

NTPC GRA 2022-23

SAES Concluding Argument

In their General Rate Application to the NWT Public Utilities Board (NWTPUB), Northwest Territories Power Corporation (NTPC) has asked for rate adjustments over the next two years as follows:

- Thermal Zone – 2.5% increase in 2022-23 and a further 2.5% increase in 2023-24 to all customer classes.
- Snare Zone - 2.5% increase in 2022-23 and a further 2.5% increase in 2023-24 to all customer classes.
- Taltson Zone – 10% increase in 2022-23 and a further 10% increase in 2023-24 to all customer classes.
- Norman Wells (as rates transition into the Thermal Zone) - 10% increase in 2022-23 and a further 10% increase in 2023-24 to all customer classes.

In its Decision 2-2022 the NWTPUB rejected the NTPC Interim rate application for 10% increases in the Taltson Zone and Norman Wells and directed NTPC to apply an interim across the board increase of 2.5%.

Fairness as the Guiding Principle of Board Operation

Fairness is the key element of the Public Utility Board's legislated mandate. The NWT Public Utility Act, Section 48, Part 2 states that the sole responsibility for determining the fairness or reasonableness of proposed rates from a utility provider lies with the PUB. In this process, the role of NWTPUB is to determine the fairness of the rates proposed by NTPC. The GNWT through the Minister can provide policy direction, but the Board must rule on all issues of fairness. The Board must consider the utilities request for revenue as well as their apportionment of that revenue requirement to the customer base. This responsibility includes the fairness of existing revenue requirements and rates, as circumstances or new evidence can change previous decisions. Unjustified increases to costs or failures to utilize the system properly to maximize revenue are unfair to the customers and owners.

Historically, the central principle of fairness has been “user pay”. Cost of service was determined and rates set in each community to meet each systems revenue requirement. This principle was amended when the utility requested a “Rate Zone” system that assigns customers on the basis of generation technology. For example, the utility lumps together the costs of service for customers in all the thermal communities and applies a uniform rate to the non-government customers in the thermal communities. A similar practice occurs in the Hydro Zones. However, this amended

“user pay” fairness principle has not been applied to government customers, as each community has its own government rate. Regardless of how revenue requirements are met in each Zone, until the present GRA, rates have generally followed the “user pay” principle. In the current GRA, the Utility is asking for a new fairness principle to be applied. The utility has requested a major rate increase in the Taltson Zone that is not related to an increased cost of service in the Zone. The new fairness principle they wish to apply is to be based on relative rates. The customers with the lowest rates (i.e., those with the lowest cost of service) are being assigned an increased revenue share because they have the lowest rates. The NWTPUB must decide on the fairness of this new principle.

Reviewing the Evidence.

In its submissions during the evidence gathering phases of this proceeding, SAES has introduced evidence of:

- The global climate crisis currently unfolding.
- The global, national and NWT commitments responding to the climate crisis.
- The emerging energy transition from fossil carbon-based energy to net zero energy systems by 2050.
 - The opportunities created by this energy transition for the energy systems of the NWT including; Opportunities for electrical load growth in the heating, transportation and energy storage sectors.
 - Opportunities for cost reductions by transitioning from high cost, high carbon refined petroleum products to low cost, emission free renewable energy sources.
- Ways to increase the fairness of the proposed rate structure including:
 - More consistent application of GNWT Rate Policy.
 - Re-examination of the Taltson Zone Wholesale Rates.
 - Re-examination of the Common Cost allocations.
 - An accurate and precise estimate of the surplus energy currently available from the Taltson and Snare Hydro resources.
 - Development of a Net Metering policy that enables and promotes the installation of renewable energy systems.

Evidence Updates

In the period since SAES introduced this evidence, one third of Pakistan flooded, China experienced its worst drought on record, Europe is having its worst drought in 500 years, there is drought in Africa, across much of the US and Mexico. Thousands have died from environmental catastrophe and hundreds of millions are suffering. We are only at 1.2C degrees of warming.

The IPCC published a report; [Climate Change 2022 Mitigation of Climate Change](https://www.ipcc.ch/report/ar6/wg3/?s=03). <https://www.ipcc.ch/report/ar6/wg3/?s=03> which concludes;

“Reducing GHG emissions across the full energy sector requires major transitions, including a substantial reduction in overall fossil fuel use, the deployment of low-emission energy sources, switching to alternative energy carriers, and energy efficiency and conservation. The continued installation of unabated fossil fuel infrastructure will ‘lock-in’ GHG emissions.”

