NORTHWEST TERRITORIES

Energy Initiatives Report

Reporting on Actions under the *2030 Energy Strategy*

Rapport sur les initiatives énergétiques

Rapport sur les mesures prises dans le cadre de la *Stratégie énergétique 2030*

TERRITOIRES DU NORD-OUEST

2022-2023

Le présent document contient la traduction française du résumé et du message de la ministre.

Government of Northwest Territories
Gouvernement des Territoires du Nord-Ouest

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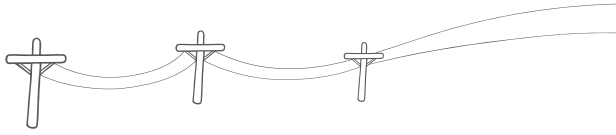


MINISTER'S MESSAGE

The Honourable Caroline Wawzonek
Minister of Infrastructure

Secure. Affordable. Sustainable. This is the 2030 Energy Strategy's vision for the Northwest Territories' energy system – a system that is less dependent on fossil fuels and contributes to the economic, social and environmental well-being of the NWT and its residents.

I am pleased to present the 2022-2023 Energy Initiatives Report, which details the progress made in realizing that vision and advancing the strategic objectives of the Energy Strategy.

Many of the Energy Strategy's initiatives are focused on reducing greenhouse gas emissions, contributing to the first goal of the Government of the Northwest Territories (GNWT) Climate Change Strategic Framework. The territory's collective efforts have yielded a 25% reduction in greenhouse gas emissions since 2005, placing us on track to meet our target of a 30% reduction by 2030. This accomplishment reflects a collaborative commitment from individuals, businesses and governments across the NWT.

This report outlines the key actions taken by the GNWT and its partners in the 2022-2023 fiscal year. A noteworthy highlight is the release of the 2022-2025 Energy Action Plan, a roadmap to help guide investments of $194 million over three years. This plan encompasses 68 unique actions and initiatives aligned with the strategic objectives of the Energy Strategy.

Moving forward, we remain steadfast in our commitment to improving the reliability of our energy system, stabilizing energy costs and reducing greenhouse gas emissions. The GNWT has forecasted significant emissions reductions, equivalent to annually displacing 18.2 million litres of diesel oil by 2028, translating to $27.2 million in savings for that year alone.

Our approach recognizes the unique circumstances of our vast geography and small population and facing challenges with innovative solutions and continued investment. The Energy Initiatives Report showcases initiatives such as the Greenhouse Gas Grant Program and the Arctic Energy Alliance's programs, which have delivered tangible benefits to our residents, communities and businesses. Just one example is the start of our investment in an electric vehicle fast charging corridor from Yellowknife to the NWT/Alberta border to reduce emissions from transportation. We also continue to advance important clean energy projects like the Taltson Hydro Expansion and the Fort Providence-Kakisa Transmission line.

Looking ahead, we are performing a review of the Energy Strategy and have engaged with Indigenous governments, Indigenous organizations, partners, stakeholders and the public in a multilateral dialogue. This marks an exciting opportunity to shape the future of our energy landscape collaboratively with our partners. It also comes at a time when the Government of Canada has pledged to achieve net-zero emissions by 2050. In this context, the review is considering if the approach in the Energy Strategy should evolve as we seek new pathways to a lower carbon future and secure, affordable and sustainable energy in the NWT.

These are dynamic times. The world is changing, and the NWT must change with it. As the Minister of Infrastructure, I am honored to lead the department through this transformative period and look forward championing this work in the 20th Assembly.

The Honourable Caroline Wawzonek
Minister of Infrastructure

MESSAGE DE LA MINISTRE

Madame Caroline Wawzonek
Ministre de l'Infrastructure

Sûr. Abordable. Durable. Un système moins dépendant des combustibles fossiles qui contribue au bien-être économique, social et environnemental des Territoires du Nord-Ouest (TNO) et de ses habitants : voilà la vision de la Stratégie énergétique 2030 pour le système énergétique des TNO.

J'ai le plaisir de présenter le Rapport 2022-2023 sur les initiatives énergétiques, qui détaille les progrès réalisés pour concrétiser cette vision et pour promouvoir les objectifs stratégiques de la Stratégie énergétique.

De nombreuses initiatives de la Stratégie énergétique visent à réduire les émissions de gaz à effet de serre, contribuant ainsi à l'atteinte du premier objectif du Cadre stratégique sur le changement climatique du gouvernement des Territoires du Nord-Ouest (GTNO). Aux TNO, les efforts collectifs ont permis de réduire les émissions de gaz à effet de serre de 25 % depuis 2005, ce qui nous place en bonne voie pour atteindre notre objectif de réduction de 30 % d'ici 2030. Cette réalisation est le fruit d'un effort commun de la part des particuliers, des entreprises et des gouvernements des TNO.

Le présent rapport fait état des principales mesures prises par le GTNO et ses partenaires au cours de l'exercice 2022-2023. Parmi les faits marquants, citons la publication du Plan d'action énergétique 2022-2025, une feuille de route visant à orienter des investissements de 194 millions de dollars sur trois ans. Ce plan comprend 68 mesures et initiatives uniques alignées sur les objectifs stratégiques de la Stratégie énergétique.

Pour l'avenir, nous demeurons résolus à accroître la fiabilité de notre système énergétique, à stabiliser les coûts de l'énergie et à réduire les émissions de gaz à effet de serre. Le GTNO a prévu d'importantes réductions d'émissions qui correspondraient à une réduction annuelle de 18,2 millions de litres de carburant diesel d'ici 2028 et se traduiraient par des économies de 27,2 millions de dollars pour cette seule année.

Notre approche tient compte des circonstances uniques inhérentes à notre vaste territoire et à notre faible population, et nous surmonterons les obstacles grâce à des solutions novatrices et à des investissements continus. Le Rapport sur les initiatives énergétiques présente des projets comme le Programme de subventions publiques pour la réduction des gaz à effet de serre et les programmes de l'Arctic Energy Alliance, qui ont généré des retombées concrètes pour nos résidents, nos collectivités et nos entreprises. Le corridor de recharge rapide pour véhicules électriques de Yellowknife à la frontière de l'Alberta pour réduire les émissions du transport routier, dans lequel le GTNO a commencé à investir, est un autre exemple de projet présenté. Nous continuons également à faire avancer d'importants projets d'énergie propre comme l'agrandissement de la centrale hydroélectrique Taltson et la ligne de transport d'électricité reliant Fort Providence à Kakisa.

Nous procédons actuellement à un réexamen de la Stratégie énergétique et nous avons entamé un dialogue multilatéral avec les gouvernements et les organisations autochtones, nos partenaires, les parties prenantes et le public. Il s'agit d'une formidable occasion de façonner l'avenir du domaine de l'énergie des TNO en collaboration avec nos partenaires. Ce réexamen arrive également au moment où le gouvernement du Canada s'engage à atteindre la carboneutralité d'ici 2050. À cet égard, nous nous demandons si l'approche adoptée dans la Stratégie énergétique doit évoluer de concert avec les nouveaux moyens qui permettront de réduire les émissions de carbone et d'assurer que les TNO bénéficient d'une énergie sûre, abordable et durable.

Nous vivons une époque en pleine évolution. Le monde change, et les TNO doivent changer avec lui. En tant que ministre de l'Infrastructure, je suis heureuse de diriger le ministère au cours de cette période de transformation et me réjouis de promouvoir ce travail à la 20e Assemblée législative.

L'honorable Caroline Wawzonek
Ministre de l'Infrastructure

LIST OF ACRONYMS

This page lists and spells out the acronyms used throughout the Report.

AEA ..... Arctic Energy Alliance

ARI ..... Aurora Research Institute

BEV ..... Battery Electric Vehicle

CARF ..... Capital Asset Retrofit Fund

CCSF..... Climate Change Strategic Framework

CFR ..... Clean Fuel Regulations

CIRNAC ..... Crown-Indigenous Relations and Northern Affairs Canada

CNG ..... Compressed Natural Gas

DDC..... Direct Digital Control

ECCC ..... Environment and Climate Change Canada

ECM ..... Electronically Commutated Motor

ECC ..... GNWT Department of Environment and Climate Change

EV ..... Electric Vehicle

GHG ..... Greenhouse Gas

GJ..... Gigajoule

GNWT..... Government of the Northwest Territories

HNWT..... Housing Northwest Territories

ICIP ..... Investing in Canada Infrastructure Program

INF ..... GNWT Department of Infrastructure

kt.....Kilotonne

kW ..... Kilowatt

LCELF ..... Low Carbon Economy Leadership Fund

LED..... Light-emitting Diode

LNG..... Liquefied Natural Gas

MTS ..... Marine Transportation Services

MW..... Megawatt

NIR..... National Inventory Report

NRCAN..... Natural Resources Canada

NTPC..... Northwest Territories Power Corporation

NUL..... Northland Utilities Ltd.

NWT ..... Northwest Territories

PPA ..... Power Purchase Agreement

PV ..... Photovoltaic

REACHE..... (Northern) Responsible Energy Approach for Community Heat and Electricity (Program)

SCEDE ..... Standing Committee on Economic Development and Environment

TJ ..... Terajoule

ZEV ..... Zero Emission Vehicle

EXECUTIVE SUMMARY

The 2022-2023 Energy Initiatives Report: Reporting on Actions under the 2030 Energy Strategy (Report) highlights new clean energy projects, upgrades to existing energy infrastructure, community energy initiatives, as well as energy conservation and efficiency programs the GNWT and its partners implemented in 2022-2023 for the benefit of NWT residents and businesses. Collectively, these advance the vision of a secure, affordable, and sustainable energy system that is less dependent on fossil fuels and contributes to the economic, social, and environmental wellbeing of the territory and its residents. Five years into implementing the *Energy Strategy*, the GNWT and its partners achieved a lot in 2022-2023.

The NWT is committed to reducing greenhouse gas emissions (GHG) by 30% below 2005 levels by 2030, when it is supposed to achieve 1,094 kilotonnes (kt) of carbon dioxide equivalent (CO_2e). In 2021, the most recent year for which data is available, NWT emissions were 1,287 kt CO_2e. This is a 25% reduction in GHG emissions since 2005 and the NWT is on track to meet its goal of achieving its 2030 emissions reduction target. This is due both to the planned actions by people, businesses, and governments across the NWT, as well as an anticipated reduction in mining activity in the late 2020s.

The GNWT invested $26.9 million to advance the objectives of the *Energy Strategy* in 2022-2023 and it is estimated funded actions and initiatives will reduce the territory's GHG emissions by 50.2 kt CO_2e by 2028. In addition, the GNWT also spent $21.3 million that year in programs and policies to help stabilize the cost of energy and support low-income households.

What follows is a selection of meaningful actions and initiatives that were undertaken under each strategic objective in 2022-2023.

WORKING TOGETHER

The GNWT continues to work with communities, Indigenous governments, Indigenous organizations, and businesses to develop energy solutions at the local level. Through the Arctic Energy Alliance (AEA), community energy planning processes were started with the Hamlet of Ulukhaktok, the Ka'aa'gee Tu First Nation in Kakisa, and the Village of Fort Simpson.

The GNWT also worked with the Government of Canada and Northland Utilities (NUL) to start renewable energy pre-feasibility studies for the communities of Wekweètì and Sambaa K'e as we look to advance community-led renewable projects that reduce GHG emissions, reduce energy costs, and provide economic benefits to Northern communities.

This was also a successful year for the GHG Grant Program, with 10 projects approved under the two streams of the program in 2022-2023. The program provides funding to support businesses, industry, communities, and government to develop projects that reduce their operating costs and reduce GHG emissions in the NWT.

REDUCE GHG EMISSIONS FROM ELECTRICITY GENERATION IN DIESEL COMMUNITIES

One major initiative that was completed under this objective is the Inuvik Wind Project, which was commissioned in fall 2023. The wind turbine is expected to deliver 30% of Inuvik's annual electricity requirements, reduce annual GHG emissions by 6 kt CO_2e, and offset diesel consumption by up to three million litres per year.

The GNWT also continues to advance the Fort Providence-Kakisa Transmission Line and the Whatì Transmission Line projects. A Land Use Permit application was submitted to the Mackenzie Valley Land and Water Board during the fall of 2023 for the Fort Providence-Kakisa Transmission Line, which was ultimately approved in December 2023.

This section also highlights GNWT's partnership with the Aurora Research Institute to monitor wind and solar resources across the NWT, and thus inform the next generation of renewable energy projects in the territory.

REDUCE GHG EMISSIONS FROM TRANSPORTATION

Transportation accounts for a large share of NWT emissions, representing 63% of the territory's GHG emissions in 2021. Increasing electric vehicle (EV) use in the territory is one of the main ways the GNWT intends to reduce emissions and costs from transportation, and 2022-2023 saw a lot of progress in this area.

In 2023 the GNWT announced $3.8 million in funding – $1.9 million provided by the GNWT and another $1.9 million from the Government of Canada – for NWT electric utilities to install EV fast chargers in Yellowknife, Behchokǫ̀, Fort Providence, Enterprise, Hay River, Buffalo Junction and Fort Smith. Once these charging stations are operating, which is expected to happen by December 2024, they will create a zero-emission charging corridor in the NWT.

INCREASE RENEWABLE HEAT AND ENERGY EFFICIENCY IN BUILDINGS

The AEA, which is funded by the GNWT, is one of the most important organizations helping the GNWT achieve these objectives. It is a non-profit society dedicated to helping reduce the costs and environmental impacts of energy in the NWT by providing programs and services to residents, communities, non-profits, and businesses. In 2022-2023, AEA delivered programs and services in all NWT communities, giving out a total of 2,656 incentives worth $1.3 million in combined value. This resulted in 1,400 megawatt hours (MWh) in energy savings. These incentives also avoided the use of 10,000 gigajoules of fossil fuels and reduced territorial GHG emissions by 1.1 kt of CO_2e. This year, the AEA also undertook a special project to test cold-climate air-source heat pumps in two homes in Yellowknife and report on the effectiveness and the economics of this emerging solution for heating in the North.

The GNWT's Capital Asset Retrofit Program (CARF) continues to provide great value to the territory. CARF delivers energy efficiency projects for GNWT facilities to reduce their GHG emissions, energy use and operating costs. In 2022-2023, approximately $3.7 million was assigned to energy retrofit projects, resulting in an estimated $290,000 of annual savings. Since the program began in 2007-2008, CARF projects have reached overall cumulative emissions reductions of 15.8 kt of CO_2e in GNWT-owned assets.

LONG-TERM VISION

The goal of this strategic objective is looking to the future—develop the NWT's energy potential, address industry emissions, and do our part to meet Canada's national climate change objectives.

Work done in 2022-2023 included releasing the *2022-2025 Energy Action Plan* in December 2022. The GNWT implements the *Energy Strategy* through three-year action plans. This plan includes 68 actions and initiatives aligned with the *Energy Strategy's* strategic objectives and commits $194 million in investment to fulfill the three-year plan. The Report provides a status update for each of these actions and initiatives in the Appendix section.

The GNWT also continued to advance the Taltson Hydro Expansion Project, which aims to more than double the hydro capacity in the NWT, connect 10 communities and unify the hydro grid that would cover over 70% of the NWT's population. Among the highlights of work done this year, the project team worked with its Indigenous government partners in exploring two routes for the transmission line that would connect the Taltson hydro system with the Snare and Bluefish hydro systems in the NWT's North Slave region.

The GNWT also commissioned Navius Research—a leading Canadian consulting firm—to model potential emissions reduction pathways in the NWT. With the Government of Canada now committed to reducing the country's emissions by 40-45% below 2005 levels by 2030, and achieving net-zero emissions by 2050, the modelling work was done to understand possible, cost-effective low-carbon pathways for the NWT to follow to achieve net-zero emissions by 2050. The Navius low carbon pathways study findings were released in 2023 and showed the NWT is on track to achieve its 2030 target of a 30% emissions reduction below 2005 levels. However, the study found more work and federal support are needed should the NWT adopt Government of Canada objectives of reducing GHG emissions by 40-45% in 2030 and achieving net-zero emissions by 2050.

This study's findings will be used in 2023-2024 to inform GNWT's engagement on the five-year review of the *Energy Strategy* and the *Climate Change Strategic Framework*. When the GNWT launched the *Energy Strategy* in 2018, it committed to reviewing it after five years. In 2022-2023, the GNWT engaged with its partners to collaboratively design an approach to the review of the *Energy Strategy*, which took place in the summer of 2023. The resulting plan included extensive engagement with Indigenous governments, Indigenous organizations, partners, utilities, industry, non-governmental organizations, community governments, and other stakeholders, and culminated with a three-day multilateral dialogue that took place in Yellowknife in July 2023. *A What We Heard* report will be released in 2024 to summarize the results of the engagement.

SOMMAIRE

Le Rapport 2022-2023 sur les initiatives énergétiques : rapport sur les mesures prises dans le cadre de la Stratégie énergétique 2030 (Rapport) fait état des nouveaux projets d'énergie propre, de la modernisation des infrastructures énergétiques existantes, des initiatives énergétiques des collectivités et des programmes de conservation et d'efficacité énergétique mis en œuvre par le GTNO et ses partenaires en 2022-2023 pour les résidents et les entreprises des TNO. Dans leur ensemble, ces mesures permettent de concrétiser l'objectif du GTNO, lequel est de mettre en place un système énergétique sécuritaire, abordable, durable et moins dépendant des combustibles fossiles qui contribuera au bien-être économique, social et environnemental des TNO et de ses habitants. En 2022-2023, soit cinq ans après le début de la mise en œuvre de la Stratégie énergétique, le GTNO et ses partenaires ont réalisé beaucoup de choses.

Les TNO se sont engagés à réduire les émissions de GES de 30 % (par rapport au niveau de 2005) d'ici 2030, année à laquelle les émissions devraient être de 1 094 kilotonnes (kt) d'équivalent dioxyde de carbone (éq. CO_2). En 2021, l'année la plus récente pour laquelle on dispose de données, les émissions des TNO s'élevaient à 1 287 kt éq. CO_2. Il s'agit d'une réduction de 25 % depuis 2005, ce qui signifie que les TNO sont en voie d'atteindre leur objectif de réduction des émissions pour 2030. Cette réduction est due à deux facteurs : la prise de mesures par la population, les entreprises et les gouvernements à l'échelle des TNO et une diminution prévue de l'activité minière à la fin des années 2020.

En 2022-2023, le GTNO a investi 26,9 millions de dollars pour parvenir aux objectifs fixés dans la Stratégie énergétique, et on estime que les mesures et les initiatives de financement mises en place permettront de réduire les émissions de GES de 50,2 kt éq. CO_2 aux TNO d'ici 2028. La même année, le GTNO a également consacré 21,3 millions de dollars à la mise en place de programmes et de mesures visant à stabiliser le coût de l'énergie et à soutenir les ménages à faible revenu.

Voici un aperçu des mesures et des initiatives utiles qui ont été mises en place en 2022-2023 pour réaliser chaque objectif stratégique.

TRAVAILLER ENSEMBLE

Le GTNO continue de travailler avec les collectivités, les gouvernements et les organisations autochtones ainsi qu'avec les entreprises pour élaborer des solutions énergétiques à l'échelle locale. Grâce à l'Arctic Energy Alliance (AEA), les processus communautaires de planification énergétique ont été entamés avec le Hameau d'Ulukhaktok, la Première Nation Ka'aa'gee Tu de Kakisa et le Village de Fort Simpson.

Le GTNO a également collaboré avec le gouvernement du Canada et Northland Utilities pour réaliser des études de préfaisabilité sur les énergies renouvelables dans les collectivités de Wekweètì et de Sambaa K'e dans l'optique de faire progresser les projets d'énergies renouvelables. Menés par les collectivités, ces projets permettraient de réduire les émissions de gaz à effet de serre, de diminuer les coûts énergétiques et de générer des retombées économiques dans les collectivités ténoises.

Le Programme de subventions pour la réduction des GES a connu une année fructueuse en 2022-2023. En effet, dix projets ont été approuvés au titre de ses deux volets. Ce programme finance les entreprises, l'industrie, les collectivités et les gouvernements des TNO pour qu'ils élaborent des projets visant à réduire leurs coûts d'exploitation et leurs émissions de GES.

RÉDUCTION DES ÉMISSIONS DE GES DÉCOULANT DE LA PRODUCTION D'ÉLECTRICITÉ DANS LES COLLECTIVITÉS ALIMENTÉES AU DIESEL

Une des principales initiatives réalisées s'inscrivant dans cet objectif est le projet éolien d'Inuvik, qui a été lancé à l'automne 2023. L'éolienne devrait couvrir 30 % des besoins annuels en électricité d'Inuvik, réduire les émissions annuelles de GES de six kt éq. CO_2 et diminuer la consommation de diesel jusqu'à trois millions de litres par an.

Le GTNO continue également à faire avancer les projets de ligne de transport d'électricité reliant Fort Providence et Kakisa et de ligne de transport d'électricité jusqu'à Whatì. Une demande de permis d'utilisation des terres soumise à l'Office des terres et des eaux de la vallée du Mackenzie au cours de l'automne 2023 pour la ligne de transport d'électricité reliant Fort Providence et Kakisa a finalement été approuvée en décembre 2023.

Cette section met également en lumière le partenariat du GTNO avec l'Institut de recherche Aurora qui surveille les ressources éoliennes et solaires partout aux TNO. Les informations ainsi recueillies serviront pour les projets d'énergie renouvelable qui seront réalisés aux TNO.

RÉDUCTION DES ÉMISSIONS DE GES ATTRIBUABLES AU TRANSPORT

Aux TNO, en 2021, les transports représentent 63 % des émissions de GES, une part importante de leurs émissions. L'augmentation de l'utilisation des véhicules électriques (VE) aux TNO est l'un des principaux moyens par lesquels le GTNO entend réduire les émissions et les coûts liés au transport, et on a accompli de nombreux progrès dans ce domaine en 2022-2023.

En 2023, le GTNO a annoncé un financement de 3,8 millions de dollars (1,9 million de dollars fournis par le GTNO et 1,9 million de dollars par le gouvernement du Canada) pour les services publics d'électricité aux TNO afin que ces derniers installent des bornes de recharge rapide pour véhicules électriques à Yellowknife, Behchokǫ̀, Fort Providence, Enterprise, Hay River, Buffalo Junction et Fort Smith. Une fois en service, soit d'ici décembre 2024, ces bornes de recharge créeront un corridor de recharge zéro émission aux TNO.

AUGMENTATION DE LA CHALEUR RENOUVELABLE ET DE L'EFFICACITÉ ÉNERGÉTIQUE DANS LES BÂTIMENTS

Financée par le GTNO, l'AEA est sans doute l'une des organisations qui aident le plus le GTNO à atteindre ces objectifs. Il s'agit d'une société sans but lucratif dont l'objectif est d'aider à réduire les coûts de l'énergie et ses effets sur l'environnement aux TNO en proposant des programmes et des services aux résidents, aux collectivités, aux organisations sans but lucratif et aux entreprises. En 2022-2023, l'AEA a mis en œuvre des programmes et des services dans toutes les collectivités des TNO. Ces programmes et services ont permis d'accorder 2 656 subventions d'une valeur combinée de 1,3 million de dollars, et de réaliser des économies d'énergie de l'ordre de 1 400 mégawattheures (MWh). Ces subventions ont également permis de réduire l'utilisation de combustibles fossiles de 10 000 gigajoules et les émissions de GES de 1,1 kt éq. CO_2. Cette année, l'AEA a également entrepris un projet spécial visant à tester les thermopompes à air pour climats froids dans deux maisons à Yellowknife et à faire état de l'efficacité et des aspects économiques de cette nouvelle technologie pour le chauffage dans le Nord.

Le Fonds de modernisation des immobilisations (FMI) du GTNO continue d'être très utile pour les TNO. Il permet de réaliser des projets en lien avec l'efficacité énergétique pour réduire les émissions de GES, la consommation d'énergie et les coûts d'exploitation des installations. En 2022-2023, le FMI a investi 3,7 millions de dollars dans des projets de modernisation énergétique qui ont permis de réaliser des économies annuelles estimées à 290 000 $. Depuis le lancement du programme en 2007-2008, le FMI a permis de réduire les émissions cumulatives générées par les actifs du GTNO de 15,8 kt éq. CO_2.

