

# Fink Machine Inc. Biomass District Heating

## A Review of 6 Years of Success

IDEA2018 Local Solutions, Global Impact – Vancouver, BC

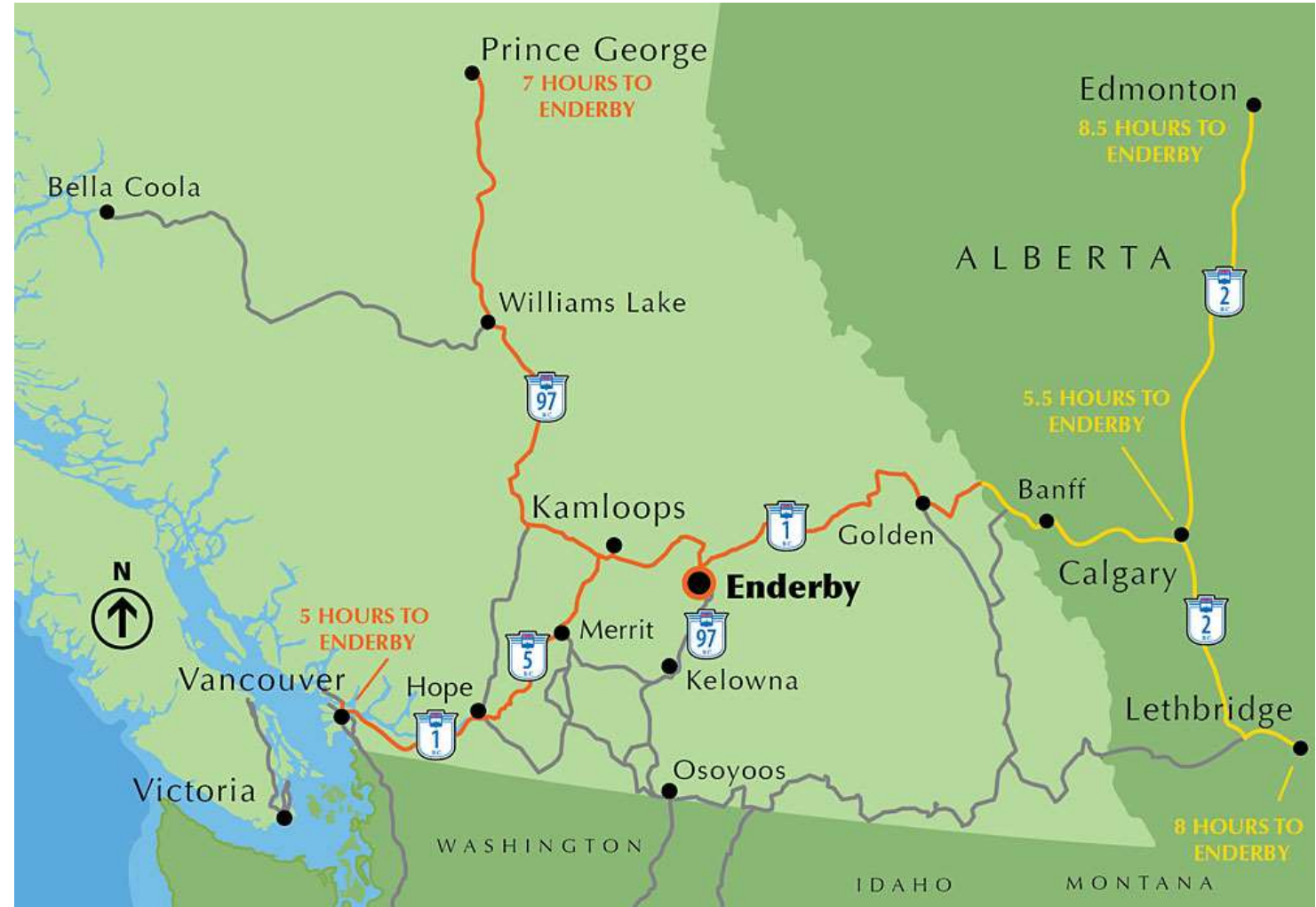
David Dubois BSc ChE, Manager of Business Development – Fink Machine



*State of the Art Bio Energy Heating Systems  
Revolutionary Wood Heating Technology  
Highly Economical for Commercial, Industrial Buildings*