And “Electricity systems powered predominantly by renewables are becoming increasingly viable. Electricity systems in some countries and regions are already predominantly powered by renewables. It will be more challenging to supply the entire energy system with renewable energy. Even though operational, technological, economic, regulatory, and social challenges remain, a variety of systemic solutions to accommodate large shares of renewables in the energy system have emerged. A broad portfolio of options, such as integrating systems, coupling sectors, energy storage, smart grids, demand-side management, sustainable biofuels, electrolytic hydrogen and derivatives, and others will ultimately be needed to accommodate large shares of renewables in energy systems.”

The IPCC conclusions are supported by a team of scientists from 15 internationally leading research institutes who reviewed the science behind 100% renewable energy modeling. “The main conclusion of these studies is that **100% renewables is feasible worldwide at low cost.**”

“In most transition pathways, solar energy and wind power increasingly emerge as the central pillars of a sustainable energy system combined with energy efficiency measures. Cost-optimization modeling and greater resource availability tend to lead to higher solar photovoltaic shares, while emphasis on energy supply diversification tends to point to higher wind power contributions. Recent research has focused on the challenges and opportunities regarding grid congestion, energy storage, sector coupling, electrification of transport and industry implying power-to-X and hydrogen-to-X, and the inclusion of natural and technical carbon dioxide removal (CDR) approaches. The result is a holistic vision of the transition towards a net-negative greenhouse gas emissions economy that can limit global warming to 1.5°C with a clearly defined carbon

budget in a sustainable and cost-effective manner based on 100% renewable energy-industry-CDR systems”. <https://ieeexplore.ieee.org/document/9837910> .

The growing consensus among scientists is that a 100% renewable global energy system by 2050 is technically and economically feasible and it will be a better system than what we have now. This new energy paradigm will be based on hydro, solar and wind energy, energy storage, sector coupling, and direct and indirect electrification of almost all energy services. <https://innovationorigins.com/en/researchers-agree-the-world-can-reach-a-100-renewable-energy-system-by-or-before-2050/> .

The "Green Shoots" Are Emerging.

Economies are decoupling economic growth from carbon emissions.

<https://www.vox.com/platform/amp/future-perfect/23447414/degrowth-decoupling-carbon-emissions-economic-growth>

They are taking advantage of increasingly inexpensive renewable energy technologies including; solar, wind, energy storage; new regulations on air pollution; and putting a price on carbon, which sends a price signal to consumers and markets seeking the lowest cost/price solutions.

In fact, decarbonisation can lower energy costs, lower health care costs, avoid catastrophic losses and stimulate economic growth. For example, the demand for the mineral resources required to transition to electrified transportation is stimulating the mining industry worldwide.

Energy Transition Progress

Solar has entered the terawatt era. “Rising from around 100 GW of solar capacity in 2012, the global solar market has grown exponentially and will surpass 1000 GW (1 TW) in 2022...this achievement follows an enormous 90% decrease in solar costs between 2009 and 2021* making solar a global phenomenon”

<https://www.solarpowereurope.org/news/2022-the-year-of-terawatt-solar>.

If current trends continue the world will add a second terawatt of solar generation by 2025. By 2030, the world will be adding a terawatt of solar generation per year. Earth will have 10+ terawatts of solar generation producing raw energy that is “too cheap to meter”. <https://www.theatlantic.com/science/archive/2022/10/inflation-reduction-act-climate-economy/671659/>. This is the renewable energy growth rate that is needed to meet the Paris target of keeping global warming to less than +1.5C.

Meanwhile, “Alberta's REP (Renewable Energy Program) contracted for new renewable generation at prices in the range of CA\$30 to CA\$43/MWh (US\$23 to US\$33/MWh), well below expectations and among the lowest procurement costs globally at the time. It

led directly to a nearly 50% increase in installed wind capacity in the province. Contracts for over 1360 MW of wind generation were signed at prices in the range of CA\$30 to CA\$43/MWh...These contracts have resulted in gains to the government of CA\$75.5 million (US\$60 million) ...In addition to this, we estimate that at least CA\$56 million in tradable greenhouse gas emissions credits have been surrendered to the government under the REP contracts. Thus, we estimate a cumulative surplus of over CA\$130 million to date.”