OBJECTIF À LONG TERME

Pour atteindre cet objectif stratégique, les TNO devront se tourner vers l'avenir et développer leur potentiel énergétique, réduire les émissions industrielles et faire leur part pour atteindre les objectifs nationaux en matière de changement climatique.

Parmi les travaux réalisés en 2022-2023, mentionnons la publication du Plan d'action énergétique 2022-2025 en décembre 2022, soit l'un des plans d'action triennal réalisés par le GTNO pour mettre en œuvre sa Stratégie énergétique. Ce plan triennal comprend 68 mesures et initiatives qui correspondent aux objectifs de la Stratégie énergétique et prévoit un investissement de 194 millions de dollars. Vous trouverez l'état d'avancement de chacune de ces mesures et initiatives en annexe au rapport.

Le GTNO a également continué à faire avancer le Projet d'agrandissement de la centrale hydroélectrique Taltson, qui vise à au moins doubler la capacité hydroélectrique des TNO, à relier 10 collectivités et à consolider le réseau hydroélectrique qui desservirait plus de 70 % de la population des TNO. Parmi les faits marquants de cette année, notons que l'équipe du projet et les gouvernements autochtones partenaires ont étudié deux tracés de la ligne de transport d'électricité qui relierait le réseau hydroélectrique de la rivière Taltson aux réseaux hydroélectriques de Snare et de Bluefish dans la région du Slave Nord, aux TNO.

Le GTNO a également demandé à Navius Research, une société canadienne d'experts-conseils de premier plan, de simuler les filières possibles qui permettraient de réduire les émissions aux TNO. Le travail de simulation vise à comprendre les filières possibles et rentables de réduction des émissions de carbone que les TNO pourraient suivre pour atteindre la carboneutralité d'ici 2050, étant donné que le gouvernement canadien s'est donné comme objectifs de réduire les émissions de GES du pays de 40 à 45 % (par rapport aux niveaux de 2005) d'ici 2030 et d'atteindre la carboneutralité d'ici 2050. Les conclusions de l'étude de la société Navius Research sur les filières à faibles émissions de carbone ont été publiées en 2023 et ont montré que les TNO sont en voie d'atteindre leur objectif pour 2030, soit de réduire de 30 % leurs émissions par rapport au niveau de 2005. Toutefois, l'étude a révélé que davantage de travail est nécessaire pour que les TNO atteignent les objectifs du gouvernement du Canada, lesquels sont mentionnés plus haut.

Les conclusions de cette étude seront utilisées en 2023-2024 pour orienter les échanges du GTNO avec le public sur l'examen quinquennal de la Stratégie énergétique et du Cadre stratégique sur le changement climatique. (Lorsque le GTNO a lancé sa stratégie énergétique en 2018, il s'est engagé à la réexaminer tous les cinq ans.) En 2022-2023, le GTNO a fait appel à ses partenaires pour développer conjointement une approche qui permettrait d'examiner la Stratégie énergétique. Les échanges, qui ont eu lieu à l'été 2023, ont débouché sur un plan dans lequel on a prévu des échanges approfondis avec les gouvernements autochtones, les organisations autochtones, les partenaires, les entreprises de services publics, l'industrie, les organisations non gouvernementales, les administrations communautaires et d'autres parties prenantes. En juillet 2023, un dialogue multilatéral de trois jours à Yellowknife a marqué le point culminant des échanges. Un rapport sur ce que nous avons entendu sera publié en 2024 pour présenter les conclusions qui en découlent.

INTRODUCTION

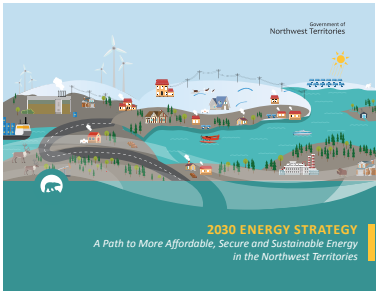
The NWT's overall annual emissions were 1,287 kt of CO_2e in 2021, the most recent year for which data is available. This corresponds to a 25% reduction in GHG emissions since 2005. This is due to actions taken by individuals, businesses, and governments across the NWT, as well as a reduction in mining activity over this period. The NWT is on track to meet its goal of reducing emissions by 30% by 2030.

The 2022-2023 Energy Initiatives Report: Reporting on Actions under the 2030 Energy Strategy (Report), summarizes the key energy actions and initiatives undertaken by the GNWT and its partners over the past fiscal year. While most projects directly or indirectly reduce GHG emissions, the *2030 Energy Strategy* is also committed to stabilizing energy costs and increasing energy security across the NWT. The GNWT invested $26.9 million to advance these objectives in 2022-2023 and estimates its actions and initiatives will directly reduce territorial emissions by 50.2 kilotonnes (kt) by 2028.

This year's *Report* highlights the release of the *2022-2025 Energy Action Plan*, and provides an overview of projects, programs, policy initiatives, and studies conducted by the GNWT and its partners over the past fiscal year. The *Report* also provides a high-level review of the NWT's current energy and GHG emissions situation, as well as outlining the findings from a study exploring low-carbon pathways for the NWT through to 2050.

OUR MAP – *2030 ENERGY STRATEGY*

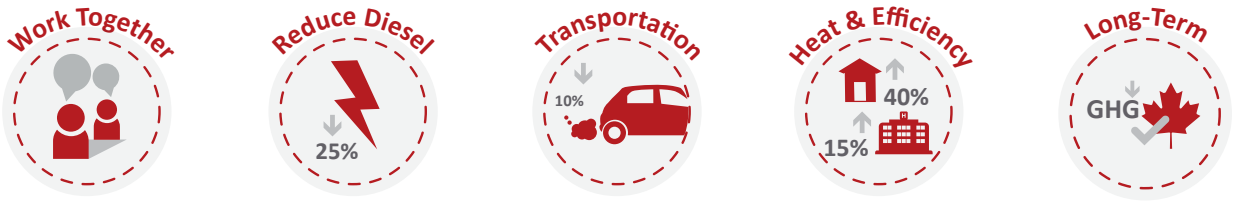
All the actions and initiatives in the Report fall under the *2030 Energy Strategy* (Strategy). Released in 2018, the ***Strategy*** sets out the GNWT's long-term approach to supporting secure, affordable, and sustainable energy in the NWT. This includes support for energy efficiency and conservation programs, local renewable and alternative energy solutions, and larger-scale energy projects. 2022-2023 was the fifth year of implementing the *Strategy*. During this fiscal year, the GNWT developed a plan to conduct the five-year review of the *Strategy*, (see page 65).



KEY LINKAGES TO THE CLIMATE CHANGE STRATEGIC FRAMEWORK AND NWT CARBON TAX

The ***Strategy*** is being implemented together with the ***Climate Change Strategic Framework (CCSF)*** and the ***NWT Carbon Tax***. Along with ensuring that energy in the NWT is secure and affordable, initiatives in the *Strategy* that reduce GHG emissions contribute to Goal One of the *CCSF*—Transition to a Lower Carbon Economy. The ***Strategy*** is the main vehicle to meet the NWT objective of reducing GHG emissions by 30% below 2005 levels by 2030, as set out in the ***CCSF***.

OUR DESTINATION – SIX STRATEGIC OBJECTIVES

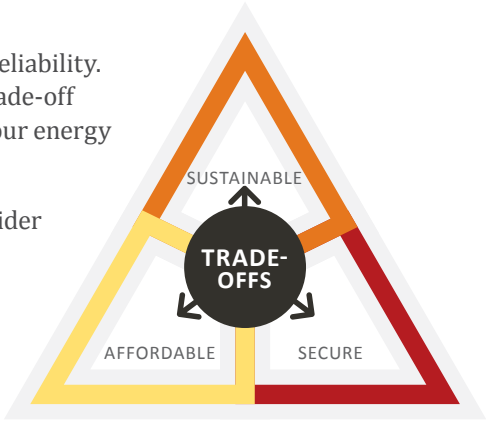


The *Strategy* has six strategic objectives (4 and 5 are bundled together) to reach the overarching vision for 2030. The strategic objectives are designed to be achieved through actions and initiatives undertaken by the GNWT and its partners.

OUR COMPASS – TRADE-OFF TRIANGLE

Transitioning to a lower carbon economy will affect energy costs and reliability. These trade-offs are particularly acute in remote communities. The Trade-off Triangle shows the balance needed between the three components of our energy systems when charting a lower carbon trajectory.

When making decisions about energy initiatives, the GNWT must consider available federal funding opportunities, stakeholder interest, project complexity and reliability, resource optimization (including GHG reductions per dollar invested), the capacity within a sector to achieve success, and most importantly, whether the initiative has community and Indigenous engagement, support, and participation.

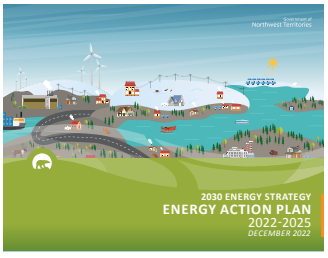


OUR VEHICLE – ENERGY ACTION PLAN

The *Energy Action Plan* includes multi-year government investments in actions and initiatives designed to achieve the strategic objectives in the *Strategy*. These actions and initiatives are undertaken by the GNWT and its partners, including Indigenous governments and organizations, the Government of Canada, Housing Northwest Territories (HNWT), the Arctic Energy Alliance (AEA), and utilities such as the Northwest Territories Power Corporation (NTPC) and Northland Utilities (NUL)—as well as residents, businesses, communities, and industry.

In December 2022—as part of the GNWT's commitment to ensuring access to secure, affordable, and sustainable energy in the NWT—the GNWT released its *2022-2025 Energy Action Plan*. A three-year roadmap for the GNWT and its partners, the *Energy Action Plan* supports initiatives that help stabilize energy costs for residents, ensure reliable energy systems, and reduce territorial GHG emissions.

With an investment of $194 million over three years, the *Energy Action Plan* has 68 unique actions and initiatives aligned with the strategic objectives in the *Strategy*. Some of these actions include grants and incentives to increase energy conservation and reduce GHG emissions in buildings, incentives for electric vehicle deployment in hydro communities, support for community-led clean energy projects, and the continuation of significant energy infrastructure upgrades.



Appendix E provides a status update on the 68 actions and initiatives included in the *2022-2025 Energy Action Plan* as of March 31, 2023.

PROGRESS TOWARDS NWT 2030 CLIMATE TARGET

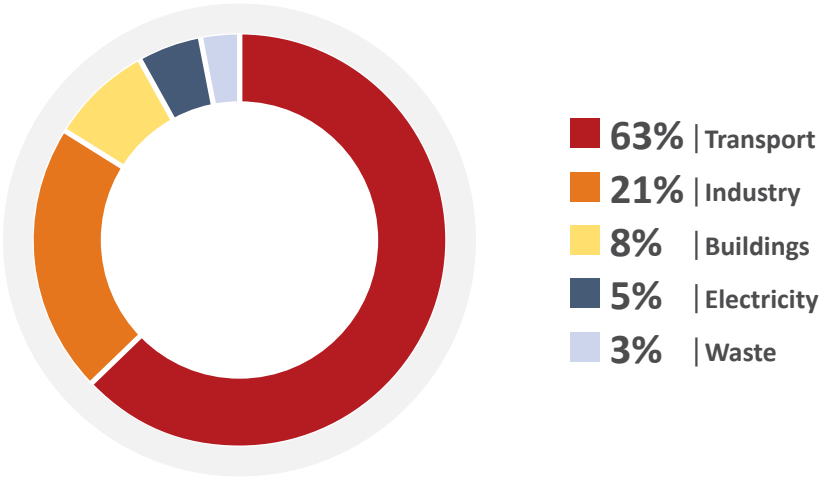
The NWT is committed to reducing GHG emissions by 30% below 2005 levels by 2030, which translates to an absolute target of 1,094 kt of CO_2e in 2030. This section outlines GHG emissions and trends by sector, progress towards the 2030 target, and a breakdown of the estimated direct GHG reductions anticipated from key programs and initiatives by strategic objective.

GREENHOUSE GAS EMISSIONS IN 2021

In 2021—the most recent year for which data is available—the NWT's overall annual emissions were 1,287 kt of CO_2e. Almost all NWT GHG emissions are produced from fossil fuel combustion to transport people and goods, keep buildings warm and powered, and fuel industry operations. Figure 1 shows the breakdown of NWT's GHG emissions by sector in 2021.

NWT's GHG emissions are historically dominated by the transportation sector, and 2021 was no exception. Primarily driven by industrial activity, transportation accounted for 63% of territorial emissions. The industrial sector was second, with on-site energy use responsible for 22% of the NWT's GHG emissions. Community buildings, electricity generation and waste were respectively responsible for nine percent, five per cent and three per cent of NWT's overall carbon emissions.

Figure 1. NWT Greenhouse Gas Emissions by Sector in 2021



Source: *Environment and Climate Change Canada*

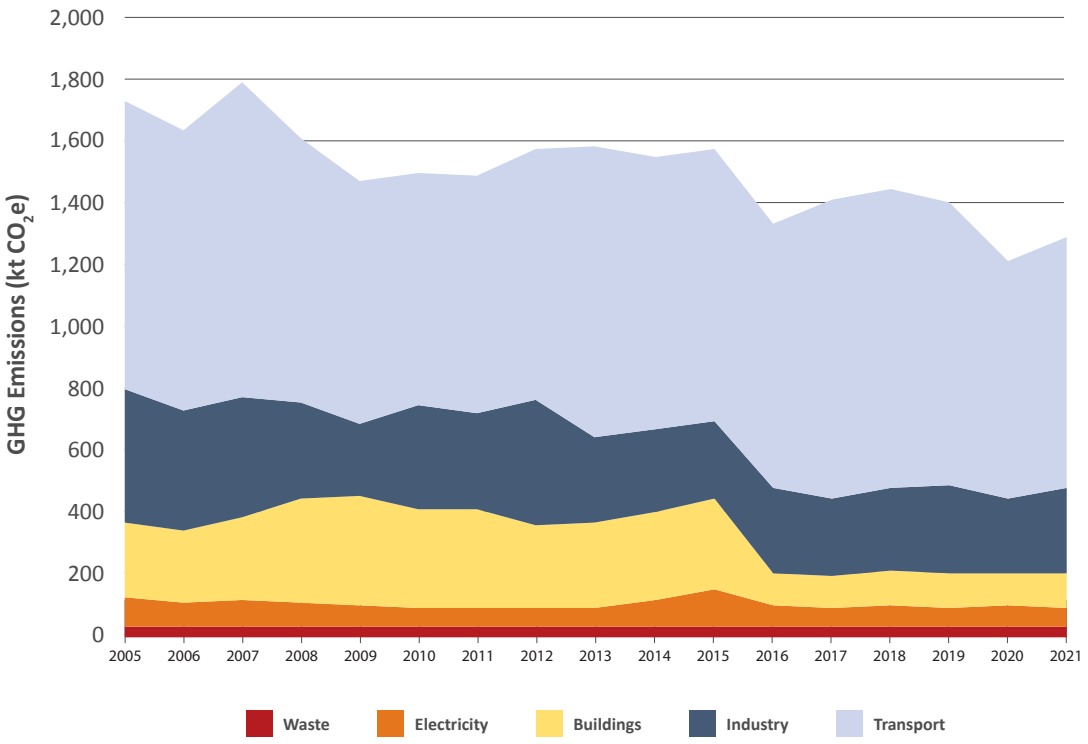
HISTORICAL GREENHOUSE GAS EMISSIONS

Figure 2 illustrates the general downward trend in NWT emissions since 2005. In fact, the NWT emitted 25% less GHG emissions in 2021 than it did in 2005, the baseline for the 2030 territorial target.

Territorial emissions fluctuate each year depending on economic activity, climate conditions, and investments in low-carbon technologies—all of which affect the total demand for fossil fuels. One prominent factor in 2020 and 2021 was the COVID-19 pandemic, and its associated health restrictions that significantly reduced NWT economic activity. The GNWT does expect to see a rebound in emissions for 2022 but we will not know what our GHG emissions were until the data becomes available in 2024.

Another factor making NWT emissions fluctuate greatly year-over-year is the Government of Canada's revisions to NWT energy data. In the past, recurring updates to historical data would generate material variations in overall NWT emissions, well beyond the incremental changes caused by updates to methodology employed to estimate emissions. The GNWT has worked over the past two years to fix major discrepancies observed between federal and territorial energy data, greatly improving territorial emissions estimates (see sidebar below).

Figure 2. NWT Greenhouse Gas Emissions between 2005 and 2021



Source: *Environment and Climate Change Canada, NTPC, NUL*
Note: *Breakdown for investments made in 2018-2019 is not available. Figures may not add up due to rounding.*

IMPROVING NWT ENERGY AND EMISSIONS DATA

In the past two years, the GNWT has been working with the Government of Canada to fix several issues identified in NWT fuel consumption data, such as unexplained substantial variations in year-over-year consumption of natural gas in the building sector. Fixing these issues led to a full recalculation of NWT historical emissions, with these now being aligned with GNWT's fuel tax data. This work helps explain why NWT historical emissions have substantially varied in recent issues of the *National Inventory Report (NIR)*. These changes include the recalculation of the 2005 baseline, now estimated at 1,723 kt, up from 1,563 kt of CO_2e when the *Energy Strategy* was released in 2018. This change does not affect the 2030 target, set at 1,094 kt of CO_2e in 2030 as the GNWT chose to maintain the more ambitious target rather than change it every time there are historical data refinements in the *NIR*. The GNWT anticipates fewer variations in future *NIR* due to the work conducted to align territorial and federal energy data—though methodological updates often lead to minor data adjustments, and last year's emissions is always based on preliminary energy use data that is usually updated in subsequent *NIRs*.

BREAKING DOWN EMISSIONS REDUCTIONS FROM NWT ENERGY INITIATIVES

Over the next several years, the GNWT and its partners will continue to make significant investments to improve the reliability of the NWT's energy system, stabilize energy costs and reduce GHG emissions. Table 1 forecasts GHG emissions reductions expected from various energy initiatives and projects conducted by the GNWT and its partners through to 2028. This table does not include an estimate of the emission reductions resulting from the *NWT Carbon Tax*, federal climate change policy or from community and individual actions.

Activities planned and funded under the *2022-2025 Energy Action Plan* are anticipated to reduce 50.2 kilotonnes of emissions in 2028. Annual GHG emissions reductions estimates are expected to continually increase through to 2030, as new initiatives are launched and as residents and businesses shift to low-carbon technologies (e.g., electric vehicles, biomass heating).

Table 1. Emissions reductions from projects and initiatives under the *2030 Energy Strategy* (in kt CO_2e)

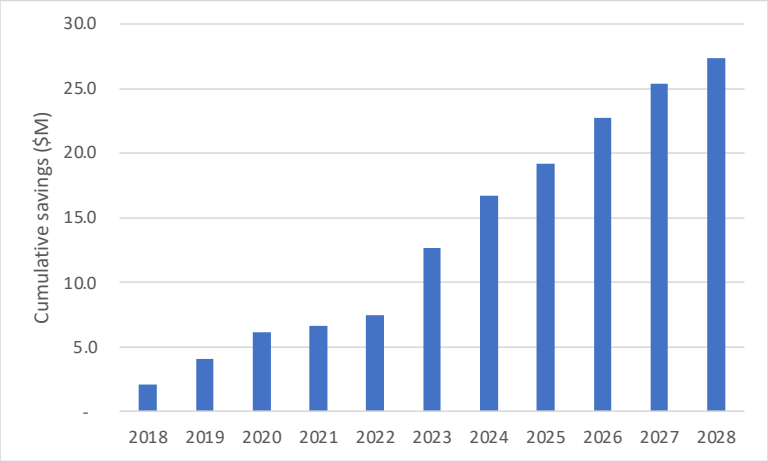
STRATEGIC OBJECTIVE	ENERGY INITIATIVE	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028
		Actual	*Actual*	*Actual*	*Actual*	*Actual*	*Forecast*	*Forecast*	*Forecast*	*Forecast*	*Forecast*	*Forecast*
1	Community Projects: heating	-	-	-	-	-	-	TBD	TBD	TBD	TBD	TBD
1	Renewable Energy Community Projects and Net-metering Program	0.2	0.5	0.8	0.8	0.7	0.9	2.3	2.5	2.6	2.7	2.9
2	Diesel Plant Replacement	-	-	-	-	0.1	0.2	0.2	0.2	0.2	0.2	0.2
2	Inuvik Wind	-	-	-	-	-	6.0	6.0	6.0	6.0	6.0	6.0
2	Transmission Lines	-	-	-	-	-	-	-	-	3.0	4.4	4.4
2	Liquefied Natural Gas Projects	-	-	-	-	-	-	-	-	-	-	-
3	Electrification of Transportation (Including AEA's EV Rebates)	-	-	0.0	0.0	0.1	0.2	0.3	0.5	0.7	1.0	1.3
3	Marine Vessels Upgrade	-	0.4	0.4	0.4	0.4	0.4	0.4	1.2	1.2	1.2	1.2
4 & 5	GHG Grant Program	-	-	0.1	0.6	1.2	2.2	5.7	6.6	7.5	8.4	9.4
4 & 5	AEA Programs (Excludes EV Rebates)	0.6	2.0	3.3	4.3	5.2	6.2	7.2	8.3	9.3	10.4	11.4
4 & 5	Capital Asset Retrofit Fund	3.0	4.6	6.6	5.9	5.5	6.6	7.7	8.7	9.8	10.9	12.0
4 & 5	NWT Housing Corp	-	-	-	0.3	0.6	0.6	0.9	1.2	1.4	1.4	1.4
6	Hydro Upgrades	-	-	-	-	-	-	-	-	-	-	-
6	Biofuels	-	-	-	-	-	TBD	TBD	TBD	TBD	TBD	TBD
6	Taltson Hydro Expansion	-	-	-	-	-	-	-	-	-	-	-
	Total (kt CO_2e):	**3.9**	**7.5**	**11.2**	**12.2**	**13.7**	**23.3**	**30.7**	**35.3**	**41.8**	**46.7**	**50.2**
Fuel Savings Equivalent (million of litres)		*1.4*	*2.7*	*4.1*	*4.4*	*5.0*	*8.4*	*11.1*	*12.8*	*15.2*	*16.9*	*18.2*

Note: *Emissions reductions are cumulative (that is, capture emissions reductions from previous years) and calculated above 2018 levels, the year the Strategy was launched.*

Emissions reductions are equivalent to an annual saving of 18.2 million litres of diesel oil in 2028, equivalent to $27.2 million in savings (Figure 3).

In fact, the current plan put Northerners, communities, and businesses on track to achieve a cumulative saving of $150 million by 2028.