# Enderby BC

- About 3000 people
- Home of Worlds Largest Reel Lawnmower



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# System Overview





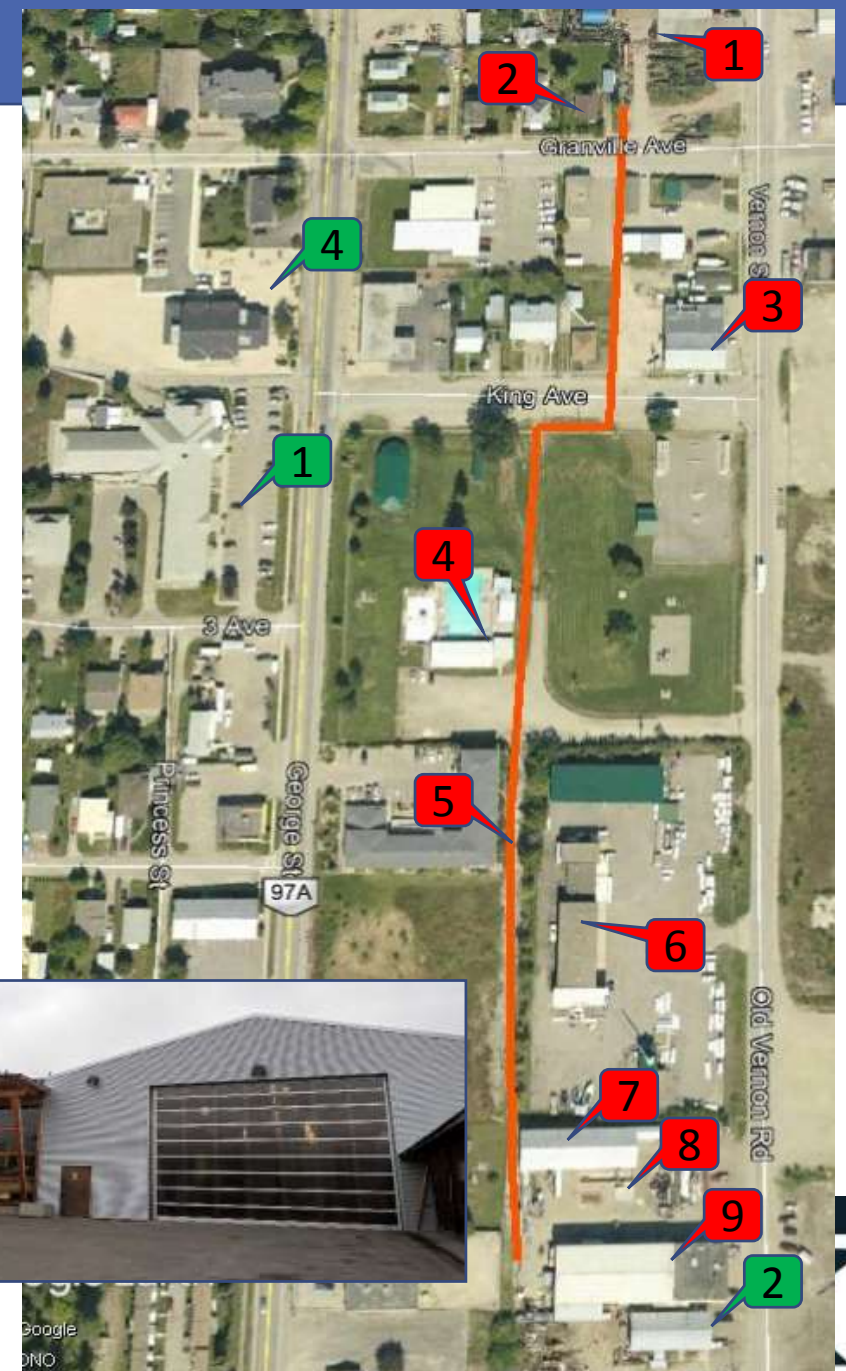
# System Overview – Phase 1

## Present Customers

- 1 Tony's Tire (35 kW)
- 2 Edwin D. (15 kW)
- 3 Enderby Autobody (35 kW)
- 4 Enderby Lions Pool (80 kW)
- 5 Royal Inn (DHW) (15 kW)
- 6 Cedar Solution (60 kW)
- 7 Fink Machine (85 kW)
- 8 Boiler House (Pyrot 540)
- 9 ENFAB (90kW)

## Future Customers

- 1 Parkview Place (120 kW)
- 2 Marvin's Mechanical (20 kW)
- 3 CNC (45 kW)
- 4 Seniors Complex



Google  
DNO

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# System Overview – Phase 2

- Phase 2 – 950 m
- Connected 2014
- Car Wash connected 2018
- Required boring under major highway



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# System Overview - Chips

- 375 m<sup>3</sup> of chip storage (3 truck loads) – 50 tonnes
- Walking floor
- Winter - Once a week delivery
- Summer - Once a month delivery