<https://www.sciencedirect.com/science/article/abs/pii/S0301421522004852?via%3Dihub>

And “the Alberta Electric System Operator (AESO) indicates 14,000 megawatts of installed solar capacity and 11,600 MW of wind — along with 5,800 MW of storage — are either under construction, have received approval or been announced by proponents”.

<https://calgaryherald.com/opinion/columnists/varcoe-a-rush-in-alberta-province-sees-flood-of-renewable-projects-with-more-growth-to-come>.

Saskatchewan has announced “400 MW of new wind generation and 300 MW of new solar generation for the region...by 2027”.

<https://discoverweyburn.com/articles/saskpower-to-bring-more-renewable-energy-generation->

Hydrogen

The “government of Canada and the province of Alberta announced Air Products would receive \$461 million in funding towards building the **world's largest net-zero hydrogen facility in the Edmonton region**. The \$1.6 billion hydrogen facility will be on-stream in 2024 and produce 165 million cubic feet of hydrogen per day. This world-scale facility positions the Edmonton region as the epicentre of Canada's hydrogen economy.”

<https://go.pardot.com/webmail/920723/320981202/0cff8a60c0e8c42a9473ef30b837ba62d80aff1528f4ee3ab74f80d2975e01cf>

“Canada is to introduce a new tax credit of up to 40% for hydrogen production, as part of an effort to bring the country’s incentive regime in line with the generous H₂ subsidies available over the border in the United States...In addition to hydrogen incentives, Canada’s finance minister Chrystia Freeland introduced tax credits of up to 30% for renewable electricity systems, energy storage systems and industrial electric vehicles”.

<https://www.hydrogeninsight.com/policy/canada-to-introduce-40-hydrogen-tax-credit-as-fears-mount-it-will-be-left-behind-by-us-ira/2-1-1346684>

“The Alaska hydrogen project is seeking \$850 million in federal funds to go with \$3.75 billion in private-sector funds, backed by offtake agreements from customers in the US

and Asia. Advantages include available natural gas and proximity to markets including Asia, supporters say. The DOE has \$8 billion and is expected to back 6-10 hydrogen hubs across the US. That money will be awarded in late 2023 or early 2024.”

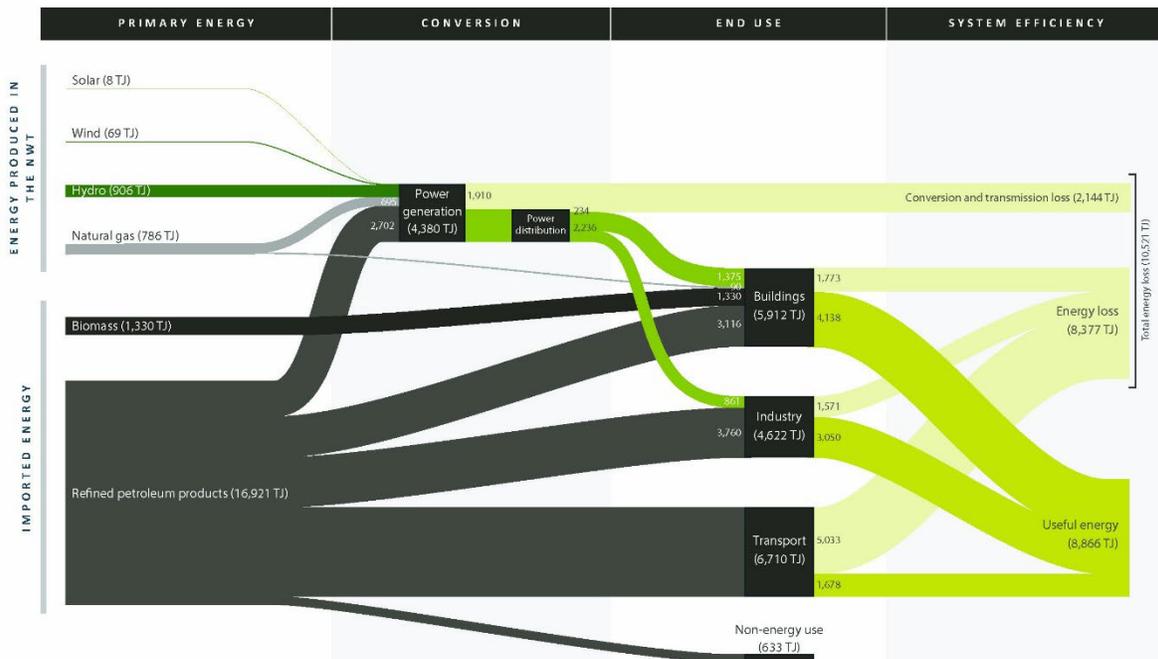
<https://www.kallanish.com/en/news/power-materials/market-reports/article-details/alaskan-agency-submits-dollar46-billion-hydrogen-hub-plan-to-doe-1122/>