Figure 3. Cumulative energy savings from energy projects

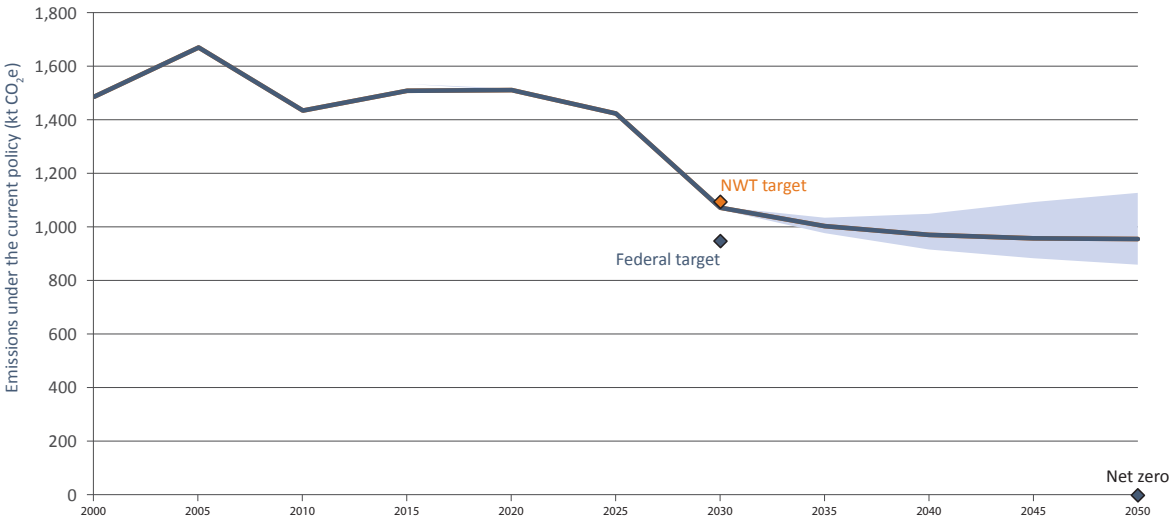


Assumptions: *All projects displace diesel and diesel costs $1.50 per litre.*

LOOKING AHEAD

In 2021-2022, the GNWT commissioned a leading Canadian consulting firm to model potential emissions reduction pathways in the NWT. The modelling included a business-as-usual scenario to predict the NWT's current GHG emissions trajectory. Findings suggest the NWT is on track to achieve its target of reducing emissions by 30% below 2005 levels by 2030 (Figure 4). Unfortunately, an anticipated reduction in mining activity in the late 2020s is one factor that contributes to the projected GHG reductions. More details about the findings of the modelling can be found page 64.

Figure 4. Territorial emissions to 2050 under current policy scenario



Source: *Navius Research*

NWT ENERGY SNAPSHOT

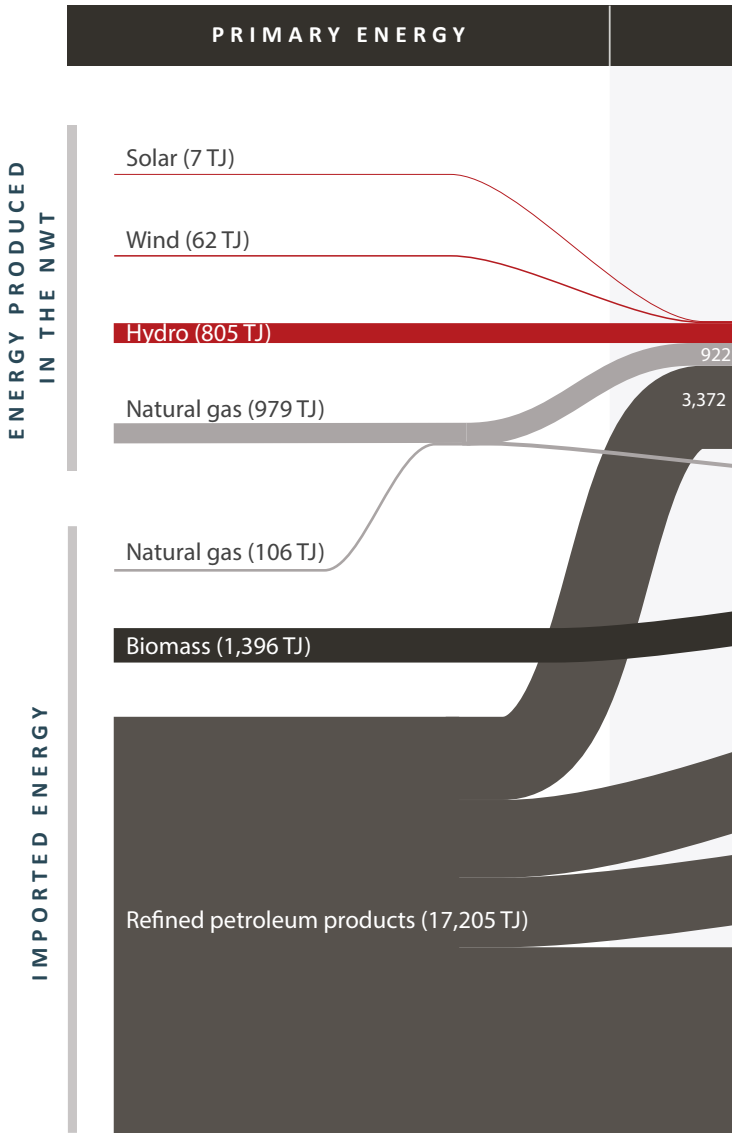
NWT Energy Supply and Demand

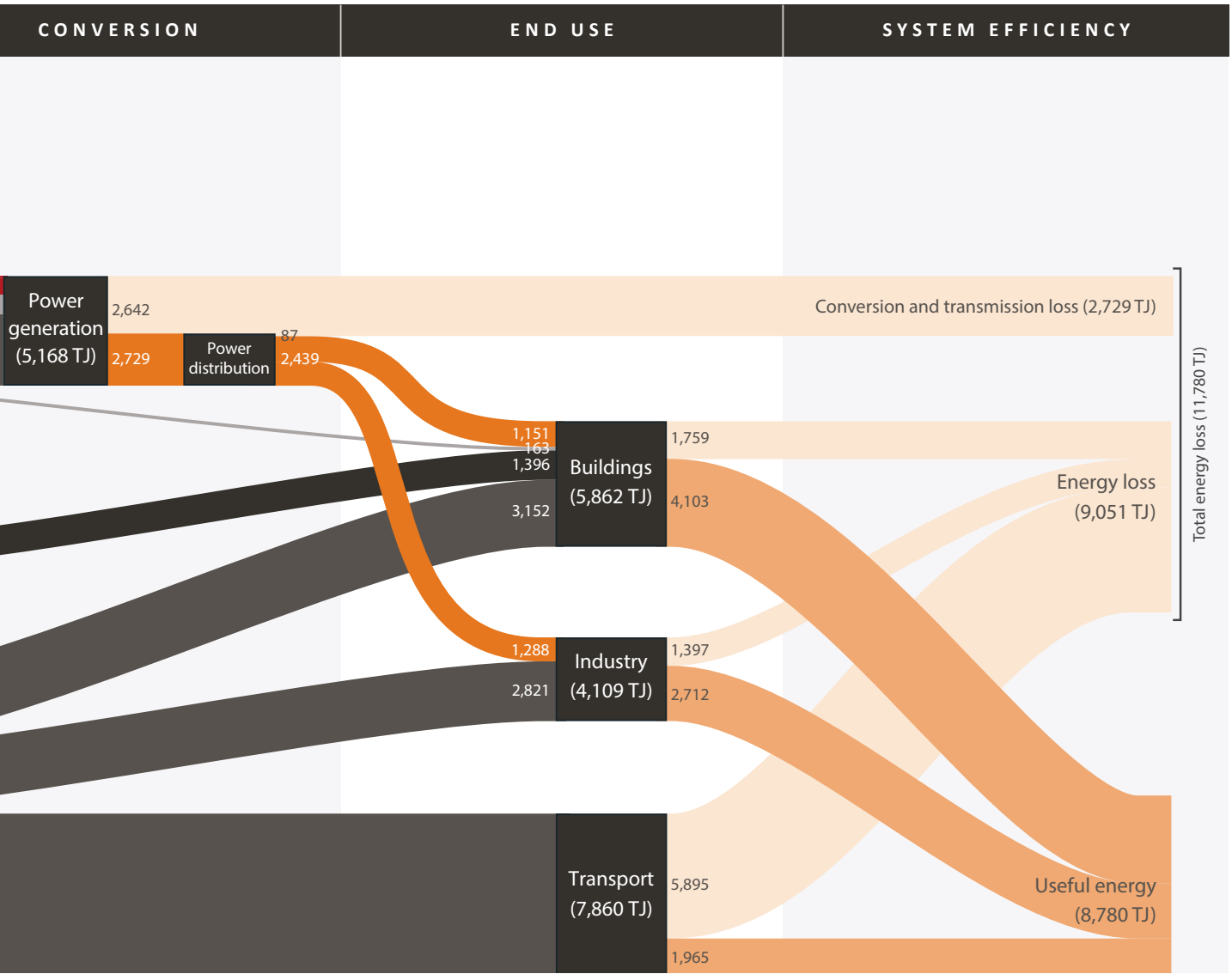
The diagram on these pages is called a Sankey diagram. Sankey diagrams are used to show the energy flow from its primary sources to its conversion to fuels and electricity, and how fuel and electricity are used to deliver energy services (e.g., heating, light, transport of people and goods). This diagram shows the NWT's energy sources and uses in 2022, the most recent year for which data is available.

The key to interpreting a Sankey diagram is to remember that the width of each line shows the quantity of energy. Also, the left side of this diagram highlights the difference between local and imported energy in the NWT; the right side of this diagram (under System Efficiency) shows where energy is most efficiently used (buildings and industry) and where it is lost (power generation and transportation).

In 2022, NWT primary energy supply represented 20,560 TJ. Fossil fuels were the dominant source of energy in the NWT, accounting for 85% of the overall territorial energy supply. This represents approximately 500 million litres of diesel fuel equivalent. Transportation accounts for most of the energy used in the NWT, with industry driving a large share of the demand. Transportation relies on gasoline for light-duty vehicles and diesel for heavy-duty vehicles. Refined petroleum products are the industry's primary source of energy to operate its facilities. Buildings primarily use a mix of electricity and petroleum products (e.g. heating oil and propane), with biomass becoming an emerging alternative for heating.

Figure 5. Energy flows in the NWT in 2022 (in terajoules)





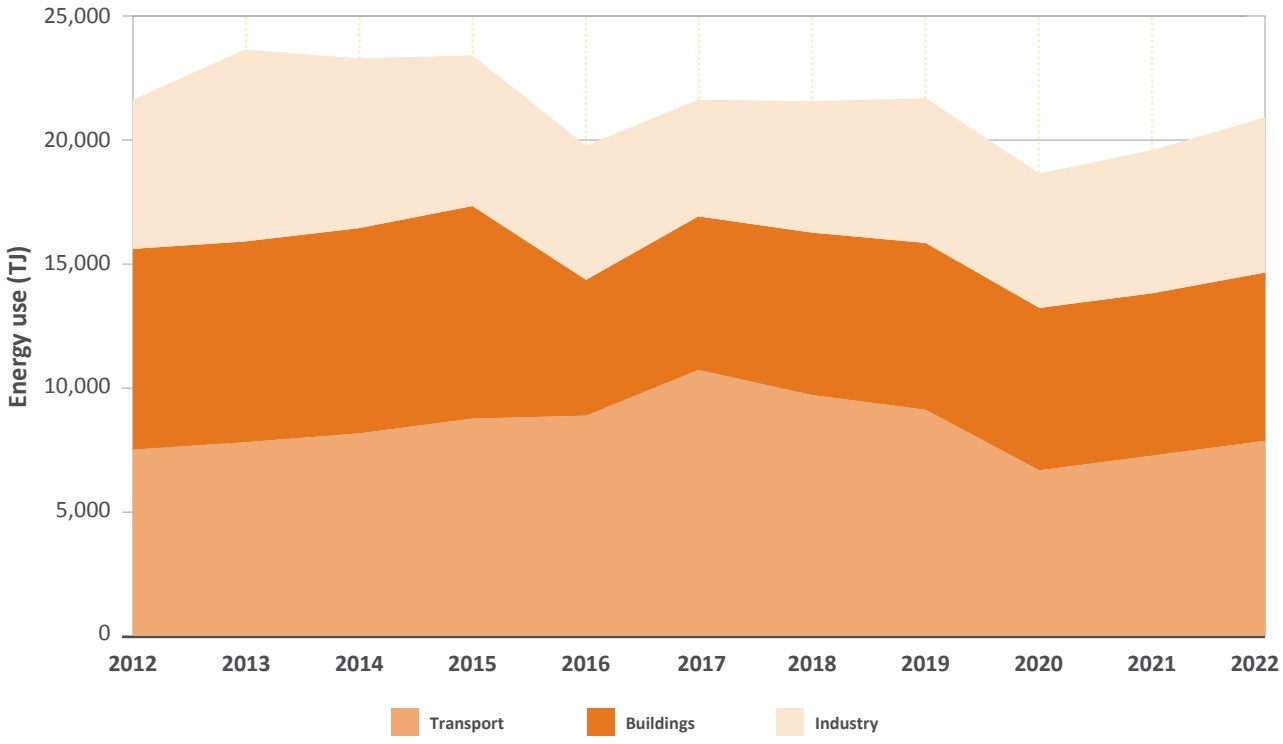
Source: *Statistics Canada, GNWT, NTPC, NUL*

Notes: *The diagram does not represent non-energy use of fossil fuels, estimated at 601 TJ in 2022. Imported natural gas corresponds to liquified natural gas imported for Inuvik's power plant. Energy loss from the end use is estimated using the average conversion efficiency of technologies for a given sector in North America. 1 terajoule (TJ) equals 1,000 gigajoules (GJ). Biomass fuel use was estimated by the GNWT.*

PRIMARY ENERGY DEMAND

Figure 6 shows NWT primary energy use for each sector between 2012 and 2022. NWT energy demand increased by 7% between 2021 and 2022, primarily due to rising energy requirements for industry (+9%) and transport (+8%) following the end of the global COVID pandemic. Transport drove the energy demand in 2022, representing 7,860 TJ or 38% of NWT energy demand, with most of transport related to industry's activities. Buildings' energy needs accounted for 6,725 TJ, or 32% of demand in 2022. With 6,274 TJ, industry accounted for 30% of NWT final energy demand in 2022.

Figure 6. Primary energy demand by sector between 2012 and 2022



Sources: *Statistics Canada, GNWT*

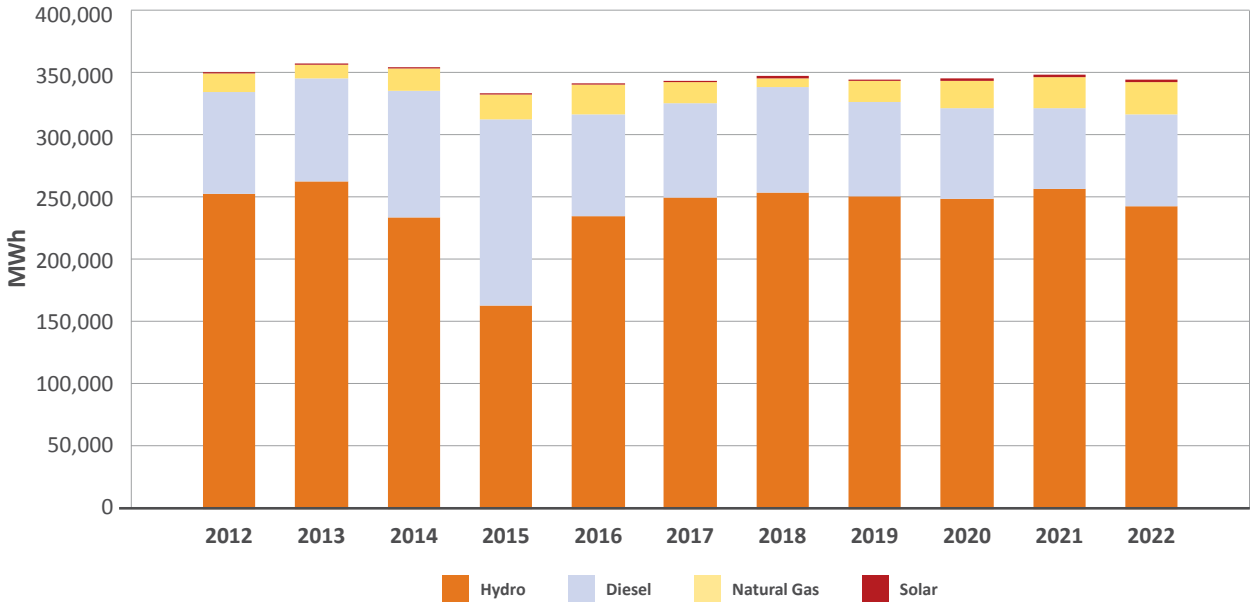
Note: *Buildings' energy demand includes power and biomass consumption. Industry's energy demand includes energy used in the agricultural sector.*

POWER GENERATION

Unlike most of Canada, the NWT is not connected to the North American electrical grid. This means each community must have its own sources of electricity generation and backup. Figure 7 shows the energy sources that were used to generate power for NWT communities between 2012 and 2022.

About 71% of the community electricity generated in the NWT in 2022 came from hydroelectric facilities, where the energy of flowing rivers is transformed into electricity. Communities not connected to one of the NWT's two hydroelectric grids—the Snare and Bluefish systems in North Slave and the Taltson system in South Slave—use fossil fuels to produce electricity. Diesel and natural gas generators respectively accounted for 21% and 8% of overall community power generation in 2022. Most NWT communities have also deployed residential and community scale solar electricity generation, although it makes up a fraction of electricity generated in the territory (less than one percent in 2022).

Figure 7. Community power generation by type between 2012 and 2022



Sources: *NTPC, NUL*

Note: *While utilities provide most NWT communities with electricity, industrial sites in the territory—such as mines— generate their own electricity on-site, primarily from diesel generators. Power generation from industry is excluded from this chart, except for electricity generated by Imperial Oil and sold to NTPC in Norman Wells.*

ENERGY TRANSITION INVESTMENTS

The GNWT and its partners—including the Government of Canada, Indigenous governments, and organizations, NTPC and the AEA, as well as residents, communities, businesses, and industry—are making significant investments to implement the *Strategy*. Between 2018-2019 and 2022-2023, the GNWT invested $165 million to advance the objectives of the *Strategy*. This figure does not account for programs and policies implemented by the GNWT to stabilize the cost of energy (see sidebar on page 27).

In 2022-2023, the GNWT invested $26.9 million to support energy projects and initiatives across the NWT. This represents a 59% decrease in budget when compared to the previous fiscal year ($52.9 million). The decreased budget is largely related to the completion of capital projects funded using Government of Canada funding, and not a decrease in GNWT support for other programs and initiatives.

Table 2. GNWT Energy-Related Investments by Strategic Objective

STRATEGIC OBJECTIVE	2018-2019	2019-2020	2020-2021	2021-2022	2022-2023
1. Working Together	N/A	$103,000	$807,000	$585,000	$422,000
2. Electricity		$12,444,000	$21,480,000	$36,287,000	$11,188,000
3. Transportation		$421,000	$530,000	$823,000	$872,000
4 & 5. Energy Efficiency and Space Heating		$9,379,000	$10,368,000	$12,480,000	$11,619,000
6. Long Term Vision		$3,492,000	$4,872,000	$2,716,000	$2,817,000
Total	**$21,000,000**	**$25,837,000**	**$38,007,000**	**$52,891,000**	**$26,917,000**

Note: *Breakdown for investments made in 2018-2019 is not available. Figures may not add up due to rounding.*

Table 3. GNWT Energy-Related Investments by Funding Stream

FUNDING STREAM	2018-2019	2019-2020	2020-2021	2021-2022	2022-2023
GHG Grant Programs	N/A	$159,000	$331,000	$1,369,000	$2,000,000
Arctic Energy Alliance (core funding and LCELF funding)		$4,990,000	$5,191,000	$4,117,000	$4,240,000
Federal Low Carbon Economy Leadership Fund Portfolios (excluding AEA supplement)		$449,000	$1,239,000	$2,923,000	$206,000
Federal Investing in Canada Infrastructure Program Projects		$11,814,000	$20,469,000	$34,556,000	$10,721,000
Crown-Indigenous Relations and Northern Affairs Canada (Taltson Expansion)		$2,288,000	$3,995,000	$2,228,000	$2,300,000
Energy Core Funding		$843,000	$1,146,000	$1,982,000	$1,750,000
Capital Asset Retrofit Fund		$3,800,000	$3,800,000	$3,800,000	$3,800,000
Salaries and Administrative Expenses		$1,494,000	$1,836,000	$1,916,000	$1,900,000
Total	**$21,000,000**	**$25,837,000**	**$38,007,000**	**$52,891,000**	**$26,917,000**

Note: *Breakdown for investments made in 2018-2019 is not available. Figures may not add up due to rounding.*

The Infrastructure Canada funding noted above is being provided through a 10-year Integrated Bilateral Agreement established between Infrastructure Canada and the GNWT in 2018. In total, $339 million of federal-territorial funding is available (from 2018 to 2027) to support projects that reduce reliance on diesel fuel and reduce GHG emissions. This level of investment in the NWT's electricity system will also help improve system reliability and stabilize future electricity costs.

STABILIZING THE COST OF ENERGY

Energy transition investments in this budget *do not* include programs and policies implemented by the GNWT to help stabilize the cost of energy and support low-income households, which amounted to $21.3 million in 2022-2023. The GNWT has also provided one-time subsidies in the past to prevent potential increases to electricity rates. Such programs and subsidies include:

- **The Territorial Power Support Program (TPSP) –** designed to assist residents living outside of Yellowknife with the high costs of electricity. It offers a subsidy on power costs to reduce the financial burden on residents in these areas. This subsidy amounted to $7.6 million in 2022-2023.
- **The GNWT Rate Equalization Program (GREP) –** designed to equalize power rates across the territory by providing financial support to offset higher electricity rates in certain regions. This subsidy amounted to $0.2 million in 2022-2023.
- **Income Assistance and Senior Home Heating Subsidy –** designed to provide financial aid to eligible clients for home heating costs, ensuring they can comfortably heat their homes during colder months. This subsidy amounted to approximately $6.8 million in 2022-2023.
- **Government Electricity Rates:** Governments in NTPC communities can pay as much as 20% higher electricity rates than other clients, which acts to reduce non-government rates. This subsidy amounted to approximately $6.7 million in 2022-2023.
- **One-time Subsidies:** While not standard practice, the GNWT has also provided one-time subsidies during unique circumstances, in an effort to help offset potential increases to electricity rates. For example, in 2014-2015 the NWT experienced a low water event which impacted NTPC's ability to generate hydropower. In response to this event, the GNWT provided NTPC $45 million to offset the cost of additional diesel fuel and avoid the need to implement a territory wide rate rider.
- **Recent Electricity Sector Capital Subsidies:** Under the NWT's allocation under the federal Investing in Canada Infrastructure Program, the GNWT has allocated up to $120 million to NTPC to 2030 to help offset the cost of major infrastructure upgrades and mitigate rate increases.

ENERGY TRANSITION CHALLENGES IN THE NWT

The NWT faces many challenges to a lower carbon energy transition, which in some cases will require solutions that differ from workable solutions in other Canadian jurisdictions.

UNIQUE CIRCUMSTANCES

The NWT's immense geography (1.3 million km^2) and low population (approximately 45,000 people) means that the territory has a fragmented energy grid. The NWT is not connected to the North American electricity system, eliminating the possibility of buying from, or selling power to, southern jurisdictions. There are two separate hydro zones, and 25 local grids in remote communities that are supplied by mostly diesel-generated electricity (thermal communities). Extreme winter temperatures also make it difficult to find and supply viable or affordable heating and transportation fuel solutions in the North.

BALANCING TRADE-OFFS: RELIABILITY, AFFORDABILITY, SUSTAINABILITY

Energy security is a crucial issue in the North, as the reliability of energy systems in cold, remote areas can be a matter of life and death. Energy affordability is also critical, as the NWT already deals with some of the highest energy costs in Canada. This means that even though residents and businesses in the NWT are committed to doing their part to reduce GHG emissions, all energy initiatives in the Strategy are led by a trade-off triangle, which ensures communities, businesses, industry, and people in the NWT have access to reliable, affordable, and sustainable energy.

Massive investment into capital generation assets, development of transmission lines to bring clean hydroelectricity to thermal communities, and deployment of higher efficiency end-use technologies are how we are achieving our climate commitments while working to also keep energy reliable and costs stable. These investments also generate economic benefits by employing Indigenous and local businesses, building local capacity, and highlighting northern solutions.

LOW-CARBON TECHNOLOGIES IN THE NORTH

Although it seems counterintuitive, new technologies often lead to increased costs for consumers. Even if a technology is proven to work in the North, the NWT must often spend more to implement it than other provinces. It may cost hundreds—up to thousands—more dollars per tonne to reduce our GHG emissions compared to southern Canada.

