Regional District of Central Kootenay

COMMUNITY SUSTAINABLE LIVING ADVISORY COMMITTEE

Open Meeting Agenda

Date: Tuesday, October 13, 2020

Time: 1:00 pm

Location: RDCK Board Room, 202 Lakeside Dr., Nelson, BC

Directors will have the opportunity to participate in the meeting electronically. Proceedings are open to the public.

Pages

1. CALL TO ORDER

Chair Main called the meeting to order at 0:00 p.m.

2. TRADITIONAL LANDS ACKNOWLEDGEMENT STATEMENT

We acknowledge and respect the indigenous peoples within whose traditional lands we are meeting today.

3. ADOPTION OF AGENDA

RECOMMENDATION:
The Agenda for the October 13, 2020 Community Sustainable Living Advisory Committee meeting be adopted as circulated.

4. RECEIPT OF MINUTES 4 - 8

The August 18, 2020 Community Sustainable Living Advisory Committee minutes, have been received.

5. DELEGATE

There are no delegates.

6. STAFF REPORTS

6.1. FOR INFORMATION: UPDATES ON SUSTAINABILITY SERVICE PROJECTS 9 - 20

The Staff Report dated October 13, 2020 from Paris Marshall Smith, Sustainability Planner, has been received.

7. NEW BUSINESS

7.1. FOR INFORMATION: CSLAC FINANCIAL REPORT 21 - 28

The CSLAC Financial Report from Sangita Sudan, General Manager of Development and Community Sustainability Services, has been received.

7.2. FOR INFORMATION: CSLAC TERMS OF REFERENCE 29 - 31

The existing CSLAC Terms of Reference dated October 17, 2020, has been received for information.

Staff are requesting a discussion at the December 8, 2020 meeting to discuss updating the CSLAC Terms of Reference.

8. OLD BUSINESS

8.1. FOR INFORMATION: FOOD SECURITY INTERIM UPDATE 32 - 37

The Interim Report dated September 20, 2020 from Abra Brynne has been received

- Food Security Action Plan (May 13, 2020)

8.2. FOR INFORMATION: BIOENERGY OPPORTUNITIES IN THE RDCK - DRAFT FINAL REPORT 38 - 102

The Committee Report dated September 23, 2020 from Paris Marshall Smith, Sustainability Planner, has been received.

- Bioenergy Opportunities in the Regional District of Central Kootenay - Draft Final Report
- Summary of Recommended Opportunities

8.3. FOR DISCUSSION: WATERSHED GOVERNANCE INITIATIVE - WORKSHOP 103 - 126

- WGI Workshop Agenda
- WGI Workshop Slides
- WGI Workshop Project Process

RECOMMENDATION:
That the Board direct staff to pursue community collaborative planning pilots in watersheds of identified need and regional forums, as a part of the *Watershed Governance Initiative Act Now* response to assess immediate needs, provide information and make recommendations that lead to a watershed protection plan.

9. NEXT MEETING

The next Community Sustainable Living Advisory Committee meeting is scheduled for December 8, 2020 at 1:00 p.m.

10. ADJOURNMENT

RECOMMENDATION:

The Community Sustainable Living Advisory Committee meeting be adjourned at 0:00 p.m.

Regional District of Central Kootenay

COMMUNITY SUSTAINABLE LIVING ADVISORY COMMITTEE

Open Meeting Minutes

Tuesday, August 18, 2020 at 1:00 pm
by remote meeting due to Novel Coronavirus 2019 (COVID-19)

COMMISSION MEMBERS PRESENT

Chair L. Main	Village of Silverton
Director G. Jackman	Electoral Area A
Director A. Watson	Electoral Area D
Director R. Faust	Electoral Area E
Director T. Newell	Electoral Area F
Director H. Cunningham	Electoral Area G
Director W. Popoff	Electoral Area H
Director A. Davidoff	Electoral Area I
Director P. Peterson	Electoral Area K
Director S. Hewat	Village of Kaslo
Director D. Lockwood	Village of Salmo

GUEST COMMISSION MEMBER PRESENT

Alt. Director L. Watson	Electoral Area J

ABSENT COMMISSION MEMBER

Director A. Casemore	Electoral Area C
Director T. Wall	Electoral Area B

STAFF PRESENT

S. Sudan	General Manager of Development and Community Sustainability Services
P. Marshall-Smith	Sustainability Planner
C. Johnson	Manager of Community Sustainability Initiatives
P. Faulkner	Senior Energy Specialist

S. Horn	Chief Administrative Officer
S. Kindred	Development and Community Sustainability Initiatives Administrative Assistant

GUESTS

J. Stephen	Managing Director, Torchlight Bioresources
B. Anderson	Councillor, City of Nelson

1. CALL TO ORDER

Chair Main called the meeting to order at 1:00 p.m.

2. TRADITIONAL LANDS ACKNOWLEDGEMENT STATEMENT

We acknowledge and respect the indigenous peoples within whose traditional lands we are meeting today.

3. ADOPTION OF AGENDA

Moved and seconded,
And Resolved:

The Agenda for the August 18, 2020 Community Sustainable Living Advisory Committee meeting be adopted with the following:

That Councillor Anderson with the City of Nelson have freedom of the floor.

Carried

4. RECEIPT OF MINUTES

Moved and seconded,
And Resolved:

The June 15, 2020 Community Sustainable Living Advisory Committee minutes, have been received.

Carried

5. STAFF REPORTS

5.1 FOR INFORMATION: UPDATES ON SUSTAINABILITY SERVICE PROJECTS

The Staff Report dated August 18, 2020 from Paris Marshall Smith, Sustainability Planner, has been received.

6. DELEGATE

Bioenergy Opportunities in the Regional District of Central Kootenay: A pathway to Development.
Jamie Stephen, Torchlight Bioresources

Chair Main welcomed Jamie Stephen to the remote CSLAC meeting.

Jamie Stephen gave a presentation to the Committee regarding Bioenergy opportunities identified in the mid-term review with the purpose to narrow down options and put together some preliminary business cases.

The committee provided feedback and selected the three recommendations presented:

1. Wood Pellet Boiler Network
2. District Energy in Castlegar
3. Village District Energy

It was also noted that Bio power is not economical and requires high quality fuel for gasification based projects. Power outage issues cannot be solved with bio power but bio heat can significantly reduce electricity demand and make storage a viable option.

Wood-based liquid fuel & RNG has much lower efficiency than heat (thermal energy). Also the scale of such a project must be very large to be economically viable (Renewable Natural Gas (RNG): 450,000 bdt/yr) and generally requires high quality feedstock and therefore is not recommended for the RDCK.

Mr. Stephen addressed the Committee's questions and Chair Main thanked him for his presentation.

RECESS/ RECONVENED The meeting recessed at 3:16 pm for a break and reconvened at 3:22 pm.

7. OLD BUSINESS

7.1 FOR DISCUSSION: TIMBER DEADSTOCK BIOENERGY FEASIBILITY STUDY MID-TERM REVIEW

The Committee Report dated July 24, 2020 from Paris Marshall Smith, Sustainability Planner, re: Timber Deadstock Bioenergy Feasibility Study Mid-Term Review, has been received.

Moved and seconded,
And Resolved that it be recommended to the Board:

That the Board direct staff to further develop the business case potential of the Wood Pellet Boiler Network, District Energy in Castlegar and Village District Energy Systems as part of the Timber Deadstock Bioenergy Feasibility Study in coordination with municipal staff.

Carried

7.2 FOR DISCUSSION: WATERSHED GOVERNANCE INITIATIVE PHASE 1 INTERIM REPORT

The Committee Report dated July 24, 2020 from Paris Marshall Smith, Sustainability Planner, re: Watershed Governance Initiative Phase 1 Interim Report, has been received.

Moved and seconded,
And Resolved that it be recommended to the Board:

That the Board direct staff to pursue a community collaborative planning pilot, in watersheds of identified need, as a part of the Watershed Governance Initiative Act Now response, that will include community members, First Nations, and stakeholders of associated government agencies to assess immediate needs and with recommendations that lead to a watershed protection plan.

Carried

8. NEXT MEETING

The next Community Sustainable Living Advisory Committee meeting is scheduled for October 13, 2020 at 1:00 pm.

9. ADJOURNMENT

Moved and seconded,
And Resolved:

The Community Sustainable Living Advisory Committee meeting be adjourned at 4:04 pm.

Carried

_____

Leah Main, Chair

_____

Shelly Kindred, Secretary

REGIONAL DISTRICT OF CENTRAL KOOTENAY

Memorandum
CSLAC Staff Update

Date: 2020/10/13
To: Community Sustainable Living Advisory Committee
From: Paris Marshall Smith, Sustainability Planner
Subject: UPDATE ON SUSTAINABILITY SERVICE PROJECTS & AREAS OF ACTIVITY
File: 01-0515-20-CSLAC

The purpose of this memo is to provide an update to the Community Sustainability Living Advisory Committee (CSLAC) of the current activity of the Sustainability Planner within S105. Updates on S100 initiatives such as the Regional Energy Efficiency Program (REEP) and 100% Renewable Energy by 2050 will go directly to the Board.

The Community for Sustainable Living Committee Service 105 was re-established in 2017. In September, 2018, the Sustainability Coordinator position moved to full time with 0.5 of the FTE funded by FortisBC as Senior Energy Specialist (SES) for a term ending in October 2020. In February 2020, the two 0.5 positions were made 1.0 FTE each. A new SES is being was hired in June, 2020. The Sustainability Coordinator became a full time Sustainability Planner position.

- Year 1 (2017) focus – responding to projects underway and initiating new activity to support Board priorities on Coordinated Delivery; Water – protection & advocacy; Housing; and Food & Agriculture. Energy & Climate Change are also Board priorities as per the climate action charter;
- Year 2 (2018) focus – integrating initiatives internally and externally through coordinated communication, marketing, policy development and by-law review.
- Year 3 (2019) focus – Watershed Governance Initiative, Senior Energy Specialist, Regional Energy Efficiency Program (REEP),
- Year 4 (2020) focus – Watershed Governance Initiative, Timber Deadstock Bioenergy, Regional Energy Efficiency Program (REEP) and Climate Action Initiative

GMDS – General Manager of Development & Community Sustainability Services, CSM – Manager of Community Sustainability Services & SP – Sustainability Planner

SUMMARY OF SUSTAINABILITY PLANNER WORK TIME DISTRIBUTION

AREA OF WORK	CURRENT %	COMMITMENT
Community Sustainability Service (105) initiatives		
Watershed Governance Initiative	30%	Project Plan developed, if approved will move to 20-25%% of time.
Biofuel project	25%	Kick off meeting on June 4, project has been pushed back by 6 weeks due to contracting time, see below for details.
RDI – Climate Adaptation project	10%	Next project will be participating in Natural Asset Management training in Fall 2020
Admin	10%	The admin rhythm revolves around the bi-monthly CSLAC meeting
General admin (S100) initiatives		
100% renewable energy plan	15%	Supporting the RDCK area descriptions and coordinating the local government review
Climate Action Imperative	2%	Currently, updating the RDCK policy framework to include climate action lens
REEP	3%	Responsibilities include oversight until end of 2020, transitioning management to Senior Energy Specialist
Admin	5%	Reporting as needed to the Board
TOTAL	100%	

Service 105	Project	Board Resolution	Responsible	Update of activity	Staff time & funding	Current allocation of resources by SP	Next Steps
Food & Agriculture							
	CENTRAL KOOTENAY FOOD POLICY COUNCIL	1. 718/17 That the Board direct staff to include a $10,000 per year funding for the Central Kootenay Food Policy Council within the 2018-2022 draft financial plan for Service S105. 2. 741/18 That the Board grant the balance of $22,083.62.00 to the Central Kootenay Food Policy Council (CKFPC) contingent on all grant reporting and society action reporting deliverables be presented and approved by the Board; AND FURTHER, that staff obtain documentation form CKFPC that indicates they are in compliance with the British Columbia Societies Act. 3. 757/18 That the Board appoint the following Directors to the Central Kootenay Food Policy Council for a term to end December 31, 2020 Director Faust and the second appointment BE REFERRED to December 13, 2018 Board meeting. 4. 03/19 That the Board appoint the following Director to the Central Kootenay Food Policy Council for a term to end December 31, 2020 as per resolution 757/18: Director Peterson Director Main (Alternate) 5. 48/19 That the Board agrees that the Central Kootenay Food Policy Council has satisfied the Board's requirements and has demonstrated that it is in compliance with funders and the BC Societies Act; AS SUCH, the RDCK Board grants the balance of the $29,347.87 to the Central Kootenay Food Policy Council from Community Sustainability Service S105. *Continues on next page*	Executive Director Abra Brynne with support from SP/GMDS	Council met on October, ED Brynne has provided an interim report on the Food Security Project	$10,000 from S105 + staff time	Minimal – 1-2 hours per month to attend meetings and follow email conversations. SP has joined Policy Working group and is supporting the development of a Policy project plan. Nelson Wight, Planning Manager, is acting as liaison for the Evidence Based Planning project with RDCK staff.	Continue to support work of the CKFPC and distribute to RD network.

6. 284/20 That the Board approve the $25,000 in the 2020 Financial Plan from Community Sustainable Living Service S105 be held for a Food Security Coordinator position within the Emergency Operations Centre as leveraging funds.

7. 285/20 That the Board direct staff to report on options to establish a Food Security Coordinator position to be fully funded through Community Sustainable Living Service S105 with a budget up to $25,000.

8. 377/20 That the Board send a letter of support for the Columbia Basin Food Security Plan;
AND FURTHER, that the Board allocate funds to the first phase of the "Central Kootenay Interim Food Security Action Plan" from Community Sustainability Service S105 in the amount of $22,145.00 to the Central Kootenay Food Policy Council.

Service 105	Project	Board Resolution	Responsible	Update of activity	Staff time & funding	Current allocation of resources by SP	Next Steps
Water							
	WATERSHED GOVERNANCE PROJECT PLANNING	1. 88/18 That the Board direct staff to invite the Polis Project to host a workshop with the RDCK staff and Directors on watershed governance; AND FURTHER expenses and stipend be paid by General Administration S100. 2. 256/18 The Watershed Governance workshop with the POLIS Project be booked for May 18th, 2018 and the Watershed Governance Workshop Discussion report be made available to all Board Directors. 3. 487/18 That the Board direct staff to develop a Regional Watershed Governance Initiative project plan, and identify an allocation for General Manager of Development Service and Sustainability Coordinator's time to implement the project plan for consideration in the draft 2019 five year financial plan within General Administration Service (S100). 4. 892/18 That the RDCK Board directs staff to seek funding to launch and coordinate a scoping study to better understand the potential watershed governance roles and responsibilities of the RDCK; with areas for the study to be determine by the Community Sustainable Living Advisory Committee at the January committee meeting; And Further, the Board allocates staff time of the Sustainability Planner (0.3 FTE), General Manager of Development Services (0.1 FTE) and Water Services Liaison (0.1 FTE) to support the procurement process for services. 5. 13/19 That the Board direct staff to develop a Regional Watershed Governance Initiative project plan, and identify an allocation for General Manager	GMDS/SP & Water Service Liaison	The Watershed Governance Initiative Project Plan has been approved and staff have provided a Phase 1 interim update for CSLAC this month	Expenses from S100 + staff time	SP (0.3 FTE), GMDS (0.05 FTE), CSM (0.1 FTE) and Water Services Liaison (0.1 FTE) to support the project	Continue with Phase 1 of Project Plan

of Development Service and Sustainability Coordinator's time to implement the project plan for consideration in the draft 2019 five year financial plan within General Administration Service (S100).

