Heating Buildings with Biomass in the NWT

Robert Sexton, President of the Board AEA and Director of Strategic Energy Policy and Programs, GNWT

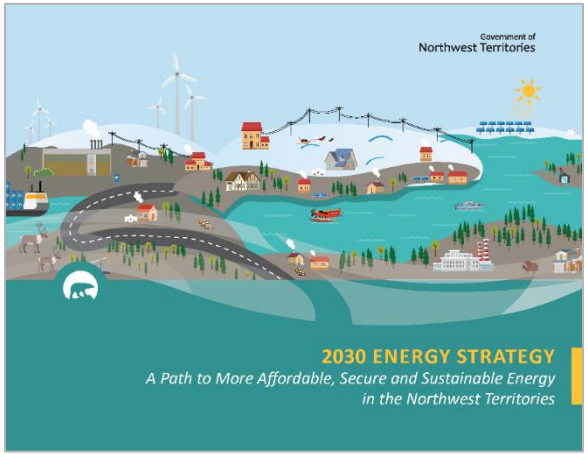
Arctic Biomass Summit – January 27, 2016

Government of
Northwest Territories

Presentation Overview

- Current NWT Approach: 2030 Energy Strategy
- Main Facts about Biomass in the NWT:
  - NWT: A National Biomass Leader
  - A Cost-Effective Heating Option in the NWT
  - Biomass Use in the NWT
  - GNWT leading the way
  - Supporting adoption
  - Supporting biomass supply chains to remote communities
- Net Zero - Prospects for Biomass in the NWT

Current Approach: 2030 Energy Strategy



Goal to guide the long-term development of **secure**, **affordable** and **sustainable energy** for transportation, heat and electricity.

GNWT's **main mechanism to reach the 2030 target** of reducing NWT emissions by 30% below 2005 levels.

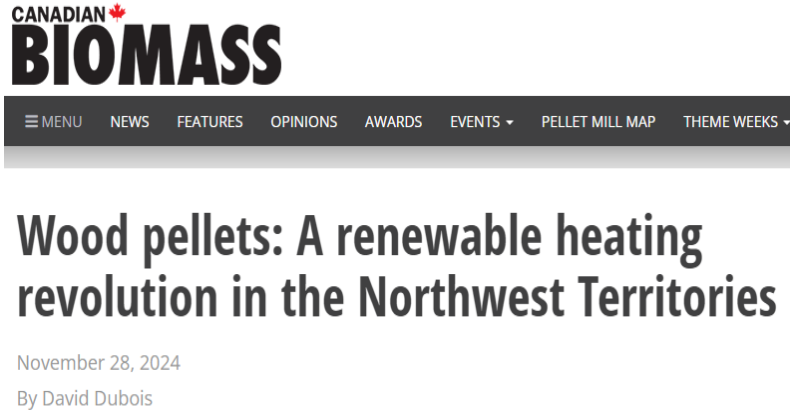
Six strategic objectives, including:

- **Increase the share of renewable energy used for community heating to 40% by 2030.**

NWT: a National Biomass Leader

Biomass is a ‘low-tech’ heating option that can take multiple forms: cordwood, wood pellets, and wood chips.

In the NWT there are 96 larger-scale wood pellet boilers, providing heat to 64 institutional buildings, 13 multi-unit residential buildings, and 19 commercial buildings.


