Woody Biomass Thermal Heating
Project Development Workshops

Cranbrook, BC • Castlegar, BC

REPORT

Submitted by
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Rocky Mountain TRENCH NATURAL RESOURCES SOCIETY

SCR Management Inc.

Rocky Mountain Trench Ecosystem Restoration Program
Restoring Nature's Balance.

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SUMMARY

Two six-hour bioenergy workshops were held in Cranbrook and Castlegar on October 4-5, 2010. The workshops followed a two-day (June 21-22, 2010) tour of wood biomass heating projects operating in Montana under the US Fuels For Schools program.

The October workshops provided participants with an overview of thermal woody biomass energy project development. Nine speakers from British Columbia, Montana and Vermont delivered a total of nine presentations that described successful projects; provided practical advice on planning and implementing such projects; and discussed how using woody biomass for small-scale heating could support ecosystem restoration and fuels management projects in the Kootenay region of southeastern BC. Workshop presenters and their topics are listed on pp 5-8 of this report. Presentations are available for download on the home page of the Rocky Mountain Trench Natural Resources Society website: www.trenchsociety.com.

A total of 68 people attended the workshops, which were publicized via word of mouth, organizers' mailing lists, and paid advertisements and news stories in regional media. Participants attended from the general public; municipal, regional and provincial governments; First Nations; the forest industry; non-governmental organizations; a post-secondary institution; and consulting companies. The workshop registration fee of $30 included an agenda package, refreshment breaks and lunch.

Participants were asked to complete an evaluation form distributed with the agenda package. Responses from the completed evaluation forms indicate the workshops were very well received. The evaluation questionnaire is provided in Appendix 3, and the responses are provided in the next sections, which provide details about the two workshops

Success was due in large part to sponsor support, which provided the means to offer these timely and important workshops featuring excellent speakers at a nominal cost. Thank you!

At the Cranbrook workshop:

Julie Kies, from Montana's Department of Natural Resources and Conservation, describes her experience with the US Fuels For Schools program.

Cranbrook Workshop

The first workshop, held October 4 at the Heritage Inn in Cranbrook, drew 35 participants (see Appendix 1). The event was opened by Chief Cheryl Casimir from the St. Mary's Indian Band who welcomed us to the traditional territory of the Ktunaxa First Nation. Chief Casimir was supportive of our efforts to create opportunities for utilizing forest waste and low-value fibre in the Rocky Mountain Trench region.

PARTICIPANT EVALUATION n=22

What key information did you take home from the workshop?

- Chipping information , harvesting systems and costs
- Awareness will help at the executive level will enable participation at the Nation (First Nations) level
- The initial complexities of fuel supply and project economics are being given careful consideration
- Feasibility considerations and criteria well presented
- A lot of good ideas of using biomass for energy
- It appears that there is a source of fuel available in the Trench
- Small biomass heating systems require a better quality fuel. i.e. not hog fuel
- Hopefully use ecosystem restoration waste biomass

How will the information you learned benefit your organization?

- Long term fuel supply planning. Need to determine supply and costs and the long term sustainability tied to existing needs
- There will not be much competition for fibre presently being used by Tembec
- Feasibility consideration
- Understanding the economics of different systems and planning
- Some realistic analysis – business plans and ideas brought forward
- We will have a use for what once was waste
- Ideas for utilizing woody debris from my own organization

Were there any aspects of bioenergy systems that should have been addressed?

- A glossary of terms would have been helpful and especially measures such as M^3 = # ODT and or BDTs
- Discussion of where to go from here
- More emphasis on power generation, the challenges and issues
- More information about pellets
- Costs as it relates to supply availability

Additional comments

- This workshop should have been 2 days. There should be a workshop on this every year until something happens. We need the public to carry this initiative.
- Should have invited Tembec to speak as they are the only co-gen operating in the area to speak from their perspective
- Workshop gave a good balanced perspective of the biomass industry
- More network time would be valuable

Average Responses to:

- Overall evaluation of the workshop
- Venue, lunch and refreshments
- Quality of information presented

1= needs improvement, 2= average, 3= good, and 4 = excellent (n=22)

- Overall evaluation of the workshop = 3.38
- Venue, lunch and refreshments =3.43
- Quality of information presented =3.71

Castlegar Workshop

The second workshop, held October 5 at the Sandman Inn in Castlegar, drew 33 participants, including a large group of students from Selkirk College's School of Renewable Resources (see Appendix 2).

