responsible for the majority of the electricity supply in the NWT, making it well-positioned to develop renewable electricity projects that displace the use of fossil fuels. The GNWT is also responsible for establishing regulatory oversight and providing subsidies for the electricity system.

In 2017, the GNWT will release a new energy strategy to establish the principles to guide the approach to energy in the NWT. The energy strategy will focus on the affordability, reliability and environmental impact of energy by targeting the electricity, heating, and transportation sectors through the promotion of energy efficiency, and a focus on renewable and alternative energy. From this strategy the GNWT will develop actions to support reliable, affordable, and sustainable energy over the long term.

Issues related to the NWT's oil and natural gas resources will be addressed through a separate NWT oil and gas strategy. The GNWT's Department of Industry, Tourism and Investment will engage the public separately on that topic.

The GNWT's Department of Environment and Natural Resources is developing a Climate Change Strategic Framework that will detail the GNWT's approach to climate change. The framework will lay out the GNWT's approach to researching and monitoring climate change impacts, to adapting to the changing climate in the north, and reducing greenhouse gas (GHG) emissions. Most of the GHG emissions in the NWT come from energy use, and the new energy strategy will help guide the GNWT's future actions around reducing these GHG emissions. The GNWT will engage the public on both energy and climate change topics at the same regional public engagement meetings this fall.

This document is structured as follows:

- A discussion of the major energy issues that we face in the NWT, including: cost of living, GHG reductions, alternative and renewable energy solutions for electricity, heat and transportation energy, and energy conservation and efficiency;
- A section on making the electricity sector work for Northerners; and
- A discussion on the proposed long term approach that includes the potential expansion of hydroelectricity and the establishment of a target to reduce diesel use in NWT communities.

Your input is critical to the success of this new energy strategy, to help us get it right, and to address the energy issues that Northerners find important.



Collville Lake, NT 135 Kw Solar PV Installation. Photo credit - Wade Carpenter.

The Objectives

The GNWT uses three (3) key objectives to guide energy decision-making.

1. Ensuring energy reliability
2. Addressing energy affordability
3. Reducing environmental impacts from energy use

In practice, there is a need to balance these three objectives. Affordability is very important but our energy supply must also be reliable. In our arctic and sub-arctic climates it is critical that we have a reliable energy system. A failure in the supply of heating oil or electricity is not simply an inconvenience, it can quickly become a major emergency that can threaten infrastructure and public safety. The need for backup power is part of what makes our electricity system so expensive.

We must also address environmental impacts of our energy use, and transition to a lower carbon economy.

As we address the affordability, reliability and environmental impacts of energy in the NWT, the GNWT will continue to engage community and Aboriginal governments, which is a long standing principle of the GNWT.

Energy Use by Sector

It is important to understand how we use energy to know where we should focus our efforts to address affordability, reliability and environmental impacts.

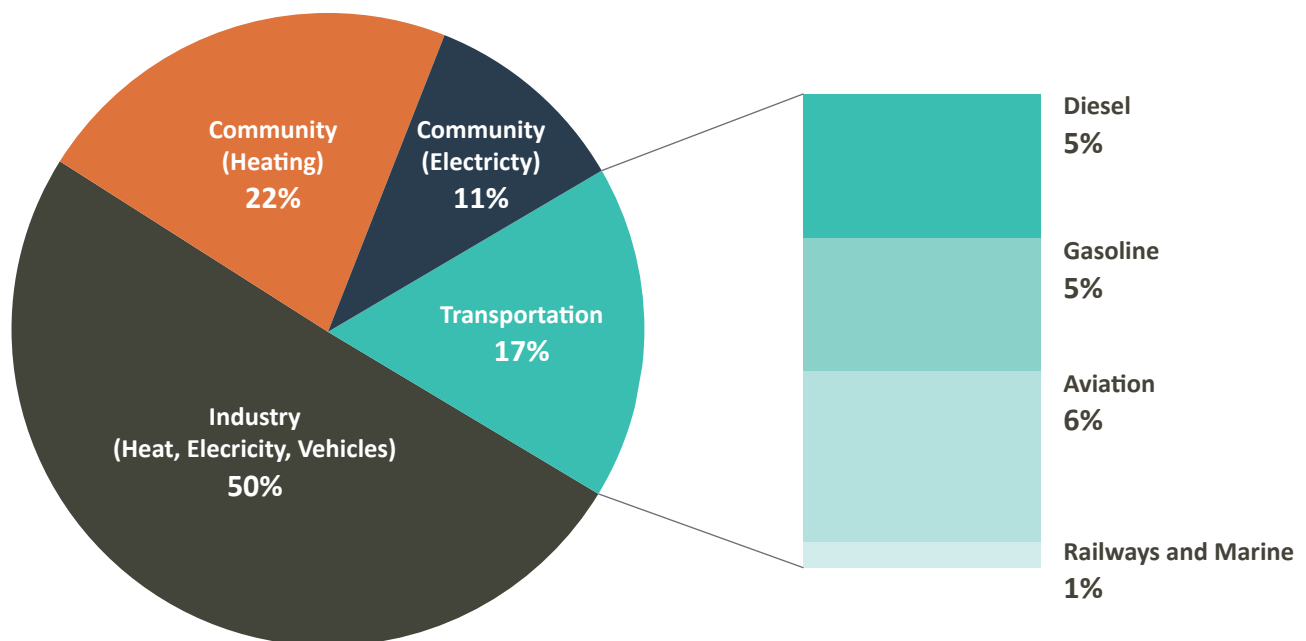
Below are two figures that show energy use by sector. Figure 1 includes energy use for industry which includes off road transportation, and Figure 2 is focused on communities.