CANADIAN BIOMASS

MENU NEWS FEATURES OPINIONS AWARDS EVENTS PELLET MILL MAP THEME WEEKS

Wood pellets: A renewable heating revolution in the Northwest Territories

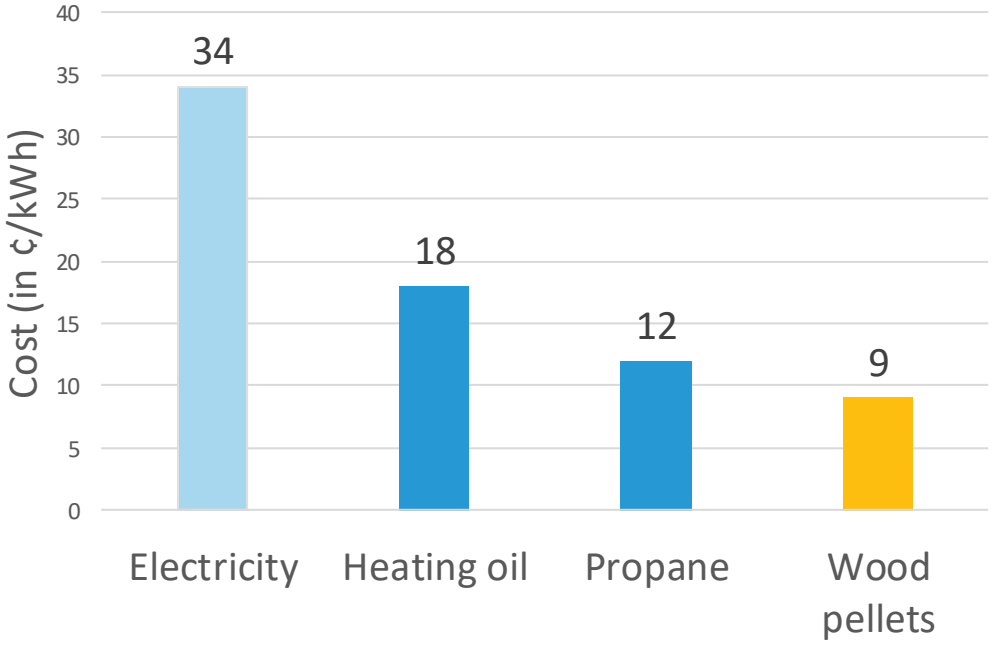
November 28, 2024

By David Dubois

NWT is a biomass leader in Canada (per capita, know-how).

A Cost-Effective Heating Option in the NWT

Wood pellets costs half as much per kWh than heating oil in Yellowknife



Source: AEA Fuel Cost Library 2024

Biomass Use in the NWT

A recent GNWT survey estimated territorial biomass use in 2023:

- 20,000 tonnes of wood pellets (primarily used in boilers for large buildings)
- 14,500 cords of wood (used in houses)
- No wood chips currently

All wood pellets are imported from Southern Canada, while most cord wood was produced in the NWT.

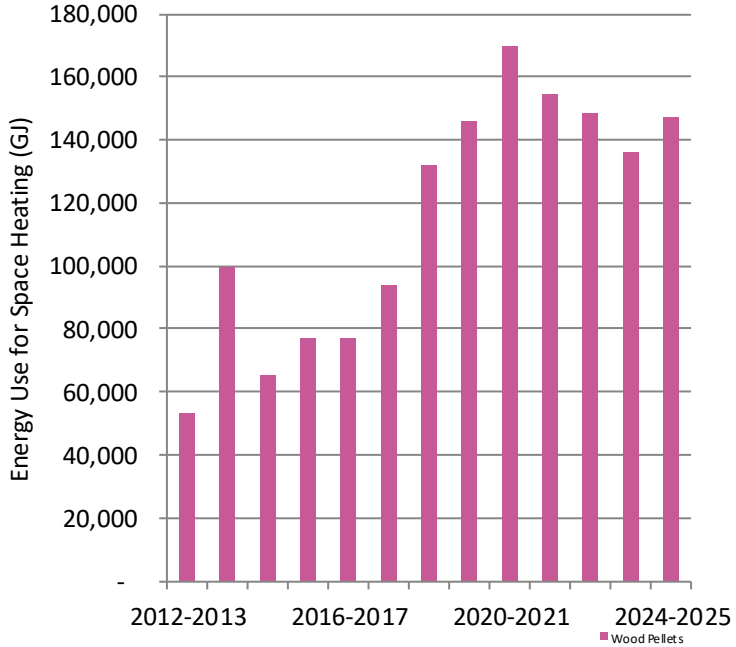
Main users of wood pellets include the GNWT, Northview REIT, City of Yellowknife, Housing NWT.

GNWT Leading the Way

In the past 15 years, the GNWT has been converting its buildings to biomass heating to lower operational costs and GHG emissions.

The initiative led to the development of wood pellets supply chains in all NWT regions, supporting local economic development and allowing other buildings to convert to biomass.

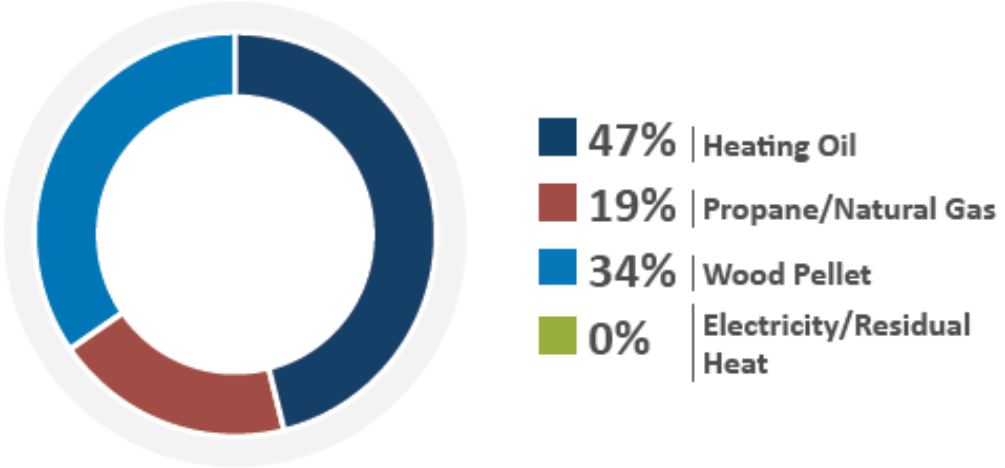
Biomass heating use nearly tripled in GNWT buildings between 2012 and 2024, passing from 53 TJ to 147 TJ.