The cost for current projects advanced by the GNWT to reduce emissions in diesel powered communities ranges from $330 to $1,100 per lifetime tonne of CO_2e abated. This is partly because our residents are spread out across such a large land area—which does not allow for economy of scale—and our extremes in climate, especially in the winter.

Without federal funding as a primary funding source, most emissions-reduction projects do not make economic sense on their own in the NWT and would adversely affect energy costs for Northerners. The reality is that continued federal support is critical as we transition our energy systems. One notable exception is biomass (e.g., firewood, wood pellets), a low-tech source of energy effectively used to heat buildings throughout the NWT.

ORGANIZATIONAL ROLES

The GNWT leads the implementation of the *Strategy* by carrying out actions and initiatives in conjunction with NTPC and the AEA. All three organizations work with NWT communities, Indigenous governments, Indigenous organizations, and private sector partners on shared objectives that advance the *Strategy*.

GOVERNMENT OF THE NORTHWEST TERRITORIES

The GNWT's Department of Infrastructure (Infrastructure)—led by the Energy Division—develops energy policy, secures federal funding for energy initiatives, and administers application-based funding programs that support NWT communities, northern businesses, and industry to reduce their energy use and GHG emissions.

The Energy Division works with other Infrastructure divisions to support internal energy initiatives—such as the Capital Asset Retrofit Fund Program (CARF) and Marine Transportation Services (MTS) fleet retrofits—as well as other GNWT departments and agencies to support energy initiatives such as public housing upgrades, community energy planning, and carbon sequestration.

The Energy Division also works closely with other levels of government including the Government of Canada, community governments, as well as Indigenous governments and Indigenous organizations, to facilitate consultation, provide advice and partnership opportunities, as well as funding for energy projects throughout the territory.

NORTHWEST TERRITORIES POWER CORPORATION (NTPC)

NTPC is a GNWT Crown Corporation that owns and operates the NWT's hydroelectric facilities and most of the territory's diesel power plants. Through its capital plan—and in partnership with NWT communities and other utilities—NTPC leads conventional, alternative, and renewable electricity solutions to maintain a reliable and affordable electricity system while working to reduce GHG emissions from diesel-generated electricity.

ARCTIC ENERGY ALLIANCE (AEA)

The AEA is a non-profit society that helps NWT residents, businesses and communities improve their own energy efficiency by providing hands-on energy conservation and efficiency programs and services on behalf of the GNWT. Almost entirely funded by the GNWT and operating through six regional offices, the AEA is the GNWT's primary delivery agent for services such as energy audits and household appliance rebates, biomass boilers and woodstoves that increase the use of renewable energy for heating, and electric vehicle rebates that reduce transportation emissions. An overview of AEA's activities in 2022-2023 is included in this report.

STRATEGIC OBJECTIVE 1 – WORK TOGETHER

WORK TOGETHER TO FIND SOLUTIONS: COMMUNITY ENGAGEMENT, PARTICIPATION AND EMPOWERMENT

Communities want to be more engaged and involved in energy solutions. By improving communication and increasing support, the GNWT is working to ensure communities can partner in developing solutions, undertake projects independently, and stay updated on local initiatives. The number, scope and scale of energy projects being undertaken independently by communities, individuals as well as Indigenous governments and Indigenous organizations across the NWT is increasing rapidly. Most of these projects are not captured in this report, but the GNWT is encouraged by this development and supports this trend. This section showcases some projects and initiatives the GNWT is actively contributing to.

COMMUNITY PROJECTS

The GNWT recognizes that Indigenous and community governments are increasingly interested in being directly involved in—or in control of—local energy planning and projects. The GNWT works directly with Indigenous and community governments—or through the AEA's community energy planning programs—to help them identify and implement energy projects.

Federal departments—such as Natural Resources Canada and Crown-Indigenous Relations and Northern Affairs Canada (CIRNAC)—are also supporting this approach by providing funding directly to communities and Indigenous governments for energy efficiency and renewable energy projects.

The GNWT is committed to supporting community-led projects wherever possible. In 2023-2024, the GNWT will continue to undertake outreach efforts to build relationships with project proponents and offer support and advice on any potential applications.

COMMUNITY ENERGY PLANNING

Community energy planning is about identifying local solutions to challenges around energy use (the types of energy that are used to heat and power a community)—as well as energy conservation and efficiency—and finding ways to implement them. Community energy planning also aims to build local capacity and energy literacy, while adhering to local values. The AEA has funding each year to work with communities to develop community energy plans.

The GNWT encourages communities to develop and implement a community energy plan. To do this, a community can apply to the AEA's program, or work independently with a consultant. The AEA has helped develop seven community energy plans since the launch of their Community Energy Planning program, with financial support primarily coming from Natural Resources Canada (NRCAN).

In 2022-2023, the AEA initiated the community energy planning process with the Hamlet of Ulukhaktok, the Ka'aa'gee Tu First Nation in Kakisa, and the Village of Fort Simpson. Each community hired a community energy champion to guide the

engagement process, help with planning activities, and ensure the project is grounded in Indigenous community traditions and local governance and protocols are respected. These champions are key to the success of community energy planning projects. All three communities developed their energy plans, which are expected to be approved in 2023-2024.

Additional information on community energy planning can be found on the AEA website, including a community energy planning approach, available community energy planning resources and community energy plans, and energy profiles for each NWT community.

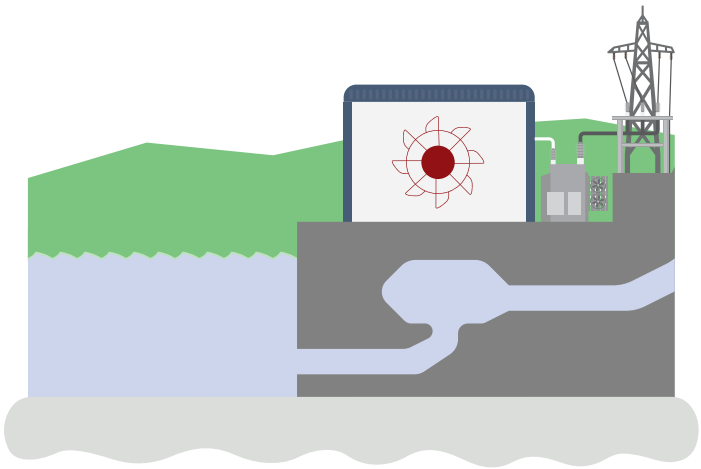
GAMÈTÌ MINI HYDRO

As part of the *Energy Strategy*, funds are available to advance community-scale hydro projects in the NWT. The Gamètì Mini Hydro project involves the evaluation of a potential mini hydroelectric facility to displace diesel-generated power in Gamètì.

In 2015, a pre-feasibility report was completed by an independent engineer hired by the community. As no water flow was being monitored, this work was based on modelled data derived from other regional data. To confirm there is sufficient water flow to support the proposed project, the GNWT arranged for a water gauge to be installed to gather data at the right location.

In 2020-2021, the GNWT provided water gauge data to the community, along with financial support to update the 2015 pre-feasibility study. During 2021-2022, COVID-19-related challenges delayed the completion of the updated study. The updated pre-feasibility study was completed in 2022-2023 and confirmed that there appears to be sufficient water available to meet the community's power needs.

ATCO—in partnership with the community—also received federal funding during 2022-2023 to complete a community renewables and heating prefeasibility study. The study will include an assessment of the hydro technical feasibility, associated costs, power production profile and development schedule. Once ATCO's work is complete, the GNWT will continue to engage with Gamètì and the Tłı̨chǫ Government to determine a path forward.



RENEWABLE PROJECTS IN WEKWEÈTÌ AND SAMBAA K'E

During 2021-2022, the GNWT worked with Northland Utilities/ATCO and CIRNAC to start renewable energy pre-feasibility studies for the communities of Wekweètì and Sambaa K'e. These studies—along with studies undertaken in 2022-2023 and 2023-2024—will assess and evaluate various renewable energy alternatives to the current use of fossil fuels for electricity generation and heating and will also help to advance the development of community-led renewable projects that will reduce GHG emissions and provide economic benefits for the community.

FORT MCPHERSON PHOTOVOLTAIC ENERGY SYSTEM: A CONCEPTUAL DESIGN PROJECT

The GNWT collaborated with University of British Columbia Okanagan Campus School of Engineering to develop a conceptual design project for the community of Fort McPherson. Fort McPherson currently relies almost exclusively on diesel power as its source of electricity. The goal of this project was to perform a feasibility study on the addition of a photovoltaic (PV) system with the potential for battery energy storage to provide clean, resilient, safe, and affordable energy in Fort McPherson.

The study found that a PV system of 74 kW is the optimal size. Such a system would generate about 67 MWh of electricity annually in the first years of operation. The PV system could offset about 19% of the average community load, which is within the 20% penetration threshold for intermittent renewable power set by the NWT Public Utilities Board in thermal communities. However, a review of the project's economics determined that significant federal funding is needed to ensure it wouldn't increase power rates.

GHG GRANT PROGRAM

The Greenhouse Gas Grant program, funded by the GNWT and Environment and Climate Change Canada, aims to reduce GHG emissions in the Northwest Territories. Designed for NWT governments, organizations, and businesses, the program supports projects like biomass boilers, biomass district heating systems, renewable electricity, and transportation initiatives like electric vehicle charging infrastructure. Organizations benefit by decreasing operating costs and contributing to national climate goals. There is a minimum project cost of $100,000 to be eligible for the GHG Grant Program. Smaller grants are available through the AEA. Enhanced promotional efforts recently led to ten additional funded projects, totaling 18 since the program's beginning.

The Program is organized in two streams. The Government stream provides grant support up to 75% of the total eligible project cost for NWT community governments, municipalities, GNWT departments, as well as Indigenous governments and organizations (which includes band or tribal councils, land claim organizations, development corporations and self-governments). The Buildings and Industry stream focuses on reducing GHG emissions in NWT businesses, industries, and non-profits, with businesses and non-profits respectively eligible for funding up to 25% and up to 40% of projects' costs.

In 2022-2023, ten projects were approved under the two streams of the Program:

- A $330,000 grant for City of Yellowknife's aquatic centre to connect to a biomass district heating system, reducing 645 tonnes of CO_2e annually.
- NTPC's $468,000 grant to establish a fast electric vehicle charging station at Behchokǫ, anticipated to cut 140 tonnes of CO_2e each year.
- Łíídlıı̨ Kų́ę́ First Nation's solar and wind project funded at $77,105, targeting a reduction of 14 tonnes of CO_2e annually.
- Deh Cho First Nations received $81,153 for off-grid solar installations within Edéhzhíe National Wildlife Area, decreasing CO_2e emissions by 10 tonnes annually.
- 6133 NWT Ltd. was allocated $300,000 to retrofit Yellowknife's main post office with a biomass-fired boiler, estimated to reduce 70 tonnes of CO_2e each year.

- Polar Developments Ltd.'s Heat Recovery Ventilator at Anderson Thompson Tower in Yellowknife, poised to cut 97 tonnes of CO_2e annually.
- Ravenscourt Condos' biomass pellet boiler installation in Yellowknife, targeting 335 tonnes of CO_2e reduction annually.
- NWT Community Services Corporation energy recovery ventilators at Northern United Place in Yellowknife, aiming for an annual CO_2e cut of 214 tonnes.
- Borealis Development Inc.'s biomass-fired boiler at the Bellanca building in Yellowknife, anticipated to reduce 476 tonnes of CO_2e annually.
- A tenth retrofit project was approved in Enterprise but was unfortunately destroyed by wildfires in 2023.

Appendix D contains a list of all projects approved under the GHG Grant Program as of March 31, 2023.

LOOKING AHEAD

With its funding set to conclude by March 31, 2024, the GHG Grant Program is in its pivotal phase. As of October 1, 2023, all funds have been allocated across both streams. Discussions with the Government of Canada are underway, exploring potential avenues for continued funding past 2024.

ASSESSING BIOMASS BARGING ON THE MACKENZIE RIVER

Nihtat Energy Ltd.—working with the GNWT—has undertaken a business case study to examine and outline the conditions necessary for the cost-effective supply of wood pellets by barge in 12 remote communities along—or in the vicinity of—the Mackenzie River. The study—funded by the Government of Canada—builds off the findings of a pilot project conducted by Nihtat Energy Ltd. in the summer of 2022 to barge 1,000 tonnes of wood pellets from Hay River to Inuvik. It will directly support the objectives of the *Energy Strategy* by looking at ways to advance towards the Strategic Objective of increasing to 40% the share of renewable energy used for space heating by 2030.

The study includes the development of community heat load profiles, a review of logistical requirements to supply wood pellets in each community, as well as an assessment of the landed cost of wood pellets in each community—to be compared against the cost of traditional fuel. The study is anticipated to be completed in 2023-2024.

INDEPENDENT POWER PRODUCERS

As part of the *Energy Strategy*, the GNWT established a participation model to allow NWT residents, communities, and Indigenous governments to participate in the supply of renewable electricity. While residents can get a credit for power fed into the grid through the net-metering program, communities, and Indigenous governments—and related businesses—developing larger renewable generation assets can sell power to utilities as Independent Power Producers through a Power Purchase Agreement (PPA).

To date, four PPAs have been signed in the Northwest Territories, all with NTPC. These PPAs are listed in Table 4. The most recent PPA to be signed is with Nihtat Energy Ltd. for a 1-MW grid-connected solar farm located in Inuvik. The project is funded by NRCan and is expected to be operational by the spring of 2024. It will displace up to 1,189 tonnes of CO_2e annually on Inuvik's power grid.

Table 4. Power Purchase Agreements signed with utilities in the NWT

LOCATION	PROPONENT	PROJECT TYPE	INSTALLED CAPACITY (kW)	YEAR PPA WAS SIGNED	YEAR PROJECT CONNECTED TO NTPC GRID	ESTIMATED ANNUAL GHG DISPLACEMENT (t CO_2e) **
Łutselk'e	Lutselk'e Dene First Nation	Solar	36	2015	2016	50
Aklavik	Nihtat Energy Ltd.	Solar	150	2020	2024*	168
Tulita	Tulita Forest Products Ltd	Solar	45	2021	2023	57
Inuvik	Nihtat Energy Ltd.	Solar	1,000	2022	2024*	1,189

** Tentative* *** Estimate based on the carbon emissions intensity of local electricity grid*

MONITORING FEDERAL ENERGY REGULATIONS

Another way the GNWT is advancing the objectives of the *Energy Strategy* is by engaging with the Government of Canada on the ongoing development of federal energy and climate policy. Central to the engagement are the implications of proposed federal policy in the NWT, especially in a context where alternative technologies are limited (when they exist), and often lead to increased costs for residents and businesses.

In past years, the GNWT has engaged with Canada on the development of the Clean Fuel Regulations (CFR), which requires decreasing GHG emissions in the transportation sector through the use of low carbon fuels and the deployment of clean technologies.

The final regulations that came into effect in January 2023 broadly exempt the NWT, with only transportation fuels used in the industrial sector being subject to the regulations.

In spring 2022, the Government of Canada approached the GNWT to engage on a new piece of regulations, specific the electricity sector and called the Clean Electricity Regulations. The regulations require the great share of Canada's power supply to be net-zero emissions by 2035. In 2022-2023, the GNWT engaged multiple times with the Government of Canada to discuss the implications of such rules in the NWT. Draft regulations were released in the summer of 2023.

STRATEGIC OBJECTIVE 2 – REDUCE DIESEL

REDUCE GHG EMISSIONS FROM ELECTRICITY GENERATION IN DIESEL COMMUNITIES BY 25%

Reducing reliance on diesel electricity generation in communities is a priority. The GNWT and its partners are working to implement renewable and alternative energy solutions appropriate to each community and region. These initiatives are intended to help reduce GHG emissions from diesel electricity by 25% below average historical levels by 2030.

TRANSMISSION LINES

FORT PROVIDENCE AND KAKISA TRANSMISSION LINE

As part of its commitment to reduce GHG emissions from electricity generation in diesel-powered communities, the GNWT is proposing to construct a 170-km transmission line from the Taltson hydroelectricity system to Fort Providence, Kakisa, and Dory Point. These communities are accessible by road and relatively close to the Taltson system, which has a surplus of hydropower available. This project will reduce diesel fuel consumption for power generation by approximately one million litres and reduce GHG emissions by 3,000 tonnes of CO_2e per year. Replacing diesel electricity with hydroelectricity should also help stabilize the cost of power in these communities in future years.

PROJECT MILESTONES

2019-2020 – The GNWT selected the highway routing and updated previous technical and costing studies, initiated engagement with Indigenous governments and organizations, and conducted engagement activities.

2020-2021 – The GNWT continued consultation and engagement activities, applied for, and received federal funding support for the project, and completed preparations for environmental desktop studies and an environmental field program.

2021-2022 – The GNWT completed an environmental field program to gather baseline data and identify potential impacts. During the year, the GNWT continued consultation and engagement activities with Indigenous governments and organizations, communities, and other stakeholders to provide information on the project and address concerns. The GNWT also provided $550,000 to NTPC and $100,000 to NUL to undertake additional engineering studies and begin planning for the procurement and construction phases.

2022-2023 – The GNWT gathered additional environmental field program baseline data and continued consultation and engagement activities with Indigenous governments and organizations, communities, and other stakeholders. Engineering studies and design work also continued. Information gathered during the environmental field program, consultation and engagement, and engineering work was being used to prepare a Land Use Permit application package. The GNWT submitted the Land Use Permit application to the Mackenzie Valley Land and Water Board during the fall of 2023 and received a Land Use Permit in December 2023.

PREFERRED ROUTE

The GNWT is proposing to build the transmission line completely within existing highway corridors to minimize any potential disturbances or impacts. The transmission line would connect to the Taltson hydroelectricity system south of Hay River (near the junction of Highways 2 and 5), follow Highway 1 to connect to Kakisa and follow Highway 3 to connect to Dory Point and Fort Providence.

PROJECT FUNDING

Funding in the amount of $60 million has been secured for the project under the Investing in Canada Infrastructure Program (ICIP). $45 million provided by the Government of Canada, and the remaining 25% or $15 million from the GNWT. Once built, the transmission line will be operated and maintained by the applicable utility.

WHO WILL SUPPLY THE POWER?

The electricity distribution to Fort Providence, Kakisa and Dory Point will continue to be provided by the existing local utility. What will change is that this power will no longer come from diesel generation. Hydroelectricity will be provided by NTPC to the local utility—NUL—for sale in the community. The Fort Providence diesel power plant will remain in place to serve as back-up power generation in the event of a power outage on the new transmission line.

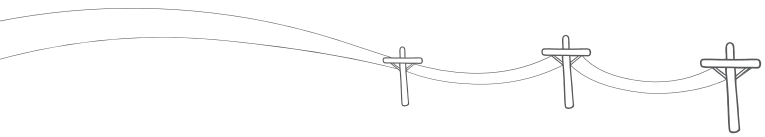
TENTATIVE TIMELINE FOR CONSTRUCTION

Construction of the proposed transmission line is tentatively planned to begin in 2025, subject to the project obtaining all regulatory authorizations.

WHATÌ TRANSMISSION LINE

This proposed project involves the construction of a 55-km transmission line to connect Whatì to the North Slave electricity system, which is primarily served by hydro. By displacing diesel generation, the project has the potential to annually displace 500,000 litres of diesel, reduce GHG emissions by 1,400 tonnes and reduce operating costs by $600,000.

The project is located almost entirely on Tłı̨chǫ lands and is supported by the Tłı̨chǫ Government. In 2021-2022, the GNWT and Tłı̨chǫ Government initiated discussions on the project and committed to working in partnership to advance the project. In 2022-2023, updates to previous technical studies were completed to identify an acceptable routing corridor for the project. In 2023-2024, the GNWT and Tłı̨chǫ Government will continue collaborating to identify and initiate additional technical and environmental studies.



WIND ENERGY

INUVIK WIND PROJECT

The Inuvik Wind Project is a key initiative under the *Energy Strategy,* and it is the first project in the NWT approved for funding under the federal government's Investing in Canada's Infrastructure Program (ICIP). This project includes the installation of a single 3.5-megawatt wind turbine and battery storage system, a six-kilometre access road, and a distribution line connecting to existing lines near Inuvik's Mike Zubko Airport. $40 million in funding has been secured for the project, with 75% provided by the Government of Canada and the GNWT providing the remaining 25%.

The GNWT has worked closely with the Gwich'in Tribal Council and the Nihtat Gwich'in Council on the Inuvik Wind Project. After commissioning, ownership of the project will be transferred to NTPC, which will also be operating it.

The Inuvik Wind Project is expected to reduce the town's GHG emissions by 6,000 tonnes annually.

Inuvik is the largest thermal community in the NWT. The wind turbine is expected to deliver 30% of Inuvik's annual electricity requirements, while contributing to the GNWT's 25% diesel reduction target for electricity. Now that it is operational, the project is anticipated to reduce annual GHG emissions by 6,000 tonnes and offset diesel consumption in Inuvik by up to three million litres per year. This represents over $3.4 million in annual fuel savings.

The construction of the six-kilometre access road to the site—along with the wind turbine and battery storage system—started in January 2022. The turbine was wintered in Hay River and was barged to Inuvik. The project was completed and has been producing power for the Inuvik grid since November 2023.

Building strong partnerships with Indigenous governments, communities and organizations is critical to advancing the objectives of the *Energy Strategy*. As the project is within the Gwich'in Settlement Area, contract work flowing from this project during the construction phase significantly benefitted Gwich'in businesses, creating jobs and spurring economic development in the Beaufort-Delta region. Approximately 90% of the work on the road was performed by local businesses.

The project's completion will also help stabilize the cost of living and doing business in Inuvik.

AURORA RESEARCH INSTITUTE WIND AND SOLAR MONITORING PROGRAM

Aurora College's Aurora Research Institute (ARI) has been at the forefront of wind resource assessment in the NWT, conducting over 10 campaigns in the last two decades. These assessments—crucial for the evaluation of wind power generation potential—have been enhanced by Light Detection and Ranging (Lidar) technology, which uses laser beams to measure wind speed and direction by detecting atmospheric particles. This technology is particularly useful in areas where traditional meteorological towers are not viable. ARI has also been pioneering solar resource assessments—a less common practice—by testing and demonstrating the effectiveness of deploying solar sensors, especially in the NWT's extreme environments.

The Aurora Research Institute has equipment set up to do four wind and solar resource assessments across the NWT.

With financial support from the GNWT and Government of Canada, ARI has acquired advanced equipment, including four ZX 300 Wind Lidar units for precise wind data collection from various heights, and three solar resource assessment (SRA) Systems to monitor solar potential. These systems are actively being used in four key resource assessment campaigns across the NWT. The campaigns are collaborative efforts with government and industry partners, aimed at monitoring and characterizing the wind and solar resources of the communities involved.

The data from these campaigns will provide a comprehensive analysis of the wind and solar potential, ultimately offering accurate predictions of the sites' annual energy production. This information will guide the estimation of wind turbine energy output and solar panel efficiencies, influencing design choices for energy system layouts. The gathered data will be shared with Indigenous and community governments as well as industry partners to support future wind and solar energy developments. Additionally, ARI will disseminate the findings to the public through detailed reports.

Equipment has been set up in Paulatuk to gather wind and solar data in the High Arctic community.

KEY CAMPAIGNS AND PARTNERSHIPS

- **Inuvik Solar Resource Assessment:** Partnering with the Government of Canada's Inuvik Satellite Station Facility, this campaign validates solar array efficiencies using SRA System data.
- **Fort McPherson and Tsiigehtchic Wind Resource Assessment:** In collaboration with NTPC, Lidar units collect wind data to support local power plant operations.
- **Wekweètì Wind and Solar Resource Assessment:** A joint initiative with the Tłı̨chǫ Community Government and ATCO, combining Lidar and SRA System data collection.
- **Paulatuk Wind and Solar Resource Assessment:** Teaming up with the Hamlet of Paulatuk, the local Energy Working Group and ATCO, this campaign gathers comprehensive wind and solar data.