By far the largest use of energy is by industry. Industry uses mostly fossil fuels, except for a small portion generated by wind energy at the Diavik Diamond Mine.

FIGURE 1: 2014 NWT Energy Supply by All Sectors

2014 NWT Energy Use by Sector

Total 25,163 Terajoules



A JOULE is a small amount of energy and the standard way to measure energy. A Terajoule is a unit of energy equal to a trillion joules. There is 3.6 million joules in a kilowatt-hour (kWh), which is another unit of energy you may be familiar with from your power bill. One kWh is enough energy to power ten 100W light bulbs for one hour.

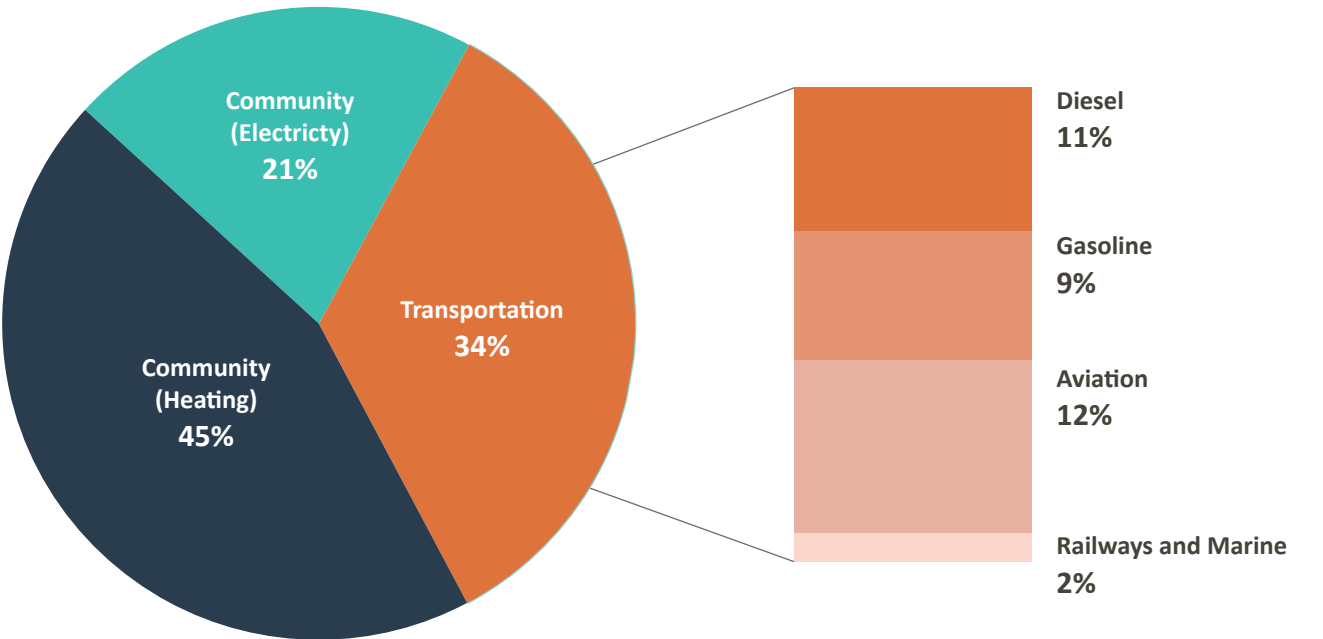
Figure 2 shows that almost half of the non-industrial community based energy use in the NWT is for heating.