PARTICIPANT EVALUATION – n=12

What key information did you take home from the workshop?

- Networking contacts
- Better understanding of biomass supplies
- Better understanding of transportation and production costs
- Understand biomass supply and uses
- Affirmation that there is a need to optimize biomass energy
- Bioenergy is doable but requires a lot of advanced planning
- There is market opportunities for bioenergy that I did not realize

How will the information you learned benefit your organization?

- This will help with project evaluations and risk assessment
- How or when to apply this new resource
- The City is looking at developing a new co-gen plant with a local forest company
- Information will help us locate technical expertise
- As a graduating student, it helps to see where the industry is going

Were there any aspects of bioenergy systems that should have been addressed?

- Electrical power generation
- Future cost estimates for pulp or fuel chips
- Small scale neighbourhood systems
- Nutrient cycling and environmental impacts of removing biomass

Other comments

- Very knowledgeable speakers and an excellent cross section of various aspects of bioenergy opportunities.
- We hope that there are some local initiatives that come from this

Average Responses to:

- Overall evaluation of the workshop = 3.67
- Venue, lunch and refreshments =2.75
- Quality of information presented =3.83

Workshop Presenters & Topics

1. **Tom Hobby** – SCR Management Inc., Victoria BC

   "Fuels Treatment Market and Non–Market Values: The Benefits of Using Woody Biomass"

   A key driving factor for supporting bioenergy development in BC is the critical link between bioenergy development and fuels management/fuel hazard reduction. The true cost of wildfires is more than the suppression costs that are accounted for. In fact, there are many environmental market and non-market values which society in the long-run has to pay for.

2. **Randy Harris** – Team Leader Ecosystem Restoration, Rocky Mountain Forest District, Cranbrook BC

   Dan Murphy – Coordinator, Rocky Mountain Trench Natural Resources Society, Cranbrook BC

   "Ecosystem Restoration & Bioenergy"

   Stakeholders in the East Kootenay are conducting a long-term grassland/open forest ecosystem restoration program on Crown land, in provincial and national parks, on private conservation properties, and on First Nations land. However, finding markets for the small-diameter wood removed during the restoration process is a major obstacle to continued success. Using this woody biomass to fuel small-scale heating installations has the potential to provide the necessary economic incentive.

3. **Julie Kies** – Biomass Utilization Program Manager, Montana Department of Natural Resources and Conservation, Missoula, Montana

   "Montana Fuels For Schools Program: Lessons from Montana Applied to BC"

   With experience of 11 wood biomass energy projects across Montana, Julie was very clear about some of the caveats and challenges posed by thermal biomass development in a rural setting. She specifically described the issues surrounding feedstock procurement and service contracts in the region. Some take-home messages:

   - Match fuel type to the appropriate system. Hog fuels had been a problem in original design and most had converted to cleaner low-grade chips.
   - Explore carbon offsets as these were beneficial for several projects in the region.
   - Develop a pilot project in the region to lead others and for others to see.

4. **Adam Sherman** – Biomass Energy Resource Center (BERC), Montpelier, Vermont

"Fuels for Schools Program in Vermont: Key Lessons Learned from Feasibility and Planning Projects"

BERC has participated in more than 40 thermal biomass development projects in the Vermont region of the eastern US. Key drivers that forged thermal woody biomass project development in Vermont include:

- High energy prices – driving organizations to seek alternatives.
- Abundance of chips and fibre – fibre available from many small woodlots.
- Champions – key people who "made it happen" in communities was key to success.
- BERC – leadership as a support NGO to serve as a catalyst for bioenergy development.
- No political opposition – strong political support from both Republicans and Democrats to get bioenergy off the ground.