DIESEL PLANT REPLACEMENTS AND EFFICIENCY IMPROVEMENTS

SACHS HARBOUR

This project involves the replacement of the existing diesel plant, which is at the end of its operating life. A modern plant will also facilitate the addition of renewable energy technologies to the local grid. In 2019-2020, the project was approved by Infrastructure Canada—through the Arctic Energy Fund—and a contribution agreement was signed with NTPC. The total budget is $8.9 million (75% ICIP + 25% NTPC). The 75% federal funding means that NTPC saves $6.7 million from its capital plan, which reduces the pressure on electricity rates.

The existing power plant has a low fuel efficiency of 3.1 kWh/L. Installation of a new high-efficiency diesel plant will provide the community with a reliable and cleaner supply of electricity. The project is expected to displace about 100 tonnes of GHG emissions per year.

A new plant and auxiliary equipment were shipped to Sachs Harbour in the fall of 2020, but NTPC was forced to defer the construction phase of the project due to COVID-19 challenges. Construction on the project was restarted in the spring of 2022. NTPC is taking steps to ensure the existing plant can continue to operate until 2023-2024, when the new plant will be operating.

Construction continues on the new Sachs Harbour power plant.

ŁUTSELK'E

Like Sachs Harbour, the existing diesel-electric plant in Łutselk'e is also at the end of its operating life. And similarly, a modern plant will facilitate the addition of renewable energy technologies to the community's grid. In 2019-2020, the project was approved by Infrastructure Canada—through the Arctic Energy Fund—and a contribution agreement was signed with NTPC. The total budget is $11.7 million (75% ICIP + 25% NTPC). The 75% federal funding means that NTPC saves $8.8 million from its capital plan, which reduces pressure on electricity rates.

At Łutselk'e's request, the new diesel plant was constructed on a more appropriate site on the outskirts of the community. The new diesel plant will provide the community with reliable power and will be able to accommodate the addition of renewable energy technologies more easily to the local grid. The project is expected to reduce GHG emissions by 100 tonnes per year.

During 2020-2021, NTPC initiated design, procurement, and site preparation activities. Shipment of material and equipment to the site and initial construction of the plant was undertaken during 2021-2022. Construction and commissioning of the new plant was successfully completed during 2022-2023 and it is now in operation.

The new Łutselk'e power plant was commissioned in 2023.

FORT SIMPSON PLANT RELOCATION

In 2021-2022, the GNWT completed a climate adaptation study that recommended the existing diesel power plant be relocated due to future flooding risks. In 2022-2023, NTPC estimated the scope of work and capital cost to relocate the existing diesel power plant, which will be moved to the same site identified for the Fort Simpson LNG project, therefore integrating the two projects. Work is ongoing to identify funding opportunities to advance this new project.

LIQUEFIED NATURAL GAS (LNG)

FORT SIMPSON LNG

In 2019-2020, a feasibility report was completed for the design of a new modular gas generating plant and LNG storage and vaporization facility on a parcel of land outside of the downtown core in Fort Simpson. The project was approved by Infrastructure Canada through the Green Infrastructure Fund. The total project budget is $15 million (75% ICIP + 25% NTPC). Although a fossil fuel, natural gas is a cost-effective alternative to diesel fuel for electricity, heating, and transportation. It burns cleaner and produces 25% fewer GHG emissions per unit of energy produced than diesel. Natural gas is odourless, non-toxic, and can be liquefied (LNG) or compressed (CNG), and safely and efficiently transported over long distances to locations not supplied by pipeline or a local resource.

It was intended that the project would consist of LNG storage, a re-gasification system, truck offload, on-site generation, as well as a space for storage and workspace. Other elements would have included a distribution interconnect to the main electrical grid, communications, and security. Going to a more efficient and lower emissions source was expected to result in 85% diesel displacement with a reduction of 1,800 tonnes of GHG per year, representing a 27% reduction in GHG emissions.

During 2020-2021, NTPC considered several options for the design of the gas generating plant and prepared to procure generation and electrical equipment.

However, in March 2021, the project was paused to undertake work associated with the need to relocate the existing diesel power plant due to flood risks. In 2022-2023, an estimate was completed for several options to expand the scope of the LNG project to include relocation of the existing diesel power plant. In 2023-2024, the GNWT will work with NTPC to identify and pursue additional funding for the expanded scope.

TUKTOYAKTUK LNG

Similar to the Fort Simpson LNG project, the intent of this project is to install a natural gas-fired generating unit in Tuktoyaktuk to displace diesel, thus reducing generating costs as well as GHG emissions. During 2020-2021, the GNWT initiated a feasibility study that identified and evaluated different options on how to best integrate gas-fired generation units into the existing diesel plant. To proceed into the second phase of the feasibility study, GNWT and NTPC reviewed the available options to determine the best potential solutions. In 2021-2022, the GNWT and NTPC worked together to select a preferred solution and completed additional pre-design work.

The project is currently still in the feasibility stage. If this project proceeds to construction, it could potentially be supplied with LNG from the proposed M-18 well that the Inuvialuit Petroleum Corporation is developing just outside of Tuktoyaktuk.

LOOKING AHEAD

In 2023-2024, the GNWT is planning to initiate a review of the NWT's known hydroelectric resources to determine if there are opportunities to develop additional feasible hydro projects to meet community or regional electricity demand in the future. If additional feasible projects are identified, the GNWT will work in partnership with Indigenous governments and organizations and community governments to discuss and advance them.

STRATEGIC OBJECTIVE 3 – TRANSPORTATION

REDUCE EMISSIONS FROM TRANSPORTATION BY 10% ON A PER-PERSON BASIS

Reducing emissions from transportation by 10% per capita is a strategic objective of the *Strategy*. Transportation accounted for 63% of GHG emissions in the NWT in 2021. Increasing electric vehicle (EV) use is one of the main ways the NWT intends to reduce emissions from vehicles.

ELECTRIC VEHICLES IN THE NORTHWEST TERRITORIES

EV adoption is gaining momentum across Canada. Following the recent commitment by the federal government to ensure that all new light-duty cars and passenger trucks are zero-emission vehicles by 2035, it is poised to increase even further. During 2022-2023, the GNWT made significant strides in the deployment of EVs—particularly in hydro communities. These communities leverage clean electricity to maximize reductions in emissions, while offering a more cost-effective means of transportation—estimated to be two to four times cheaper than gasoline-powered cars.

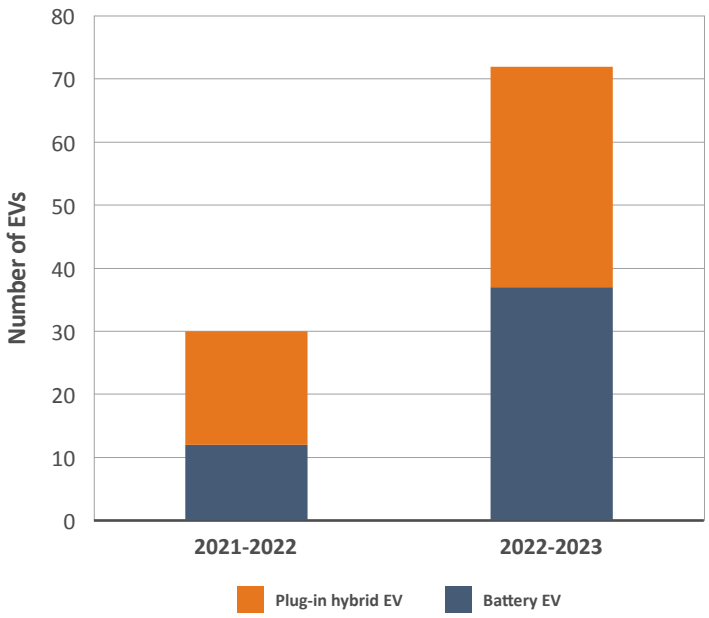
PROMOTING EV ADOPTION IN THE NWT

One of the key initiatives aimed at boosting EV adoption in the NWT is AEA's Electric Vehicle Incentive Program. This program incentivizes the transition to electric vehicles in NWT communities served by hydroelectric power by providing substantial rebates to offset the initial cost of purchasing an EV.

Participants in the program are eligible for a $5,000 rebate for the purchase of an EV, in addition to the $5,000 incentive offered by the Government of Canada. Eligible vehicles include battery-operated EVs as well as plug-in hybrids. The program also supports the purchase and installation of residential charging infrastructure, offering up to $500 for Level 2 chargers. As of March 31, 2023, this popular program has provided incentives for 31 EVs and 16 chargers—with 11 EVs and five chargers rebated for a total value of $58,000 in 2022-2023. It is estimated that this program collectively contributes to a reduction of 34 tonnes of CO_2e per year.

In 2022-2023, the NWT saw a substantial increase in EV registrations. A total of 72 EV registrations was a remarkable 140% increase compared to the previous year (Figure 8). Of these 72 EVs, 37 are fully electric, relying solely on a battery to store energy, while 35 are plug-in hybrids. The latter category combines a smaller battery with a gasoline engine to extend the range of the vehicle.

Figure 8. Electric Vehicles in the NWT



Source: *GNWT, Driver and Vehicle Services*

FIVE FACTS ABOUT EVs IN THE NWT

1. EVs are two to four times less expensive to operate than their gasoline equivalent on a per-kilometre basis in the NWT.
2. EVs work well in the extreme cold despite a known decrease in battery range (gasoline cars and trucks also experience a less-known decrease in performance in extreme cold, with reduced fuel efficiency).
3. Most modern EVs use heat pumps to efficiently heat the cabin and offer a comfortable experience in winter.
4. Fast charging stations can fully charge an EV in less than an hour.
5. The GNWT intends to complete a corridor of fast-charging stations to connect communities around Great Slave Lake by the end of 2024.

DEVELOPING EV INFRASTRUCTURE

In previous years, the GNWT and the AEA jointly subsidized the deployment of two Level 2 charging stations in Yellowknife, such as the one near City Hall, which are currently available for public use at no cost. Level 2 chargers operate faster than Level 1 chargers, which run on regular 110-volt outlets and have the ability to fully charge an EV in five to 12 hours (depending on several factors such as battery size). While Level 1 and 2 chargers can effectively serve the daily commuting needs within a community, faster chargers become essential for longer trips, such as travel between communities.

In 2021-2022, the GNWT announced its intention to establish a corridor of fast chargers in hydro communities around Great Slave Lake, connecting the NWT to Alberta (Figure 9). The selection of fast charger locations was informed by practical considerations, taking into account the availability of utility infrastructure, as well as insights derived from a 2020 study focused on EV adoption and corresponding EV infrastructure requirements. The corridor will encompass fast charging stations situated at six locations around Great Slave Lake. Each location will be outfitted with at least one Level 3 charger, known for its capability to recharge an EV in less than hour. In some instances, a combination of Level 3 and Level 2 chargers will be provided, adding flexibility for EV users.

As part of this plan, the GNWT allocated funds for the installation of two Level 3 chargers in Yellowknife in 2021-2022, to be owned and operated by NUL. In 2022-2023, the GNWT provided funds through the GHG Grant Program to install a Level 3 charger in Behchokǫ̀. Similar chargers are planned for installation in Fort Providence, Enterprise, Hay River, Buffalo Junction and Fort Smith, with funding and initiatives aligned with the objectives outlined in the *2022-2025 Energy Action Plan*.

Figure 9. Proposed Level 3 charging stations

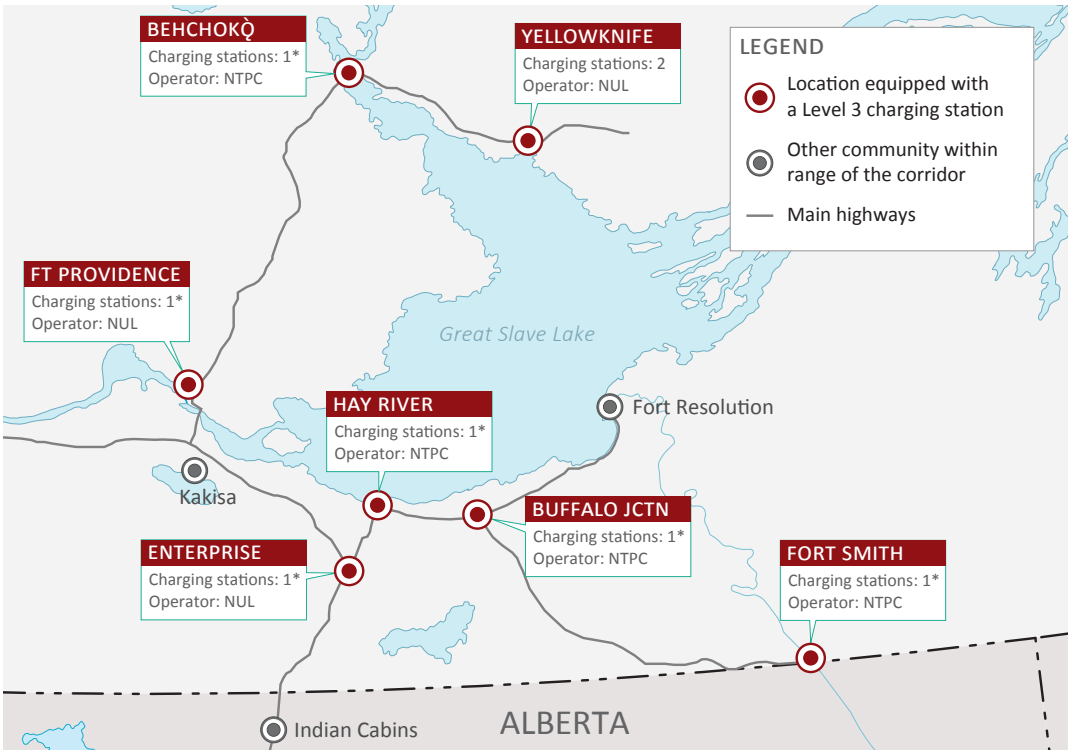


Figure 9 shows the locations of the Level 3 chargers forming a zero-emissions corridor around Great Slave Lake.
** Location equipped with an additional Level 2 charging station for redundancy purposes.*

The EV corridor represents a $3.8 million investment, made possible by combining the following three funding sources:

- GNWT funding, including new funding requested under the GNWT's *2022-25 Energy Action Plan* ($1.9 million),
- The GNWT's GHG Grant Program, supported by the Government of Canada's Low Carbon Economy Leadership Fund ($1.5 million),
- The GNWT's Electric Vehicle Infrastructure Program (see sidebar below), supported by the Government of Canada's Zero Emission Vehicle Infrastructure Program ($360,000).

Fast chargers forming the EV corridor will be owned and operated by NWT electric utilities, NTPC and NUL. It is anticipated the EV corridor be completed by December 2024.

GNWT'S ELECTRIC VEHICLE INFRASTRUCTURE PROGRAM

In 2022-2023, the GNWT announced a new application-based funding program to provide rebates for businesses, governments, utilities, and organizations to install Level 2 and Level 3 chargers in the NWT. By targeting organizations, the new program complements AEA's pilot program, which solely offers rebates for Level 2 chargers for residents and small businesses. The GNWT received $414,000 from Natural Resources Canada to administer the program for two years. More information can be found on the Department of Infrastructure's website.

BEYOND ELECTRIC VEHICLES

The *2022-2025 Energy Action Plan* released in December 2022 contains additional initiatives that will help electrify personal mobility beyond cars. These include two pilot programs to offer rebates for electric bikes, as well as on-the-land electric vehicles, such as electric snowmobiles, ATVs, and boats. Both programs are funded by the GNWT and will be piloted by the AEA in 2023-2024.

STRATEGIC OBJECTIVES 4 & 5 – HEAT & EFFICIENCY

Increase the share of renewable energy used for community heating to 40% and increase commercial, residential, and institutional building energy efficiency by 15%.

ARCTIC ENERGY ALLIANCE (AEA) PROGRAMS AND SERVICES

The AEA is a non-profit society dedicated to helping reduce the costs and environmental impacts of energy in the NWT by providing programs and services to residents, communities, non-profits, and businesses. Funded by the GNWT, the AEA is one of its most important partners and delivery agents for energy initiatives across the NWT.

The AEA delivers programs and services directly to all NWT communities through six regional offices—Fort Simpson, Hay River, Inuvik, Norman Wells, Behchokǫ̀ and Yellowknife—and maintains a close connection to communities throughout the territory.

In 2022-2023, the AEA delivered programs and services in all NWT communities, giving out a total of 2,656 incentives worth $1.3 million in combined value. This translates into 1,400 MWh in energy savings—equivalent to taking two communities the size of Wekweètì off the grid—and avoiding the use of 10,000 GJ of fossil fuels. In 2022-2023, programs and services delivered by the AEA reduced territorial GHG emissions by 1.1 kt of CO_2e, at an average cost per rebate of $74 per lifetime tonne avoided.

In addition to its programs, the AEA undertook eight special projects in 2022-2023. One of these projects aimed to test cold-climate air-source heat pumps in the NWT (see sidebar below).

Results from the AEA's 2022-2023 programs are summarized in the following pages. To learn more about individual programs and special projects, visit http://aea.nt.ca.

AEA'S COLD-CLIMATE AIR-SOURCE HEAT PUMP PROJECT

Air-source heat pumps are a highly efficient way to heat a home using electricity. Plus, when they use a renewable source of electricity—like hydropower—they can practically eliminate GHG emissions related to home heating. Traditionally, however, air-source heat pump technology has not been well suited to the NWT's climate.

In recent years, more and more cold-climate air-source heat pumps have come on the market, but there is still very limited information on how they work in the North and how well they interact with existing heating systems. For these reasons, the AEA started a special project to test cold-climate heat pumps in Yellowknife.

With financial support from the GNWT departments of Environment and Climate Change and Infrastructure, the AEA partnered with Housing NWT to install heat pumps and monitoring equipment in two homes in a single building, with a third home serving as a control (i.e. without a heat pump). The AEA will continue to monitor the equipment over the coming winters to determine its suitability to the NWT.

The AEA has started a project to see if cold-climate heat pumps could work in the NWT.

2022-2023 ARCTIC ENERGY ALLIANCE PROGRAM RESULTS

BIOMASS ENERGY PROGRAM

Held Biomass Week educational workshops for homeowners, students, and owners and operators of larger buildings.
Launched a project to help building owners install wood pellet boilers.

Completed work on a pre-feasibility analysis for one community on a district heating system and continued working on an analysis for another community.

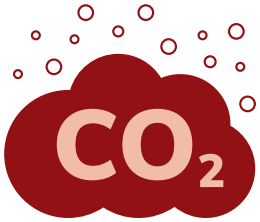
ENERGY EFFICIENCY INCENTIVE PROGRAM

2,438 rebates provided.

LED lighting continues to be the most popular eligible product.

1,644 LED Rebates

208 more than last year.



Combined, the energy efficient products purchased will save the NWT **550 tonnes** of greenhouse gases annually — more than any other AEA program this year.

DEEP HOME ENERGY RETROFIT PROGRAM

Completed **3** pre-retrofit home energyevaluations, and provided **5** final rebates worth **$29,000**, plus an additional 7 interim rebates valued at **$25,000**.
Five post-retrofit evaluations were also conducted under the program.

Combined, the **10** clients with completed projects are expected to save **200 GJ** of heating fuel a year — equivalent to the energy contained in 5,200 litres of heating oil.

ENERGY RATING SERVICES SUPPORT PROGRAM

174 home energy evaluations completed.

Evaluations performed on new homes. **28**

Combined, all recommended upgrades on existing homes could save homeowners

$410,000

and **460 tonnes** of greenhouse gas emissions a year.

COMMERCIAL ENERGY CONSERVATION AND EFFICIENCY PROGRAM

Provided **15** rebates.

The average client project will pay for itself through energy savings in just over three years.

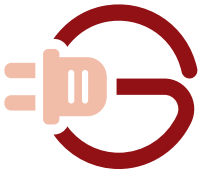
Combined, annual electricity consumption avoided by all clients' projects is roughly 240,000 kWh, which is equivalent to about 36 percent of the electricity consumed every year in Wekweètì.

COMMUNITY GOVERNMENT BUILDING ENERGY RETROFIT PROGRAM

$110,000

Distributed in rebates in four communities.

Completed **9** desktop ***"yardstick"*** energy audits and **15** on-site ***"targeted"*** building energy audits in two communities.



Energy audits identified more than

$170,000

in potential annual savings & 160 tonnes of potential annual GHG reductions

NON-PROFIT ENERGY EFFICIENCY AND CONSERVATION PROGRAM

Distributed **5** rebates valued at approximately **$78,000**

The average client project is expected to pay for itself in less than two years.

Combined, all client projects will avoid approximately 32 tonnes of greenhouse gases and 220,000 kWh of power every year — equivalent to about 33 percent of the electricity consumed every year in Wekweètì.

COMMUNITY WOOD STOVE PROGRAM

Coordinated the installation of **26** stoves in two partner communities.

Combined, all installed stoves will save **690 kg** of particulate emissions *(a 93% decrease)* and **50 tonnes** of greenhouse gas emissions a year.

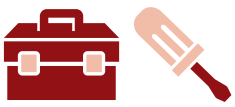
Savings from the **26** wood stoves installed in 2022-2023 *compared to heating with oil alone*

Heating oil displaced in litres:	Annual GHG reductions:	Annual savings:
43,000	**115** Tonnes	**$67,000**

DESIGNATED INCOME HOME WINTERIZATION PROGRAM

Worked with **6** partner communities to hire and train 5 local liaison workers.

Hosted educational workshops for lower-income homeowners in five communities.



Distributed **111** energy efficiency kits to workshop participants.

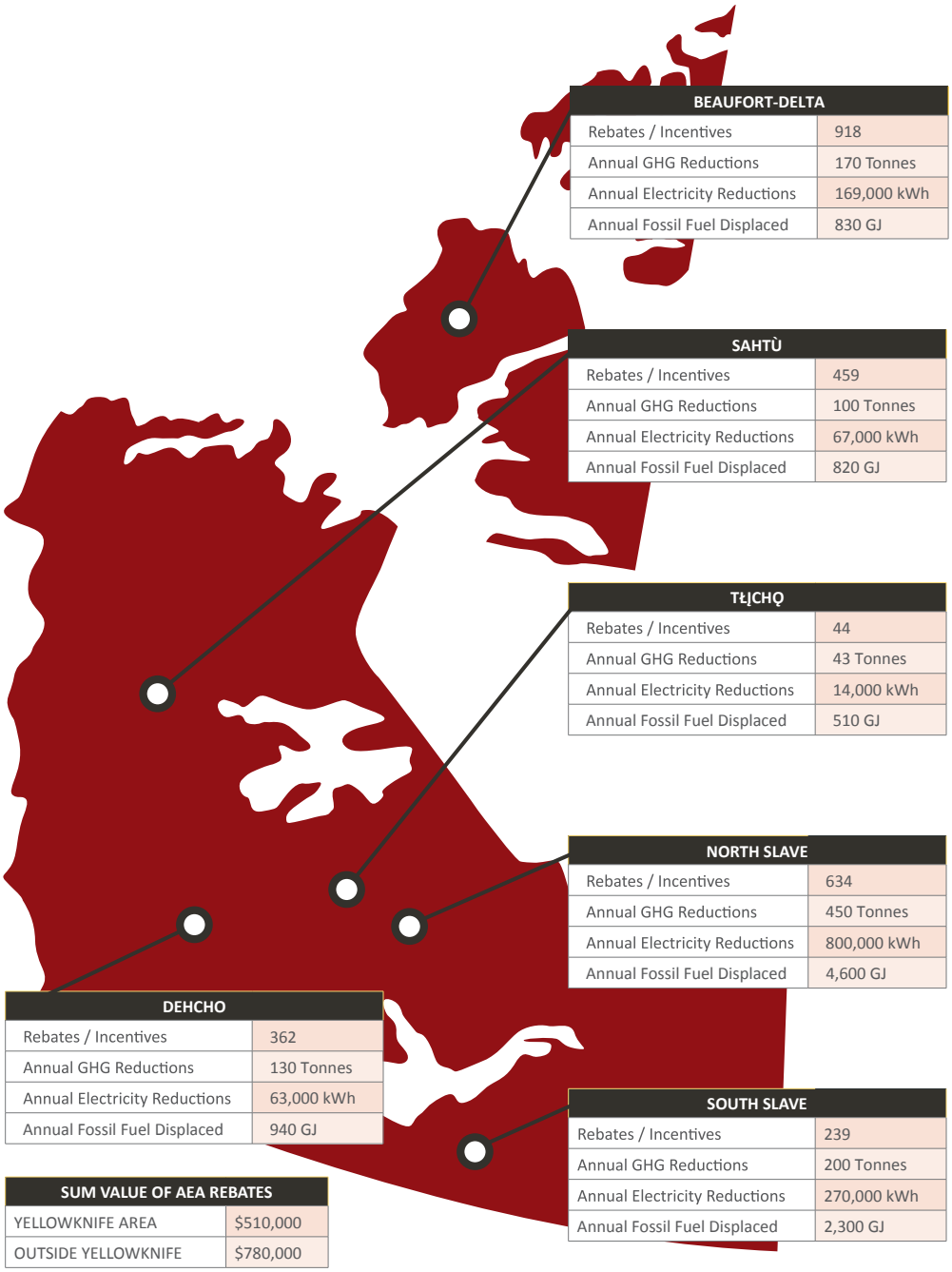
ALTERNATIVE ENERGY TECHNOLOGIES PROGRAM

36 Rebates provided.

The **36** systems that the AEA's clients installed are expected to save roughly **250** tonnes of greenhouse gases a year.