6. 121/19 That the RDCK Board approve funds in the amount of $26,250 from S105 Community Sustainable Living Advisory Service for the Watershed Governance Initiative scoping study, to complement the work being done in Area H and I's ground water studies, for the following watersheds:
   - Bourke, Sitkum & Duhamel Community Watershed (Area F);
   - Arrow Creek Community Watershed (Area B);
   - Ymir Community Watershed (Area G);
   - Argenta Watershed (Area D);
   - Harrop (Area E);
   - and Deer Creek (Area J)

7. 409/10 That the RDCK Board award the Regional Watershed Governance Initiative Scoping Study to Christina Metherall and Elucidate Consulting, and that the Chair and Corporate Officer be authorized to sign the necessary documents to a maximum value of $26,880 (includes GST).

8. 282/20 That the Board direct staff to prepare a workplan to determine the organizational capacity of the Community Sustainability Services and Water Services staff to pursue the recommendations of the RDCK Regional Watershed Governance Initiative report dated January 2020.

9. 389/20 That the Board endorse the Watershed Governance Initiative Project Plan (May 2020) and direct staff to pursue the Project Plan as a collaboration between Community Sustainability and Water Services staff.

	10. 501/20 That the Board direct staff to pursue a community collaborative planning pilot, in watersheds of identified need, as a part of the Watershed Governance Initiative Act Now response, that will include community members, First Nations, and stakeholders of associated government agencies to assess immediate needs and with recommendations that lead to a watershed protection plan.					
KOOTENAY LAKE PARTNERSHIP	1. 91/18 That the RDCK Board approve funding of $10,000 under S105 Community Sustainable Living Service to support the contracted service of the Kootenay Lake Partnership Coordinator position within the 2018 budget. 2. 414/19 That the RDCK Board extends its support for Living Lakes Canada's Foreshore Inventory and Mapping for Aquatic Species at Risk proposal to the Canada Nature Fund with in-kind contributions of mapping data and staff hours for a total contribution of $175,000.00 over the four (4) year term of the project, which is:	PM Nelson Wight	Staff have released the grant funding to Living Lakes Canada. Planning will be leading a review of DPA to align with the Shoreline Management Guidelines for Kootenay Lake EAs.	$10,000 from S105 + staff time (NOTE – not in 2019)	n/a	**As needed.**

PROJECT	IN-KIND CONTRIBUTIONS
Regional Flood and Hazard Risk AssessmentLiDAR Acquisition and Processing	Completed in 2018 $40,000.00Completed in 2018 $40,000.00
Floodplain MappingKootenay Lake Inundation Study	In Process $60,000.00In Process $10,000.00
Planning staff time for review and outreach activities associated with project implementation	Pending $25,000.00

3. 390/20 That the Board direct staff to transfer the remaining grant funding from the Real Estate Foundation (REF) in Community Sustainability Service S105, administered by RDCK on behalf of the Kootenay Lake Partnership, to Living Lakes Canada to support the Program Coordinator Position upon receiving confirmation from REF to do the transfer; AND FURTHER, that final report comes back to RDCK for information

Service 105	Project	Board Resolution	Responsible	Update of activity	Staff time & funding	Current allocation of resources by SP	Next Steps
Energy							
	BIOFUEL – TIMBER DEADSTOCK BUSINESS PLANNING	1. 119/19 That the Board direct staff to explore partnerships possibilities with Columbia Shuswap Regional District, Regional District East Kootenay and Regional District Kootenay Boundary on the Timber Deadstock Biofuel scoping study; AND FURTHER, that staff explore funding opportunities for the study 2. 232/19 That the Board approve the RDCK entering into a Contribution Agreement with Columbia Basin Trust to support the research and development of a business plan for timber deadstock biofuel in the Regional District of Central Kootenay, and that the Chair and Corporate Officer be authorized to sign the necessary documents; AND FURTHER, the required matching funds of up to $25,000 come from Service S105 - Community Sustainable Living Advisory; AND FURTHER, that the grant funds be received and administered through S105. 3. 500/20 That the Board direct staff to further develop the business case potential of the Wood Pellet Boiler Network, District Energy in Castlegar and Village District Energy Systems as part of the Timber Deadstock Bioenergy Feasibility Study in coordination with municipal staff.	GMDS/SP	The contract was signed on June 2, kick off meeting on June 4. New timelines are: • MIDTERM report - July 27, 2020 • Presentation to CSLAC at August meeting • DRAFT report - Sept 14, 2020 • FINAL report - Nov 2, 2020 • Presentation to BOARD at December meeting	Staff time	1-2 days per week over next 3 months	Work with consultants to support the project

Service 105	Project	Board Resolution	Responsible	Update of activity	Staff time & funding	Current allocation of resources by SP	Next Steps
Climate Action							
	CLIMATE ACTION IMPERATIVE	1. 124/19 That the Board direct staff to prepare a resolution that responds to ramping up RDCK's climate action in response to the climate emergency by April, 2019. 2. 272/19 - WHEREAS 1. Climate change is recognized to be an urgent reality requiring rapid decarbonisation of energy across all sectors; 2. Climate change is recognized to be an urgent reality where risks are compounded by increased climate change weather related events (more precipitation in the winter, dryer hotter summers) and increased levels of uncertainty. Preparing for increased resilience and adaptability is critical; THEREFORE BE IT RESOLVED That the Regional District of Central Kootenay Board recognizes that the world is in a global state of climate crisis. This reality creates an imperative for ALL ORDERS OF GOVERNMENT to undertake “rapid and far reaching” changes to building construction, energy systems, land use and transportation. 3. 701/19 That the Board direct staff to update the RDCK Policy Framework to incorporate a climate action lens; AND that, the 3-phased Climate Action Lens Policy strategy will seek input from the Senior Management Team to ensure smooth integration with operations and will bring recommendations to the Board for approval.	SP	Currently working on Phase 1 and 2 of the Strategy – Climate Action Guidelines, Transportation, Build Better, and Energy Recovery	Staff time	Currently updating the RDCK policy framework to include climate action lens	Continue to move the drafted policies through staff, SMT and the Board for discussion and approval

	4. 861/19 That the Board direct staff to distribute the 2019 RDCK State of Climate Action full report and summary handout to the public.					
RDI – CLIMATE ADAPTATION	1. 233/19 That the Board partner with the Rural Development Institute's Regional Approach To Rural Climate Adaptation Project Partnership and direct staff to finalize the agreement; AND FURTHER, allocate $12,500 of in-kind staff time from Service S105 for 2019-2020 (2 years) to support the Partnership. 2. 595/19 That the Board approve the RDCK entering into a Collaborative Research agreement with Selkirk College for the Regional Approach to Rural Climate Adaptation Project Partnership for the period from May 1, 2019 to March 1, 2021, and that the Chair and Corporate Officer be authorized to sign the necessary documents.	GMDS/SP	Currently participating in Natural Asset Management (NAM) training through Royal Roads and conducting a NAM inventory of Arrow Creek Watershed	Staff time	5-6 days over 2020	Continue with NAM inventory work and training
100% RENEWABLES	1. 257/18 That the Board commit to the development of strategies and implementation of projects to achieve the long-term goal of deriving 100% of its net energy from renewable sources by 2050, and commit to demonstrate strong political leadership and significantly contribute to the reduction of greenhouse gases in the region. 2. 222/19 That the Board appoint the following individual(s) to work with the West Kootenay EcoSociety towards the 100% Renewable Energy by 2050 from the Community Sustainable Living Advisory Committee; AND FURTHER, stipend and expenses to come from S105: Director Faust & Lockwood 3. 412/19 That the Board Chair and Corporate Officer sign the Memorandum of Understanding with West Kootenay 100% Renewable Energy Plan.	GMDS/SP	The draft plan has been circulated amongst rural areas EO`s and their comments have been incorporated. Prior to release to the public, the revised version will be circulated again for review.	Staff time + expenses for Directors participation	1 x 2 hours meeting every 2 months for 1.5 years (2021) + more time to support EO and community engagement	The final plan will be brought to the Board for consideration, and then staff time to support community engagement

Service 105	Project	Board Resolution	Responsible	Update of activity	Staff time & funding	Current allocation of resources by SP	Next Steps
Admin & Communications							
	WEBSITE UPDATE & PRINT MATERIAL	1. 601/18 That the Board direct staff to highlight the work of the Sustainability Service (105) through the RDCK website and announce with a media release. 2. 578/19 That the Board directs staff to procure services from Little H Design Works for $2,500 for the work of designing the summary report for the RDCK's Climate Action Indicator Project with funds to come from Service 105; AND FURTHER, staff be directed to seek quotes to produce a graphic illustration of this report for distribution on line.	SP & Communications Manager	Website continues to be updated as new information and materials are developed.	Staff time	On-going	
	ADMIN	1. 382/18 That the RDCK Board support the allocation of S105 funds 'Grants' leveraging and linking additional funds from external agencies for sustainability initiatives, as described in the Community Sustainable Living Advisory Committee Terms of Reference. 2. 123/19 That the Board approve the 2019 Community Sustainable Living Advisory Committee draft budget; AND FURTHER, that the directors stipend and expenses be reduced to $5,000 for the years 2020-23 inclusive.	SP	Project management, relationship building, meetings, communication, reporting	Staff time	4-5 hours per week	On-going

Regional District of Central Kootenay
Unaudited Service Statement

S105 Community Sustainability
Period: October 2020

REVENUE

Account		Project	Workorder		Current Month	Year To Date Actuals	Total Year Budget	Budget Remaining	Budget Utilization
41010	Requisitions				0	168,698	168,698	(0)	100%
41020	Grants in lieu of Taxes				0	34	0	(34)	0%
43025	Grants - Specified				0	5,625	0	(5,625)	0%
49100	Prior Year Surplus				0	124,754	143,517	18,763	87%
Revenue					0	299,111	312,215	13,104	96%

OPERATING EXPENSES

Account		Project	Workorder		Current Month	Year To Date Actuals	Total Year Budget	Budget Remaining	Budget Utilization
51010	Salaries				0	59,091	97,845	38,755	60%
51020	Overtime				0	1,830	0	(1,830)	0%
51030	Benefits				0	17,991	28,375	10,384	63%
51050	Employee Health & Safety				0	0	100	100	0%
51500	Directors - Allowance & Stipend				0	5,450	13,500	8,050	40%
51560	Directors - Travel				0	1,330	5,000	3,670	27%
52010	Travel				0	77	2,000	1,923	4%
52020	Education & Training				0	0	2,000	2,000	0%
52030	Memberships, Dues & Subscriptions				0	0	1,500	1,500	0%
53020	Admin, Office Supplies & Postage				0	787	3,000	2,213	26%
53030	Communication				45	(246)	3,500	3,746	-7%
53040	Advertising				0	358	2,500	2,142	14%
53050	Insurance				0	797	900	103	89%
54030	Contracted Services				0	72,604	97,731	25,127	74%
55010	Repairs & Maintenance				0	397	825	428	48%
55030	Equipment				0	578	500	(78)	116%
55040	Utilities				0	231	480	249	48%
55050	Vehicles				0	1,243	0	(1,243)	0%
55055	Vehicles - Specified				0	193	1,300	1,107	15%
55060	Rentals				0	323	1,200	877	27%
57010	Grants				0	32,145	35,000	2,855	92%
Operating Expenses					45	195,180	297,256	102,077	66%

CAPITAL EXPENSES

Account		Project	Workorder		Current Month	Year To Date Actuals	Total Year Budget	Budget Remaining	Budget Utilization

NON-OPERATING EXPENSES

Account		Project	Workorder		Current Month	Year To Date Actuals	Total Year Budget	Budget Remaining	Budget Utilization
59510	Transfer to Other Service - General Admin. Fee				0	7,702	10,269	2,567	75%
59520	Transfer to Other Service - IT Fee				0	3,518	4,690	1,173	75%
Non-Operating Expenses					0	11,219	14,959	3,740	75%

Total Service	(45)	92,713	(0)	

For Service: S105 - Community Sustainability
Period 202001 - 202010

Work Order	Work Order Description	Amount	Trans.date	Vendor/ Customer	Vendor Name	Text
Community Sustainability						
Total Account 41010	Requisitions	-168,698.28				
Total Account 41020	Grants in lieu of Taxes	-34.05				
Total Account 43025	Grants - Specified	-5,625.00				
Total Account 49100	Prior Year Surplus	-124,753.89				
Total Account 51010	Salaries	59,090.56				
Total Account 51020	Overtime	1,830.06				
Total Account 51030	Benefits	17,991.10				
Total Account 51500	Directors - Allowance & Stipend	5,450.00				
Total Account 51560	Directors - Travel	1,330.32				
Total Account 52010	Travel	77.41				
Total Account 53020	Admin, Office Supplies & Postage	786.72				
Total Account 53030	Communication	-246.14				
Total Account 53040	Advertising	358.45				
Total Account 53050	Insurance	797.00				
Total Account 54030	Contracted Services	72,603.70				
Total Account 55010	Repairs & Maintenance	396.90				
Total Account 55030	Equipment	577.78				
Total Account 55040	Utilities	231.39				
Total Account 55050	Vehicles	1,243.29				
Total Account 55055	Vehicles - Specified	193.14				
Total Account 55060	Rentals	322.90				
Total Account 57010	Grants	32,145.00				
Total Account 59510	Transfer to Other Service - General Admin	7,701.63				
Total Account 59520	Transfer to Other Service - IT Fee	3,517.50				
Total Service S105 Community Sustainability		-92,712.51				

Regional District of Central Kootenay
Unaudited Service Statement

S105 Community Sustainability

OPR230 Comm Sustain - Kootenay Lake Partnership (Shoreline Management Guidelines)

Period: October 2020

REVENUE

Account		Workorder		Current Month	Year To Date Actuals	Total Year Budget	Budget Remaining	Budget Utilization
49100	Prior Year Surplus			0	15,672	15,672	0	100%
Revenue				0	15,672	15,672	0	100%

OPERATING EXPENSES

Account		Workorder		Current Month	Year To Date Actuals	Total Year Budget	Budget Remaining	Budget Utilization
54030	Contracted Services			0	15,672	15,672	0	100%
Operating Expenses				0	15,672	15,672	0	100%

CAPITAL EXPENSES

Account		Workorder		Current Month	Year To Date Actuals	Total Year Budget	Budget Remaining	Budget Utilization

NON-OPERATING EXPENSES

Account		Workorder		Current Month	Year To Date Actuals	Total Year Budget	Budget Remaining	Budget Utilization

Total Service				0	0	(0)		

Regional District of Central Kootenay
Unaudited Service Statement

S105 Community Sustainability
OVR113 General - Community Sustainability
Period: October 2020

REVENUE

Account		Workorder		Current Month	Year To Date Actuals	Total Year Budget	Budget Remaining	Budget Utilization
41010	Requisitions			0	168,698	168,698	(0)	100%
41020	Grants in lieu of Taxes			0	34	0	(34)	0%
43025	Grants - Specified			0	5,625	0	(5,625)	0%
49100	Prior Year Surplus			0	109,082	127,845	18,763	85%
Revenue				0	283,439	296,543	13,104	96%