Issues with transferring the Vermont experience to BC:

- Cheaper energy costs (electric and natural gas) in BC, which makes wood biomass conversion a tougher sell.
- Vermont had subsidies for project development, up to 90% of cost.
- BERC was core funded for several years to assist in getting bioenergy projects off the ground.

Key take-home messages:

- Focus on high heat users for projects within a region.
- Find champions to support the process.
- Build clusters of biomass energy projects to develop a critical mass and synergies.
- Pay attention to fuel supply and the length of the supply chain.
- First projects are critical for success. Make careful plans.

5. **Tom Hobby** – SCR Management Inc., Victoria BC

"Small-scale Thermal Biomass Heating Feasibility in BC"

Tom brought the session back to the theme of developing projects in BC. He provided an overview of the recent BC Safety Authority's successful support of the amendment to the Safety Act and the implications for boiler operations and imports from other jurisdictions. He presented some resource tools available to groups who want to evaluate pre-feasibility and feasibility of bioenergy projects, and he provided a brief overview of his company and the work that SCR Management can offer clients for BC thermal bioenergy development.

6. **Wayne Burkinshaw & Toby Jefferies** – All-Wood Fibre, Prince George BC

"Fuel Supplier/Harvesting Contractor Lessons Learned"

Wayne and Toby presented on 20 years of experience harvesting biomass in BC, including the various types of systems they currently use in their operation and key

factors in effective and efficient biomass harvesting. The bottom line: there is a very thin line for profit margins in the biomass harvesting business as biomass is not high-value fibre. Cost control, therefore, is essential for survival. All-Wood Fibre has many years of practical experience harvesting hog-fuels and chips in the region and they are positioned and willing to support niche markets like few others in the BC fibre harvesting business. Some key points:

Marketing

- What is the end user looking for?
- How available is the fibre?
- What does the landowner need/want for the fibre?
- Don't forget to add in stumpage!

Production costs

- Size of chips are inverse to cost.
- BDU ≠ BDT – know the nomenclature.
- All slash piles are not created equal: keep piles clean.

Transportation

- B-Train vs. Shuffle (walking floor systems).
- What can the end user take?
- What will the road system safely handle?
- Who else is using the road system?

Road maintenance costs

- Grading
- Signage
- Pull-outs
- Sanding
- Road user costs

7. **Tom Hobby** – SCR Management Inc., Victoria BC

"Harvest Engineering Research: Lessons from Oregon State University Research"

Several research projects dealing with fibre harvesting and transportation systems are currently being conducted in Oregon by OSU. Oregon has very diverse forests and diverse forested areas; many of these areas are more difficult to harvest than others. This more challenging terrain requires innovation in harvesting and procurement if biomass production is to become feasible. BC has its own issues with respect to terrain and access for biomass harvesting, making Oregon's lessons critical to BC biomass harvesting.

Current research underway:

- One-pass harvesting vs. sawlog/pulp-only harvesting.
- Roadside vs. satellite chipping/grinding.
- Chipping in the stand using mobile chippers.

Lessons learned:

- Many cost savings are yet to be realized by new harvesting and transport systems.

- Continued applied research in this area will lead to reducing costs.
- Oregon State will have engineering studies available soon that will focus on biomass production costs and will support BC studies led by the Forest Engineering Research Institute of Canada and others.
- Scandinavian biomass suppliers have a wealth of knowledge and experience in harvesting and transporting biomass, which via knowledge transfer, may yield future biomass harvesting costs savings.

8. **Cornelius Suchy** – Canadian Biomass Energy Research Ltd., Revelstoke, BC

"Design and Construction: Elements for Successful Project Development"

Cornelius presented a model for project development, including a list of key questions for assessing projects. His "real life" case study examined the City of Castlegar's recreation facility and provided actual data and analysis. Key points for project development:
Check the political viability

- Political support
- Legal barriers
- Public acceptance
- Champion on board

Consider fuel sources and logistics

- Forest residues
- Ag residues (some types may be unfeasible)
- Urban residues

Define your project

- Pick an easy project – i.e. a system with a large boiler
- Don't pick retrofits
- Select projects with at least $100k heating costs
- District heating should be phase 2 or 3

Check logistical or architectural constraints

- Check availability of fuel
- Decide on location of the plant
- Check architectural constraints
- Access by trucks

9. **Burkard Fink** – Fink Machine Inc., Vernon, BC

"Thermal Biomass Bioenergy Development in BC: Lessons Learned"

Fink Machine has developed thermal wood biomass projects and sold boilers across North America. Burkard described the KOB PRYTEC and PRYROT boiler systems and their applications in a myriad of locations. Fink Machine has an excellent reputation for both project development and systems service. Once a system is in operation, the company supplies parts and service for the units they sell and install.