The average system is expected to pay for itself in less than six years.

AEA PROGRAMS' REGIONAL RESULTS



BEAUFORT-DELTA	
Rebates / Incentives	918
Annual GHG Reductions	170 Tonnes
Annual Electricity Reductions	169,000 kWh
Annual Fossil Fuel Displaced	830 GJ

SAHTÙ	
Rebates / Incentives	459
Annual GHG Reductions	100 Tonnes
Annual Electricity Reductions	67,000 kWh
Annual Fossil Fuel Displaced	820 GJ

TŁĮCHǪ	
Rebates / Incentives	44
Annual GHG Reductions	43 Tonnes
Annual Electricity Reductions	14,000 kWh
Annual Fossil Fuel Displaced	510 GJ

NORTH SLAVE	
Rebates / Incentives	634
Annual GHG Reductions	450 Tonnes
Annual Electricity Reductions	800,000 kWh
Annual Fossil Fuel Displaced	4,600 GJ

DEHCHO	
Rebates / Incentives	362
Annual GHG Reductions	130 Tonnes
Annual Electricity Reductions	63,000 kWh
Annual Fossil Fuel Displaced	940 GJ

SOUTH SLAVE	
Rebates / Incentives	239
Annual GHG Reductions	200 Tonnes
Annual Electricity Reductions	270,000 kWh
Annual Fossil Fuel Displaced	2,300 GJ

SUM VALUE OF AEA REBATES	
YELLOWKNIFE AREA	$510,000
OUTSIDE YELLOWKNIFE	$780,000

CAPITAL ASSET RETROFIT FUND

Initiated in 2007, the Capital Asset Retrofit Fund (CARF) program delivers energy efficiency projects for GNWT facilities to reduce their GHG emissions, energy use and operating costs. In 2022-2023, approximately $3.8 million was assigned to energy retrofit projects, resulting in an estimated $290,000 of annual savings. Since the inception of the program, CARF projects have now reached overall cumulative emissions reductions of 15.8 kt CO_2e in GNWT-owned assets.

2022-2023 CARF PROJECT HIGHLIGHTS

Some of the CARF projects commissioned in 2022-2023 are showcased in this report. For a full list of CARF projects funded in 2022-2023, see Appendix B. All biomass boiler replacement projects completed under CARF are listed in Appendix C.

Yellowknife Prince of Wales Northern Heritage Centre Biomass Optimization

The Prince of Wales Northern Heritage Centre's 300kW biomass system has been in operation since 2016. Through operational feedback, data analysis and experience gained with more recent biomass projects, an opportunity for system optimization was identified. This project, funded by CARF, was for the addition of two 1,500 litre thermal storage tanks and increasing the size of the heat exchanger between the biomass and building systems. Additional thermal mass helps to stabilize biomass boiler operation, improve overall efficiency, and reduce maintenance requirements. Increasing the size of the heat exchanger eliminates the related efficiency losses by allowing heat from the biomass system to feed directly into the building.

The project aims to increase biomass utilization in the Prince of Wales Northern Heritage Centre building by 30% overall, providing an annual savings of $26,000 and an additional GHG offset of 156 tonnes per year by displacing 58,000 litres of heating oil annually.

Prince of Wales Heritage Centre's biomass heating system upgrades make it more efficient.

ANNUAL RESULTS

GHG reductions:
156 tonnes of CO_2e

Savings:
$26,000

Heating oil displaced:
58,000 litres

Tulita's Chief Albert Wright School has been switched to more energy efficient LED lighting.

Tulita Chief Albert Wright School Lighting Retrofit

Funded by CARF, this project replaced existing fluorescent lighting throughout the building with LED equivalents. LED lighting retrofits are typically straightforward projects. When replacing older lighting technology, the benefits include reduced power consumption, increased unit lifespan, reduced maintenance, and short payback periods. This project will reduce annual electrical consumption of the building by 53,000 kWh resulting in estimated savings of $59,000 per year and providing a payback period of less than 6 years. As Tulita is a Thermal Community (electricity is generated by diesel generators) there is a direct annual reduction in GHG emissions of 32 t of CO_2e.

ANNUAL RESULTS

GHG reductions:
32 tonnes of CO_2e

Savings:
$59,000

Electricity savings:
53,000 kWh

Fort's Smith's River Ridge correctional complex got new energy-efficient LED lighting and a digital control system thanks to CARF.

Fort Smith Correctional Complex (River Ridge) Lighting and Digital Controls Upgrade

This energy upgrade project funded by CARF replaced all existing lighting with LED equivalents as well as the addition of a Direct Digital Control (DDC) system throughout the building. Adding a DDC system provides improved building control, scheduling, and remote monitoring. As the facility has an existing hydronic connection to the Fort Smith's Women's Correctional Centre, the new DDC system allows for better control to prioritize the use of the women's correctional centre's biomass boiler and reduce the overall fuel oil use at River Ridge. The total project aims to save $22,000 annually as well as offsetting approximately 30,000 litres of fuel and 81 t of CO_2e.

ANNUAL RESULTS

GHG reductions:
81 tonnes

Savings:
$22,000

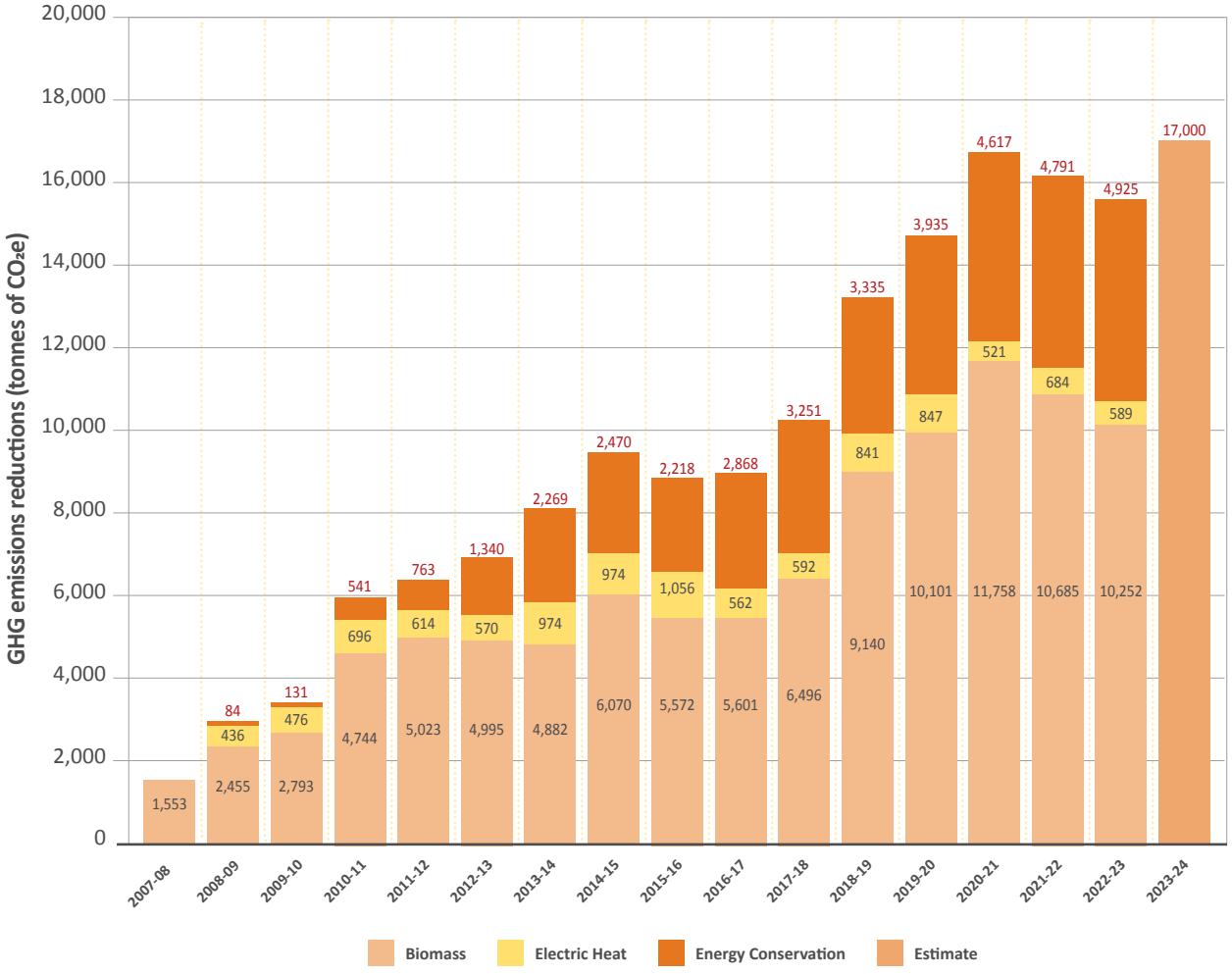
Heating oil displaced:
30,000 litres

CARF CONTRIBUTION TO EMISSIONS REDUCTIONS

Projects deployed through the CARF program since 2007-2008 have reduced GHG emissions by 15,766 t of CO_2e in 2022-2023, resulting in cost savings of $3.7 million for the GNWT. These numbers are slightly lower than in the previous year (respectively 16,160 kt and $4.1 million in 2021-2022) due to reduced operation of GNWT biomass boilers in 2022-2023 due to supply chain issues.

Figure 10 shows how most of the GHG emissions reductions and resultant cost savings came from a switch to biomass for space heating. The combined action of reduced reliance on biomass for space heating and additional emissions reductions achieved through energy conservation and electric heat resulted in a net 0.4 kt increase in emissions since the previous year.

Figure 10. GHG Reductions from Initiatives in GNWT Buildings since 2007-2008



Note: *GHG emissions reductions from biomass projects include all biomass projects funded by the GNWT across the NWT, with some of them not funded by CARF.*

See Appendix A for an inventory of GNWT buildings' energy use and GHG emissions.

HOUSING NORTHWEST TERRITORIES

ENERGY MANAGEMENT STRATEGY

In 2023, Housing Northwest Territories (Housing NWT) released its *Energy Management Strategy* and its accompanying three-year *Energy Management Blueprint*.

The *Strategy's* vision by 2030 is for Housing NWT to maintain a sustainable housing portfolio that is less reliant on fossil fuels and contributes to the economic, social, and environmental well-being of the NWT and its residents. This will be achieved by:

- Providing a structured approach to managing energy use within Housing NWT's portfolio.
- Aligning with the NWT's *2030 Climate Change Strategic Framework* and the *2030 Energy Strategy*.
- Setting specific, measurable targets for reducing energy consumption, increasing renewable energy use, and cutting greenhouse gas emissions.
- Achieving greater operational efficiency, reduce costs associated with energy consumption, and potentially redirect savings to other initiatives.
- Anticipating technological advancements in renewable energy and changes in climate policy.
- Demonstrating accountability to stakeholders and maintain transparency about its energy management practices and progress towards its 2030 goals.

Objectives of the *Strategy* are being advanced through measurable actions set out in the *Blueprint*, which will serve as a roadmap toward achieving the NWT's 2030 energy targets.

HOUSING NWT'S COMMITMENT TO 100 NEW UNITS

Housing NWT is constructing 100 additional units of public housing in communities across the NWT configured as two- and three-bedroom houses as well as singles duplexes and fourplexes.

These housing designs are highly energy-efficient, targeting 20% greater than building code's minimum requirements with the goal of reducing GHG emissions and lowering operational costs.

Each building's design maximizes energy conservation through an optimized form and airtight envelope, which contribute to minimizing heat loss. This construction implements low-maintenance materials and systems and is designed for climate resiliency to maximize service life in our Northern context. High-performance insulation, siding, and roofing materials have been selected not only for their robustness, but also for their long-term durability in the face of potential climate change-induced events. These low-maintenance materials are specifically selected to withstand extreme weather conditions, ensuring the longevity of each unit.

New energy efficient Housing NWT units built in Sambaa K'e (top) and Nahanni Butte (bottom).

LOOKING INTO NET-ZERO EMISSIONS SPACE HEATING

In Fort Smith, Housing NWT worked in partnership with the Fort Smith Métis Council to construct a duplex which includes an electric boiler, a first for Housing NWT. This boiler will result in zero-emissions space heating since Fort Smith's grid is fed by hydropower.

Housing NWT also has plans to continue to convert its fossil fuel appliances to biomass, with the ultimate goal of achieving net-zero emissions space heating in the NWT.

HOUSING NWT'S DISTRICT HEATING SYSTEMS STUDY

In 2022-23, the GNWT contributed $400,000 to Housing NWT to undertake a feasibility study for biomass district heating systems serving multiple buildings in numerous NWT communities, including Yellowknife, Inuvik, Hay River, and Fort Providence. The study will identify potential buildings for such retrofit, propose a design for the district heating system, and develop a capital and operating budget for each project. Housing NWT anticipates the study to be complete in 2024.

STRATEGIC OBJECTIVE 6 – LONG-TERM

A longer-term vision: develop the NWT's energy potential, address industry emissions and do our part to meet national climate change objectives

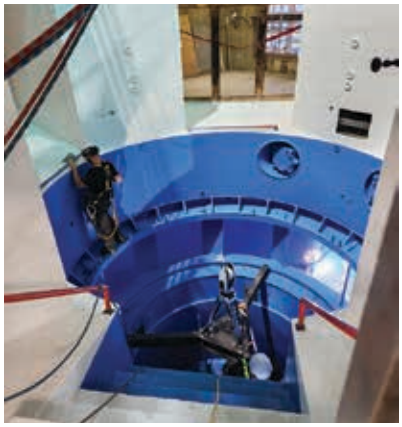
HYDROELECTRIC SYSTEMS UPGRADES

TALTSON HYDRO OVERHAUL PROJECT

Components of the existing Taltson hydroelectric generating facility are approaching or have already exceeded their useful life. This project is a multi-year initiative to refurbish the turbine and generator components and extend the facility's operating life. $23.8 million in funding has been secured—75% from Infrastructure Canada and the remaining 25% from NTPC.

This project is in the construction phase. The turbine and generator were shipped to the site during the 2022-2023 winter road season. Construction is scheduled to be completed in 2023-2024.

Once completed, this project will ensure the Taltson facility will continue to provide clean hydroelectricity for the next 40 to 60 years. This investment in clean electricity infrastructure will provide better opportunities for new business ventures and industries to access low GHG emissions electricity.



The Taltson Overhaul Project will be completed in 2024.

SNARE FORKS UNIT 1 & UNIT 2 OVERHAUL PROJECT

Components of the existing Snare Forks hydroelectric generating facility are also approaching or have exceeded their useful life. This project is a multi-year initiative to upgrade the Unit 1 and Unit 2 generating units and extend the facility's operating life. $18.9 million in funding has been secured—75% from Infrastructure Canada and the remaining 25% from NTPC.

This project is in the construction phase. Work on Unit 1 is complete and has been operating since November 2020. Interim work has been completed on Unit 2 to extend the life of the unit. Therefore, it was decided in 2022-2023 to postpone the major overhaul of Unit 2 until 2028 so NTPC can focus on other more urgent major asset replacements.

When finished, this project will ensure the continued reliability of the electricity supply from the 9.2-MW Snare Forks facility. GHG emissions from burning diesel due to any unexpected shutdowns will be reduced, and the percentage of hydroelectricity being supplied to meet the NWT's annual electricity requirements will be maintained.

ASSESSING GEOTHERMAL POTENTIAL

FORT LIARD GEOTHERMAL PROJECT

Geothermal energy is identified as a potential longer-term option for energy production in the *Strategy*. There may be significant geothermal energy potential in the NWT, but much of it is very deep, untested, and potentially very expensive to develop. More study and data are needed to better understand geothermal resources across the NWT.

In 2018, the GNWT committed to lead a science-based study—with the assistance of the NWT Geological Survey—to assess the geothermal potential near the community of Fort Liard. The study has experienced delays, and is expected to be publicly released by the end of 2023-2024. Should the potential for a geothermal project be established, the availability of funding—among other factors—will determine whether an exploratory drilling program can be undertaken near Fort Liard.

OTHER PROJECTS

Beyond the GNWT's ongoing geothermal initiative in Fort Liard, there are other partnerships undertaking separate science-based and feasibility-level geothermal studies in the south of the NWT. The combination of local knowledge and geothermal expertise that these partnerships provide are key in finding solutions to the technical, economic, and environmental issues that have prevented the deployment of geothermal technology in the NWT. The GNWT is committed to supporting these partnerships when possible and will continue to monitor their advancements.

TALTSON HYDRO EXPANSION PROJECT

Twice as Much Clean Power

The Taltson Expansion Project aims to more than double the hydro capacity in the Northwest Territories. By connecting 10 NWT communities, the unified hydro grid would cover over 70% of the NWT's population. The project offers opportunities to strengthen Indigenous partnerships, advance community electrification and catalyze economic growth by providing communities and industry with access to clean energy, all while aligning with GHG emission reduction goals.

Building Indigenous Partnerships

Since 2018, the GNWT's partnership with the Akaitcho Dene First Nation (ADFN) and Northwest Territory Métis Nation (NWTMN) has been guided by a Memorandum of Understanding (MOU) that signifies a shared commitment to exploring Taltson's potential.

Indigenous partner involvement has been a central focus of the project with more than 30 Working Group Meetings, three Steering Committee Meetings, and numerous technical briefings to the partner leadership of the ADFN, GNWT and NWTMN.

Design Engineering and Route Exploration

The exploration of two critical transmission line route options—the Western Great Slave Lake Route and the direct-to-Yellowknife Submarine Cable Route—is underway. A comprehensive route comparison report is in process of being completed.

Advancing Commercial Arrangements

The review process—including updated capital cost estimates—is geared towards refining proposed ownership structures in collaboration with the Canada Infrastructure Bank. This involves evaluating risks, revenue-sharing mechanisms and exploring financing options. These steps are crucial for aligning the commercial structure with the defined principles of the MOU and the business case, operations and market risks that will need to be managed prior to a construction decision.

Preparing for Regulatory Processes and Next Steps

As the focus shifts towards formalizing commercial agreements the partners are defining the conditions necessary to proceed to construction. This work will ensure that the NWT is best positioned to meet growing energy demands from communities and industry with clean, reliable energy. The project is evaluating the ramifications of climate change and new federal climate policies on its design and the future energy demand in the territory.

Looking Ahead

A single hydro grid will integrate the Snare, Bluefish and Taltson hydro systems to provide 115.5 MW of low impact hydro power that will connect 10 NWT communities and provide the foundational infrastructure needed for industry to be part of a long-term solution to stabilize the cost of energy, electrify transportation and industrial demand to reduce GHG emissions and grow our economy sustainably. The Taltson project team will continue to collaborate, quantify risks and benefits, formalize the business partnership and work to secure federal funding. Immediate work will focus on land use and traditional knowledge considerations to inform winter road construction to Nonacho Lake and transmission line routing for the Western Great Slave Lake and overland/submarine cable options. Ongoing collaboration, commercial arrangements, and technical advancements are steadily defining the project's potential.

Members from Northwest Territory Métis Nation and GNWT staff flew over potential transmission route options in October 2022. The findings from this work were incorporated into technical reports on transmission line route alternatives.