OPERATING EXPENSES

Account		Workorder		Current Month	Year To Date Actuals	Total Year Budget	Budget Remaining	Budget Utilization
51010	Salaries			0	59,091	97,845	38,755	60%
51020	Overtime			0	1,830	0	(1,830)	0%
51030	Benefits			0	17,991	28,375	10,384	63%
51050	Employee Health & Safety			0	0	100	100	0%
51500	Directors - Allowance & Stipend			0	5,450	13,500	8,050	40%
51560	Directors - Travel			0	1,330	5,000	3,670	27%
52010	Travel			0	77	2,000	1,923	4%
52020	Education & Training			0	0	2,000	2,000	0%
52030	Memberships, Dues & Subscriptions			0	0	1,500	1,500	0%
53020	Admin, Office Supplies & Postage			0	787	3,000	2,213	26%
53030	Communication			45	(246)	3,500	3,746	-7%
53040	Advertising			0	358	2,500	2,142	14%
53050	Insurance			0	797	900	103	89%
54030	Contracted Services			0	56,932	82,059	25,127	69%
55010	Repairs & Maintenance			0	397	825	428	48%
55030	Equipment			0	578	500	(78)	116%
55040	Utilities			0	231	480	249	48%
55050	Vehicles			0	1,243	0	(1,243)	0%
55055	Vehicles - Specified			0	193	1,300	1,107	15%
55060	Rentals			0	323	1,200	877	27%
57010	Grants			0	32,145	35,000	2,855	92%
Operating Expenses				45	179,508	281,584	102,077	64%

CAPITAL EXPENSES

Account		Workorder		Current Month	Year To Date Actuals	Total Year Budget	Budget Remaining	Budget Utilization

NON-OPERATING EXPENSES

Account		Workorder		Current Month	Year To Date Actuals	Total Year Budget	Budget Remaining	Budget Utilization
59510	Transfer to Other Service - General Admin. Fee			0	7,702	10,269	2,567	75%
59520	Transfer to Other Service - IT Fee			0	3,518	4,690	1,173	75%
Non-Operating Expenses				0	11,219	14,959	3,740	75%

Total Service	(45)	92,713	(0)		

Regional District of Central Kootenay

Unaudited Service Statement

S105 Community Sustainability

Period: October 2020

REVENUE

Account		Project	Current Month	Year To Date Actuals	Total Year Budget	Budget Remaining	Budget Utilization
41010	Requisitions		0	168,698	0	(168,698)	0%
41020	Grants in lieu of Taxes		0	34	0	(34)	0%
Revenue			0	168,732	0	(168,732)	0%

OPERATING EXPENSES

Account		Project	Current Month	Year To Date Actuals	Total Year Budget	Budget Remaining	Budget Utilization

CAPITAL EXPENSES

Account		Project	Current Month	Year To Date Actuals	Total Year Budget	Budget Remaining	Budget Utilization

NON-OPERATING EXPENSES

Account		Project	Current Month	Year To Date Actuals	Total Year Budget	Budget Remaining	Budget Utilization

Total Service			0	168,732	0		

Regional District of Central Kootenay

Unaudited Service Statement

S105 Community Sustainability

OPR230-100 Comm Sustain - Kootenay Lake Partnership (Shoreline Management Guidelines)-General

Period: October 2020

REVENUE

Account		Project	Current Month	Year To Date Actuals	Total Year Budget	Budget Remaining	Budget Utilization
49100	Prior Year Surplus		0	15,672	15,672	0	100%
Revenue			0	15,672	15,672	0	100%

OPERATING EXPENSES

Account		Project	Current Month	Year To Date Actuals	Total Year Budget	Budget Remaining	Budget Utilization
54030	Contracted Services		0	15,672	15,672	0	100%
Operating Expenses			0	15,672	15,672	0	100%

CAPITAL EXPENSES

Account		Project	Current Month	Year To Date Actuals	Total Year Budget	Budget Remaining	Budget Utilization

NON-OPERATING EXPENSES

Account		Project	Current Month	Year To Date Actuals	Total Year Budget	Budget Remaining	Budget Utilization

Total Service			0	0	(0)		

Regional District of Central Kootenay
Unaudited Service Statement

S105 Community Sustainability

OVR113-100 General - Community Sustainability Administration

Period: October 2020

REVENUE

Account		Project	Current Month	Year To Date Actuals	Total Year Budget	Budget Remaining	Budget Utilization
41010	Requisitions		0	0	168,698	168,698	0%
43025	Grants - Specified		0	5,625	0	(5,625)	0%
49100	Prior Year Surplus		0	109,082	127,845	18,763	85%
Revenue			0	114,707	296,543	181,836	39%

OPERATING EXPENSES

Account		Project	Current Month	Year To Date Actuals	Total Year Budget	Budget Remaining	Budget Utilization
51010	Salaries		0	59,091	97,845	38,755	60%
51020	Overtime		0	1,830	0	(1,830)	0%
51030	Benefits		0	17,991	28,375	10,384	63%
51050	Employee Health & Safety		0	0	100	100	0%
51500	Directors - Allowance & Stipend		0	5,450	13,500	8,050	40%
51560	Directors - Travel		0	1,330	5,000	3,670	27%
52010	Travel		0	77	2,000	1,923	4%
52020	Education & Training		0	0	2,000	2,000	0%
52030	Memberships, Dues & Subscriptions		0	0	1,500	1,500	0%
53020	Admin, Office Supplies & Postage		0	787	3,000	2,213	26%
53030	Communication		45	(246)	3,500	3,746	-7%
53040	Advertising		0	358	2,500	2,142	14%
53050	Insurance		0	797	900	103	89%
54030	Contracted Services		0	56,932	82,059	25,127	69%
55010	Repairs & Maintenance		0	397	825	428	48%
55030	Equipment		0	578	500	(78)	116%
55040	Utilities		0	231	480	249	48%
55050	Vehicles		0	1,243	0	(1,243)	0%
55055	Vehicles - Specified		0	193	1,300	1,107	15%
55060	Rentals		0	323	1,200	877	27%
57010	Grants		0	0	25,000	25,000	0%
Operating Expenses			45	147,363	271,584	124,222	54%

CAPITAL EXPENSES

Account		Project	Current Month	Year To Date Actuals	Total Year Budget	Budget Remaining	Budget Utilization

NON-OPERATING EXPENSES

Account		Project	Current Month	Year To Date Actuals	Total Year Budget	Budget Remaining	Budget Utilization
59510	Transfer to Other Service - General Admin. Fee		0	7,702	10,269	2,567	75%
59520	Transfer to Other Service - IT Fee		0	3,518	4,690	1,173	75%
Non-Operating Expenses			0	11,219	14,959	3,740	75%

Total Service	(45)	(43,875)	10,000		

Regional District of Central Kootenay

Unaudited Service Statement

S105 Community Sustainability

OVR113-110 General – Community Sustainablity – Food Policy Council

Period: October 2020

REVENUE

Account		Project	Current Month	Year To Date Actuals	Total Year Budget	Budget Remaining	Budget Utilization

OPERATING EXPENSES

Account		Project	Current Month	Year To Date Actuals	Total Year Budget	Budget Remaining	Budget Utilization
57010	Grants		0	32,145	10,000	(22,145)	321%
Operating Expenses			0	32,145	10,000	(22,145)	321%

CAPITAL EXPENSES

Account		Project	Current Month	Year To Date Actuals	Total Year Budget	Budget Remaining	Budget Utilization

NON-OPERATING EXPENSES

Account		Project	Current Month	Year To Date Actuals	Total Year Budget	Budget Remaining	Budget Utilization

Total Service			0	(32,145)	(10,000)		

Community Sustainable Living Advisory Committee

Terms of Reference

Adopted October 17th, 2017

1.0 Application

These terms of reference apply to the Community Sustainable Living Advisory Committee (CSLAC) established as per the direction of the RDCK Board, to consider items related to regional sustainability and provide recommendations on projects and initiatives to the RDCK Board under the Community Sustainable Living Service Establishment Bylaw No. 2135, 2010 ("the Service").

2.0 Role/Purpose of the CSLAC

The role of the CSLAC is to make recommendations to the Regional District of Central Kootenay (RDCK) Board of Directors on the coordination, research, analytical, development and management services related to the social, cultural and economic development of the RDCK as it relates to the CSLA Service 105. As well the CSLAC will advance objectives set out in the Integrated Community Sustainability Plan. The CSLAC will act in an advisory capacity only and the RDCK Board retains the authority to make final decisions.

3.0 Duration and Structure

The CSLAC shall be comprised of seven members who will serve for the duration of the elected term.

4.0 Principles and Objectives of the CSLAC

The objectives of the CSLAC are as follows:

- Discuss and review projects and initiatives that are socially, culturally, economically and environmentally sustainable as identified in the Service such as: food security and agriculture, climate change initiatives, region wide economic development initiatives, affordable housing strategies and other region-wide initiatives of sustainable community importance in the RDCK.
- Provide input that will result in sustainability initiatives that are supported by the Board and acceptable to the public.
- Make recommendations on sustainability projects, opportunities, service provision, and other related matters of the Service to the RDCK Board.
- Receive and relay feedback from the community.
- Initiate and participate in the review of Sustainable Central Kootenay Plan to develop strategies that are current.

Tasks of the CSLAC are as follows:

- Undertake related readings and review of information provided;
- Attend meetings as required;

- Provide input, feedback and recommendations, including identifying potential opportunities and strategies for consideration;

5.0 Representation to the CSLAC

5.1. Technical Representation to the CSLAC may include:

- Consultants and experts
- Staff from RDCK, member municipalities or regional districts

5.2 Community Delegation to the CSLAC may include:

The CSLAC may invite local stakeholder groups or community members, as needed, to input on specific topics and initiatives.

6.0 Voting

Voting is limited to elected official appointed to the CSLAC by the RDCK Board.

7. 0 Meetings of the CSLAC

7. 1 Scheduling

The committee will endeavour to hold meetings at least six times per year, with additional meetings to be summoned as required. The RDCK General Manager of Development Services, in consultation with the Chair of the Committee, will summon meetings.

The RDCK will advertise meeting dates through local media channels. These advertisements will explicitly invite attendance from stakeholders who are not members of the CSLAC.

7.2 Protocol and Procedures

- At the first meeting of each year, the CSLAC shall elect a Chair and if the Chair is absent for any meeting, the Committee will elect an acting Chair for the meeting.
- The Chair will generally conduct meetings in accordance with *Roberts Rules of Order*.
- Quorum will be deemed to have been achieved with the attendance of 60 percent of members or more (currently means 4 of 7 members).
- All CSLAC members are equal and will have equal opportunity to contribute to discussions at meetings.
- CSLAC members will respect the contributions of other members and make all efforts to understand alternative viewpoints.
- CSLAC members will endeavour to work collaboratively, and to engage in open, honest dialogue. CSLAC meetings will generally be open to the public. Non-members will be granted speaking privileges at the discretion of the Chair.
- The Chair may close meetings to the public as required to safeguard the confidentiality of sensitive information or issues in keeping with The Local Government Act
- RDCK staff will attend meetings to act as a resource to the CSLAC by providing administrative support for facilitation, meeting logistics, minute taking, and agenda preparation.
- Any CSLAC member perceived to be in a conflict of interest for an issue before the CSLAC shall excuse themselves from proceedings unless specifically requested to speak through a majority vote of the remaining CSLAC members.

- All proposed projects shall be referred to the CSLAC by the Board.
- Any new initiative must have majority vote (51%) from CSLAC to be recommended to the Board. The Board has the authority to approve all projects recommended by CSLAC.

7.3 Communication

Minutes of CSLAC meetings will be provided as an information item to the RDCK Board of Directors. Specific actionable recommendations arising out of the minutes, and approved by the Board, will be routed through RDCK staff to the appropriate organization or individual.

7.4 Leveraging funds

In order to support sustainability initiatives in the RDCK, the CSLAC/S105 Budget contains a line item *'Grants – specified' (?)*. With direction from the Board, these funds are intended to be used to leverage or link additional funds from external agencies.

CENTRAL KOOTENAY | FOOD POLICY COUNCIL

21 September 2020

Regional District of Central Kootenay
attention: Paris Marshall Smith
202 Lakeside Drive
Nelson, BC V1L 6B8

Interim Report for the Food Security Action Plan

Six months into the pandemic in BC, many have adjusted to a new way of life as it impacts their work, their food, their children's activities. Despite a growing most of "recovery reports" from various sources, it has become abundantly clear that the pandemic is not over, nor is there a foreseeable end in sight. The impacts of the pandemic are not always intuitive or logical. As a result, a key activity of this project is to source and monitor relevant data in an effort to piece together as cohesive an understanding as possible how to best support the food systems and residents of the area. The data sets range from housing starts, job losses and business closures, levels of emergency food venue usage at a regional level. More broadly, we are also monitoring provincial, national, and international information sources, including the Food and Agriculture Organization of the United Nations, which releases regular reports on the state of global supply chains, transportation and logistics sector, pandemic outbreaks, and the reports and analysis by various governmental and civil society organizations on the impact and appropriate responses to the pandemic.

Our use of funds to date have aligned with our submitted budget, providing the resources for the Council staff to undertake the project activities. We do not anticipate this to change over the course of the project and expect to use all the funds provided.

The remainder of the report focused on the activities related to the Project Work Plan and identifies the activities undertaken to date.

Food Access

- outreach to area food providers to assess their experience of the impact of the pandemic was initiated and will include periodic check-ins to monitor changes and related needs, if any. To date, most emergency food providers in the Central Kootenay appear to be resourced at a level that is commensurate with the need. The monitoring will be necessary as it is expected that job loss will increase, household resources compromised and the grant and donor streams may be reduced.
- Information about funding opportunities have been shared with emergency food providers and Council members, who are encouraged to share them further
- A meeting will be convened in the coming months with emergency food providers to assess the level of need for group provisioning and storage options

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Food Literacy

- The annual Food Directory has been our main food systems literacy vehicle to date
- Multiple interviews have been granted to journalists in the region as well as elsewhere on food systems and the pandemic
- Close contact is maintained with Interior Health colleagues to cross-promote each other's information and identify gaps. Outreach to BC Healthy Communities has been undertaken and a meeting to take place in early October

Food Economies

- The Food Directory was published in early August and saw an increase of users again this year, contributing to the regional food data-base for this project. Additional outreach to key partners and the farming and food businesses of the region will be undertaken in the coming months to complete the database.
- Weekly pandemic meetings continued through the end of August, promoted through our website, e-news, email reminders and the communications platforms of our colleagues, including the Kootenay Boundary Farm Advisors and Interior Health
- Farmer participation in the weekly zoom meetings fell off with the busier part of the season. Nevertheless, regular contact with farmers in different parts of the region and in different sectors has been maintained, to monitor their experience of the pandemic on their respective businesses and any needs they anticipate. Policy related data is being monitored and will be integrated into the final report recommendations.
- Information about farmers has also been gathered regularly through the Kootenay Boundary Farm Advisors, Basin Business Advisor's Agriculture Specialist, and the True Local Coordinator at the Kootenay Coop (who works directly with 150 area food producers).
- We determined that various government and other farm-focused agencies such as Fields Forward and the Kootenay Lake Economic Action Partnership have been meeting the need for reliable information and so have conceded that work to others, though we continue to monitor in case that changes
- Outreach has been ongoing to the CBT for possible funding opportunities related to food systems in the region and the pandemic. A related project concept was formulated and was the basis for a funding application to the Community Gaming Grants Environment stream. The Domestic Navigator project concept was also promoted to the Minister of Agriculture through a joint Open Letter submitted in early July, along with other civil society and academic partners. Other funding sources will be pursued in the coming months with partners wherever possible.