Transportation is also significant at 34%, while electricity is a smaller percentage of our energy use but is a significant factor in the cost of living.

FIGURE 2: 2014 NWT Energy Use by Sector (Excluding Industry)

2014 NWT Energy Use by Sector (Excluding Industry)

Total 12,502 Terajoules



Where We Invest Government Resources

For the 2016-17 fiscal year the GNWT will spend about \$9 million on energy initiatives. Of this total, about \$500,000 is allocated for studies and research to ensure we are making the best decisions on where to invest in energy projects.

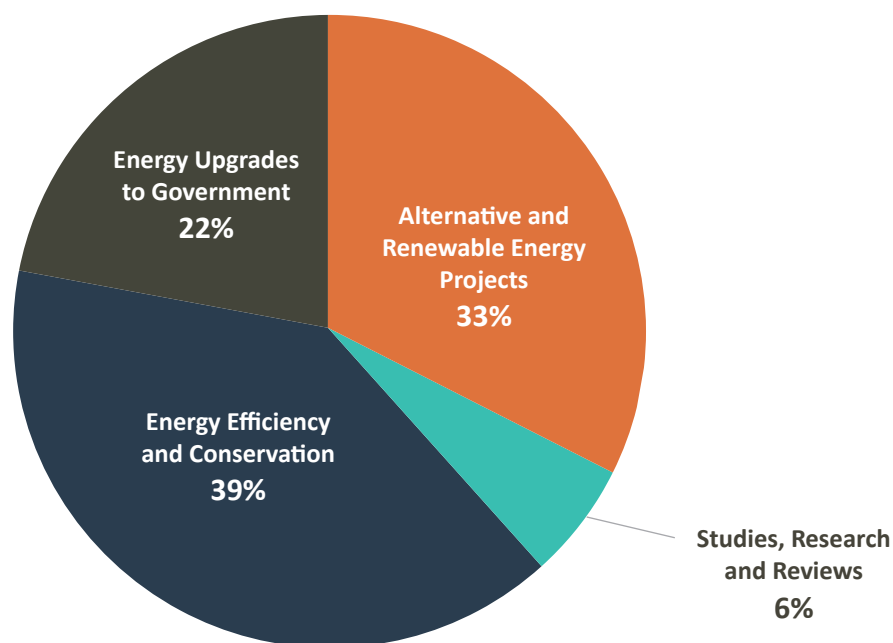
About one third of this budget was allocated for alternative and renewable energy projects, including wind energy project design in Inuvik, wood pellet boilers and electric heat in government buildings, and the installation of solar panels with special high efficiency generators in Aklavik. Finally, just over 60% of the budget was allocated for energy upgrades to

government buildings and for public energy efficiency and conservation programs for residents, businesses and communities offered through the Arctic Energy Alliance (AEA). The NWT Housing Corporation also makes substantial investments in energy efficiency in public housing, but this is not included in Figure 3.

FIGURE 3: 2016-17 GNWT Energy Initiative Funding

2016-17 GNWT Energy Initiative Funding

\$9 Million Total



The Issues

The new energy strategy will set the direction on how the GNWT will address the cost of living and climate change through a combination of promoting energy

conservation and efficiency, investing in local renewable and alternative forms of energy, and making the electricity sector work for Northerners.

1. Reducing Energy Costs and Emissions

The GNWT recognizes that energy efficiency and conservation programs are usually the most cost effective ways to reduce energy use, costs and greenhouse gas emissions. Another way to reduce emissions is to use alternative and renewable energy sources such as biomass, solar and wind energy. What follows is a discussion of reducing energy use, costs and emissions for various energy use categories and sectors including heating, government operations, transportation, and electricity.

Energy Efficiency Programs and Services

Supporting the use of energy efficient technologies is one of the most effective ways to reduce energy use, reduce costs and address climate change. Energy efficiency and conservation could be considered the ‘fuel’ of choice in the NWT as in many cases it is cheaper to save a unit of energy through energy efficiency and conservation than it is to produce a unit of energy.

The GNWT currently provides several energy efficiency programs and services through the Arctic Energy Alliance, a not-for-profit society. In 2016-17, the GNWT is providing over \$3 million to fund incentive programs and provide advice and support regarding energy efficiency and alternative energy options for residents, businesses and communities.

