

ALTERNATIVE ENERGY AND SUSTAINABLE DEVELOPMENT IN THE ARCTIC

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MAJOR CHALLENGES IN THE ARCTIC

- Extraordinary energy costs
- Housing conditions
- Reliability and availability of energy sources
- Food security
- Economic diversification and volatility
- Balancing of traditional practices and economic development

I. EXTRAORDINARY ENERGY COSTS

- Mostly dependent on costly diesel deliveries: spillage, limited delivery period, local air pollution
- large heating demands most of the year
- High transportation costs: air transport, snowmobiles, ATVs, boats
- Limited storage options and experience with renewables in extreme cold climate conditions

2. HOUSING CONDITIONS

- High cost
- Low energy efficiency
- Crowded dwellings
- Mostly rental housing

3.RELIABILITY AND AVAILABILITY OF ENERGY SOURCES

- Diesel supply and prices
- Biomass for heating (e.g. Nunatsiavut) and for energy provision (NWT)
- Large hydro (recent NWT drought)
- Natural gas supplies (e.g. Inuvik, NWT)
- LNG or renewable options?

4. FOOD SECURITY

- Air transport cost for store bought food and limited competition drives up prices in most areas
- Increasing cost for subsistence harvesting: fuel, investment and maintenance cost impede access to country food

5. ECONOMIC DIVERSIFICATION AND VOLATILITY

- Canadian North mostly dependent on Public admin and mining for GDP
- Commodity prices fluctuate heavily and currently are in a slump
- Lack of skills and manufacturing base
- Energy costs an issue for mining companies and new businesses (e.g. fishery processing)

6. BALANCING OF TRADITIONAL PRACTICES AND ECONOMIC DEVELOPMENT

- New economic branches need to consider traditional practices and cultural needs
- Ideally need to combine land based activities with wage-based activities, e.g. biomass collection from the land while harvesting on the land, commercial fishery
- Minimize interference with traditional hunting and fishing practices: wind power installation or railway/shipping routes for mining operations





Report on the State of Alternative Energy in the Arctic

Presented to:

Polar Knowledge Canada

[to download the PDF file.](#)

<https://curve.carleton.ca/08515c6b-3b39-4c41-ad7b-2c6306cf0379>

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Table 10 Total Number of Renewable Energy Projects by Region

	Yukon	NWT	Nunavut	Nunavik (QC)	Nunatsiavut (NL)
Electricity	24	51	1	1	0
Heat	11	39	13	0	0
Total	35	90	14	1	0

Table 11 Types of Renewable Energy Projects by Region

	Electricity			Heat				
	Hydro	Solar PV	Wind	Biomass	Geo- thermal	Heat Recovery	Solar Thermal	Other
Yukon	9	13	2	3	4	3	1	
NWT	7	43	1	31		7		1
Nunavut		1				6	7	
Nunavik (QC)			1					
Nunatsiavut (NL)								
Total	16	57	4	34	4	16	8	1

POLICY INSIGHTS/LESSONS LEARNED

- Difficult for independent alternative energy projects to enter the market power purchase agreements need to be recrafted: Innavik, Nunavik, QC example
- Arms length Energy NGOs such as Arctic Energy Alliance are crucial: NWT
- Reinvest into new generation renewables (wind, solar storage, etc.) and share data with mining companies: Raglan (Glencore) and Diavik
- Create new economic opportunities with excess hydro, solar or wind in specific seasons and knowledge from renewable technologies in extreme cold climate conditions

POLICY INSIGHTS/LESSONS LEARNED

- Energy autonomy matters even if it is not the optimal short term financial option: e.g. Lutselk'e and Fort McPherson, NWT
- Locally sourced biomass an interesting option in certain areas for district heating and electricity generation rather than importing wood pellets

POLICY INSIGHTS/LESSONS LEARNED

A unified approach to policies

High-level political commitments coupled with a coordinated, overarching policy approach, where regionally-appropriate renewable energy, conservation and energy efficiency strategies are incorporated into overall energy plans

A long-term vision to guide short and medium term planning

Examples: The Yukon 20-Year Plan

systematic and detailed financial analysis that includes sensitivity analysis, numerous scenarios and relevant information about technologies of interest.

POLICY INSIGHTS/LESSONS LEARNED

The further development of **specific energy efficiency endorsement labels for the North** such as the SuperGreen home performance label (similar to the Natural Resources Canada's R2000 or EnergyStar), or Leadership in Energy and Environmental Design (LEED) (or LEED-North equivalent) created by Northerners for Northerners

Consistent and transparent methods for financial analysis

A more comprehensive calculation of all the saved costs (including GHG emission reductions, air quality impacts and spillage externalities) tied to diesel displacement needs to be derived for different local contexts

POLICY INSIGHTS/LESSONS LEARNED

Demand side management and conservation versus capacity adjustments
in an increasingly uncertain and volatile environment

Capacity building and education

Active engagement in the energy policy process

Examine potential for **alternative financing models** to support renewable energy and energy efficiency and conservation

More **pilot projects and data assessment** needed in extreme climate conditions:
opportunity for training and new employment

A **network of project champions** to promote the sharing of knowledge and experience between communities across the Arctic and to support areas with no champions or lack of expertise