ENGAGEMENT EFFORTS

- Over 30 Working Group Meetings
- Three Steering Committee Meetings: including Leadership representatives from GNWT, ADFN, and NWTMN
- Numerous technical briefings delivered
- Objective: Developing trust and shaping project trajectory based on partner input

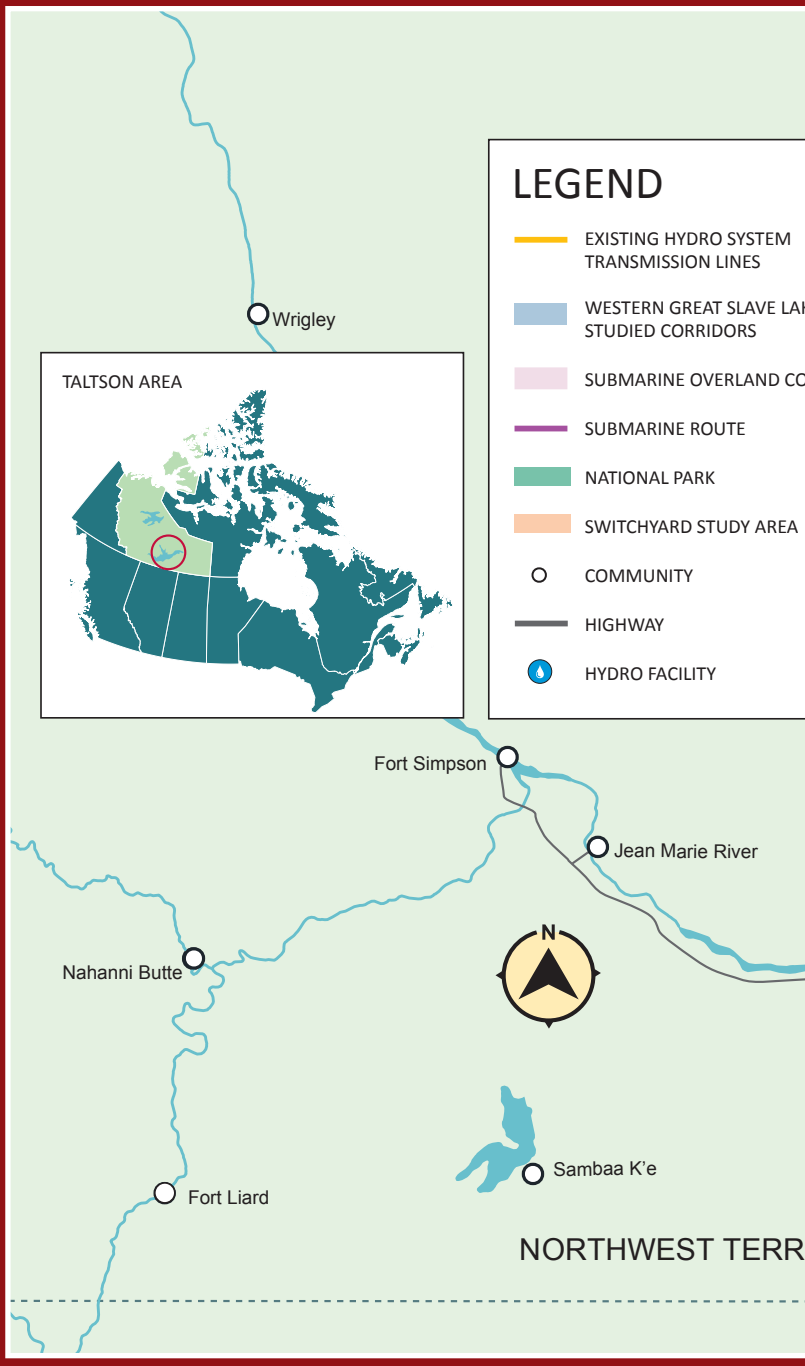
CLIMATE CHANGE CONSIDERATIONS

- Ongoing climate impact studies on project design
- Recognition of Taltson Expansion as a solution to replace diesel back-up during Snare drought/low water events
- Evaluation of new federal climate policies:
  - 2035 ban on the sale of internal combustion vehicles
  - Impact on future energy demand in the territory
- Exploration of climate change-related challenges on the evolving energy landscape

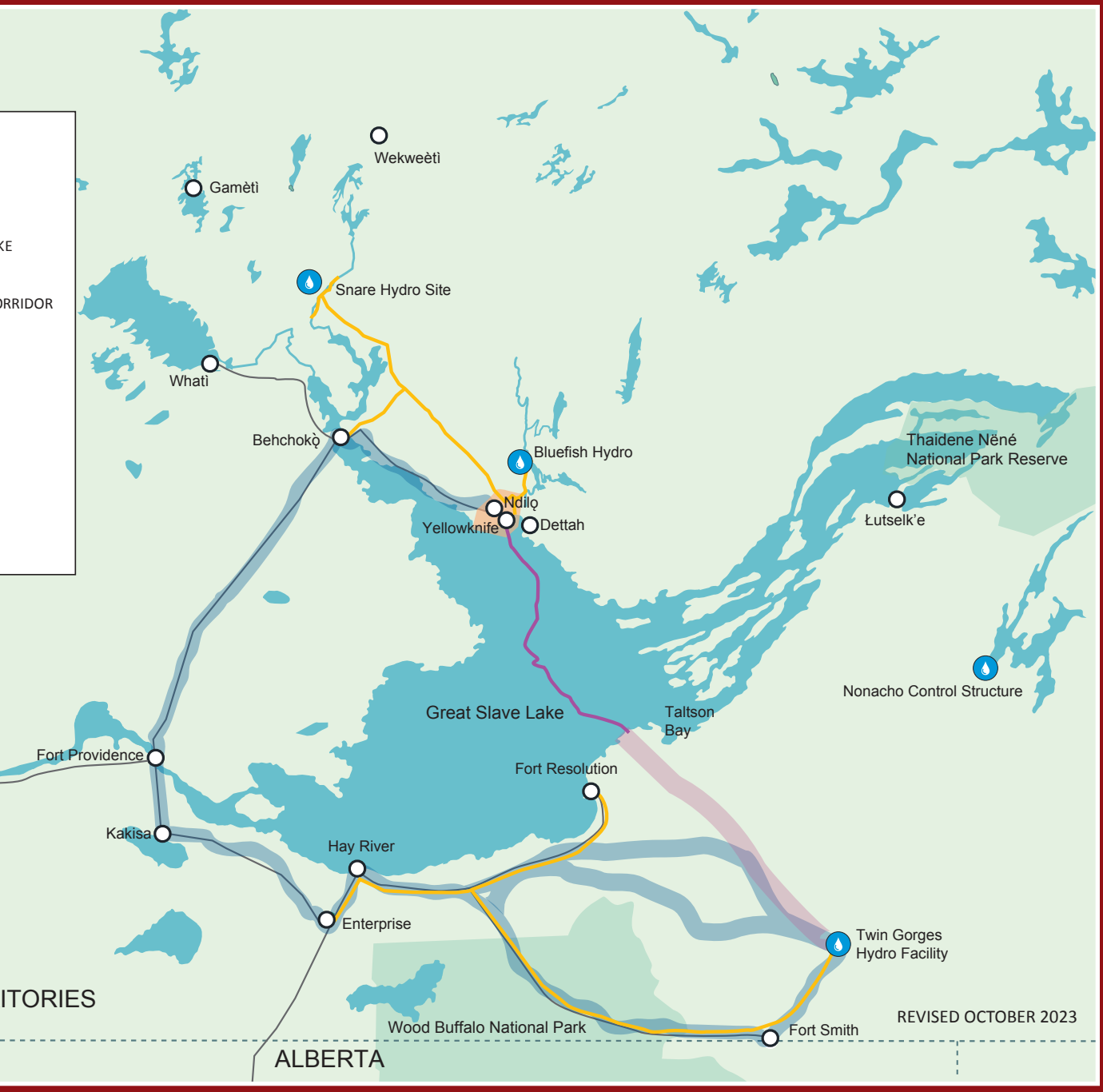
FEDERAL FUNDING

- Amount: $20 million
- Source: CIRNAC, Government of Canada
- Timeline: Provided since 2018
- Key workstreams:
  - Building Indigenous Partnerships
  - Design Engineering
  - Advancing Commercial Arrangements
  - Preparing for Regulatory Processes

TALTSON TRANSMISSION LI



NE ROUTE OPTIONS



MODELING EMISSIONS REDUCTION PATHWAYS IN THE NWT

The NWT's current target for GHG emissions reductions is 30% below 2005 levels by 2030. In recent years, Canada has become more ambitious in its emissions reduction efforts, committing to reduce the country's emissions by 40-45% (below 2005 levels) by 2030, and achieving net-zero emissions by 2050. The GNWT commissioned Navius Research—a leading Canadian consulting firm—to model potential emissions reduction pathways in the NWT. This section highlights some of the key findings as well as implications the GNWT identified from the modeling work. These findings will be used in 2023-2024 to inform GNWT's engagement on the five-year review of the *Strategy* and the CCSF. The Navius study can be found on the Department of Infrastructure's website.

MODELING APPROACH

The objective of the modeling work was to understand possible, cost-effective low-carbon pathways for the NWT to follow to achieve net-zero emissions by 2050. These should be considered *potential* pathways, and not a prediction or prescription of what should be done. Navius customized their economic model to represent the NWT's economy and energy system.

The model considered various factors such as Gross Domestic Product forecasts, mine operations, low-carbon technology costs, and current climate mitigation efforts in North America. Four different scenarios were analyzed (see the Navius Report for details).

KEY FINDINGS

1. The NWT is on track to achieve its 2030 target of a 30% emissions reduction below 2005 levels. However, more work is needed should the NWT adopt Government of Canada objectives of reducing GHG emissions by 40-45% in 2030 and achieving net-zero emissions by 2050.
2. A combination of five technologies offers an approach for the NWT to achieve drastic emissions reductions, including a net-zero objective by 2050:

- Boosting low-carbon electricity (hydro, wind, solar) coupled with battery storage.
- Electrifying energy end-uses by transitioning to electric vehicles and utilizing heat pumps for space heating.
- Maximizing biomass usage for heating buildings.
- Adopting biofuels as a last resort to displace diesel fuel in harder-to-abate sectors such as transportation, building heating, and potentially power generation.
- Exploring technology and nature-based solutions to remove and store carbon from the atmosphere.

ACHIEVING NET-ZERO EMISSIONS: WHAT IT COULD TAKE

The Navius report suggests the NWT achieving a net-zero emissions target by 2050 will involve:

- Doubling electricity supply from 275 GWh/year to 570 GWh/year;
- Increased reliance on biomass heating for buildings, potentially up to 45% of the space heating load;
- Potential adoption of battery electric vehicles for half of light-duty vehicles and 30-40% of medium-duty vehicles;
- Exploration of suitable Arctic-grade liquid biofuels to replace fossil fuels in transportation, building heating, and possibly power generation.

LOOKING AHEAD

The Navius modeling work demonstrates that while the NWT is on track to meet its original 2030 emissions reduction target, further efforts and investments would be required to achieve higher reductions by 2030 and ultimately reach net-zero emissions by 2050. Implementing a strong suite of technologies is crucial to meet a net-zero target, but these initiatives would have significant implications for the NWT's energy system, economy, and residents. Addressing these challenges will require substantial Government of Canada funding support, as well as strong policies that consider economic impacts and the potential of the territory's critical mineral resources.

HEADING TO THE FIVE-YEAR REVIEW OF THE *2030 ENERGY STRATEGY*

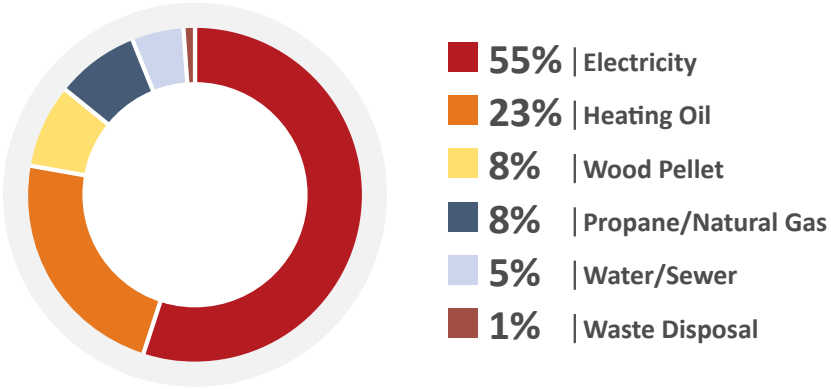
When the GNWT launched the *Strategy* in 2018, it committed to reviewing it after five years. In 2022-2023, the Department of Infrastructure engaged with its partners to collaboratively design an approach to the review of the *Strategy*, which took place in the summer of 2023. The resulting plan includes extensive engagement with Indigenous governments, Indigenous organizations, partners, utilities, industry, non-governmental organizations, community governments, and other stakeholders. It culminated with a three-day multilateral dialogue that took place in Yellowknife in July 2023. The discussion was supported by the findings of the Navius Low Carbon Pathways Study as well as a discussion guide. A *What We Heard* report will be released to summarize the results of the engagement.

APPENDIX A: GNWT BUILDINGS ENERGY USE AND GHG EMISSIONS

GNWT BUILDINGS ENERGY EXPENDITURES

In 2022-2023, the cost of heat and power for GNWT facilities totaled $41.8 million, a 13% increase from 2021-2022. Figure 12 shows that electricity is the largest energy cost for the GNWT, followed by heating (heating oil, wood pellets, propane, and natural gas). All buildings' expenditures inflated in 2022-2023, some remarkably (+38% for heating oil, +20% for water and sewer, +12% for wood pellets when compared to 2020-2021), except for propane and natural gas expenditures that decreased by 6% due to decreased use that year. The overall increase in energy expenditures is primarily explained by a surge in energy costs.

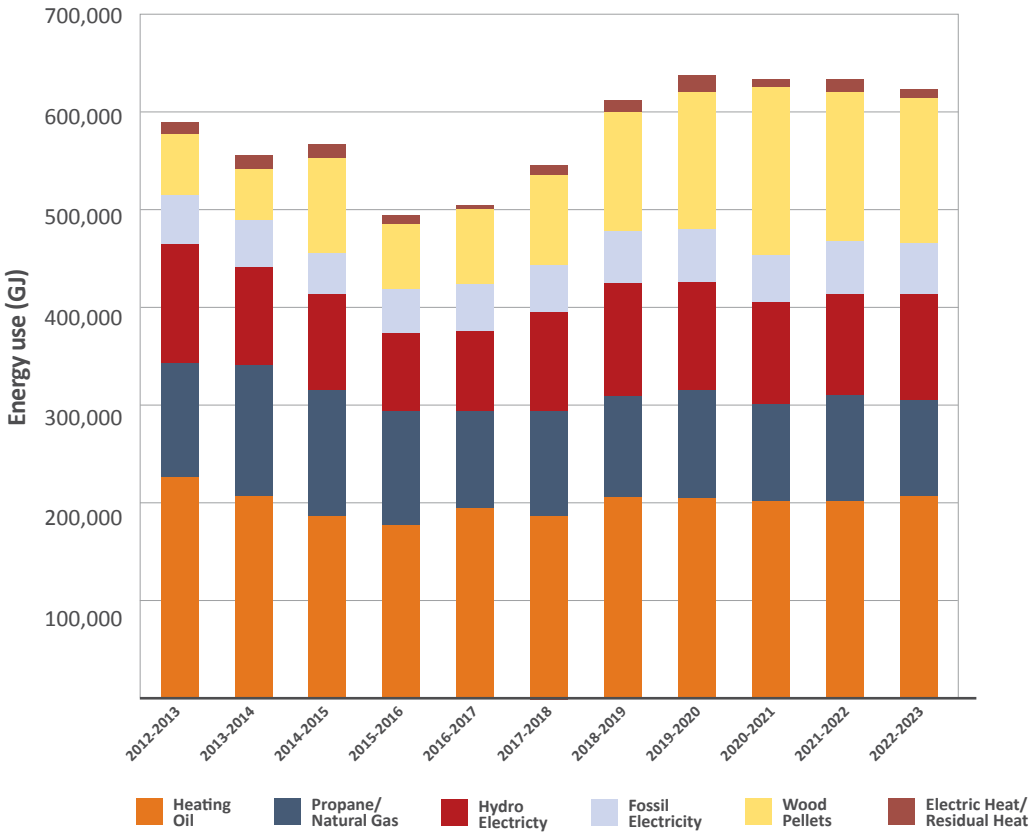
Figure 11. GNWT Utility Expenditures in 2022-2023



GNWT BUILDINGS ENERGY USE

Figure 13 outlines the breakdown of the GNWT's total annual energy use by fuel type. Compared to previous years, the GNWT slightly decreased its overall energy consumption in 2022-2023—a 1% decrease when compared to 2021-2022. Electricity needs were met with a volume of hydroelectricity similar to last year, and a 6% increase in electricity produced by fossil generators. At the same time, energy used to heat GNWT buildings decreased by 2%, with the contribution of low-carbon sources (wood pellets, electricity, and residual heat) and fossil fuels (heating oil, propane, and natural gas) respectively decreasing by 5% and 1%. The decrease in low-carbon heat sources is primarily due to the reduced operation of GNWT biomass boilers caused by wood pellets supply chain issues in the South Slave.

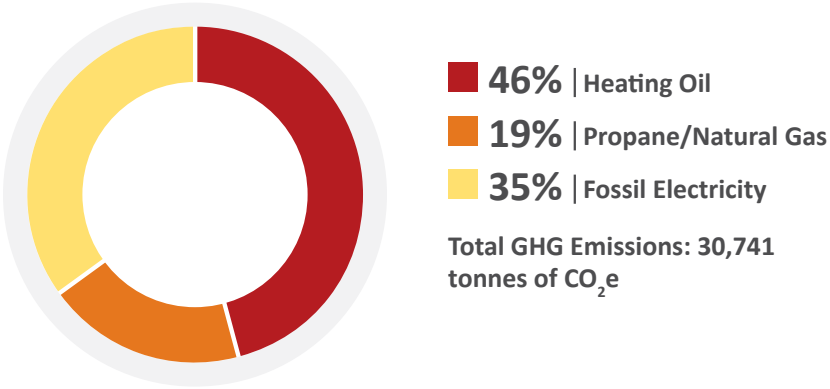
Figure 12. GNWT Energy Use by Fuel Type in 2022-2023



GNWT BUILDINGS GHG EMISSIONS

In 2022-2023, GNWT buildings were responsible for about 30,741 tonnes of GHG emissions due to fossil fuels used for heating and by using electricity generated from fossil fuels (see Figure 14). This corresponds to a 2% increase in emissions compared to the previous year, which is explained by an increase in heating oil and fossil electricity consumption.

Figure 13. GNWT Greenhouse Gas Emissions by Fuel Type



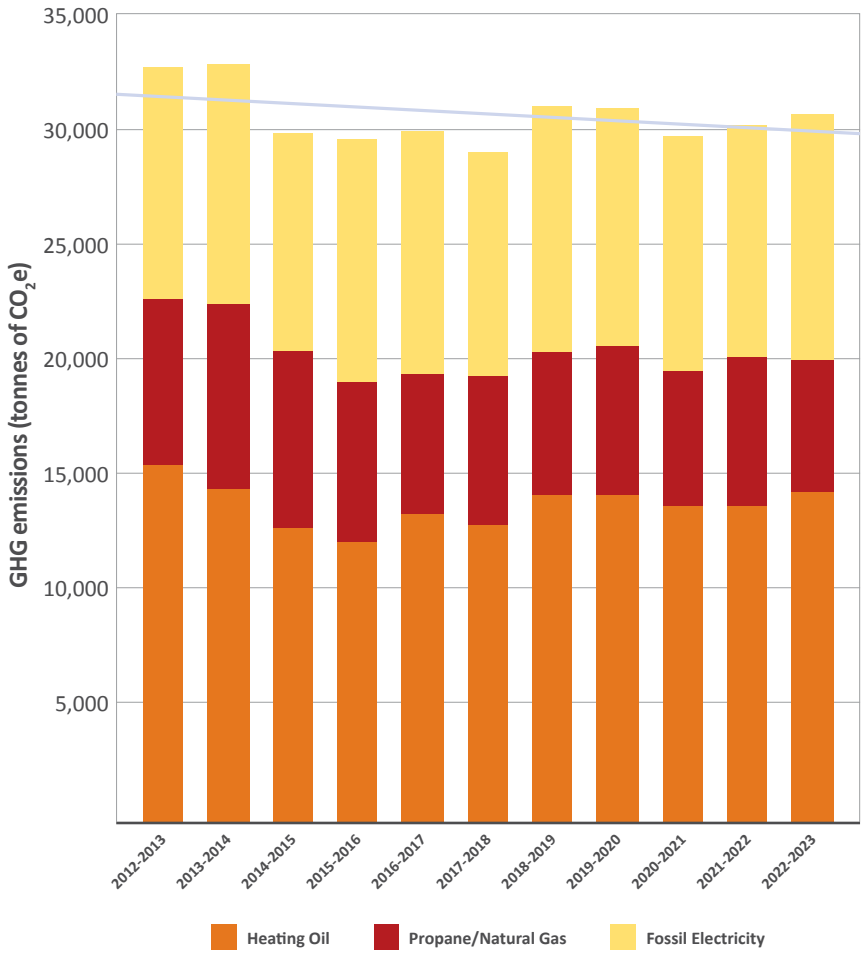
Note: *Emissions from biomass are not accounted for because biomass is a renewable source of energy.*

GHG EMISSIONS REDUCTIONS TREND

Despite an increase in overall energy consumption in recent years (Figure 13), continued efforts to improve energy efficiency and increase the use of biomass heating have resulted in the GNWT reducing GHG emissions from its buildings between 2012-2013 and 2022-2023 (Figure 15).

Note: *Emissions from biomass are not accounted for because biomass is a renewable source of energy.*

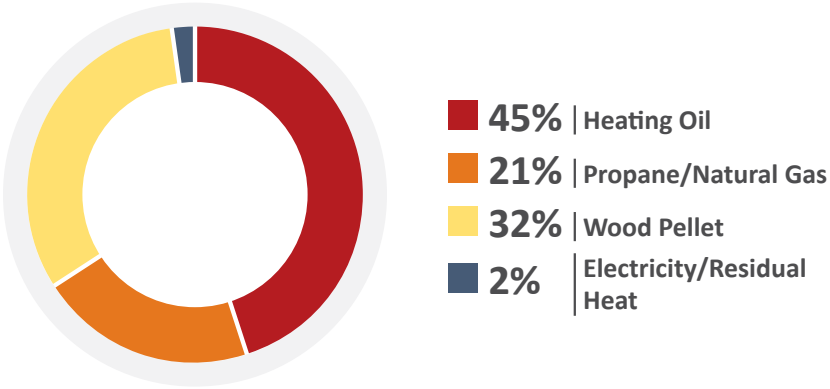
Figure 14. GNWT Buildings GHG Emissions Trend



SPACE HEATING BY FUEL TYPE

In 2022-2023, space heating for GNWT facilities totaled 459,733 GJ. As shown in Figure 16, 34% of this total was provided by renewable electric heat and biomass energy, with the remainder provided by fossil fuels such as heating oil (45%) and propane and natural gas (21%). In 2022-2023, GHG emissions associated with space heating accounted for 20,059 tonnes of CO_2e, a slight increase from the previous year.

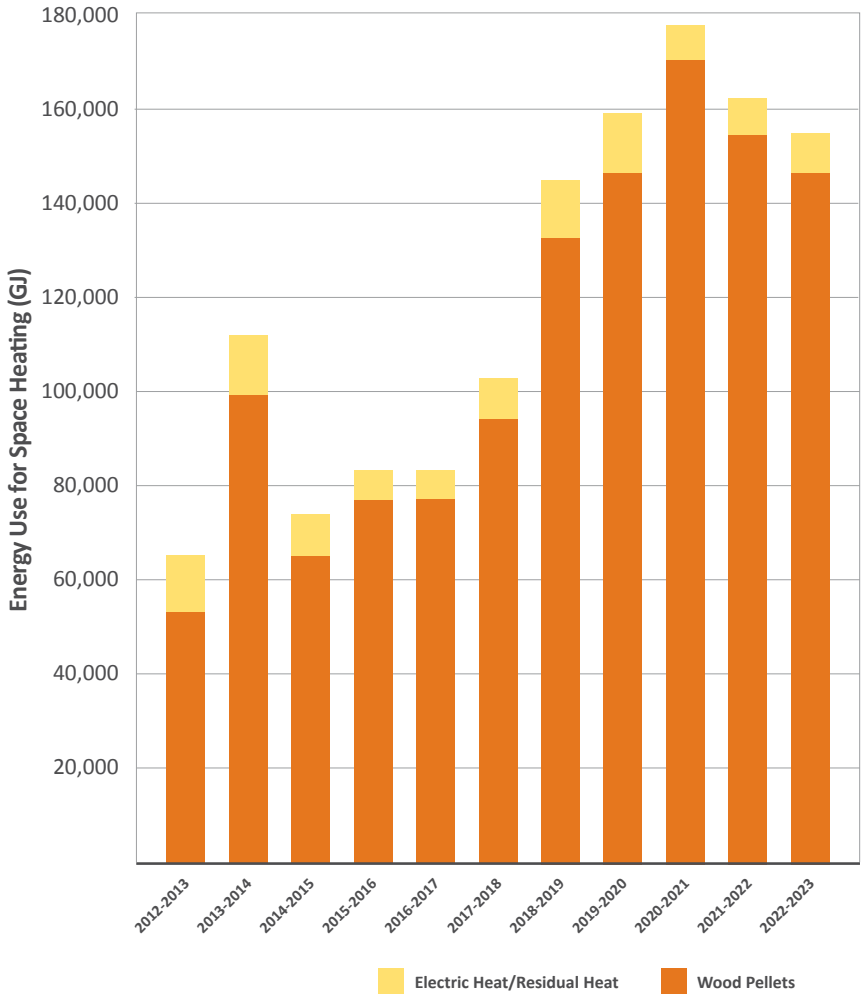
Figure 15. GNWT Space Heating Energy Sources in 2022-2023



RENEWABLE HEATING

Figure 17 shows the trend in heating supplied by renewable energy for GNWT buildings. Reduced operation of GNWT biomass boilers caused by wood pellet supply chain issues in the South Slave explain the decrease in renewable energy use in 2022-2023 compared to previous years. The 156,596 GJ of renewable heat used in 2022-2023 corresponds to a 10,834 t of CO_2e reduction, assuming heating oil is the source of heat displaced.

Figure 16. GNWT Space Heating Provided by Renewable Energy



APPENDIX B: 2022-2023 CAPITAL ASSET RETROFIT FUND PROJECTS

FACILITY	LOCATION	DETAILS
North Slave Region		
Elizabeth Mackenzie Elementary School	Behchokǫ̀	Full LED lighting retrofit of the facility.
Mezi School	Whatì	Full LED lighting retrofit of the facility.
Alexis Arromaker School	Wekweètì	Full LED lighting reftrofit and DDC controls upgrade.
Prince of Wales Northern Heritage Centre	Yellowknife	Biomass Thermal Storage and Optimization Project.
North Slave Regional Office	Yellowknife	Full LED lighting retrofit of the facility.
South Slave Region		
MTS Maintenance Garage	Hay River	Installation of Containerized Wood Pellet Boiler.
Aurora College and Health Centre	Fort Smith	Biomass Thermal Storage and Optimization Project.
Sahtú		
Chief Albert Wright School	Tulita	Full LED lighting retrofit of the facility.
Grandfather Ayha School	Deline	Full LED lighting retrofit of the facility.
Beaufort Delta Region		
Chief Paul Niditchie School and Community Gym	Tsiigehtchic	Full LED lighting retrofit of the facility.
Deh Cho Region		
Charles Yohin School	Nahanni Butte	Full LED lighting retrofit and heating upgrade.
Milton Building, ITI Building	Sambaa Ke and Nahanni Butte	Full LED lighting retrofit of the facility.
Echo Dene School	Fort Liard	Full LED lighting retrofit of the facility.