One observation made in the past is that incentive programs may not adequately reach lower income residents. Energy efficiency improvements can be expensive and still require homeowners to invest their own cash up front. This means that households that would benefit most from energy savings are least often able to achieve them.

The NWT Association of Communities has passed resolutions for the GNWT to allow municipalities to use local improvement charges as a means for residents to

finance energy efficiency improvements to their homes. The City of Yellowknife has developed a report on this issue called *Loans for Heat* ([see yellowknife.ca](http://yellowknife.ca)) that recommends changes to the NWT *Cities Towns and Villages Act* to allow municipalities to use local improvement charges to support residential energy efficiency investment.

Government Leading by Example

Through its buildings and operations the GNWT is the largest non-industrial user of electricity and heating fuel in the NWT. The GNWT leads by example through the Capital Asset Retrofit Fund Program, which provides funding for energy efficiency upgrades on government buildings funded through savings from previous energy improvements. The program reduces energy consumption and operating costs, as well as GHG emissions associated with the operation of GNWT buildings.

For Discussion

The GNWT proposes to continue to lead by example and ensure that government buildings are energy efficient and use alternative and renewable fuels for heating where feasible. The GNWT also proposes to continue to provide the incentives and tools required for residents, businesses and communities to manage their own energy costs through the Arctic Energy Alliance. Information on existing programs can be

found at the Arctic Energy Alliance website at aea.nt.ca. However, opportunities for improvement are always open for discussion, including:

- The GNWT could look for ways to improve energy efficiency programs and services to lower income residents and families.
- The GNWT could make changes to the *Cities Towns and Villages Act* to allow the larger tax-based municipalities to provide loans based on the value of their property as a means of helping residents finance energy efficiency improvements in their homes.



Do you have any comments on the GNWT approach to energy efficiency?

Are there other ways energy efficiency incentives and services for residents, business and communities could be improved?

Reducing Heating Costs and Emissions

The main ways governments can address costs and emissions from heating is to support energy conservation and efficiency efforts, and to influence the heating sector through promoting the use of alternative fuels such as biomass.

The GNWT is leading efforts to reduce emissions through energy efficiency, and by using low carbon heating sources such as wood pellets. By 2017-18, nearly 20% of GNWT heating should be provided through the use of biomass. The GNWT has also committed to using locally sourced biomass, promoting further expansion of this industry.

One unique opportunity to reduce emissions from heating exists in the South

Slave region. The Taltson hydro facility has between five and eight megawatts of surplus power and the GNWT has been using some of this surplus energy for electric heating. This surplus power can be sold at a reduced rate. Efforts will be made to expand the use of electric heating in the South Slave region. A recent report on the potential for the expansion of electric heating can be found at nwtenergy.ca.

In addition to biomass, natural gas holds some promise. There may be opportunities for the GNWT to promote the use of liquefied natural gas (LNG) by the private sector in all season road-connected communities.

For Discussion

- The GNWT proposes to continue to support biomass for heating in residential, commercial, and government buildings to help offset fossil fuel use and reduce GHG emissions.
- The GNWT proposes to continue to support the development of a locally sourced biomass fuel supply by giving priority to the procurement of locally sourced wood pellets.
- The GNWT continually assesses emerging technologies and their application in our northern environment. Some examples that the GNWT could assess include:
 - The feasibility of using heat pumps and renewables such as solar as in alternative heat sources in the NWT;
 - The feasibility of using liquid natural gas (LNG) based district heating in communities with economic access to LNG supply; and
 - The feasibility and economics of using small scale biomass combined heat and power systems in government buildings.



Are there other technologies that should be assessed and perhaps developed as pilot projects?

Reducing Transportation Costs and Emissions

Transport energy represents a significant percentage of the total energy use and associated GHG emissions in the NWT. Long transportation distances, the geographical remoteness of northern communities and a limited highway system means a heavy reliance not only on road and marine transportation, but on GHG intensive modes such as air travel. The introduction of new technologies on the market and stricter emissions standards at the federal level will likely improve the energy efficiency of the transportation sector in the NWT.

More fuel efficient vehicles that are less carbon intensive are becoming increasingly available. It is important to assess the viability of using hybrid electric cars in regions served by renewable hydro. The Arctic Energy Alliance tested an electric-gasoline vehicle in Yellowknife and found that the technology does work but the economics were challenging with electricity rates over 30 cents per kilowatt hour. The AEA report on electric vehicles is available on their website at aea.nt.ca.