CENTRAL KOOTENAY | FOOD POLICY COUNCIL

Interim Food Security Action Plan

13 May 2020

Submitted by Abra Brynne, Executive Director
info@ckfoodpolicy.ca | 250.777.2480
www,ckfoodpolicy.ca

Proposal

Across the Central Kootenay, communities and individuals are being impacted by the COVID-19 pandemic. Food security at a household and regional level is being undermined:

- Disruptions to food supply chains have been erupting across sectors and geographies (meat processing, rice export embargoes, flour shortages, to name a few) and impacting the food available in our region. These impacts do not occur uniformly across the Regional District but are influenced by factors such as local poverty rates, distance from larger centres, proximity to major transportation routes etc;
- Unemployment continues to rises (temporary and permanent), resulting in more and more individuals and households facing increased risk of food insecurity precisely at a time when food prices are rising[1];
- Emergency food services have lost their volunteer base that typically relies heavily on seniors; there is also inconsistent access to funding made available from various bodies (government, CBT, food bank associations), and difficulties sourcing the necessary volumes of food;
- Farmers, food processors and other food businesses are navigating a diverse range of challenges that are impacting if and how they are able to remain in business, with some permanent business losses already occurring.

As the weeks and months of this pandemic roll on there is an urgent need to find efficiencies, share information, and activate supports in order to reduce threats to food security and our local food economy.

This Interim Food Security Action Plan proposes to address the immediate food-related fallout from the pandemic being felt across the Central Kootenay. This will enable a rapid response to the needs being experienced across our region and the ability to adapt as circumstances continue to change. As and when additional funds will be secured from other Regional Districts within the Columbia Basin as well as the Columbia Basin Trust, other foundations and partners, the full food security plan appended to this proposal will be activated, expanding the geographical scope and longer-term supports.

Work Plan

An Advisory Committee will be created to guide the project, drawing on a governance matrix that will allow for diverse voices and needs to be represented from communities across the Central Kootenay and diverse food sector actors. The Work Plan runs from June 1st through September 30th.

The work will draw on the immediate and some of the medium-term actions itemized in the appended Columbia Basin Food Security Plan, but focusing on the Central Kootenay. The work is channeled into three distinct areas:

- Food Access: ensuring that those who experience or risk hunger can meet their dietary needs.

[1] Statistics Canada reports a rise of 2.3% in the cost of food in March 2020 and a combined job loss of 3 million in March and April.

- Food Literacy: addressing the uncertainty, misinformation and fear related to food as a possible vector, expanded reliance on home cooking, adapting to available foods.
- Food Economies: the farms, food processors, retailers, restaurants, shippers and others engaged in producing food for commercial exchange.

Food Access
Immediate Goal: to determine specifics and level of need being experienced by emergency food service providers; to establish support mechanisms, build efficiencies and enhance the capacity of emergency food providers[2].

- Outreach to all emergency food providers to assess their need for staff / volunteers, food supplies, change in level of service.
- If they are not already networked, convene representatives of each service to identify where efficiencies can be built in (food deliveries, sharing best practices for safety protocols etc.); provide platform for ongoing information sharing.
- Support applications or other processes necessary for RDCK emergency food providers to access federal and provincial funds dedicated to the sector in the pandemic.
- Work with Interior Health and food scientists to support consistent safety protocols and training to address both food safety and virus control measures; update as necessary and new evidence dictates.
- Use leverage of local government and other partners (Food Banks BC, Interior Health) to broker food supplies and deliveries as needed for emergency food providers.
- Ascertain any needs for additional storage, wholesale outlets for emergency food providers.

Food Literacy
Immediate Goal: To reduce fear of food as a virus vector; to build food skills around sourcing and safe food handling.

- Amplify information being created by the BC Centre for Disease Control, Interior Health and other reliable sources.
- In collaboration with Interior Health, Kootenay Food and other key partners, create regular column to be distributed in social media, conventional media and Local Government communications that provides education about how to handle food to remove COVID-19 exposure risk.
- Collaborate with Interior Health, BC Centre for Disease Control to ensure that there is widespread, credible, accessible, and consistent information to address safety concerns in the general public about purchasing local food.

Food Economies
Immediate Goal: To understand and address the immediate needs of area food producers so that their businesses survive the initial impact of the pandemic.

- Outreach to all area farm and sector organizations. Where one does not exist – for example, food processors - determine key contacts / networkers. Broadcast invitation to join the CKFPC's weekly food sector zoom meetings.
- In collaboration with KBFA, convene representatives of each organization / sector to identify critical initial and medium term needs and issues (immediate through 6 months); establish regular contact and information sharing mechanisms that can support joint problem-solving, identify synergies.
- In collaboration with KBFA, Kootenay Food, Fields Forward, agricultural organizations,

[2] There are many forms of emergency food provision in this region. Some are formally aligned with the provincial and / or federal food bank association, others with school food programs, while others are run by community-based non-profits as one of various social services provided.

relevant Ministries and other partners, support sector organizations to access current information and supports of relevance to their sector (inputs, labour, housing, shipping, storage, processing etc)
- Work with Interior Health, BC Centre for Disease Control and food scientists to support consistent safety protocols and training to address both food safety and virus control measures; update as necessary and as new evidence dictates.
- Engage KBFA, Basin Business Advisors, Selkirk College Applied Research Centre, Kootenay Food, and others to provide technical supports
- Document regulatory and policy barriers facing area food producers (such as slaughter access, housing, access to agricultural stability programs, etc.);
- In collaboration with key partners, begin database of area food producers, document and analyze their challenges and successes, inventory food produced in the region.
- Begin outreach to CBT, SIDIT, Creston Investment Cooperative, and area Credit Unions to develop funding / financing plans and programs for individual businesses that complement federal and provincial programs
- Identify possible funders for longer-term projects to expand and secure food production in the region.

Budget: June 1st through September 30th

This budget reflects the staff time and resources related to information gathering, convening and supports made available in the next three months only and exclusively for the Central Kootenay (as opposed to the larger plan, which is longer term and includes the entire Columbia Basin). This will lay the groundwork for the larger project and also enable the transfer of lessons learned to other portions of the Columbia Basin once funding is secured to expand the work.

Expenses

Item	Rate	Hours / week	Subtotal
Staffing	$65/hour	32	$2080.00
June 1 - September 30th (13 weeks)			$27,040.00
Incidentals (communications, phone etc.)			$100.00
Admin (Bookkeeping, record keeping)	$25/month	3 months	$75.00
		Total	$27,215.00

Revenue

Item	Confirmed	Amount
CKFPC In-kind Contribution: 6 hours / week @$65/hour (see Note 1)	Yes	$5070.00
RDCK Contribution Request	No	$22,145.00
	Total	$27,215.00

Note 1: Since the beginning of April, the Food Policy Council has devoted approximately 20 hours / week to addressing the impact of the pandemic on our region's food systems as an emerging, urgent and ever changing issue. This is not sustainable for the Council, since we have limited funds that are not tied to specific project deliverables. The $10,000 annual contribution of

from the RDCK's Sustainability Service is one source of funding that we have been able to repurpose for this work, however, it only amounts to approximately 180 hours / year of staff time.

Moving the larger food security plan forward

The full proposal has been submitted to the Columbia Basin Trust resulting in a meeting , scheduled for May 15th with the Manager of Special Initiatives, Katie Kendall, at the request of the CEO, Johnny Strilaeff. The proposal has been shared with the leadership of the Regional District of Kootenay Boundary and of East Kootenay. It has also been submitted to the Real Estate Foundation and the McConnell Family Foundation with other possible funding sources under consideration.

Background

The initial food security plan was developed in early April in response to a request from the RDCK Emergency Operations Centre, which had the intention of integrating it into their operations. The request was made because the impact of the COVID-19 pandemic on both household and communal level food security was starting to be felt and seen. Subsequent discussions amongst the leadership at the RDCK and with funders led to a request that the plan be adapted into a proposal, with the Food Policy Council as the lead agency, outside the EOC. The plan was then expanded to include the full Columbia Basin, on the basis of existing cooperation and integration across the region from a funding, food economy, and local government perspective.

In the interim, disruptions in the global food supply and job loss by residents in our region continue to negatively impact our communities. The scale of the problem, the threat from a host of factors that are disrupting our food supplies (meat packing plant shut downs, rotting vegetables due to no farm workers, milk being dumped) and the ongoing economic challenges experienced from job retraction or loss add up to a complex set of factors that need an ambitious and equally complex response. In addition to the impacts of the pandemic, the ongoing impacts of climate change, political upheaval in various parts of the world, and other natural disasters will affect food supply chains around the world.

The full food security proposal (appended) was developed based on 30 years of work in the food systems of this region by the Executive Director of the Food Policy Council. It has also drawn on the reports provided by participants in weekly zoom meetings that the Council has been hosting since the end of March. The meetings are open to anyone in the Columbia Basin involved in the food sector. Attendance includes those who provide emergency food services, farmers, food processors, retailers, local government, non-profits, the Basin Business Advisors and Kootenay Boundary Farm Advisors. It spans communities from Rock Creek to Kaslo, from Revelstoke to Creston, the Slocan Valley, Nelson, Cranbrook, Invermere and Golden. These meetings have enabled the Food Policy Council to gather current information on how communities are being impacted, what opportunities there are for resolution, and outstanding needs as they continue to evolve with the continuation of the pandemic.

The proposal is also informed by ongoing monitoring of key news sources related to the pandemic and food, such as the United Nations Food and Agriculture Organization's *Global Information and Early Warning System*, various industry sources and key news outlets, as well as through participation by the Food Policy Council's Executive Director in provincial and national food systems networks that are coordinating information collection and dissemination in response to the pandemic.

REGIONAL DISTRICT OF CENTRAL KOOTENAY
Committee Report

Date of Report:	September 23, 2020
Date & Type of Meeting:	October 13, 2020 Community Sustainability Living Advisory Committee
Author:	**Paris Marshall Smith, Sustainability Planner**
Subject:	BIOENERGY OPPORTUNITIES IN THE REGIONAL DISTRICT OF CENTRAL KOOTENAY - DRAFT FINAL REPORT REVIEW
File:	10-5200-20-BIOFUEL

SECTION 1: EXECUTIVE SUMMARY

The purpose of this report is to provide a review of the draft *Bioenergy Opportunities in the Regional District of Central Kootenay - A Pathway to Development* final report. The RDCK is seeking opportunities to increase resilience in rural and remote communities where thermal and electrical energy options are few, travel distances are long and economic opportunities are limited. As well, the RDCK is considering how to promote a decarbonization of the thermal energy (primarily residential heating) market.

Torchlight Bioresources and Kerr Wood Leidal were contracted to conduct a study of full fiber utilization and determine:

1. the business case potential (is this possible and if so under what conditions?);
2. the best process (design) for maximum utilization with consideration to the social (alternative and reliable energy source, job creation), economic (job creation, circular growth) and environmental goals (emphasis on reducing emissions by a minimum of 40% of existing energy source);
3. the role for local government; and,
4. provide a review of innovative rural and remote bioenergy projects relevant to the RDCK.

The *Bioenergy Opportunities in the Regional District of Central Kootenay - A Pathway to Development* draft final report responds to the above points and presents 3 opportunities for review and consideration with recommendation from staff on if and how to proceed.

1. **Wood Pellet Boiler Network:** establishment of a local bulk wood pellet storage and delivery logistics system, requires market development;
2. **District Energy in Castlegar:** industry fueled district energy system for the City using the waste heat of the Mercer Celgar pulp mill to displace natural gas in building heat supply; and,
3. **Rural Community District Energy Systems:** hog or harvest residue fueled district energy systems for small rural communities like Nakusp, Kaslo, New Denver, Riondel, and Silverton that lack access to natural gas, and therefore often use high cost propane, heating oil, and electricity for building heat.

Staff have recently learned that co-generation (heat and electricity) is being considered at Lardeau Valley Forest Products. Along with the operations of Hamill Creek, Boards by George and Pine Profiles, this new information will be included in the final report.

At this time, comments on the draft report are invited and may be incorporated into the final report expected for Board receipt in December.

SECTION 2: BACKGROUND / ANALYSIS

This report reviews the draft *Bioenergy Opportunities in the Regional District of Central Kootenay - A Pathway to Development* final report and invites feedback. The final report will be provided for receipt by CSLAC and presented to the Board at the December meeting.

The *Bioenergy Opportunities in the Regional District of Central Kootenay - A Pathway to Development* report presents four categories: Purpose and Success; Proposed Development Approach; and Role of the RDCK for each of the three leading opportunities. As well, a summary is provided in the attached *Summary of Recommended Opportunities*:

1. **Wood Pellet Boiler Network:** establishment of a local bulk wood pellet storage and delivery logistics system, requires market development;
2. **District Energy in Castlegar:** a district energy system for the City using the waste heat of the Mercer Celgar pulp mill to displace natural gas in building heat supply; and,
3. **Rural Community District Energy Systems:** Wood fueled (hog fuel or harvest residue) district energy systems for small rural communities like Nakusp, Kaslo, New Denver, Riondel, and Silverton that lack access to natural gas, and therefore often use high cost propane, heating oil, and electricity for building heat.

2.1 – Progress to date

Board Res #	Resolution	Staff actions
119/19	That the Board direct staff to explore partnerships possibilities with Columbia Shuswap Regional District, Regional District East Kootenay and Regional District Kootenay Boundary on the Timber Deadstock Biofuel scoping study; AND FURTHER, that staff explore funding opportunities for the study	Staff reached out to colleagues from the Regional District of Kootenay Boundary and East Kootenay and received interest in pursuing a conversation about a tri-regional initiative. No further discussions have occurred at this time.
232/19	That the Board approve the RDCK entering into a Contribution Agreement with Columbia Basin Trust to support the research and development of a business plan for timber deadstock biofuel in the Regional District of Central Kootenay, and that the Chair and Corporate Officer be authorized to sign the necessary documents; AND FURTHER, the required matching funds of up to $25,000 come from Service S105 - Community Sustainable Living Advisory	Staff received funding from Columbia Basin Trust for $25,000 to support the research and development of a business plan for timber deadstock biofuel in the Regional District of Central Kootenay.

703/19	That the Board direct staff to issue a Biofuel Business Case Request for Expressions Of Interest (REOI) with input from CSLAC from qualified professionals to short-list potential proponents for a subsequent Biofuel Business Case Request For Proposals (RFP)	In April 2020, the project was awarded to Torchlight Bioresources Limited and Kerr Wood Leidal
514/20	That the Board direct staff to further develop the business case potential of the Wood Pellet Boiler Network, District Energy in Castlegar and Village District Energy Systems as part of the Timber Deadstock Bioenergy Feasibility Study in coordination with municipal staff.	