The NWT Problem

GNWT has released an analysis of energy flows in the NWT that illustrates the magnitude and inefficiency of the Territory’s dependence on refined petroleum products in all sectors. It also shows the small contribution currently supplied by non-emitting renewable energy sources. Decarbonisation of the NWT energy system will require an enormous expansion of renewable energy generation and storage to electrify the services currently provided by refined fossil fuels (primarily diesel and aviation fuels).

<https://www.inf.gov.nt.ca/en/services/energy/2021-2022-energy-initiatives-report>.

The report lists the efforts made in the NWT to reduce Greenhouse Gas Emissions. These have been studies, plans and small, one-off, demonstration scale projects. Some have been creative and successful. But the report also shows how these minor efforts have had a minimal effect on actual emissions. It does not present a credible plan to achieve legislated targets. It does not present the “holistic vision of the transition towards a net-negative greenhouse gas emissions economy”, that is needed.



The evidence presented by SAES in this proceeding supports the conclusions that; the world is facing an existential climate crisis; world civilizations have recognized this crisis and begun a coordinated response; that response includes a global energy transition from high carbon fossil energy to decarbonized renewable energy sources, energy efficiency and energy storage. There is mounting evidence of consensus and progress towards Paris targets globally and in neighboring jurisdictions. There is mounting evidence that the new global energy system will be better than the current fossil carbon dominated system.

To meet its decarbonisation obligations, the NWT will need to increase its efforts by orders of magnitude. It must expand renewable energy generation to decarbonize electricity generation. It must then electrify energy services in the buildings, industry and transportation sectors. Clearly the role of an assertive, ambitious electricity utility is central to this mission.

But, the NTPC GRA 2022/23 reveals a publicly owned utility that is increasingly; financially unaffordable, environmentally unsustainable and dangerously insecure. Its costs are rising. Its sales are falling. Its supply chains are increasingly at risk. It forecasts no load growth. It forecasts a decrease in sales from solar and no sales from wind. It has not received policy direction from its shareholder on how to contribute to the GNWT or Government of Canada greenhouse gas commitments. NTPC proposes business as usual with a larger revenue requirement.

Some promising projects have been announced (wind and solar projects in Inuvik), but, NTPC has no plan to increase renewable energy penetration or to couple with other sectors in any of the Rate Zones. Instead, it retains a disingenuous “net metering” policy that caps renewable energy penetration at a ridiculously low level in order to protect the incumbent diesel generation systems. It has no plan to maximize the use of surplus renewable energy available in the hydro zones to offset the carbon emissions from heating, transportation or industry. It forecasts the continued installation of fossil fuel infrastructure that will ‘lock-in’ GHG emissions for decades (i.e., LNG in Inuvik and Fort Simpson etc.). At the same time, it allows large amounts of zero emission hydroelectricity to be wasted while customer rates inflate to unsustainably high levels in the Hydro Zones.

The GRA continues to use public subsidies and manipulated rate setting to reduce the unsustainably high cost and inconvenience of diesel generation in the Thermal Zone. This practice sends price signals that make high carbon fossil energy more affordable while non-emitting renewable energy becomes less affordable. It directly contradicts the purpose of carbon pricing, one of the key tools of decarbonisation. These practices are not those of an assertive, ambitious electricity utility with an “holistic vision of the transition towards a net-negative greenhouse gas emissions economy”, that is needed. They do not benefit NTPC ratepayers; they are not in the interest of the NWT public

owners; and not consistent with obligations to the other citizens of Earth. The NWTPUB must decide the fairness of these practices.

Other Fairness Issues

A) Fairness related to common costs.

The GRA shows common costs of \$33M out of a total budget of \$110M. Thirty percent of the revenue requirement is for headquarters administrative costs. It should be noted that NWT customers in the Hydro Zones also pay 100% of the administrative costs of Northland Utilities. We note as well the addition of 17 new administrative positions in the system with minimal justification. Is it fair for NWT customers to have to pay for such high administration costs?