GNWT Space Heating Provided by biomass from 2012 to 2024

GNWT Leading the Way

As 2025, 34% of GNWT buildings' heating is supplied by biomass, supported by 52 biomass boiler systems operating in 16 communities.



GNWT Space Heating Energy Sources in 2024-2025

Supporting Adoption

The Arctic Energy Alliance administers rebates and programs aimed for residents and small organizations and supports feasibility studies.

GNWT's GHG Grant Program is one main source of funding for larger biomass projects (stand alone and district heating systems).

Canada also directly funds biomass projects advanced by communities, Indigenous governments, and Indigenous organizations.

Committed to net zero by 2050

Five technology pathways will be key to achieving NZ emissions in the NWT:

1. Developing renewable electricity supply
2. Electrifying heating and transportation
3. Developing biomass for space heating
4. Substituting fossil fuels with liquid biofuels for hard-to-abate end-uses
5. Residual GHG emissions can be addressed using carbon offsets

What it means:

- Extending biomass availability in remote communities, possibly developing territorial production

Thank you

Background: Select Projects Supported by the GNWT

Funded by the GNWT GHG Grant Program:

- $750,000 for Housing NWT to install a pellet boiler at Stanley Isaiah Complex (Fort Simpson)
- $1,125,000 for wood pellet boilers for Mildred Hall School and Range Lake Schools (Yellowknife)
- $928,000 for wood pellet boilers for École St Patrick and Weledeh Schools (Yellowknife)
- $330,000 for City of Yellowknife's aquatic center to connect to a biomass district heating system
- $300,000 for 6133 NWT Ltd. for a pellet boiler at the Yellowknife Post Office

Backgound: Prospects for Biomass in the NWT: Known Challenges

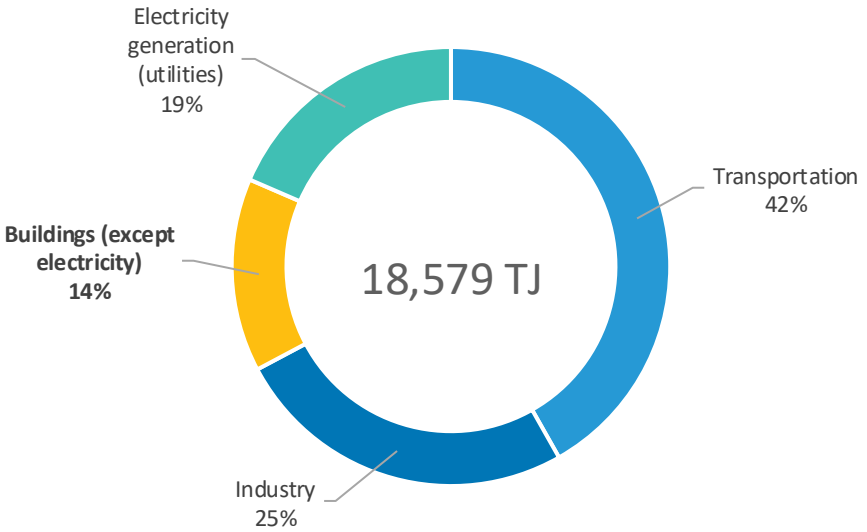
Reliance on one main producer from Southern Canada creates risks of possible supply chain disruptions. The GNWT has expressed support to the exploration of territorial production of biomass, especially around Yellowknife.

Biomass heating systems are significantly more complex to operate and maintain than heating oil systems. The GNWT is supporting initiatives to continue to train biomass boilers operators, including through the AEA, and have the Department of Infrastructure share the expertise it has gained in past 15 years.

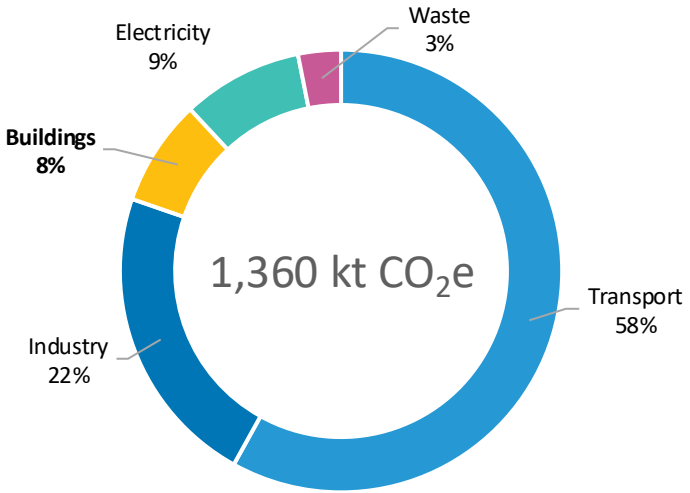
Supply chains to remote communities. The GNWT partnered with Nihtat Energy Limited to study the cost competitiveness of barge-delivered pellets.

Biomass supply in northernmost communities is costly and impacted by the effects of climate change. The GNWT has expressed support to projects aimed at increasing seasonal storage to increase resilience of biomass projects.

Space Heating: Energy use & GHGs in 2023



14% of primary energy use



8% of GHG emissions