Appendix 1

Registrants: Cranbrook Bioenergy Workshop – Oct 4, 2010

Allen, Jeff	Forestry Consultant
Black, Mike	Ministry of Forests & Range
Bjorn, Bob	Retired Rancher
Blissett, Scott	Nupqu Development Corporation
Byford, Steve	BC Timber Sales
Dureski, Brian	Tembec
Gay, Rob	Regional District of East Kootenay
Goodwin, Kent	Kimberley Nature Park Society
Grady, Gerry	BC Timber Sales
Graham, Irv	Adventure Tourism Lodge Owner/Woodlot Licensee
Havens, Lloyd	Tembec
Heigh, Dennis	Wildfire Management Branch
Johnston, Glen	General Public
Johnston, Jerry	General Public
Kroschell, Jamie	BC Timber Sales
Luke, Bob	First Nations
McArthur, David	Logging/Slashing Contractor
Mercer, Wayne	Tembec
Monk, Ron	General Public
Neil, Rob	Nature Trust of British Columbia
Palmer, Duane	Palmer Bar Holdings
Park, Tim	Forestry Worker
Pelkonen, Becky	First Nations
Penson, Jim	Regional District of East Kootenay
Pinsent, Wes	Forestry Consultant
Read, Mark	Village of Radium Hot Springs
Schaefer, Carrie	Columbia Basin Trust
Streloff, Ken	Tembec
Tipper, Gary	Nature Conservancy of Canada
Wake, Bill	Palmer Bar Holdings
Watson, Brian	Nupqu Development Corporation
Weaver, Kevin	City of Cranbrook
Wigle, Dan	St. Mary's Indian Band
Woodbury, Bruce	Mayor, Village of Canal Flats
Wullum, Curtis	Lower Kootenay Indian Band – Economic Development

Appendix 2

Registrants: Castlegar Bioenergy Workshop – Oct 5, 2010

Aldinger, Cliff	
Amott, Cecile	City of Grand Forks
Andrews, Carol	Selkirk College, School of Renewable Resources
Boilard, Corey	Ridgeline Resources
Burch, Lynne	City of Grand Forks
Bradford, Mac	Business Owner
Deverney, Stu	Selkirk College
Dunsdon, Richard	Village of Midway
Glover, Shane	Logger
Glover, Gary	Logger
Hill, Peter	Terasen Gas Energy Solutions
Kniss, Bert	Village of Fruitvale
Krueckl, Bernie	City of Grand Forks
Love, Alex	City of Grand Forks
Morissette, Steve	School District 20
Munroe, Brad	Forestry Consultant
Scott-May, Cathy	Consultant
White, Michael	Ministry of Forests & Range
Wright, Chuck	Zellstoff Celgar

Students: Selkirk College, School of Renewable Resources
Tasha Brekkas
Andrew Hill
Laura Pierik
Kevin Heidt
Kathleen Janz
Dylan Simpson
Tyler Pellegrin
Raquel Milare
George Oulton
Colin Tippett
Isaac Hinksman
Steven Henderson
Brenden Mercer
Wes McKay

Appendix 3

Participant Evaluation

1. What key information did you take home from the workshop?
2. How will the information learned benefit your organization?
3. Were there any aspects of bioenergy development that should have been covered?
4. Additional Comments?
5. Overall evaluation of the workshop 1 ☐ 2 ☐ 3 ☐ 4 ☐
6. Venue, lunch and refreshments 1 ☐ 2 ☐ 3 ☐ 4 ☐
7. Quality of information presented 1 ☐ 2 ☐ 3 ☐ 4 ☐