Energy Service Companies in Yukon

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Talk will Focus on:

1. Yukon Wood Products Association
   1. What we do and who we are
2. Why Biomass?
3. Energy Service Companies in Yukon
4. Carbon Neutrality and Sustainability
Who is the Forest Industry in Yukon

Not these guys
We are these guys
We are in the Energy Business
Why Biomass?

Need to look back to see ahead
Yukon Has a Rich History in Biomass
The Alaska Highway changed Everything
Shift from Biomass to Fossil Fuels
Yukon Territory receives a transfer payment to support the population.

- $1.2 Billion received from Ottawa annually

- Every 6 years a complete transfer is leaked out of Yukon economy. 2/3 to USA oil refineries
Biomass Strategy

Yukon Adopted it February 2016

• $60,000,000.00 spent on fuel and electricity for heat
• 75% or $50,000,000.00 on imported fossil fuels for heat
• The forest industry in Yukon is a biomass energy industry
Wood Energy Costs Less
<table>
<thead>
<tr>
<th>Fuel/energy source</th>
<th>Units per GJ</th>
<th>Efficiency</th>
<th>Price</th>
<th>Cost/GJ</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wood</td>
<td>0.053 cords/GJ</td>
<td>60% wood stove 80% chip boiler</td>
<td>$275/cord $150.00/tonne</td>
<td>$24.51</td>
</tr>
<tr>
<td>Electricity</td>
<td>277.8 kWh/GJ</td>
<td>100%</td>
<td>No subsidy closer to $0.20/kWh</td>
<td>$41.67</td>
</tr>
<tr>
<td>Fuel Oil</td>
<td>26.2 litres/GJ</td>
<td>80%</td>
<td>$1.10/litre</td>
<td>$35.99</td>
</tr>
</tbody>
</table>
Yukon’s Energy Service Companies

Capacity and Business Models
Energy Service Models

• Customer owns and operates the system
  – Straight up fuel purchase contract
  – Raven Recycling and Yukon Gardens

• Teslin Tlingit Council Development Corp owns and operates district heat systems

• Heat sales model
  – Customer purchases heat and leaves fueling and operations to a Heat Sales company
Heat Sales Model
Yukon Biomass Inc.

WE SELL HEAT

Switching to heat derived from Biomass means:

- No oil spill liability
- Not subject to any ‘Carbon Tax’
- Using a renewable energy resource
- You would be supporting local employment.
- Circulating your fuel money back into the Yukon economy
- Not burning fossil fuels that are causing global warming
- Lower fuel costs compared to fuel oil, propane or electricity.
- Burning beetle kill wood, (i.e. dead trees which are a huge fire hazard).

Getting heat from Yukon Biomass Inc. means:

- No need to feed the boilers
- No need to reorder fuel
- No need to clean the ash out
- Very low annual maintenance charges
- No need to worry about fuel quality or condition
- Simple meter reading for heat energy supplied.
- We service them to get the most out of the fuel we supply.
- Boiler emissions that are similar to your old oil or propane boilers.
- Charges are based on a meter reading rather than per cord or weight of fuel.
- With a separate plant room, there is no need to upgrade your building or equipment room
- By leaving your existing equipment intact and serviced it can act as a backup heating system
- We use the most efficient boilers with two stage burners that delivers heat at over 90% efficiency

heatsales@yukon-biomass.ca
YBI Owners

• Professional Structural Engineer 35 + years international practice
• Hydronic heat and biomass specialist with 25+ years in the business reaching back to Germany
• Registered Professional Forester 40 + years in forest industry
• Yukon’s largest logger 25+ years in the business
Chain of custody from Stump to Heat in the Building

- YBI undertakes a design build project and installs all of the equipment
  - Designed for 80% of highest demand days, existing system picks up the difference for less than 10% of the year
  - Includes long term purchase agreement for 10+ years
  - Price of energy is based upon a price/kWh of heat consumed
Chain of custody cont’d,

- YBI manages the delivery of fuel by purchasing wood chips from the logger who delivers at a contract price/tonne
  - Wood chips must meet size specifications and moisture content
    - Penalties may be applied to purchase price for substandard wood chips
Chain of custody cont’d,

• YBI installs, owns and operates the boilers including fuel purchase, maintenance, and replacement

• The Customer simply pays for a metered kWh of energy consumed by the building
  – Never touches the boiler systems
Timber Harvesting and Biomass Manufacture
Bear Creek Logging Inc
3 Product Lines Cordwood, Chips, Wood Pellets and Residual Lumber
Employs Seven Staff. Truckers and Machine Operators
3860 Bandit Beast
Chip inventory now in place
Mechanical Trades

– ACS Mechanical....Whitehorse
– HVACtech Systems.....Whitehorse
– Fink Mechanical......Enderby BC
– Ventek Energy ........Kamloops BC
ACS Mechanical. Hargassner system
Fink Machine Inc and Yukon Gardens

200 km energy diet

100 km food diet
Manufactures firewood and distribution
Renewable and GHG Neutral
Biomass is Renewable and Carbon Neutral
Axe cut stump under second growth spruce
Look Back to Look Forward

- Biomass use has been around in Yukon for a long time
- **Demand** for wood/biomass is **growing**
- **$50,000,000.00** heating market that can shift to the 100km or 60 mile energy diet
- **Community based Economic Development**
  - Active communities doing forest stewardship
Back and Forward continued

- Future is for **more heat** and **some electricity** from wood
- **Carbon capture** cycle already happened in our second growth logged forests along the Yukon River
- We will **reduce fossil fuel** dependence and contribute to reduce carbon emissions
Thank you for listening