Similar to electric heat, a reduced price for surplus hydroelectricity in the South Slave region would make electric vehicles a viable option.

We need to investigate if there are options for less carbon intensive fuel sources that would work in cold climate. Much of the NWT's diesel transportation emissions are from the transportation of fuel to mines and communities, and a shift from diesel to

renewables, such as hydro, would result in a significant reduction in transport emissions.

The GNWT's Department of Transportation is also taking action to promote energy efficient driving practices under their environmental strategy entitled "Green Light".

For Discussion

- The GNWT could lead by example and introduce hybrid and hybrid-electric vehicles into its vehicle fleet and heavy equipment as appropriate.
- The GNWT could continue to track the development of liquid biofuel technology and look for potential opportunities to use in cold climates.



How can the GNWT better encourage NWT residents, businesses and community governments to make smart transport choices allowing them to reduce their own costs and reduce greenhouse gas emissions?

Should the GNWT consider incentives to encourage NWT residents and businesses to purchase hybrid vehicles in all communities, or plug in hybrid-electric vehicles in hydro communities?

Alternative and Renewable Energy Solutions for Electricity

One of the priorities of the new energy strategy will be to increase the production of renewable and alternative electricity. The main goal is to reduce GHG emissions, and to help improve energy security and price stability. Renewable and alternative energy options include solar, wind, biomass, natural gas, and geo-energy. Fact sheets on these various forms of energy, as well as

information on the successful projects the GNWT has undertaken to date, can be found at nwtenergy.ca.

The cost of energy is a significant contributor to the high cost of living in the NWT. The GNWT has been subsidizing both large and small scale alternative and renewable electricity projects across the NWT to ensure that these desirable GHG reduction projects do not increase electricity rates. The deployment of cutting edge technology such as the Colville Lake solar-battery-diesel system, and the planned development of a wind project in Inuvik, requires subsidies to prevent further upward pressure on electricity rates. For example, the first major solar array in Fort Simpson, at a cost of \$1 million, required a GNWT contribution of over \$700,000 to make it affordable and economic.

The NWT is a leader in the use of biomass and currently ranks second in the country in installed solar power per person. In 2016-17, the GNWT will investigate the feasibility and undertake planning and design work for an Inuvik wind project, cutting-edge variable speed generator and solar project is also being installed in Aklavik. This project will allow for larger amounts of intermittent renewable energy to be put into the system, similar to what was achieved with the solar-diesel-battery system in Colville Lake.

For Discussion

- The GNWT will continue to invest in and build alternative and renewable electricity projects in the NWT to reduce fossil fuel emissions and increase energy security.

- The GNWT also proposes to continue to subsidize alternative and renewable energy projects to ensure that additional costs are not passed on to communities through electricity rates.



Are there other technologies or alternative energy sources that the GNWT should be investigating?

Carbon Pricing

The discussion around the cost and benefits of a carbon pricing mechanism is an issue that will be addressed through the climate change strategic framework. There is a discussion at the national level as a result of the First Ministers' Vancouver Declaration that commits all Canadian jurisdictions to:

"Transition to a low carbon economy by adopting a broad range of domestic measures, including carbon pricing mechanisms, adapted to each province's and territory's specific circumstances, in particular the realities of Canada's Indigenous peoples and Arctic and sub-Arctic regions."

Through the climate change strategic framework, NWT residents will have an opportunity to discuss various approaches to carbon pricing mechanisms, and to weigh the potential benefits of such a mechanism against the potential impacts on the cost of living in the north.

2. Making the Electricity System Work for Northerners

We use electricity every day to light our communities, run our appliances, and to power our televisions and computers. Electricity utilities in the NWT serve a population of about 44,000 people. The GNWT provides substantial subsidies to the system to reduce the impact electricity services have on the high cost of living in the NWT. It is important that the NWT is served by an electricity system that provides reliable, secure, affordable electricity. The system should also support the integration of low carbon generation sources to address climate change.

The GNWT plays a central role in the NWT's electricity sector. It establishes the regulatory structure for electricity utilities through the Public Utilities Board (PUB), it subsidizes utility rates and renewable energy projects, it owns the public electricity utility NWT Power Corporation (NTPC), and it develops and sets overall electricity policy for the NWT.