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# System Overview – Energy Centre

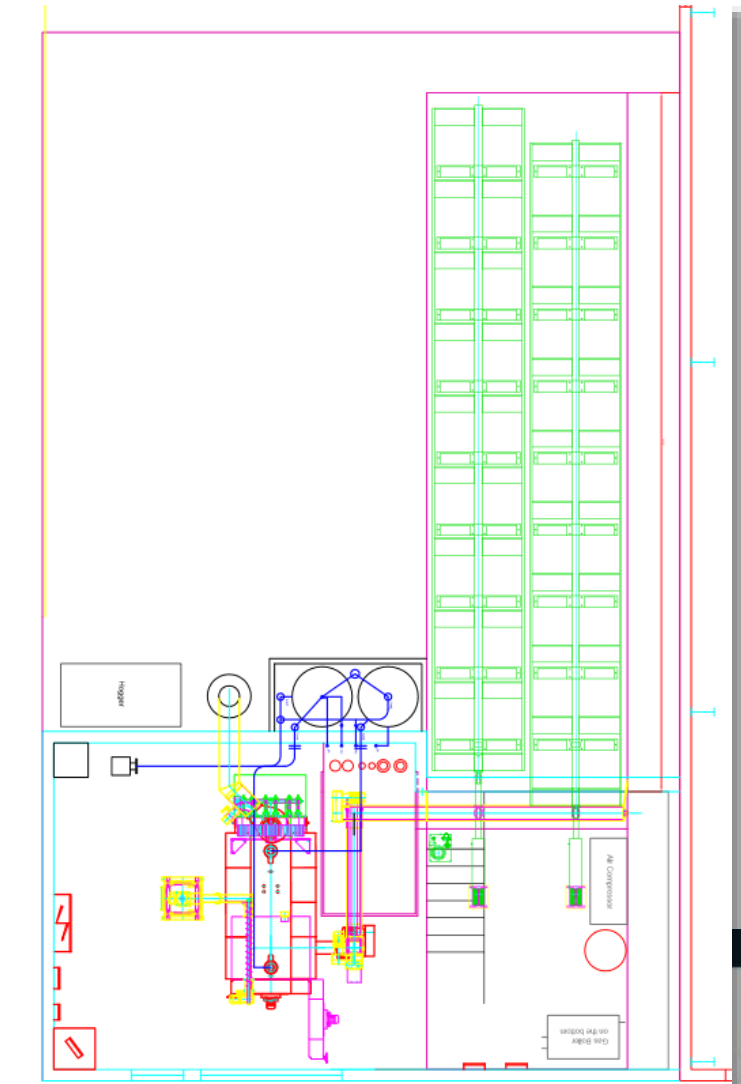
- 540 kW **Viessmann** Wood Chip Boiler
- 2 x 4000 L buffer tanks in series
- 85° C Supply Temp - 20+°C delta T
- 3 x 3" Header
- NG Back-up but minimal usage



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# Design Considerations – Risk vs Reward

- 3" PEX for mainlines
- Leverage internal capacity/knowledge
- KISS
- Included minor retrofits for Phase 1
- Window of opportunity
- Phase 1 -  $\frac{3}{4}$  is on municipal right-of-way's



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# Operation Overview

- Minimal staffing requirement – 10 hours/month
  - Operations
  - Maintenance
  - Accounting
  - MANAGEMENT
- Clients pay for usage
  - Phase 1 - no connection charges
  - Phase 2 – connection charges and going forward



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# Chip Supply



- Changed suppliers multiple times
  - Tried landfill waste but contamination was too high but working to get cleaner
- Currently paying \$50-70/tonne - \$3.85-\$5.40/GJ
- Moisture is 15-25%
- Expense is about \$35k per year – 550-600 tonnes/year



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# Best Practices

- Get good as-built drawings and document with pictures - pixels are cheap
- Balance risk
  - PEX Piping
  - Design/Engineering
  - Right of Ways
- Leverage experience going forward
  - Phase 2 trenching half the cost of Phase 1 – wider trench



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# Other Considerations



- Utility Regulations
- Trust in Proponent
  - Smaller System – comfort in one-to-one relationship
  - Larger System – comfort in size
- Understand your market and drivers
  - Economic
  - Environment
  - Business Development



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# Observations

- Champions are critical – but do not forget operations staff
- Pumping costs were surprizing – \$8k/year
- Proof of concept and kicking the tires
- Manage development costs
- Energy Transfer Stations
  - Built in phase 1 - bought in phase 2



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# Thank You



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David Dubois  
Manager of Business Development

[david@finkmachine.com](mailto:david@finkmachine.com)

250-457-7319



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