APPENDIX C:
BIOMASS PROJECTS COMPLETED BY GNWT SINCE 2006

FACILITY	LOCATION	COMPLETION YEAR	SIZE (KW)
Range Lake North School	Yellowknife	2022	300
Prince of Wales Northern Heritage Centre	Yellowknife	2022	300
MTS Maintenance Garage	Hay River	2022	150
Aurora College & Health Centre	Fort Smith	2022	720
Range Lake North School	Yellowknife	2022	300
Mildred Hall School	Yellowknife	2022	300
Stanton Legacy	Yellowknife	2021	2500
Chief Sunrise School	Kátł'odeeche (Hay River)	2020	150
Environment and Climate Change Lab/Warehouse	Fort Simpson	2019	40
Woman's Territorial Corrections Centre	Fort Smith	2019	300
Inuvik Territorial Hospital	Inuvik	2019	1250
Ecole Alain St. Cyr	Yellowknife	2019	540
Construction Mining Institute Training	Fort Smith	2018	300
Inuvik School Biomass	Inuvik	2018	950
Stanton Territorial Hospital	Yellowknife	2018	2500
Behchokǫ̀ Long Term Care Facility*	Behchokǫ̀	2017	100
Fort McPherson Health Centre*	Fort McPherson	2017	40
Health Centre	Fort Resolution	2017	100
Health Centre/Long term care facility	Norman Wells	2017	400
Infrastructure Maintenance Shop	Norman Wells	2017	100
ENR Workshop/Office	Tulita	2017	58
Whatì Health Centre (heat purchase)	Whatì	2017	30
Chief Ts'elehye School	Fort Good Hope	2016	150

(*) These facilities purchase heat from a third-party biomass boiler.

FACILITY	LOCATION	COMPLETION YEAR	SIZE (KW)
Chief Albert Wright School	Tulita	2016	200
Prince of Wales Northern Heritage Centre	Yellowknife	2016	400
New Health Centre	Fort Providence	2015	75
Deninoo School	Fort Resolution	2015	200
New Health Centre	Hay River	2015	950
Airport Terminal Building	Yellowknife	2015	400
South Mackenzie Correctional Centre	Hay River	2014	224
Airport Combined Services Building	Norman Wells	2014	224
Airport Terminal Building	Norman Wells	2014	168
Mackenzie Mountain School	Norman Wells	2014	224
New Office Building	Yellowknife	2014	650
Deh Gah School	Fort Providence	2013	300
Elizabeth MacKenzie Elementary School	Behchokǫ̀	2012	540
Central Heating Plant	Fort Simpson	2012	980
Fort Smith Health Centre	Fort Smith	2012	750
Combined Service Building (Department of Infrastructure)	Yellowknife	2012	540
P.W. Kaeser High School & Recreation Centre	Fort Smith	2010	750
Aurora College (GNWT)	Fort Smith	2010	720
Highways Maintenance Garage	Hay River	2010	300
Central Heating Plant (for 4 Hay River Schools)	Hay River	2010	1000
Legislative Assembly Building	Yellowknife	2010	300
Chief Jimmy Bruneau School	Behchokǫ̀	2009	720
K'alemi Dene School	Ndilǫ	2009	60
École St. Joseph School	Yellowknife	2009	540
Sir John Franklin High School*	Yellowknife	2008	750
North Slave Correctional Facility*	Yellowknife	2006	1500

(*) These facilities purchase heat from a third-party biomass boiler.

APPENDIX D: APPROVED PROJECTS UNDER THE GHG GRANT PROGRAM

Table 4. Projects approved under the GHG Grant Program as of March 31, 2023

APPROVAL YEAR	PROPONENT	TITLE	LOCATION	STATUS	FUNDING AMOUNT ($)	EMISSIONS REDUCTIONS (TONNES CO_2E/YEAR)
2018-2019	Community Government of Gamètì	Sustainable Northern Agriculture Project	Gamètì	Complete	$133,000	93
2019-2020	Town of Fort Smith Public Government	Energy Management in Community Buildings	Fort Smith	Ongoing	$360,000	510
2020-2021	Yellowknife Education District no. 1	Pellet Boiler Installations for Mildred Hall School and Range Lake School	Yellowknife	Ongoing	$1,125,000	578
2020-2021	Snowshoe Inn	Fort Providence Energy Incubator	Fort Providence	Complete	$37,000	87
2020-2021	J&R Mechanical Ltd	Woolgar Avenue Biomass District Heating System	Yellowknife	Complete	$274,000	396
2021-2022	Yellowknife Catholic Schools	Wood Pellet Boiler Project at Ecole St Patrick and Weledeh Schools	Yellowknife	Ongoing	$928,125	449
2021-2022	Gwich'in Tribal Council	Biomass Furnaces for Gwich'in Camp	Inuvik	Ongoing	$235,000	103
2021-2022	NTPC	Inuvik Power Plant – 3rd LNG Fuel Tank	Inuvik	Complete	$879,000	606
2022-2023	Polar Developments	Anderson Thompson HRV – Polar Developments	Yellowknife	Ongoing	$80,000	97
2022-2023	Yellowknife Condominium Corporation #32	Ravenscourt GHG Reduction Project	Yellowknife	Ongoing	$321,200	299
2022-2023	Borealis Development Inc.	The Nest (Bellanca Biomass/HVAC)	Yellowknife	Ongoing	$600,000	476
2022-2023	City of Yellowknife	Aquatic Centre Connection	Yellowknife	Ongoing	$330,000	645

APPROVAL YEAR	PROPONENT	TITLE	LOCATION	STATUS	FUNDING AMOUNT ($)	EMISSIONS REDUCTIONS (TONNES CO_2E/YEAR)
2022-2023	NTPC	Level 3 EV charging station	Behchokǫ̀	Ongoing	$468,000	140
2022-2023	Łíídlıı̨ Kų́ę́ First Nation	On the Land Camp Solar & Wind Project	Deh Cho Region	Ongoing	$77,105	14
2022-2023	Deh Cho First Nation	Off-Grid Solar	Deh Cho Region	Ongoing	$81,153	9
2022-2023	Yellowknife Post Office	Yellowknife Post Office – 6113 Ltd	Yellowknife	Ongoing	$300,000	70
				Total	**$6,262,383**	**4,601**

Table 4 does not include projects that were awarded funding under the GHG Grant Program and did not proceed. These include a project advanced by the City of Yellowknife to install a biomass boiler at the water treatment plant, as well as a project to install energy recovery ventilators at the Northern United Place. Both projects had a contribution signed in 2022-2023, with the proponents deciding to cancel their respective projects. The table excludes a project in Enterprise that was awarded in 2022-2023 and unfortunately was destroyed by wildfires the same year.

APPENDIX E: STATUS OF ACTIONS AND INITIATIVES FROM THE *2022-2025 ENERGY ACTION PLAN*

The *2022-2025 Energy Action Plan* contains 68 initiatives focused on implementing new energy efficiency and greenhouse gas emissions reduction incentive programs and taking steps to position the territory to complete larger infrastructure projects by 2030. This appendix provides a status update for the actions and initiatives included in the *2022-2025 Energy Action Plan* by Strategic Objective as of March 31, 2023.

Unless specified otherwise, actions and initiatives included in the 2022-2025 Energy Action Plan are led by the Department of Infrastructure.

WORKING TOGETHER

INITIATIVES	LEAD	STATUS
Continue to involve and engage communities on energy projects	GNWT/NTPC	Ongoing activities relative to this initiative are summarized in sections reporting on Strategic Objectives 1, 2 and 6. Major projects include Gamètì mini hydro, renewable projects in Wekweètì and Sambaa K'e, the Whatì transmission line, and the Taltson hydro expansion. The Arctic Energy Alliance (AEA) also plays a leading role engaging with and supporting communities.
Continue outreach and communication with stakeholders	GNWT	This action is achieved through targeted outreach and communication with stakeholders. This includes various working groups, events, and through the AEA. The dissemination of the information compiled in the annual Energy Initiatives Report is one main way to communicate with stakeholders and the public.
Develop a corporate GHG inventory	GNWT	In 2022-2023, the GNWT developed an Inventory Management Plan to document the approach for enhancing the GNWT corporate GHG emissions inventory. This action, led by ECC, is also part of the *2030 Climate Change Strategic Framework Action Plan* 2019-2023 (Action Area 1.4).
Create partnership opportunities in local renewable energy projects for community and Indigenous Governments and organizations that support local capacity development	GNWT/NTPC	Ongoing activities relative to this initiative are summarized in sections reporting on Strategic Objectives 1, 2, and 6. Major projects include the Whatì and Fort Providence transmission lines and the Taltson hydro expansion project.
Expand support for community-based energy planning	AEA	In 2022-2023, the AEA initiated the community energy planning process with the Hamlet of Ulukhaktok, the Ka'aa'gee Tu First Nation in Kakisa, and the Village of Fort Simpson. AEA's community energy planning efforts are summarized in section on Strategic Objective 1.
Energy mentorship for community representatives	GNWT/AEA	This initiative is scheduled for 2023-2024.

INITIATIVES	LEAD	STATUS
Update and communicate the Renewable Electricity Participation Model for Diesel Communities	GNWT	This initiative is planned for 2023-2024.
Support community-based energy projects by providing technical and financial support to help communities advance renewable energy and energy saving projects	GNWT	Ongoing activities relative to this initiative are summarized in section reporting on Strategic Objective 1. Projects include Gamètì mini hydro, renewable projects in Wekweètì and Sambaa K'e, and the Fort McPherson photovoltaic energy system study.
Continue to administer the application based GHG Grant Program for Governments	GNWT	Ten projects were approved under the two streams of the GHG Grant Program in 2022-2023. More information about the program and projects funded can be found in the section about Strategic Objective 1 and Appendix D.
Re-invest in an application based GHG Grant Program for governments and communities pending federal funding	GNWT	Discussions with the Government of Canada are underway to explore potential avenues to have the GHG Grant Program funded past 2024.

REDUCE DIESEL USE IN POWER GENERATION BY 25%

INITIATIVES	LEAD	STATUS
Complete the Inuvik Wind Project	GNWT/NTPC	The wind turbine began operating in the Fall 2023. More information about the project is available in section reporting on Strategic Objective 2.
Give policy direction to the PUB to address intermittent renewable generation community capacity limits	GNWT/NTPC	This initiative is planned for 2023-2024.
Give policy direction to the PUB to address Net Metering and Community Power Producer Policy	GNWT/NTPC	This initiative is planned for 2023-2024.
Provide direction to the PUB to implement load growth initiatives	GNWT	This initiative is planned for 2023-2024.
Continue to assess emerging energy technologies and undertake technical and engineering feasibility studies	GNWT	Ongoing activities relative to this initiative are primarily summarized in sections reporting on Strategic Objectives 1, 2 and 6. These activities include engineering and techno-economic studies as well as funding to test southern technologies in the North. Example of the latter include AEA's pilot to test cold-climate heat pumps in Yellowknife (see AEA section in section reporting on Strategic Objectives 4 and 5).
Investigate anaerobic digestion for heat and power generation	GNWT	This initiative has been postponed.
Continue NTPC hydro asset overhauls	GNWT/NTPC	Overhaul of Snare Forks Unit 1 was completed in 2020-2021, with major work on Unit 2 postponed to 2028. Taltson overhaul is scheduled to be completed in 2023-2024. More information about these projects is available in section reporting on Strategic Objective 6.
Examine renewable solutions for off-grid diesel	GNWT/NTPC	One main project advanced to support this initiative is the ongoing funding of Aurora Research Institute's wind and solar monitoring program. More information about the project is available in the section reporting on Strategic Objective 2.

INITIATIVES	LEAD	STATUS
Community LNG projects for electricity generation	GNWT/NTPC	In 2023-2024, the construction of both Fort Simpson and Tuktoyaktuk's LNG projects are contingent on securing funding. More information about these projects is available in the section reporting on Strategic Objective 2.
Continue diesel efficiency upgrades	GNWT/NTPC	Łutselk'e's new diesel plant was built and commissioned in 2022-2023. Installation and commissioning of Sachs Harbour's new diesel plant was delayed due to the COVID pandemic. Next steps for Fort Simpson's plant relocation will be informed by decisions regarding the LNG plant as well as the new plant's location. More information about the project is available in the section reporting on Strategic Objective 2.
Initiate construction of transmission line to Fort Providence and Kakisa	GNWT/NTPC	In 2022-2023, the GNWT gathered additional environmental field program baseline data and continued consultation and engagement activities with Indigenous governments and organizations, communities, and other stakeholders. Engineering studies and design work also continued. Information gathered during the environmental field program, Consultation and engagement, and engineering work was used to prepare a Land Use Permit application package. INF submitted the Land Use Permit application to the Mackenzie Valley Land and Water Board during the fall of 2023 and received a Land Use Permit in December 2023. More information about the project is available in the section reporting on Strategic Objective 2.
Advance technical work to build a transmission line from the Snare electricity system to Whatì	GNWT/NTPC	In 2021-2022, the GNWT and Tłı̨chǫ Government initiated discussions on the project of building a 55-km transmission line to connect Whatì to the North Slave electricity system and committed to working in partnership to advance the project. In 2022-2023, updates to previous technical studies were completed to identify an acceptable routing corridor for the project. More information about the project is available in the section reporting on Strategic Objective 2.
Assess the potential for community based mini-hydro projects	GNWT	This initiative is scheduled to start in 2023-2024.

REDUCE EMISSIONS BY 10% IN TRANSPORTATION

INITIATIVES	LEAD	STATUS
Continue and expand a rebate program for electric vehicles and installing fast charging stations	GNWT/AEA	In 2022-2023, the GNWT provided the AEA with $100,000 in additional funding for its Electric Vehicle Incentive Program. More information about the program is available in the section reporting on Strategic Objective 3.
Continue to build a zero-emission vehicles corridor in the NWT hydro zones	GNWT	In 2021-2022 the GNWT allocated funds to establish two Level 3 chargers in Yellowknife. In 2022-2023, the GNWT provided funds through the GHG Grant Program to install a Level 3 charger in Behchoko. Funds were subsequently announced for similar chargers in Fort Providence, Enterprise, Hay River, Buffalo Junction and Fort Smith. More information about progress on the zero-emission vehicles corridor is available in the section reporting on Strategic Objective 3.
Develop a program funding public, commercial and multi-unit residential electric vehicle charging infrastructure	GNWT	The GNWT launched the Electric Vehicle Infrastructure Program in 2022-2023 to provide rebates for businesses, governments, utilities, and organizations to install Level 2 and Level 3 charging stations in the NWT. More information about the program is available in the section reporting on Strategic Objective 3.
Create a rebate for electric bikes in hydro zones	GNWT/AEA	This initiative is scheduled for 2023-2024.
Explore the potential of a pilot program to provide rebates for on-the-land electric vehicles (e.g., electric snowmobiles, electric boats)	GNWT/AEA	This initiative is scheduled for 2023-2024.
Continue to access the status of emerging low-carbon transportation technologies, such as electric, hydrogen and suitable advanced liquid biofuels	GNWT	This initiative is scheduled for 2023-2024.
Assess the potential for a GNWT electric vehicles procurement policy and investigate funding options for incremental costs	GNWT	This initiative is scheduled for 2023-2024.
Continue to work with the federal government on emissions reduction in the transportation sector	GNWT	Working with the federal government on emissions reduction in the transportation sector is part of GNWT's ongoing work.
Monitor the implementation of the federal Clean Fuel Regulations and the availability of Arctic-grade biofuels for the North	GNWT	The GNWT continues to monitor the implementation of the Clean Fuel Regulations in the NWT as well as the availability of Arctic-grade biofuels. More information about the implementation of the Clean Fuel Regulations in the NWT can be found in the section reporting on the Strategic Objective 1.
Support community-based transportation initiatives through the GHG Grant Program for Governments	GNWT	Ten projects were approved under the two streams of the GHG Grant Program in 2022-2023, with one project specific to low-carbon transportation. More information about the program and projects funded can be found in the section relative to the Strategic Objective 1 and Appendix D.
Support industrial vehicle efficiency through the GHG Grant Program for Buildings and Industry	GNWT	Ten projects were approved under the two streams of the GHG Grant Program in 2022-2023. More information about the Program and projects funded can be found in the section relative to the Strategic Objective 1 and Appendix D.

INCREASE RENEWABLE ENERGY USE FOR HEATING FROM 20% TO 40% AND INCREASE ENERGY EFFICIENCY IN BUILDINGS, PER CAPITA, BY 15%

INITIATIVES	LEAD	STATUS
Create a new program for low-income households to address energy poverty	GNWT/AEA	This program is scheduled to start in 2023-2024.
Fund additional energy auditor capacity	AEA	In 2022-2023, the GNWT provided the AEA with additional funding for energy auditor capacity, representing $75,000 in value.
Enhance the Energy Efficiency Rebate Incentive Program	AEA	The GNWT continued to provide LCELF funding to support AEA's Energy Efficiency Incentive Program, representing $400,000 in 2022-2023. More information about AEA's programs can be found in the section reporting on Strategic Objectives 4 and 5.
Re-invest in funding for enhancements to the Energy Efficiency Rebate Incentive Program	AEA	This initiative is scheduled to start in 2024-2025, pending availability of funding.
Continue and expand the GNWT Capital Asset Retrofit Fund	GNWT	The GNWT continues to invest approximately $3.8 million each year for projects that reduce GNWT buildings' GHG emissions, energy use and operating costs. More information about CARF can be found in the section reporting on Strategic Objectives 4 and 5.
Review energy efficiency and conservation programs as part of the five-year review of the *2030 Energy Strategy*	GNWT/AEA	This initiative is scheduled to start in 2024-2025, pending availability of funding.
Conduct a wood pellet supply chain assessment and expansion study	GNWT	The GNWT has partnered with Nihtat Energy Ltd. to commission a logistical and economic study to examine the conditions for the supply of barge-delivered wood pellets as a cost-effective heating fuel option in 12 remote communities along—or in the vicinity of—the Mackenzie River. More information about the study can be found in the section reporting on Strategic Objective 1.
Explore potential for large scale centralized heating systems in communities	GNWT	This initiative has been postponed.
Continue to administer the GHG Grant Program for Buildings and Industry	GNWT	Ten projects were approved under the two streams of the GHG Grant Program in 2022-2023. More information about the program and projects funded can be found in the section relative to Strategic Objective 1 and Appendix D.
Deep Home Energy Retrofit Program (ERS follow-up and implementation support)	AEA	The GNWT continued to provide LCELF funding to support AEA's Deep Home Energy Retrofit Program, representing $50,000 in 2022-2023. More information about AEA's programs can be found in the section reporting on Strategic Objectives 4 and 5.
Energy efficiency and conservation retrofits for non-government organizations	AEA	The GNWT continued to provide LCELF funding to support AEA's energy efficiency and conservation retrofits for non-government organizations program, representing $100,000 in 2022-2023. More information about AEA's programs can be found in the section reporting on Strategic Objectives 4 and 5.

INITIATIVES	LEAD	STATUS
Enhancement to the Alternative Energy Technologies Program	AEA	The GNWT continued to provide LCELF funding to support AEA's Alternative Energy Technologies Program, representing $300,000 in 2022-2023. More information about AEA's programs can be found in the section reporting on Strategic Objectives 4 and 5.
Enhancement to the Commercial Energy Conservation and Efficiency Program	AEA	The GNWT continued to provide LCELF funding to support AEA's Commercial Energy Conservation and Efficiency Program, representing $175,000 in 2022-2023. More information about AEA's programs can be found in the section reporting on Strategic Objectives 4 and 5.
Enhance the Community Government Program	AEA	The GNWT continued to provide LCELF funding to support AEA's Community Government Program, representing $50,000 in 2022-2023. More information about AEA's programs can be found in the section reporting on Strategic Objectives 4 and 5.
Continue the Community Woodstove Program	AEA	The GNWT continued to provide LCELF funding to support AEA's Community Woodstove Program, representing $300,000 in 2022-2023. More information about AEA's programs can be found in the section reporting on Strategic Objectives 4 and 5.
Re-invest in an application based GHG Grant Program for buildings and industry, pending federal funding	GNWT	This initiative is scheduled to start in 2024-2025, pending availability of funding.
Re-invest in a Deep Home Energy Retrofit Program, pending federal funding	AEA	This initiative is scheduled to start in 2024-2025, pending availability of funding.
Re-invest in energy efficiency and conservation retrofits for non-government organizations after LCELF funding sunsets, pending federal funding	AEA	This initiative is scheduled to start in 2024-2025, pending availability of funding.
Re-invest in enhancement to the Alternative Energy Technologies Program after LCELF funding sunsets, pending federal funding	AEA	This initiative is scheduled to start in 2024-2025, pending availability of funding.
Re-invest in enhancement to the Commercial Energy Conservation and Efficiency Program after LCELF funding sunsets, pending federal funding	AEA	This initiative is scheduled to start in 2024-2025, pending availability of funding.
Re-invest in enhancements to the Community Government Program after LCELF funding sunsets, pending federal funding	AEA	This initiative is scheduled to start in 2024-2025, pending availability of funding.
Re-invest in Community Woodstove Program after LCELF funding sunsets, pending federal funding	AEA	This initiative is scheduled to start in 2024-2025, pending availability of funding.
Develop and implement an energy management strategy for Housing NWT	Housing NWT	In 2022-2023, Housing NWT released its Energy Management Strategy and its accompanying three-year Energy Management Blueprint. More information can be found in the section reporting on Strategic Objectives 4 and 5.

LONGER-TERM VISION

INITIATIVES	LEAD	STATUS
Develop approach to the five-year review of the *2030 Energy Strategy*, complete review, and update the Strategy	GNWT	In 2022-2023, the Departments of Infrastructure and Environment and Climate Change engaged with its partners to collaboratively design an approach to the five-year review of the *Energy Strategy*, scheduled to take place in 2023-2024. More information about the review is available in the section reporting on Strategic Objective 6.
Conduct a techno-economic assessment of pathways to net-zero emissions for the NWT	GNWT	In 2021-2022, the GNWT commissioned a leading Canadian consulting firm to model the technological and economic implications of achieving various emissions reduction targets in the NWT, including a net-zero target in 2050. A high-level summary of the study—released in Spring 2023—is available in the section reporting on Strategic Objective 6.
Utility energy storage concept	GNWT	This initiative is planned for 2024-2025.
Assess technical feasibility of wide electrification of end-uses (e.g., transportation, heating, industry) in hydro communities	GNWT	This initiative is planned for 2024-2025.
Hydro and transmission development	GNWT/NTPC	This initiative is planned for 2024-2025.
Assess the potential for hydrogen production and use in the NWT (e.g., transportation)	GNWT	This initiative is planned for 2024-2025.
Assess the potential contribution of negative emissions technologies (e.g., carbon offsets) to net-zero pathways for the NWT	GNWT	This initiative is planned for 2023-2024.
Assess the potential for legislation to advance energy and climate objectives	GNWT	This work will most likely be part of the five-year review of the *Energy Strategy*, scheduled to start in 2023-2024. More information about the review is available in the section reporting on Strategic Objective 6.
Continue to monitor the development of small modular reactors	GNWT	Monitoring development of emerging technologies such as small and micro modular nuclear reactors is part of GNWT's ongoing work. The GNWT also sits as an observer at the Canada Nuclear Leadership Table.
Conduct an organic waste study and landfill gas assessment	GNWT	This initiative is scheduled for 2023-2024.
Taltson Hydroelectricity Expansion Project	GNWT/NTPC	A full update about the project is available in the section reporting on Strategic Objective 6.