Bella Bella Heat Pumps Project

Electrification Opportunities with Indigenous Communities in BC

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Challenges in Indigenous Housing in Canada

- Colonial system of housing management leads to...

- Inadequate housing quality
  - Air quality & moisture issues
  - High energy costs

- Lack of construction for new homes creates overcrowding
Community Leadership & Solutions

Community approaches to design & construction
- UBC Partnership
- Camosun Partnership

New approaches to financing
- Reconciliation Table
- Partnerships and Joint Ventures
- Access to grants and loans
Community Leadership & Solutions

Improving the existing housing stock
- Energy efficient updates
- Cost Saving on heating

Education and Training
- Training for maintenance of current needs
- Supporting local economy
- Sustainable workforce
Current Heating Systems in Bella Bella

Two Main Systems:
1) Oil/Diesel & Wood Furnaces
2) Electric Furnaces or Electric Radiators

Other Factors:
- Many homes use plug-in electric heaters throughout the home
- Some homes with diesel/oil systems do not use them due to the cost of oil
Heiltsuk Energy Solution
Many other issues are related to home heating:

- Heating costs are a significant portion of household spending
- Health & Mould issues are exacerbated when residents resort to plug-in heaters instead of furnace
- Risks of spills and leaks on land & water
Identifying the Technology

- Ductless Air Source Heat Pumps were the most cost effective option

- Pilot project was developed with 20 homes

- Local residents hired for project coordination & trained for maintenance & installation
Project Benefits

Significant cost savings for residents & band maintenance department

Improved air circulation & Air Quality

Reduced environmental impact – pollution & greenhouse gas emissions

Reduced risk of fuel spills on land and water

Elders’ heating security
Results to Date

- Pilot home recipients are very happy with their new heat pumps
- Savings of up to $1,000 reported in the first two months alone
- Improvement in air quality & asthma for some residents with children
- We are now working to install systems across all 400 community homes
What is a Heat Pump?

- A Heat Pump works like an air conditioner in reverse
- Collects warmth out of the air and brings it inside the home using refrigeration fluid
- Operates at temperatures down to -25 degrees Celsius
- Typically uses one third the energy to create the same amount of heat as a conventional furnace (300% efficient)
What’s the true cost of heating?

In B.C., heating your home with clean electricity doesn’t have to increase your bill.

Gas furnace

Electric heat pump

Annual heating bill

$375 $300-$400

Carbon pollution

1,000 kg 25 kg

For a typical efficiency upgraded single-family home in the Lower Mainland, comparing a high-efficiency (92-95% AFUE) gas furnace and an air source heat pump (7.4-12 HSPF). Electricity costs are calculated at BC Hydro’s Tier 2 residential rate and all rates include fixed charges.
Solutions are needed for both Off-Grid and On-Grid Communities

<table>
<thead>
<tr>
<th></th>
<th>OFF-grid</th>
<th>ON-grid no NG</th>
<th>ON-grid with NG</th>
</tr>
</thead>
<tbody>
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Challenge - Access to Natural Gas

Indigenous Communities
- Red: No Access to Natural Gas
- Green: Access to Natural Gas
Cost of Heat ($/GJ) for Communities with Natural Gas Access

- Heat Pump - Air Source
- Natural Gas - High
- Natural Gas - Low
- Electricity - High
- Electricity - Low
Cost of Heat ($/GJ) for Communities without Natural Gas

- **Heat Pump - Air Source**: $10.96
- **Electricity - High**: $40.93
- **Electricity - Low**: $27.29
- **Propane**: $34.29
- **Diesel**: $29.76
## Investment Comparison

<table>
<thead>
<tr>
<th>Cost of Investment</th>
<th>Heat Pump Replaces Oil Furnace</th>
<th>Building Envelope Improvements on Home with Oil Furnace</th>
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<tbody>
<tr>
<td>Efficiency Improvement</td>
<td>50-65%</td>
<td>30%</td>
</tr>
<tr>
<td>Simple Payback Period</td>
<td>3 - 8 Years</td>
<td>7 - 14 Years</td>
</tr>
<tr>
<td>GHG Reduction</td>
<td>93%+</td>
<td>30%</td>
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Financing Solutions - Scale of Opportunity

14,000 Total Detached Homes on Reserve in BC

10,000 Need Repairs

8,000 Built Before 1991

Current Heating Costs | $18.9 Million Annually
Investment to Replace Heating Systems | $88 Million
Lifetime Cost Savings | $176 Million
Return On Investment | 15-20% Annually
# Project Financing - Barriers & Solutions

<table>
<thead>
<tr>
<th>Current Colonial System</th>
<th>Self-Determined System</th>
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</thead>
<tbody>
<tr>
<td>Communities compete for funds</td>
<td>Communities are entitled to financing for projects</td>
</tr>
<tr>
<td>Application &amp; reporting process is complex &amp; burdensome</td>
<td>Simple application &amp; reporting</td>
</tr>
<tr>
<td>Government decides who is successful</td>
<td>All communities that meet requirements are successful</td>
</tr>
<tr>
<td>Project development takes years due to funding applications</td>
<td>Projects advance on the community’s timelines</td>
</tr>
<tr>
<td>Limited funding supports set # of projects per year</td>
<td>No limit to the number of projects that can be supported</td>
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Summary

1) Indigenous housing on reserve is broken, and communities are taking leadership to address the crisis

2) We need more homes and better homes, but we also need solutions for existing housing

3) Electrification is a compelling opportunity for indigenous communities in BC to reduce heating costs in existing homes, but new financing tools are needed to deploy resources at scale and meet the challenge head-on.
Thank you!