B) Fairness in the 2018 Cost of Service analysis for the Taltson Zone.

SAES raised concerns with the COS Analysis done in 2018, especially with the costs assigned to the Wholesale and Interruptible Rates in the Taltson Zone. Approximately 60% of the energy sold in the zone went to Wholesale and Interruptible rate customers, but, only 33% of the cost was assigned to these customers. SAES concerns regarding investment costs, share of common cost and operational cost were dismissed by NTPC because the 2018 rate application had dealt with the issue. SAES notes that there were no interveners representing the communities of Fort Smith and Fort Resolution, during this 2018 process. Wholesale customers were represented by Northland Utilities and by the Town of Hay River.

Why does this matter? If costs were more fairly assigned, the percentage of costs assigned to Fort Smith and Fort Resolution would be lower. Those two communities would be paying over 90% of their costs, rather than less than 80% calculated by NTPC. The accuracy of the COS done in 2018 by NTPC is fundamental to their argument regarding disproportionate rate increases. The NWTPUB must determine fairness in this matter?

C) Fairness in the treatment of government rates for Fort Smith.

SAES has presented evidence to this process that shows the Government rates in Fort Smith are outliers to all other rates in communities where NTPC provides both generation and distribution services. In all other cases, government rates are set substantially higher than non-government rates. Generally, government rates are between 100% and 130% of the COS. This compares to non government rates which generally run between 80 to 100 percent. In Fort Resolution, government rates are set much higher than in Fort Smith. How is this fair to the non-government customers in Fort Smith?

D) Fairness in the development of potential markets for surplus electricity in the Taltson Zone.

The 90GWh of surplus hydroelectricity available in the Taltson Zone has remained remarkably stable over 30 years. This surplus will be increased by an additional 30GWh when the \$50M+ upgrade of the Taltson Dam is complete. This upgrade will increase the output capacity of the dam to 22 MW. Without new revenue streams, the cost of building and maintaining this surplus will be assigned to the customer base.

SAES has presented evidence that there is a large potential for use of this energy to replace fossil fuels for space heating in the South Slave. There is also an opportunity for the production and use of green hydrogen. The third potential is for the extension of the existing transmission grid to Ft Providence to service that community as well as Kakisa. Fourth, there is the opportunity to provide energy to a potential reopening of the Pine Point Mine. All of these potential uses have value and cost.

1. Space heating.

The cost of fossil fuel continues to increase. The opportunity to use 40GWh of surplus energy for heat during the winter months has many benefits. The existing rate for electric heat is \$.09/kwh. At that rate heat sales could generate new revenue of \$3.5M. A similar amount would be saved by those utilizing electricity instead of imported fossil fuels (the price of heating fuel in Fort Smith is approaching \$2/liter or ~ \$0.20/kWh), giving a net positive impact to the NWT economy in excess of \$7M annually.

The use of green electricity for heating would help the NWT meet its GHG commitments. The Town of Fort Smith, in its new Energy Plan has identified electric heating as an essential requirement to accomplish its GHG reductions. A constraint to electric heat from the Taltson is the lack of demand for 6 months of the year. Another constraint is the condition of the distribution system in Fort Smith. NTPC stated they were moving ahead with a study this year on upgrading that distribution system. Investment in the upgrading of the distribution systems in the communities could be significant, but could be amortized over a very long term.

2. Green Hydrogen.

The US has just announced subsidies of up to \$3/ kg for green hydrogen. Canada will follow suit. A potential scenario for the production of green hydrogen, in the NWT, would be a multi-MW scale electrolysis plant located on an industrial brown field site near Pine Point. Hydrogen could be made available as a fuel for long distance trucking (as is currently being promoted by the Alberta Government). It could be made available for use in mining operations or for backing up renewable

energy systems by producing electricity through fuel cells. In its early years, hydrogen production will need energy at very low cost. However, 50GWh of surplus energy sold for \$.03/ kWh could still generate revenue of \$1.5M per year from a resource that is currently wasted.

A hydrogen plant located on the Taltson grid would have the capacity to load follow and use any surplus in the system. Any low-cost sources of energy like solar could also be input anywhere on the grid. In more remote off-grid communities and industrial sites, green hydrogen produced on site could store energy to back up renewable energy systems. The NWT has a low-risk opportunity to enter the new energy paradigm that will reduce costs, add reliability, sustainability and independence all around the north. There is also great potential here to contribute to GHG targets.