Overall, our electricity system is powered mainly by hydroelectricity. In an average year over 75% of community electricity (excluding industry) is produced using renewable hydroelectricity. Hydropower is available in the North Slave and services Yellowknife, Behchokò and Dettah, as well in the South Slave, servicing Hay River, Fort Smith, Fort Resolution and Enterprise. The remaining 25 communities are serviced mostly with diesel, and some natural gas in Inuvik and in Normal Wells.

Currently, most of the NWT's communities are powered by the NWT Power Corporation, a Crown Corporation owned by the GNWT. It operates all three hydroelectricity sites to provide power to the North and South Slave regions, and generates and distributes power to twenty-one thermal communities. Two other corporations, Northland Utilities (YK) and Northland Utilities (NWT), distribute electricity in Yellowknife and Hay River, and produce and distribute power in Kakisa, Fort Providence, Wekweètì and Sambaa K'e.

Communities in the NWT can enter into franchise agreements with utility providers to provide electricity services. These agreements are allowed under NWT legislation, which sets out the limits and requirements of these agreements. Franchise agreements expire from time to time, and it is up to the communities to decide who will get the right to then provide electricity.

In 2009-10, an extensive process was held to review electricity issues in the NWT. An independent panel travelled across the north and produced a report with recommendations. This document largely establishes the current GNWT policy framework for the electricity system in place today (see: nwtenergy.ca).

During the public review process the Electricity Review panel found that residents wanted to maintain ownership of NTPC. NTPC plays a critical role in the development of renewable energy sources for community electricity supply.

The GNWT also provides significant subsidies to NWT residents to reduce the cost of energy. This includes:

- About \$6 million per year for the Territorial Power Subsidy Programs which reduce residential electricity rates in all thermal communities to the Yellowknife rate;
- \$600,000 per year to maintain power rates in Northland Utilities diesel communities on par with NTPC diesel communities;
- Over \$3 million through Income Security programs for Income Assistance and Seniors Home Heating Subsidy clients;
- Subsidies for public housing that amount to over \$15 million per year; and
- Various one-time extraordinary subsidies that the GNWT has paid out due to low hydro levels and to reduce the impact of the 2012-13 electricity rate change.

A summary of annual energy subsidies can be found in the final pages of the 2013 Energy Action Plan located at nwtenergy.ca.

Some issues that have been raised in past public engagement activities include net metering and independent power producers. Some background information on these topics is provided below as a basis for public discussion.

Independent Power Producers (IPP) and Net Metering

The GNWT has taken steps to help residents supply their own clean, renewable power into the electricity system through net metering, where residents can install domestic scale renewables, feed extra electricity into the grid, and gain credits for future use. Another option to help increase renewable energy production is through independent power producers (IPP), where communities can install their

own renewable energy and sell power directly to the utility. IPPs are generally larger installations that sell power directly to the utility through an agreement, whereas net metering installations offset electricity use in a building.

Net Metering

Recently the PUB established more clearly defined and stable net metering guidelines for residents. There are some issues with net metering however. Net metering can increase the overall cost of electricity for people not participating in the program¹. This is why GNWT direction to the PUB included the provision that the PUB and utilities track the costs of net metering to the electricity system. It should also be noted that most of the net metered systems in place have received GNWT subsidies through renewable energy funding programs.

Two other issues with net metering may become important in the future. First, small isolated communities can only install a limited amount of intermittent renewables, such as solar or wind, before the electricity system becomes unstable. Therefore, it is conceivable that the GNWT will need to consider placing a limit on net metering in the future. The second issue relates to net metering in hydro communities. In NWT hydro communities there is already a surplus of renewable hydropower available. This raises the question of whether the GNWT should limit net metering in hydro communities.

¹Some jurisdictions that were leaders in net metering, such as the State of Hawaii (an isolated diesel-based market) have recently canceled their net metering programs, in favor of a lower feed-in tariff, as the ongoing cost of subsidizing residents to feed into the electricity system was becoming prohibitive.

An Independent Power Producers Policy

Recently the community of Łutselk'e became an IPP and sells solar power to NTPC, displacing about 2% of the annual diesel used for generation in the community. Łutselk'e has embraced the project and has determined that annual revenues made possible by this subsidized project will be re-invested into the community. The project raised awareness of energy issues in the community, and residents now feel that they are part of the solution in the transition to a low carbon economy.

It is expected that more communities will be interested in becoming IPPs and the GNWT could establish an IPP policy to make clear rules and balance the interests of individual communities with the electricity system as a whole.