2.2 - Background

Underutilized wood fiber sources include forest-based and manufacturing wood waste, logging wildfire fuel mitigation residue and regional and municipal wood waste management programs.[1] Currently, this wood waste fiber or residual biomass is under-valued as a potential source of renewable energy. If matched with the right-sized technology and appropriate business model, residual biomass could support rural and remote communities such as, but not exclusive to, the north end of Kootenay Lake (Area D), the East shore of Kootenay Lake (Area A), Slocan Valley (Area H) and Arrow Lakes (Area K) with greater (bio) energy options.

The bioenergy potential can be understood as providing environmental, economic and social benefits such as:

- Supporting localized rural and remote economic generation and manufacturing opportunities;
- Supporting micro-grid low carbon energy production, diversification and independence;
- Reducing regional production of greenhouse gas emissions (GHGs) by replacing the use of high carbon fuel sources such as propane and heating oil; and,
- Providing rural and remote residents with a less expensive thermal energy source than electricity, propane or heating oil.

While this list suggests significant potential for use(s) of residual biomass in localized applications, the RDCK recognizes that the challenge is designing the appropriate business model.

Through the Timber Deadstock Bioenergy Study, the RDCK is seeking opportunities to increase resilience in rural and remote communities where thermal and electrical energy options are few, travel distances are long and economic opportunities are limited. Effort is needed to consider and promote localized low carbon renewable energy solutions.

[1] Bioenergy technology review for small-scale forest operators – The Pembina Institute, 2015

To further investigate this potential, Torchlight Bioresources and Kerr Wood Leidal were contracted to conduct a study to:

1. Analyze the business case potential (what is possible and under what conditions?);
2. Assess the best process (design) for maximum utilization with consideration to the social (alternative and reliable energy source, job creation), economic (job creation, circular growth) and environmental goals (emphasis on reducing emissions by a minimum of 40% of existing energy source);
3. Determine the role for local government; and,
4. Conduct review of innovative rural and remote bioenergy projects relevant to the RDCK.

The attached *Bioenergy Opportunities in the Regional District of Central Kootenay* draft final report responds to the above points and further outlines the three leading projects and initiatives chosen by CSLAC. This report provides information to support decision making for if and how to proceed. It is recommended that decisions are made in December with the receipt of the final report.

2.3 - *Bioenergy Opportunities in the Regional District of Central Kootenay* report findings

Bioenergy Opportunities in the Regional District of Central Kootenay lays out the bioenergy context in the RDCK by providing an overview of:

1. Regional forest resources: primary feedstocks for bioenergy in the RDCK are forest residue and hogfuel which vary significantly in cost. Subsidies from Forest Enhancement Society of British Columbia (FESBC) or another entity would make harvest residue collection, chipping, and transportation more accessible. Also, the current market for hogfuel (Kettle Falls power plant in Washington State) is vulnerable and therefore developing a secondary local market would support the regional industry as a whole;
2. RDCK energy market: demand is divided between thermal, electricity and transportation fuels. The market is focussed on buildings, commercial/industrial and transportation. In terms of carbonized thermal energy sources, Nelson and Creston have the highest percentage of fossil fuel consumption relative to total building energy consumption. Smaller communities without access to natural gas have high rates of low carbon electricity and wood consumption. Mercer Celgar`s operations create 30% more greenhouse gas emissions than all other buildings across the RDCK.
3. A review of commercially ready bioenergy technology: there are many commercially viable technologies (as opposed to first-of kind) that could meet the RDCK`s desire to provide economic development, decarbonisation of energy supply and best use of local resources; and,
4. A discussion of supply chains and operations: the report provides an analysis of wood pellet and hog fuel distribution hubs based on supply areas.

The report clarifies the most appropriate bioenergy applications for the RDCK based on scale, density of settlements and available feedstock. Industrial heating (Mercer Celgar), individual building heat (via pellet boilers), and DE systems (in the rural communities or Castlegar, Creston or Nelson), heated with centralized bioheat or combined heat and power plants, are the most viable approaches for bioenergy generation in the RDCK.

Further clarification is provided regarding electrical grid stabilization. Local biopower (electricity) generation was considered as a potential option for the communities to address outages, but are

reported to not be viable. The communities most affected by power outages have very small electricity loads and biopower technologies at the scale required are far from economical on the BC electricity grid. Furthermore, electrical generation of biopower is expensive and requires high quality clean dry feedstock for which there is currently a market elsewhere. In lieu of finding a solution for grid stabilization via biopower, the *Bioenergy Opportunities in the Regional District of Central Kootenay* report makes suggestions of how to support stabilization of the grid in other ways.

2.4 - Summary of 3 preferred opportunities

Leading opportunities	An evaluation of the 3 opportunities based on the study criteria			
	Rural economic generation	**Improving regional energy security**	**Decarbonization of energy market**	**Providing RDCK residents a more affordable thermal energy source**
1. Wood Pellet Boiler Network	**Medium** – does not create new jobs but moves propane/oil distribution to pellet distribution and creates rural hubs of processing centers and distribution networks	**High** – creates decentralized infrastructure model that could be managed by a third party or community	**High** – requires transportation emissions but provides a more efficient and cleaner thermal energy that could displace fossil fuels	**Medium** – after the initial capital investment the operational cost is lower than electricity, propane or oil
2. District Energy (DE) in Castlegar	**High** – installation of DE system and operations would provide skilled jobs and could be used to leverage investment and management of rural bioenergy systems	**Medium** – creates a localized circular consumption of energy that is being produced through Mercer Celgar mill	**High** - use of waste heat to displace fossil fuel thermal energy in Castlegar households and buildings. This project would place Castlegar as a national leader in decarbonization	**Medium** – after the initial capital investment, which could be supported through grants, the operational cost is lower than natural gas
3. Rural Community District	**High** – installation of DE system and operations would	**High** – creates localized production of thermal energy	**High** – DE system would offset natural gas, propane or oil	**Medium** - after the initial capital investment, which could be supported

Energy (DE) Systems	provide skilled jobs			through grants, the operational cost is lower than natural gas, propane or oil

The highest level of impact will come from the development of **3. Rural Community District Energy Systems** however it is the most expensive to install with the least likelihood of attracting private investment. An option for attracting private investment is outlined below.

2.5 - Proposed Development Approach – see *Summary of Recommended Opportunities* attached for further information of the proposed development approach, roles of the RDCK and funding requirements & actions.

The *Bioenergy Opportunities in the Regional District of Central Kootenay - A Pathway to Development* report describes the purpose, success, proposed development approach and role for the RDCK of the three leading opportunities.

Opportunity	Description	Options for next steps		
		Proceed	**Phased**	**Stop**
1. **Wood Pellet Boiler Network**	Establishment of a local bulk wood pellet storage and delivery logistics system	Source infrastructure funding and build in a pre-feasibility study into the project development	Pause on establishment of wood pellet network until the DE systems are in place, then build to compliment DE system gaps	Do not continue with the project
2. **District Energy in Castlegar**	District energy (DE) system for the City using the waste heat of the Mercer Celgar pulp mill to displace natural gas in building heat supply	Conduct a full feasibility study to determine the capital and operating costs of a multi-stage DE development for all buildings in Castlegar	Conduct a full feasibility study to determine the capital and operating costs of a multi-stage DE development for **only** downtown core of Castlegar	Do not continue with the project
3. **Rural Community District Energy Systems**	Wood fueled (hog fuel or harvest residue) district energy systems for small rural communities like Nakusp, Kaslo, New Denver, Riondel, and Silverton that lack access to natural gas, and therefore often	Conduct a full feasibility study to determine the capital and operating costs of a multi-stage DE development in rural communities – requires 10% LG contribution	Conduct a full feasibility study to determine the capital and operating costs of a multi-stage DE development for **only** downtown core of Castlegar	Do not continue with the project

	use high cost propane, heating oil, and electricity for building heat.			

Funding for feasibility studies:

1. FCM via its Green Municipal Fund offers 50% of the costs of DE feasibility studies (applications accepted year round). **Requires 10% LG contribution**
2. Natural Resources Canada via the Investments in Forest Industry Transformation (IFIT) fund for forest industry participants to complete feasibility studies on bioenergy and bioproduct developments (applications accepted year round). Application for this funding would require an industry partnership, for example Mercer Celgar, Kalesnikoff or Interfor would be eligible for this fund.
3. RDCK and Castlegar 10% contribution likely to be between $60,000 - $80,000.

If grant applications are prepared by the City of Castlegar and/or RDCK and an industry partner, a competitive process could be held to select a feasibility study team. Alternatively, a consulting team could prepare the grant funding applications, with the understanding they would be awarded the work upon acceptance of the proposals by FCM and Natural Resources Canada.

Upon completion of the DE feasibility study and a positive business case outcome, the consulting team, in collaboration with the City of Castlegar, Mercer Celgar, and potentially, the RDCK, could apply for 73.3% infrastructure funding via CleanBC/Investing in Canada Infrastructure Program. More federal infrastructure funding may be available as part of a COVID-19 economic recovery plan. It is recommended that a competitive process for a private sector development partner occur prior to application for grant funding.

2.6 - Business structure

The recommended structure is a **100% municipal and/or regional district-owned heat utility**, with development, construction, operation, and maintenance by a private sector partner. The private sector partner would also be responsible for financing 26.7% of the project capital cost. Full public sector ownership of the DE assets is possible via a multi-decade concession agreement with the private sector partner. This concession agreement would detail the permitted rate of return on capital deployed and terms for recovering operation and maintenance expenses from the customer base. The concession agreement could include a clause to permit the utility to take over operation and maintenance of the DE system in the future.

An example of this type of structure is Alectra Utilities in Ontario and more information here. Alectra is an electric utility owned by a number of municipalities, each with a different percentage of shares. Essentially it benefits from economies-of-scale (governance, administration, etc. and the municipalities have equity relative to the assets in each community. Municipal representatives sit on the board.

If the RDCK is interested in investigating the opportunity of a regional utility, it would be beneficial to consider relationships with entities such as Nelson Hydro who have substantial experience and operational structures to learn from.

With regards to the Urban District Energy in Creston and Nelson Mercer Celgar 550 and Gasifier the *Bioenergy Opportunities in the Regional District of Central Kootenay* report suggests a supportive (non financial) and advocacy role for the RDCK respectively.

2.7 - Recommended Next Steps

The analysis provided above and within the *Bioenergy Opportunities in the Regional District of Central Kootenay* makes clear that all options for bioenergy in the RDCK as a response to remote economic development and affordability are complex and costly.

If there is desire to proceed with the investigation of bioenergy opportunities in the RDCK, staff recommend the next step be to complete full feasibility studies for DE systems in both Castlegar and rural communities. This would be a partnership between the City of Castlegar, industry, and the RDCK. And would require a cash contribution of approximately $60,000 - $80,000 which could be shared between the partners.

SECTION 3: DETAILED ANALYSIS

a. Financial Considerations – Cost and Resource Allocations:

Included in Financial Plan:	☐ YES	☒ NO		**Financial Plan Amendment:**	☐ YES	☒ NO	
Debt Bylaw Required:	☐ YES	☒ NO		**Public/Gov't Approvals req'd:**	☐ YES	☒ NO	

If there is interest to proceed with full feasibility studies, a 10% cash contribution of approximately $60,000 - $80,000 is required. The details of this contribution will be clarified by RDCK and City of Castlegar staff in discussion with industry and funding partners.

b. Legislative Considerations (Applicable Policies and/or Bylaws):

None at this time

c. Environmental Considerations:

The *Bioenergy Opportunities in the Regional District of Central Kootenay* considers how to de-carbonize thermal energy sources for residential, commercial and industrial applications. As well, looks at how to localize energy distribution systems thereby reducing the transportation energy needed.

d. Social Considerations:

The *Bioenergy Opportunities in the Regional District of Central Kootenay* considers how to provide a more affordable thermal energy source for RDCK residents with an emphasis on improving comfort and livability in rural communities.

e. Economic Considerations:

The *Bioenergy Opportunities in the Regional District of Central Kootenay* presents options rural economic development through the development of a wood pellet distribution network and the installation and maintenance of multiple districts energy systems.

f. Communication Considerations:

Any further investigation will require communication with RDCK member municipality staff and forest industry representatives.
g. Staffing/Departmental Workplan Considerations:
Project management is included in the Sustainability Planner`s current workplan for 2020. Any further investigation will require additional allocation of staff time for the 2021 workplan.
h. Board Strategic Plan/Priorities Considerations:
The investigation of timber deadstock bioenergy opportunities align with the Board priorities of Coordinated Service Delivery, Wildfire Management & Economic Development.
SECTION 4: OPTIONS & PROS / CONS
Based on the information provided in the *Bioenergy Opportunities in the Regional District of Central Kootenay*, staff are recommending further investigation of District Energy in Castlegar and Rural Community District Energy Systems be considered at the December Board meeting.
SECTION 5: RECOMMENDATION(S)
Report is for information only

Respectfully submitted,

Signature:

Name: Paris Marshall Smith

CONCURRENCE	Initials:
Chief Administrative Officer	
General Manager of Development Services	
Manager of Community Sustainability	

ATTACHMENTS:
Attachment A – Bioenergy Opportunities in the Regional District of Central Kootenay – draft final report
Attachment B – Summary of Recommended Opportunities

Bioenergy Opportunities in the Regional District of Central Kootenay

A Pathway to Development

TORCHLIGHT BIORESOURCES

&

KERR WOOD LEIDAL
consulting engineers

Draft Report

2020

Bioenergy Opportunities in the Regional District of Central Kootenay

A Pathway to Development

Prepared for

DRAFT REPORT

September 30th, 2020

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EXECUTIVE SUMMARY

The forestry sector is an important contributor to the economy of Central Kootenay, with in-forest operations, several sawmills, and the largest pulp mill in southeast British Columbia providing employment to thousands of residents. The sector also generates hundreds of thousands of tonnes of low-grade wood fibre in the form of mill and harvest residues, with the former used for heat and power generation in Canada and the United States and the latter largely left at harvest sites and burned for wildfire prevention. While Central Kootenay is a large exporter of electricity to the rest of British Columbia and the United States due to the presence of numerous large hydropower facilities, some rural areas of the district that lack natural gas access and may be subject to power outages are considered to have poor energy security and resiliency relative to large urban areas of the province. For over a decade the Regional District of Central Kootenay (RDCK) has recognized the opportunity for wood-based bioenergy to complement local hydropower resources and reduce greenhouse gas emissions in the energy sector while simultaneously improving air quality and forestry operations by creating a market for low-grade wood fibre. However, progress on actual project development has been slow.

With a goal to accelerate bioenergy sector development, particularly in rural areas, the RDCK contracted TorchLight Bioresources and Kerr Wood Leidal to identify specific bioenergy project opportunities within Central Kootenay and to propose potential pathways to development. A review of the forestry sector indicated that while large volumes of harvest residues are not utilized and available for bioenergy production, they are a high cost fuel and it is more likely that low cost hog fuel, a bark-dominated mill residue, will be the primary feedstock for new bioenergy projects in the near term. Economic utilization of harvest residues is likely to require financial support from a higher level of government, particularly in mountainous Central Kootenay. Given the current oversupply of low-carbon, low-cost electricity in British Columbia and precommercial status of wood-to-transportation fuel technologies, thermal energy (heat) was identified as the priority market for low-grade wood fibre. A comparison of communities, district energy markets, and applications identified five leading opportunities for development: 1) wood pellet boilers for rural residences and businesses; 2) small district energy systems, including centralized biomass heat plants and underground hot water piping, for rural communities such as Nakusp and Kaslo; 3) larger biomass-fuelled district energy systems to replace natural gas in Nelson and Creston; 4) a district energy system in Castlegar using waste heat from the Mercer Celgar pulp mill; and 5) replacement of natural gas in Mercer Celgar's lime kiln with syngas from biomass gasification. For the RDCK itself, wood pellet boilers and district energy systems in rural communities and Castlegar were identified as the priority projects for further assessment and participation. Preliminary recommendations on how these projects can be financed, developed, and operated are provided.