3. Extension to Fort Providence.

The extension of the transmission line to Fort Providence would replace diesel fired electricity in two small communities where the total demand is less than 4GWh. This is less than 5% of the available surplus. A 150 kilometer transmission line will need to be installed. The existing diesel generation plants would have to remain in the community for emergency use. A large solar farm, with variable speed diesel generation and energy storage may well be a lower cost, more secure alternative with more opportunities for the communities to participate.

4. Mining at Pine Point.

NTPC has announced in the recent weeks a MOU with a mining company to potentially use the Taltson surplus, starting in 2028 at the earliest. This effort would have a ten year life span according to public releases by the company. The revenue at wholesale rates that now exist would be substantial and year round for that time period, if the mine plans go ahead. The potential to utilize the Taltson surplus for mining operations remains aspirational, it would be a temporary use with long term revenue requirements. Rate payers could be left responsible for recovering very long term costs. In any case, a mine would require emergency and supplemental on-site back up generation capacity.

An approach where the surplus is utilized to raise revenue and reduce costs would protect the interests of the rate payers and provide fairness to the system. The solution that can move most quickly, at lowest capital investment, and long term applicability should be given priority. That is electric heating for Fort Smith and in future Fort Resolution and Hay River. (There are over one hundred public housing units in Fort Smith with existing heating systems that can be modified simply to use electric heat).

The savings from these units would help offset the cost to GNWT of any rate increases.

Hydrogen production in the system can assist in mining development, in extending renewable energy benefits across the north and assisting the people of the NWT in moving towards net zero. The Taltson may be the first and most attractive source of renewable energy for the production of Hydrogen but not the last. Because Hydrogen is an excellent energy storage medium well suited for load following in any electric system, it's development will continue.

The PUB must consider the fairness of raising customer rates while continuing to waste surplus hydroelectricity when a variety of opportunities have been identified that would increase revenues and improve service. The Board should also consider the fairness of assigning all costs to the customers while withholding the benefit of surplus power for a potential private industrial customer.

E. Fairness of Public Participation

Another important consideration for the NWTPUB is the change in corporate governance that has taken place recently at NTPC. The publicly appointed quasi-independent NTPC Board and Chair have been terminated and replaced entirely by GNWT Deputy Ministers. Public participation in NTPC affairs has been eliminated. This by necessity increases the responsibility of the Board to respond to the concerns of the public. The NWTPUB process is now the only regulatory process that is available for public participation. However, the NWTPUB process is poorly designed for public participation. The quasi-judicial nature of Board proceedings is not conducive to public participation. Plain language is not used in correspondence or reporting. Utility documents are dense, poorly drafted, full of jargon, tediously repetitious and generally not informative to the public. The NWTPUB is a public board, it has the ability to include public participation, it must re-evaluate the fairness to the public of its current process.

Recommendations:

SAES Recommendation 1.

NWTPUB should not approve NTPC GRA 2022-23 without a credible plan to achieve decarbonisation goals that are at least consistent with the legislated targets of Canada.

SAES Recommendation 2.

NWTPUB should direct NTPC to remove the cap placed on renewable energy generating systems in its net metering policy. The cap should be replaced by a

target of minimum 50% of energy from non-emitting renewable generation in each generating system by 2030.

SAES Recommendation 3.

NWTPUB should direct NTPC to seek an independent external operational audit of the Common Costs identified in this application, to be completed in 18 months.

SAES Recommendation 4.

NWTPUB should direct NTPC to review the 2018 COS for the Taltson Zone and provide a fully detailed report, updated to 2022, as public information. This report will detail the breakdown of expenditure between rate classes and the rationale for those decisions.

SAES Recommendation 5.

NWTPUB should direct that government rates in Fort Smith be increased to cover 100% of its COS. This would be consistent with other full-service communities and would comply with GNWT policy direction. RCC should then be recalculated for the Taltson Zone.

SAES Recommendation 6.

NWTPUB should direct NTPC to work constructively with the Town of Fort Smith and the GNWT to set up a working group that will answer the questions and provide technical and administrative solutions for large scale use of electric heat in the community.

SAES Recommendation 7.

NWTPUB should direct NTPC to work constructively with the mining company to understand how their requirements for energy over the short term of their project can integrate with the long term needs of the South Slave communities.

SAES Recommendation 8.

NWTPUB should conduct an internal evaluation public participation in its process. The process should be revised to encourage and enhance public participation.

End