In order to be viable the Łutselk'e solar project received subsidies from the GNWT, the federal government, and a private organization. While communities can benefit from investment by community renewable energy companies, it should be discussed if providing subsidies to individual communities is the best approach, or whether the government should reserve its limited subsidy dollars to have NTPC install renewables in thermal communities, for the benefit all NWT thermal communities.

For Discussion

- The GNWT currently supports net metering. This support is expected to be reviewed at such a time that the costs of net metering to all other customers on the system becomes significant.



Taltson Hydro Photo credit - NTPC

How Electricity Rates are Set

The rates that are paid in the NWT are based on the actual costs of providing electricity services such as fuel costs, the capital costs of generators and hydro facilities, operations and maintenance costs, interest on debt, and a fixed profit. Electricity rates have to represent all of these costs as the utility must remain a viable company.

The cost of a unit of electricity is essentially calculated by taking the entire cost of producing all of the electricity divided by all the units of electricity to be sold. For example, if it costs \$100 to produce 300 kWh of electricity, the cost of each unit of electricity to the user will be about \$0.33/kWh ($\$100/300 \text{ kWh}$). Knowing this is important because a high percentage of the costs to produce electricity are fixed costs such as hydro facilities and transmission lines. This is important to know because even if the demand for electricity is reduced, the cost for the utility to supply it may not be reduced by a similar amount. For instance, in the example above, the demand for electricity could go to 290 kWh, but the cost to produce it might only go to \$99,

meaning that per unit cost could actually increase to \$0.34/kWh.

Public utilities are required to seek approval from the NWT Public Utilities Board to set electricity rates. This is done through a two stage process called a general rate application. In the NWT, rates for various rate zones are set based on the Public Utilities Board's verified costs of providing electricity services in those zones.

This extensive process involves a utility justifying what it spends as well as justifying who should pay what costs in each rate zone. Utilities make a guaranteed but fixed profit in selling electricity, and when rates go up it is because of things like operating costs going up or replacement of generators, not because of extra profit by the utility.

3. The Vision: A Long Term Approach

Commitments at the national level, through the First Ministers' Vancouver Declaration and the Premiers' (Council of the Federation) Canadian Energy Strategy, express the need to transition away from oil towards a low carbon economy.

Through the Canadian Energy Strategy, a Remote Diesel Community Task Force was established. This working group is focused on sharing experience across the country and looking for ways to reduce the use of diesel in remote communities. As the NWT has 25 diesel-powered communities, the GNWT is an active participant.

Some of the actions discussed in the previous sections of this guide could be incorporated into a long term vision, but more could be done.

Thermal Communities

One item being discussed at the national level is the potential for jurisdictions to establish a target of reducing the use of diesel in remote communities by 25 per cent by the year 2025. In the development of the NWT energy strategy, the GNWT may choose to establish a similar target. Currently, remote NWT communities use the equivalent of about 22 million litres of diesel for power generation alone, causing the emission of 57,000 tonnes of CO₂ per year.

The GNWT has experience in reducing GHG emissions in remote communities. Figure 4 provides details on some of the energy projects completed or underway.

Reducing the current level of fossil fuels used for power generation by 25% in diesel communities would lead to a reduction of 13,000 tonnes of CO₂ annually. Achieving this reduction will require a mix of initiatives. Figure 5 provides a summary of what it might take to approach this 25% target.

Some of the projects listed perform better economically and therefore need to be subsidized less than others to avoid rate increases. This is the case for the LNG and Inuvik wind projects.

The largest project, a wind turbine system at Inuvik, represents half of the potential GHG reduction. If all new projects included in this list were implemented, GHG emissions would be reduced by over ten thousand tonnes, achieving about 80% of the target reduction. Achieving 80% of the target would require tens of millions of dollars in subsidies over the next decade. However, the costs of renewables is decreasing. Additional projects or transmission lines to connect some thermal communities to the existing hydro system would be required to fully achieve the 25% target. Through the energy strategy process, the GNWT will continue to refine these figures to determine the level of investment required to achieve this target.

It should be noted that electricity is not the only source of GHG emissions in communities. It is estimated that remote diesel communities also use approximately 32 million liters of fuel for heating and transportation, producing about 84,000 tonnes of CO₂ per year. Addressing these emissions is an opportunity to reduce GHG reductions and to reduce the cost of living in the NWT, but will require an even greater investment.