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ABBREVIATIONS

admt	Air Dried Metric Tonnes
bdt	Bone Dry Tones
CapEx	Capital Expenditure (Capital Cost)
CHP	Combined Heat and Power
CI	Carbon Intensity
C/I	Commercial/Institutional
CO_2e	Carbon Dioxide Equivalent
DE	District Energy
GHG	Greenhouse Gas
ICE	Internal Combustion Engine
Mt	Megatonne (Million Tonne)
MW_e	Megawatt Electrical
MW_{th}	Megawatt Thermal
ORC	Organic Rankine Cycle
RNG	Renewable Natural Gas

1 INTRODUCTION

Central Kootenay, located in southeast British Columbia, has a population of roughly 60,000 and covers an area of over 22,000 square kilometers. The Regional District of Central Kootenay (RDCK) is a local level of government that provides a large range of services. The RDCK consists of 11 electoral areas (A, B, C, D, E, F, G, H, I, J, K) and nine member municipalities: Castlegar, Creston, Kaslo, Nakusp, Nelson, New Denver, Salmo, Silverton and Slocan. Nelson is by far the largest population centre with approximately 11,000 residents. The region is highly mountainous, with most communities located in river valleys. There are approximately 25,000 employed persons in Central Kootenay, with Healthcare and Social Assistance, Retail Trade, and Construction that largest employers and collectively accounting for over one third of jobs. Agriculture, Forestry, Fishing, and Hunting, combined with manufacturing, account for approximately 15% of the workforce.

Central Kootenay is a very large exporter of energy, in the form of hydroelectricity, to the rest of British Columbia and the United States. However, much of the district does not have access to natural gas and a few rural areas are subject to power outages. At the same time, the district's forest sector, which is concentrated in Castlegar but includes significant facilities across the southern portion of the district, has limited markets for harvest residues, the tops and branches of felled trees and damaged timber, and hog fuel, the bark-dominated residue produced by sawmills and other solid wood product facilities. Over the past decade, the RDCK has sought to address these two challenges of high energy costs and lack of markets for low-grade wood fibre by encouraging development of a regional bioenergy industry. Ideally, a strong bioenergy industry in the RDCK would utilize low-grade wood fibre, reduce slash pile burning, create local jobs, reduce greenhouse gas (GHG) emissions, lower energy costs, and improve energy resiliency.

The RDCK has supported a number of bioenergy-related studies, including quantification the bioenergy resource potential in specific areas and a comparison of small-scale biomass combined heat and power (CHP) technologies. However, while there have been several successful projects, such as wood chip boilers than heat commercial and industrial buildings, growth of community-based bioenergy in the RDCK has been slow. To accelerate growth of the bioenergy industry in the Central Kootenay District, the RDCK contracted TorchLight Bioresources and project partner Kerr Wood Leidal to identify the most promising bioenergy opportunities in the district and to prepare recommendations on how specific projects could be developed successfully. This report is the outcome of that project. It is divided into five main sections: biomass resources in Central Kootenay (forthwith referred to as RDCK), the RDCK energy market, technology options to address the energy demands using available biomass, supply chains and operations, and leading projects and initiatives.

2 FOREST RESOURCES

The RDCK boundary follows much of the same path as the combined boundary of the Arrow Timber Supply Area (TSA) and the Kootenay Lake TSA (Figure 1). TSA areas extend beyond the RDCK boundary north, east, and west, with Rossland and Trail the largest population centres included in the TSA areas but not the RDCK. A small portion of the geographically-dispersed Cascadia TSA and two Tree Farm Licenses, 3 and 23, are also located in the district. The Kootenay Lake TSA has an Annual Allocable Cut (AAC) of 640,000 cubic meters (m^3) and the Arrow TSA has an AAC of 500,000 m^3. Both the Cascadia TSA portion and TFL 3 are small areas, with AACs of 9,300 m^3 and 80,000 m^3, respectively. In contrast, TFL 23 has an AAC of 450,000 m^3, although this does include a significant amount of wood volume from outside of the RDCK boundary. Combined, the AAC for timberlands within the RDCK boundaries is estimated at 1,400,000 – 1,500,000 m^3. The largest licensee in the district is Interfor, followed by BC Timber Sales and Canfor. Timber commitments across the district are presented in Figure 2. For the purposes of this report, m^3 are converted to bone dry tonnes (bdt) with an assumed density of 0.5 bdt/m^3. Harvest residue volume is assumed to be equal to 15% of harvest volume.

Most of the primary licensees own and operate sawmills or primary solid wood products processing mills in the region. The major and medium-sized wood processing facilities are identified in Figure 3. The largest mills are Interfor [210 million board feed (mmfbm)], Kalesnikoff Lumber (62 mmfbm), Canfor/Wynnwood (58 mmfbm), Porcupine Wood Products (48 mmfbm), and J.H. Huscroft (43 mmfm). Interfor's mill in Castlegar, therefore, consumes as much wood fibre as the next four largest mills combined. ATCO Wood Products, which has a significant commitment in the Arrow TSA and a smaller commitment in the Kootenay Lake TSA, operates a 142 M square foot/yr softwood veneer mill in Fruitvale just outside the district. Although not included in the primary licensee list, Mercer Celgar, located in Castlegar, is by far the largest wood fibre consumer in the region. With an annual capacity of 520,000 air dried metric tonnes (admt) of Kraft pulp per year, Mercer Celgar's annual wood fibre consumption is estimated at approximately 900,000 bdt per year. As noted in Figure 2, this quantity exceeds the total commitments across the district and indicates a substantial volume of wood fibre is flowing into the region to meet the fibre needs of Mercer Celgar. The mill plays a central role in the sawmill residual market in the southern interior region of BC, with the Paper Excellence Skookumchuk mill (Regional District of East Kootenay) and the Domtar Kamloops mill (Thompson-Nicola Regional District) the two other pulp mills in the region. With annual capacities of 250,000 admt and 408,000 admt respectively, both mills are smaller than Mercer Celgar. Beyond these three mills, the closest pulp mills are Quesnel (850 km to Nelson) and the BC coast (640 km to Nelson), highlighting the importance of Mercer Celgar and the Skookumchuck and Kamloops mills to southern interior wood fibre flows and sawmill residue demand.

Figure 1. Timber Supply Areas, Tree Farms Licenses, and Forest Product Facilities in the RDCK

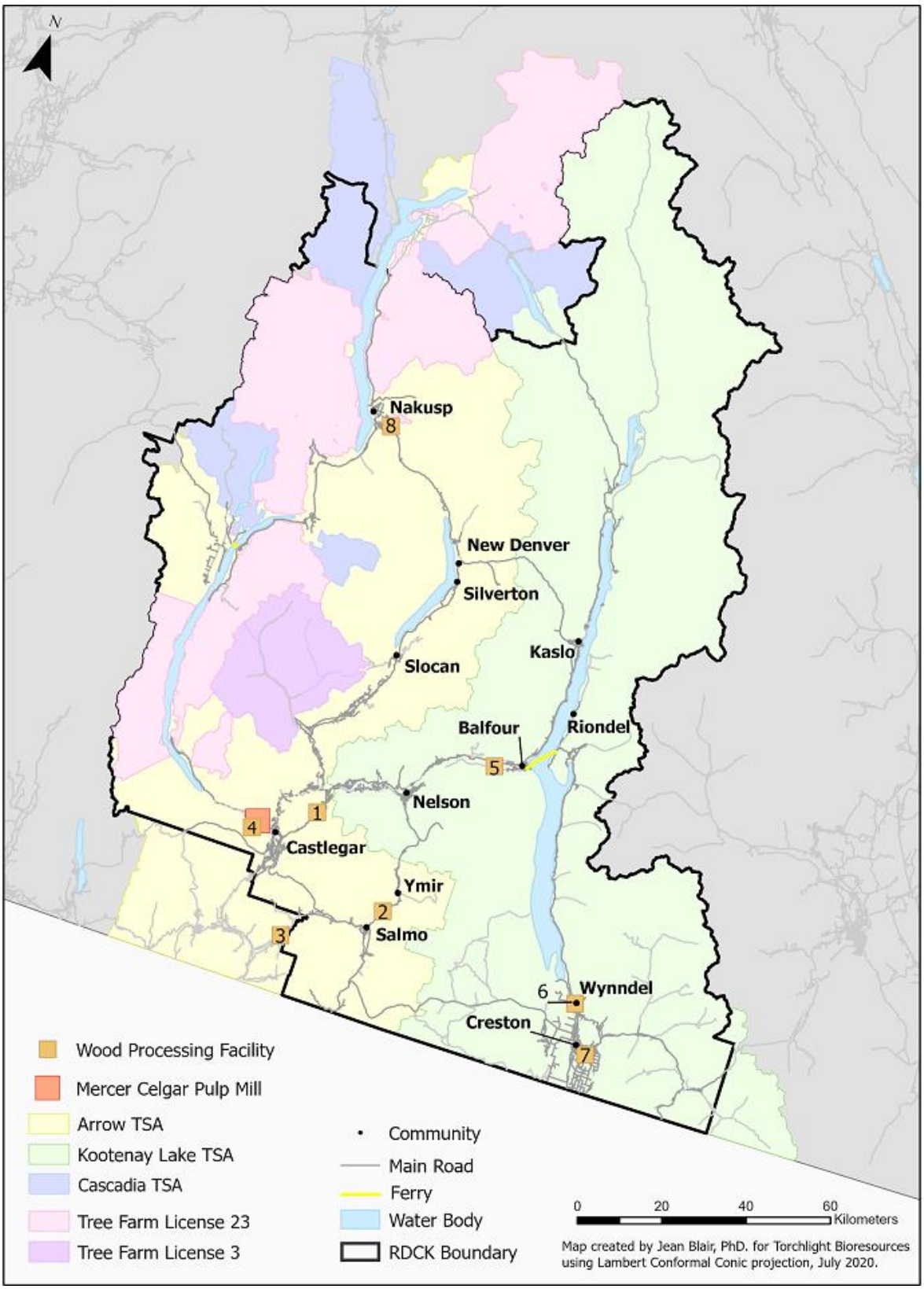


Figure 2. Timber Commitments in the Regional District of Central Kootenay

Area	Commitment (m^3)	Commitment (bdt)	Harvest Residues (bdt)	Harvest Residues (GJ)
Arrow TSA				
BC Timber Sales	157,587	78,794	11,819	224,561
ATCO Wood Products	151,627	75,814	11,372	216,068
Interfor	100,000	50,000	7,500	142,500
Tolko	47,589	23,795	3,569	67,814
Kalesnikoff Lumber	34,703	17,352	2,603	49,452
Yucwemenlucwu	17,010	8,505	1,276	24,239
Stella Jones	12,963	6,482	972	18,472
Total	**521,479**	**260,740**	**39,111**	**743,108**
Kootenay Lake TSA				
Canfor	200,842	100,421	15,063	286,200
BC Timber Sales	182,203	91,102	13,665	259,639
J.H. Huscroft	78,644	39,322	5,898	112,068
Cooper Creek Cedar[a]	69,713	34,857	5,228	99,341
Kalesnikoff Lumber	55,247	27,624	4,144	78,727
Lower Kootenay Dev't	31,043	15,522	2,328	44,236
ATCO Wood Products	20,167	10,084	1,513	28,738
Total	**637,859**	**318,930**	**47,839**	**908,949**
Cascadia TSA				
BC Timber Sales	9,310	4,655	698	13,267
Total	**9,310**	**4,655**	**698**	**13,267**
Tree Farm License 3				
Interfor	74,100	37,050	5,558	105,593
BC Timber Sales	5,900	2,950	443	8,408
Total	**80,000**	**40,000**	**6,000**	**114,000**
Tree Farm License 23				
Interfor	450,000	225,000	33,750	641,250
Total	**450,000**	**225,000**	**33,750**	**641,250**
Grand Total	**1,698,648**	**849,324**	**127,399**	**2,420,573**

[a]Timberlands division of Porcupine Wood Products

Figure 3. Primary Wood Processing Facilities in the RDCK

Figure 1	Facility	Location	Capacity[a]	Primary Products
1	Kalesnikoff Lumber	Thrums	62 mmfbm	Mass timber including cross-laminated timber
2	Porcupine Wood Products	Salmo	48 mmfbm	Western red cedar decking, fencing, sidings, and trim board
3	ATCO Wood Products[b]	Fruitvale	42 M sq ft	Softwood veneer
4	Interfor	Castlegar	210 mmfbm	Softwood lumber
5	Harrop-Procter Forest Products	Harrop-Procter	2 mmfbm	Fences, decking, rough sawn timber
6	Wynnwood (Canfor)	Wynndel	58 mmfbm	Wane-free specialty boards
7	J.H. Huscroft	Creston	43 mmfbm	Boards and specialty products
8	Box Lake Lumber	Nakusp	600,000 pieces	Split rail fencing
N/A	Mercer Celgar	Castlegar	520,000 admt	Kraft pulp

[a]mmfbm (million board feet); admt (air-dried metric tonnes)

[b]Located outside of RDCK but primary licensee within RDCK

While pulp chips and pulpwood flow into the district from neighbouring districts, the RDCK is a net exporter of mill residues sawdust, shavings, and hog fuel (bark and low-grade fibre). There is also little demand for hardwoods in the district. Sawdust and shavings are currently trucked to the pellet mills in Lavington (Pinnacle Renewable Energy/Tolko) and Princeton (Princeton Standard). These pellet mills have annual capacities of 300,000 t and 110,000 t, respectively. It is estimated that over 80,000 t of sawdust and shavings leave the region for the pellet mills. While these are long hauls, the economics are feasible because of the ability to share the cost of trucking with Mercer Celgar pulp chip deliveries via backhauls. This trucking cost savings, along with distance to coastal ports, is a major reason why a pellet mill has not been established in the RDCK to date. As for hog fuel, the primary destination for hog fuel from the smaller mills is the Kettle Falls power plant in Washington State. The plant, owned by publicly-traded utility company Avista, has a capacity of 53 MW_e and consumes approximately 60 tonnes per hour. Mill operators in the RDCK estimate that hog fuel exports from the district to Avista may exceed 150,000 bdt. If this is the case, the district would be the majority feedstock supplier to the Avista plant. Given the plant is less than 100 km to Fruitvale and only 115 km to Castlegar or Salmo, this is not an unreasonable estimate. However, the Avista plant was constructed in 1983 and is a power-only (vs. co-generation of heat and power) plant with relatively high operating costs. It was the first utility-owned (vs pulp and paper company-owned) wood waste power plant built in the U.S. and was constructed to reduce air pollution from wood waste combustion in beehive burners. However, it is now considered the highest generating cost asset in Avista's portfolio and can be subject to idling if market electricity prices are too low to justify wood fuel costs. Since sawmill and solid wood product facilities cannot operate without a market for hog fuel, the reliance of the forest products sector in the RDCK on the Kettle Falls plant is considered a high-risk situation. Approximately half the hog fuel from Wynnwood goes to Kettle Falls and the other half to the Skookumchuck pulp mill. A significant portion of the hog fuel produced by the Interfor Castelgar mill is used internally to fuel kilns for lumber drying.

