

# 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
<b>Total</b>	<b>35</b>	<b>90</b>	<b>14</b>	<b>1</b>	<b>0</b>

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)								
<b>Total</b>	<b>16</b>	<b>57</b>	<b>4</b>	<b>34</b>	<b>4</b>	<b>16</b>	<b>8</b>	<b>1</b>

## 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