FIGURE 4: Select GNWT Renewable Electricity Project

EXISTING PROJECTS	COST	ANNUAL GHG REDUCTIONS (TONNES)	SUBSIDY REQUIRED	\$ SUBSIDY/TONNE GHG REDUCTION (LIFETIME)
Colville Lake Solar and Batteries	\$3,200,000	189	\$2,000,000	\$423
Łutselk'e Solar	\$330,000	25	\$165,000	\$264
Aklavik Solar	\$420,000	42	\$350,000	\$333
Fort Simpson Solar	\$1,070,000	70	\$963,000	\$550
TOTAL	\$5,020,000	326	\$3,478,000	--

FIGURE 5: Costs of Select Proposed Projects to Reach GHG Reduction Target

POTENTIAL PROJECTS	CAPITAL COSTS	ANNUAL GHG REDUCTIONS (TONNE)	SUBSIDY REQUIRED	\$ SUBSIDY/TONNE GHG REDUCTION (LIFETIME)
Solar and Batteries Projects (4 Communities)	\$10,200,000	700	\$7,600,000	\$434
VSG Solar (6 Communities)	\$22,500,000	1,405	\$16,800,000	\$478
Other Wind (3 Communities)	\$5,700,000	835	\$2,800,000	\$134
Inuvik Wind	\$29,800,000	5,208	\$15,000,000	\$115
LNG in Fort Simpson and Tuktoyaktuk	\$13,300,000	2,307	\$3,300,000	\$57
TOTAL	\$81,500,000	10,455	\$45,500,000	--



What do you think about the GNWT setting a target for GHG reductions in communities powered by fossil fuels?

Hydroelectricity Expansion

The NWT has significant undeveloped hydroelectric capacity, including relatively low impact sites on the Taltson system. If developed, these sites could help Canada reduce its GHG emissions and provide the NWT with export revenues.

A Taltson system hydroelectric expansion project could be developed in a relatively

short time frame if it could be connected to the North American market and if federal support was available. There could be potential to export power from the Taltson system to Alberta or Saskatchewan, both heavily reliant on coal-fired generation.

While challenging, given our distance from these markets, development of NWT hydro potential could diversify the NWT economy. In addition, a site on the La Martre River in the Tłı̄chǫ region has up to 13 MW of potential hydroelectric energy that could be developed if a customer for the power emerges, such as a new mine.

A long-standing policy position of the GNWT is that any hydroelectric development will be done in partnership with Aboriginal governments. If a customer emerges, both of the projects discussed above could provide an economic development opportunity for the NWT and potential revenue streams for Aboriginal governments in the relative near term.

Leveraging External Funding

The federal government has made addressing climate change a priority, and has engaged all of the provinces and territories. The federal government has also announced funding to support renewable and alternative energy initiatives. The GNWT will continue to engage with the federal government to leverage support for short and longer term energy projects in the NWT to help offset the cost of living as well as address climate change.

For Discussion

- The GNWT could pursue an expansion of the existing Taltson hydro facility to supply power to either Alberta or Saskatchewan. If there is enough interest expressed by these provinces, and the federal government, the GNWT would likely pursue this opportunity, in partnership with Aboriginal governments.



Do you agree that the GNWT should continue to pursue hydro development?



Taltson Hydro Photo credit - NTPC

Action Planning

The GNWT has had success over the past five years in implementing solutions to energy issues in the NWT. The GNWT has successfully undertaken many projects and initiatives related to renewable and alternative energy, energy efficiency, biomass, and solar to improve the energy situation in the NWT. Recent results can be reviewed in the recently released GNWT Energy Conservation Initiatives Report and the Annual Report of the Arctic Energy Alliance available here: nwtenergy.ca.

The Discussion

The success of the new long term energy plan will depend on your valued input. As such we invite you to provide feedback and your ideas and proposed solutions to the issues facing Northern with respect to energy.

There are many ways to participate.

1. You can send us an email:

NWTenergy@gov.nt.ca

2. You can send us mail:

Energy Plan Feedback
Energy Policy and Planning Division
Department of Public Works and Services
Government of the Northwest Territories
P.O. Box 1320
Yellowknife, NT
X1A 2L9

3. You can give us a call:

1-867-767-9045, extension 32004

For French you can call 1-867-767-9021 ext. 32013

4. You can participate in our joint energy and climate change public engagement process over the course of the fall of 2016.

Details of the public engagement can be found here www.nwtenergy.ca, or you can call us at the number above for details.