Within the RDCK, there is significant demand for sawlogs, softwood pulpwood (roundwood of insufficient grade for sawmilling), and softwood chips for pulp production. Castlegar is the dominant demand hub. Based upon the currently operating situation and cost benefit of backhauls, sawdust and shavings are generally already allocated to existing pellet plants. This is especially true in the western portion of the district, which is closer to the pellet mills in Lavington and Princeton than the area around Creston. Both ATCO Wood Products and the Lower Kootenay Band, located near Creston, assessed the feasibility of a pellet plant in the district and found one to be infeasible. This means the primary feedstocks for bioenergy generation in the RDCK are hog fuel from primary wood products facilities (sawmills, ATCO veneer mill) and harvest residues. It is estimated

that there is approximately 275,000-300,000 bdt, with an energy content of 5,300,000-5,700,000 GJ, of these materials generated on an annual basis.

The cost of hog fuel and harvest residue is very different. Currently, hog fuel is sold to Avista for $10-15/bdt plus trucking. In contrast, harvest residues are anticipated to be amongst the highest cost in the province due to the challenging terrain and winding road network. Interviews with primary licensees indicated a likely delivered cost for chipped residues to Castlegar or Nelson of $70-110/bdt. This range is also consistent with modelling, including forwarding costs of $5-25/bdt, handling of $5-10/bdt, chipping costs of $40-45/bdt, and trucking of $10-25/bdt. This indicates that although harvest residue utilization is a priority for the RDCK, it is hog fuel residues from existing primary wood products facilities that will be the much lower cost fuel. It will be hard to justify a business case for energy facilities to utilize harvest residues when hog fuel could be used by facilities using available technologies. This situation could be altered if forest harvest residue collection, chipping, and transportation were financially supported by the Forest Enhancement Society of British Columbia (FESBC) or another entity.

3 RDCK ENERGY MARKET

Energy demand can be generally grouped into three primary categories: 1) thermal energy; 2) electricity; and 3) transportation fuels. In the RDCK, there is significant overlap between thermal energy demand and electricity demand due to a high percentage of homes using electricity for space heating and hot water. Although electricity and transportation markets are seeing increased integration due to the adoption of electric vehicles, electricity currently constitutes only a very small percentage of transportation energy demand at present. The reverse is also true, with transportation representing only a tiny fraction of electricity demand. Markets can also be grouped according to three primary end-uses: 1) buildings; 2) industry; and 3) transportation and machinery. On average, thermal energy constitutes 80% of energy demand of residential buildings and two-thirds of energy demand of commercial/institutional (C/I) buildings. Nationally, thermal energy is 80-85% of industrial energy demand, although this varies dramatically by facility type. RDCK building energy demand by fuel type is presented in Figure 4 and by community in Figure 5. Four incorporated communities in the RDCK, Nelson, Castlegar, Creston, and Salmo, have access to natural gas and natural gas represents 60% of building fossil fuel energy demand in unincorporated areas. Total natural gas consumption across the district is 1,250,000 GJ per year; the remaining communities use a combination of electricity, wood, propane and heating oil for space heating. As decarbonization efforts should focus on displacing fossil fuels, RDCK building fossil fuel demand, which currently accounts for 1/3 of building energy consumption, by community is presented in Figure 6.

Figure 4. RDCK Building Energy Demand by Fuel Type

Total: 4,900,000 GJ.[1]

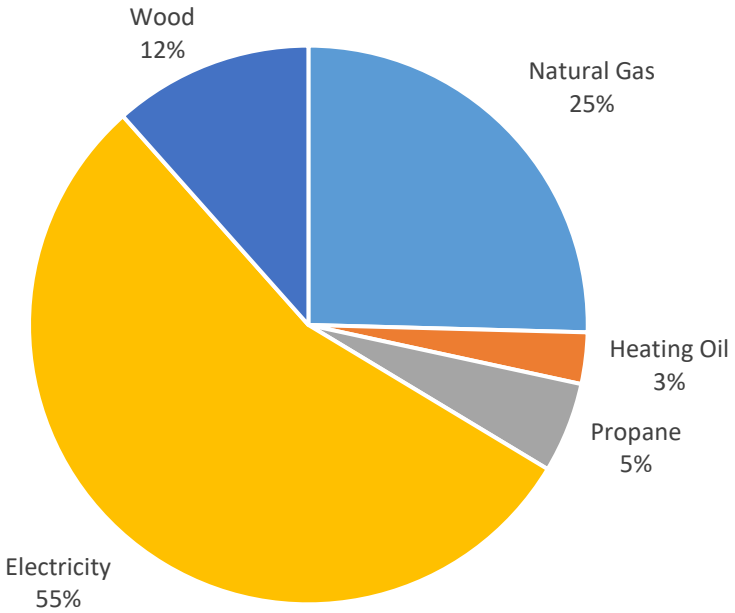
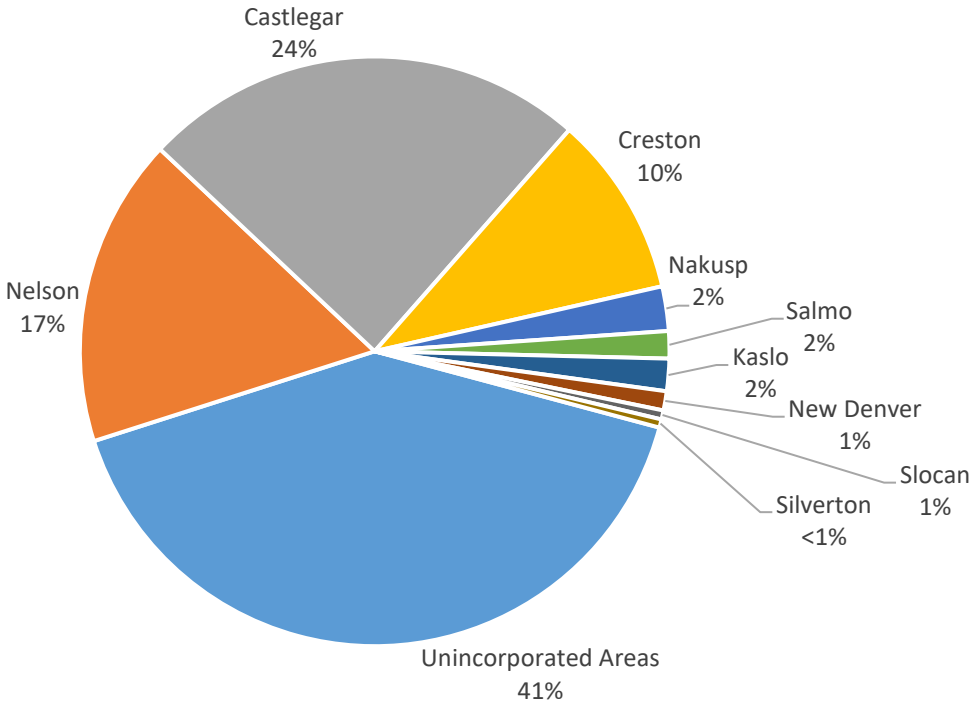


Figure 5. RDCK Building Energy Demand by Community

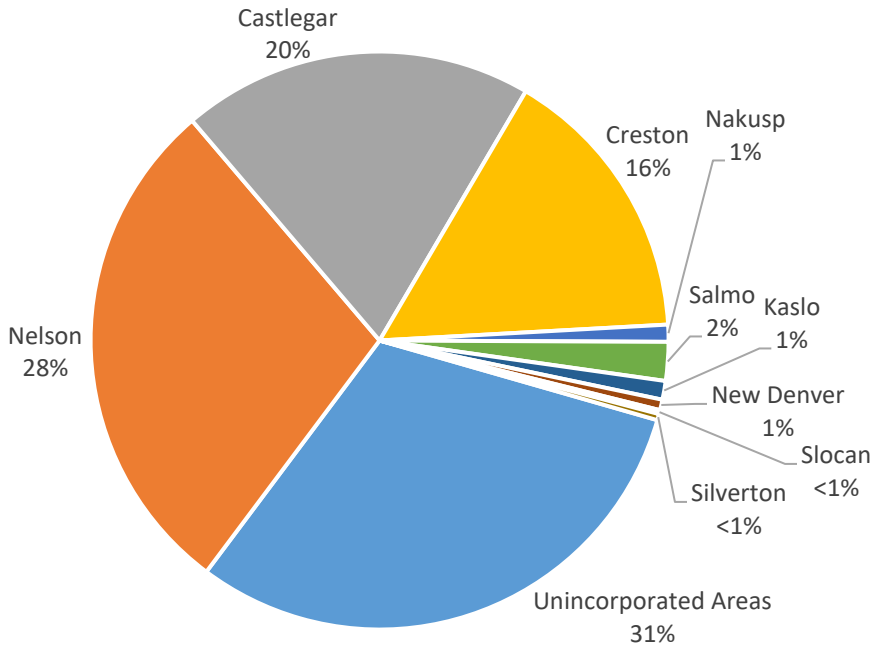
Total: 4,900,000 GJ.[1]



[1] Government of British Columbia, 2020. Community Energy and Emissions Inventory – 2012.

Figure 6. RDCK Building Fossil Fuel Energy Demand by Community

Total: 1,600,000 GJ.[2]



By comparing Figures 5 and 6, it can be seen Nelson and Creston have the highest percentage of fossil fuel consumption relative to total building energy consumption. This contrasts with the smaller communities, both incorporated and unincorporated, that have high rates of low carbon electricity and wood consumption.

There is only one facility in the RDCK listed in BC and Canada's large GHG emitters list: Mercer Celgar. The pulp mill's fossil fuel emissions were 116,500 t CO_2e in 2018. This is approximately 30% more than all building GHG emissions across the entire regional district in 2012. It also indicates that natural gas consumption by Mercer Celgar was greater than all buildings in the RDCK combined. Given the population of the RDCK increased by only 1.8% between 2011 and 2016, 2012 emissions data are sufficiently accurate for the 2018 comparison.

Light-duty vehicle fuel energy consumption has been estimated at 3,700,000-3,800,000 GJ across the district. This equates to 100-120 million litres of gasoline. As any liquid biofuels produced in the RDCK would be blended at low levels in the provincial, or broader, transportation fuel pool and not limited to use in the RDCK, the local market demand for transportation fuels will not be a primary determining factor in whether a wood-to-liquid biofuel plant would be viable in the district. This is discussed in Section 4.

[2] Government of British Columbia, 2020. Community Energy and Emissions Inventory – 2012.

3.1 Electricity

Due to numerous large hydropower generating facilities, the RDCK is a significant net exporter of electricity to the rest of British Columbia and to Washington State. Approximately 90% of electricity consumers outside of Nelson are served by FortisBC's distribution system, with the remainder served by BC Hydro. Within the Nelson area, including Harrop-Procter, Balfour, and Queens Bay, Nelson Hydro is the local distribution company (LDC). It is one of only five LDCs in the province and is unique in its ownership of a small-scale generating asset – the 9.1 MW_e Bonnington Falls hydropower facility – and electricity distribution operations. Approximately 45% of Nelson Hydro's electricity is purchased from FortisBC.[3]

In addition to the hydropower generating facilities, the RDCK is home to a large biopower generating plant. Mercer Celgar currently generates, on average, 65 MW_e, with 45 MW_e used for internal operations. The remaining 20 MW_e is sold into the BC grid under a power purchase agreement with BC Hydro, which is set to expire in the current year (2020). Approximately 90% of current generation is derived from recovery (black liquor) boiler steam, with the remaining 10% from an older power (solid fuel) boiler. In 2010, Mercer Celgar completed a Green Energy project that added a second turbine generator that increased potential generating capacity from 48 MW_e to 100 MW_e. Mercer Celgar has indicated that the turbine generator was oversized to permit future increased generation from a new, larger capacity power boiler. This larger power boiler has not been installed to date and a power purchase agreement is required to justify the investment. It should be noted that Mercer Celgar does not have an additional need for process heat at present, meaning a new power boiler would be electricity-only and only 1/3 the efficiency of a combined heat and power plant. Adding additional boiler capacity at Mercer Celgar will be the lowest cost new biopower-only generation in the district. Addition of a new power boiler to the plant is part of the company's Celgar 550 plan to increase pulp production capacity to 550,000 admt per year.

Grid electricity in British Columbia is relatively low cost compared to electricity in other Canadian provinces and the province is currently in a significant oversupply situation – estimated at 400-550 MW_e capacity on average water (3,500-5,000 GWh/yr). This situation will be compounded when the 1,100 MW_e (5,100 GWh/yr) Site C hydroelectric facility comes online. Given this position, BC Hydro is not seeking to add any new generation to the grid and has made preliminary advances to reduce generation from pulp mills in the province. There is no longer an active Standing Offer Program through which independent power producers (IPP) could sell power to BC Hydro. Therefore, new biopower purchase agreements with BC Hydro at

[3] City of Nelson, 2020. Electrical services (Nelson Hydro). https://www.nelson.ca/218/Electrical-Services-Nelson-Hydro

economically-feasible prices are deemed unlikely in the next 5-10 years. Interviews across the RDCK have suggested a general stakeholder opinion that Mercer Celgar is unlikely to secure a long-term power purchase agreement for the 35 MW_e of potential additional capacity. This also means that any other biopower project in the RDCK would need a power purchase agreement with an entity other than BC Hydro – for example, Nelson Hydro – to be viable.

Co-generation of electricity is generally desirable for heating plants with a capacity greater than 10 MW_{th}. Apart from industrial projects, this heat demand would require development of a district energy (DE) system to distribute the heat. Heat is the leading product, with electricity the higher value co-product. However, the incremental cost of biopower generation is likely to be higher than the market price for electricity in BC and a power purchase agreement with BC Hydro, FortisBC, or Nelson Hydro may not be possible. In this case, an LDC that operates the DE system may also take over electricity distribution in the community.

3.1.1 Rural Communities

It is understood that addressing extended power outages (supply interruptions), which can last in excess of 24 hours, is a priority for the RDCK. The areas most prone to outages include the north end and eastern shore of Kootenay Lake, Harrop-Procter (served by Nelson Hydro), Slocan Valley between Slocan and South Slocan, and both shores of the Arrow Lakes. Most areas, apart from Harrop-Procter, are served by FortisBC. While local biopower generation was considered as a potential option for the communities to address outages, this will not be a viable option. The communities in question have very small electricity loads and biopower technologies at the scale required are far from economical on the BC electricity grid. The technology challenges are addressed in Section 4, but the following key points should be considered:

- None of the communities are classified as 'remote' (off-grid) communities. Even though they do lose power, they are still grid-connected and subject to the same grid pricing as larger centres. A power purchase agreement would be required to connect a project.
- Generation of biopower at a scale less than 500 kW_e has a generating cost of $0.40-$0.80/kWh, which is approximately 6 to 12 times the delivered residential electricity price in BC. It is 12 to 25 times the commodity market price for electricity.
- Electricity generation efficiency greater than 15%, at the scale required, is only possible with gasification and internal combustion engine combustion of the resulting syngas. This technology approach requires very high-quality feedstock with a low moisture content, very limited bark, no contamination, and uniform chip size. This is not the type of material available in the areas that are subject to supply interruptions.

FortisBC provided a significant amount of information about the challenges and potential supply interruption solutions for the district. Almost all power outages are due to tree strikes, which are a function of the terrain and heavily forested nature of the areas. The Kootenay Lake areas are already on a loop feed, which means that outages occur because of tree strikes on both sides of the lake at the same time. The Slocan Valley is a radial feed, which means a single tree strike will interrupt supply.

There are several actions that could be taken to improve electricity system resiliency and reduce the frequency and duration of power outages:

A. Improved Vegetation Management: A common cause for power outages in rural areas in the RDCK is trees and tree branches contacting or damaging power lines. An action plan for improved vegetation management, both in terms of extensivity and frequency, along the right-of-ways for power lines could reduce the frequency of power outages.

B. Underground Transmission/Distribution Lines: An alternative to an improved vegetation management plan is rerouting existing power lines with underground power lines. This removes the possibility for tree falls to cause power outages. However, this is a relatively high cost solution compare to managing the power line right-of-way vegetation.

C. Additional Power Generation: Additional power generation would reduce the likelihood of power outages not caused by tree falls onto radial lines. For example, adding electrical generation to Duncan Dam located at the southern end of Duncan Lake, north of Kootenay Lake, would increase the reliability of the power supply in the Kaslo area. However, line capacity is viewed as a major impediment to this approach.

D. Looping Existing Radial Power Lines: Construction new distribution/transmission power lines to loop existing lines could reduce the frequency and duration of power outages experienced in the RDCK, particularly outages caused by trees. This is applicable to the Slocan Valley.

E. Storage/Backup: Battery storage of grid electricity would serve as backup in the event of an outage. This is an alternative to gasoline/diesel generators at an individual building or community level.

Based upon a preliminary assessment and discussions with FortisBC, the most viable options to avoid supply interruptions are the following:

- **Kootenay Lake, Harrop-Procter, and Arrow Lakes:** Electricity storage (batteries) at an individual building or community level. This is a low-carbon alternative to gasoline or diesel generators.

Electricity storage would be a much more viable option if electricity was not used for space or hot water heating. This is addressed in Section 3.2. This approach is projected to be lower cost than underground lines due to the distances required.

- **Slocan Valley:** Install a new line from Slocan (FortisBC) to the BC Hydro transformer in Silverton creating a loop. FortisBC doubts that the BCUC will permit this line to be included in the rate base, so another financing approach is required.

3.2 Building Heat

The dominant role for wood fuels is space, hot water, and industrial process heat. Generation of heat is 2.5 to 3 times more efficient than generation of electricity alone or production of transportation fuels. Direct combustion of wood is double the efficiency of wood conversion to biomethane (renewable natural gas) and then biomethane use for heat. Wood is already a major contributor to single family detached home space heating in the RDCK, with cord wood combustion in wood stoves the dominant approach. For the purposes of this report, building heat markets are divided into single family detached homes, commercial/institution (C/I) buildings, and district energy systems. The latter application uses underground hot water pipes to connect multiple buildings to a central heating plant. The potential heating fuels considered are hog fuel (industrial, DE), wood chips (industrial, C/I, DE), wood pellets (C/I, residential), and cord wood (residential). Biochar and pyrolysis oil production are not produced in the district and are not recommended; there are no small-scale commercial heating units designed to operate on these fuels. Briquettes and firelogs are options, although the large sawdust and shavings demand of the existing pellet mills in southeast BC means securing appropriate feedstocks may be challenging. They are also not fuels for primary heat source appliances.

3.2.1 Single Family Detached Houses

Cord wood use in wood stoves is typically considered a secondary heat source, since it requires refueling several times per day and residents cannot leave properties unattended in the winter without a primary heat source. In areas that lack natural gas, this primary heat source is usually electricity, propane, or heating oil. This report focuses on the potential role of wood as primary heating source – termed modern wood heating. For single family detached homes not connected to a DE system, the primary wood fuel options are wood pellets and cord wood. High efficiency cord wood boilers must still be manually filled, but typically only twice per day. Therefore, they can serve as a primary heating source if residents are not away from the house for more than a day. Air pollutant emissions of modern cord wood boilers are much lower than wood stoves or low efficiency outdoor wood burners.

For single family detached homeowners seeking to use wood as a primary heating source with operational requirements similar to propane or heating oil, wood pellets are the fuel of choice. Modern wood pellet boilers are highly efficient, automated, thermostat-controlled appliances that can be remotely controlled using the cloud (e.g., cellphone). Due to the flowability of pellets, they do not need to be manually fueled and most installations only require two bulk pellet deliveries per year. The only human intervention required for operations is the ash bin emptying once every 2-3 weeks. The biggest challenge with wood pellet boilers is the upfront capital cost, with a typical single-family detached home unit costing $17,000-22,000 installed. With approximately 900,000 residential pellet boilers installed in the EU, the technology is proven and reliable. Despite the high capital cost, pellet boilers are considered the leading primary (i.e., not secondary/manual) wood fuel option for residential buildings that won't be connected to a DE system. They are most likely to be considered for homes without natural gas access that are currently heated with propane or heating oil, or subject to extended power outages. Electricity demand by the boilers is very low and a battery storage system could supply sufficient power for multi-day operation.

3.2.2 Commercial/Institutional Buildings

Commercial and institutional buildings, such as schools and hospitals, not connected to a DE system can be heated with wood chips or wood pellets using modern wood boilers. The heat demand of larger C/I buildings necessitates larger boilers than single family detached homes, thus enabling the use of wood chip fuel. While pellets are generally a higher cost fuel than wood chips, there can be significant capital cost savings with using pellets. The larger a project is, the more likely it is to use wood chips. The boilers used at the C/I individual building scale are, like single family detached home boilers, manufactured in bulk in a factory and considered 'off-the-shelf'. There are over 60,000 C/I modern wood boilers operating in the EU at present. In Canada, there are over 450 C/I wood pellet and wood chip boiler projects in operation. In general, individual boilers less than 500 kW_{th} in capacity have very strict fuel specifications – particularly if they are consuming wood chips. Most boilers greater than 1500 kW_{th} capacity can consume bark-on wood chips but cannot operate solely on hog fuel, although there are exceptions. Within the RDCK, most C/I buildings are located in areas with natural gas access and are unlikely to be converted to single building boilers. A non-exhaustive list of potential C/I bioheat projects in the RDCK is listed below. These include very small DE systems when all buildings are owned by the same entity. Several C/I boilers are already installed in the RDCK, including a 950 kW_{th} wood chip boiler to heat the Kalesnikoff Lumber building.

Potential C/I Bioheat Projects:

- Whitewater Ski Resort

- Salmo Ski Hill
- Slocan Community Health Centre
- Arrow Lakes Hospital
- Nakusp and District Community Complex
- Nakusp Elementary and Secondary Schools
- Lucerne Elementary Secondary School
- JV Humphries Elementary-Secondary
- Redfish Elementary School
- Winlaw Elementary School
- W.E. Graham Community School
- Selkirk College

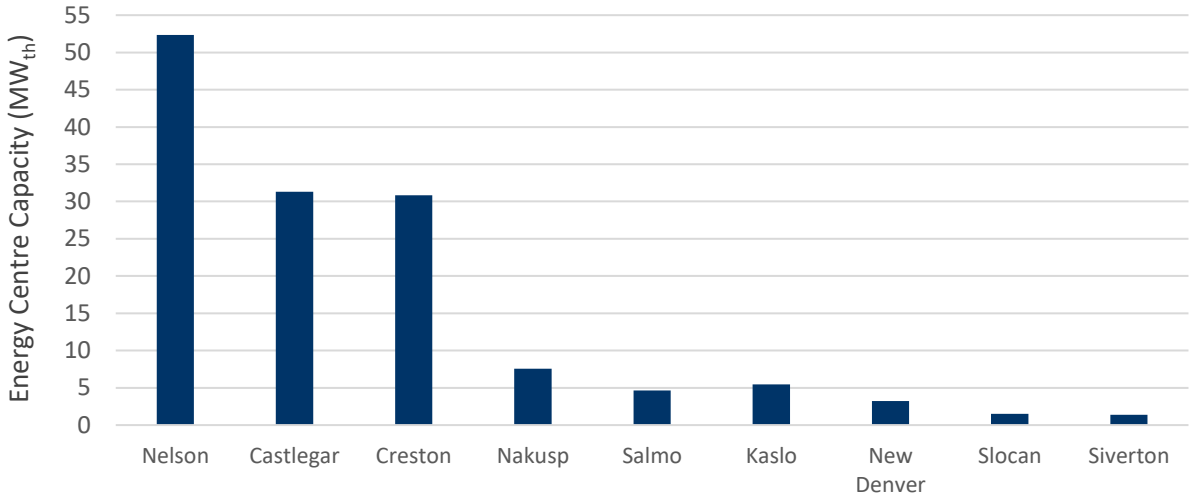
3.2.3 District Energy Systems

District energy (DE) systems are networks of pipes, often buried, that carry heated or cooled water from a centralized plant or other energy source to connected buildings. Heating or cooling individual buildings or developments through a connection to a DE system is easier and lower cost from a logistics and operations perspective. When connected to a low carbon energy source, DE systems can potentially reduce the GHG emissions of all connected loads, depending on the heat source being displaced.

The two leading low carbon technologies for DE systems are solid biomass combustion and heat pumps. As noted above, co-generation of electricity with biomass heating is typically only viable at a scale greater than 10 MW_{th}. Figure 7 presents a rough estimate of likely biomass energy centre heat capacity by community. Based upon this estimate, the only communities where co-generation of electricity has the potential to be economically viable are Nelson, Castlegar, and Creston. If DE is feasible in the small communities, including unincorporated communities, a DE energy centre is likely to be heat-only and use off-the-shelf boiler(s). Heat pumps operate by using electrical work to draw thermal energy from an external medium. This external medium can be ambient air, river/lake water, sewer water, industrial wastewater, or the ground. Heat pumps range in scale from servicing small single-family detached homes to large units with a capacity of 10-15 MW_{th}. Castlegar is unique amongst RDCK communities due to its proximity to the Mercer Celgar, which produces abundant waste heat at both 42 C and 80 C. While the former stream may need a heat pump or in-building hot water tank to boost the temperature for domestic hot water, the latter stream does not require any temperature boost to meet all building needs.

Figure 7. Potential Building Heat District Energy Demand by Community

Assumes 75% of building energy demand is space heat and hot water, 66% of building heat demand can be connected to the DE system, and 2200 full load equivalent hours per year.



A preliminary assessment of the DE development opportunities in communities within the RDCK was completed (Figure 8). Four DE development scenarios were conceptualized. These DES development options are:

- Phased DE system development in Castlegar, heated with waste hot water from Mercer Celgar;
- A downtown DE system in Nelson, heated with a biomass CHP plant;
- A DE system in Creston, heated by a biomass CHP plant also providing steam to the Columbia Brewery;
- A multi community DE development including the communities of Nakusp, Kaslo, and New Denver.

Based upon the preliminary assessment, a DE system in Salmo will be very economically challenging due to the relatively low urban density combined with existing natural gas supply. This assessment also showed that buildings in Slocan and Silverton may be too spread out for a DE and individual building boilers are likely the lower cost option – at least for parts of the communities. A small number of unincorporated communities, including parts of Riondel and Lardeau, may be considered for DE development, particularly if development is part of a community energy resilience strategy to reduce reliance on electric heat.

Community District Energy Comparison Legend

Relative Rating	Description
	Positive/Good: Promising, no apparent key issues that would affect project development. Cost may or may not be competitive.
	Neutral: Some residual issues exist which may be able to be resolved or mitigated upon further investigation. Cost may not be competitive.
	Negative: Key issues exist which may be difficult or impossible to mitigate and which would impact project development. High cost.
	Major Barriers: Multiple key issues and few positive aspects indicate major barriers that would need to be overcome to establish a business case competitive to other locations. High cost.

Figure 8. Community District Energy Comparison

Community	Community Type		Energy Demand		Distance to Heat Source		Building/Load Density		Bioenergy Fuel		Greenhouse Gas Displacement Opportunity		Conclusions Summary Rating
					Criteria Rating								
Castlegar	Urban	⊙	Large community, moderate energy demand	●	Mercer Celgar pulp mill heat source, ~ 5 km from nearest load centre	◉	Moderate, three load centres identified	⊙	Waste heat from pulp mill likely low cost	●	Existing heat source is primarily natural gas, with some heating from heating oil, wood, and propane.	●	⊙
Creston	Urban	⊙	Moderate, brewery has high heat demand	●	Biomass Boiler Plant can be centralized	●	Moderate	⊙	Scale permits use of hog fuel	⊙	Existing heat source is primarily natural gas, with some heating from heating oil, wood, and propane.	●	⊙
Kaslo	Rural	◉	Small community. No identified high heat demand buildings	◉	No easily identifiable central location for biomass boiler plant or other heat source	⊙	Low	◉	Scale may permit use of hog fuel, but extensive use of electricity may reduce potential scale	⊙	Low energy demand / small community. Existing heating sources are split between heating oil, wood, and propane.	◉	◉
Nakusp	Rural	◉	Small community, health care centres typically have high heat demand	⊙	Biomass Boiler Plant can be centralized	●	Low	◉	Scale may permit use of hog fuel, but extensive use of electricity may reduce potential scale	⊙	Low energy demand / small community. Existing heating sources are split between heating oil, wood, and propane.	⊙	◉
Nelson	Urban	⊙	Largest community energy demand in Central Kootenays	●	Biomass Boiler Plant can be centralized	●	Moderate	⊙	Scale permits use of hog fuel	⊙	Existing heat source is primarily natural gas, with some heating from heating oil, wood, and propane.	●	⊙
New Denver	Rural	◉	Small community, health care centres typically have high heat demand	⊙	No easily identifiable central location for biomass boiler plant or other heat source	⊙	Low	◉	Scale likely inhibits use of hog fuel; higher quality fuel required	◉	Low energy demand / small community. Existing heating sources are split between heating oil, wood, and propane.	◉	◉
Salmo	Rural	◉	Small community. No identified high heat demand buildings	◉	No easily identifiable central location for biomass boiler plant or other heat source	⊙	Low	◉	Scale may permit use of hog fuel, but extensive use of electricity may reduce potential scale	⊙	Low energy demand / small community. Existing heat source is primarily natural gas, with some heating from heating oil, wood, and propane.	⊙	◉
Silverton	Rural	◉	Small community. No identified high heat demand buildings	◉	No easily identifiable central location for biomass boiler plant or other heat source	⊙	Low	◉	Scale likely inhibits use of hog fuel; higher quality fuel required	◉	Low energy demand / small community. Existing heating sources are split between heating oil, wood, and propane.	◉	◉
Slocan	Rural	◉	Small community. No identified high heat demand buildings	◉	No easily identifiable central location for biomass boiler plant or other heat source	⊙	Low	◉	Scale likely inhibits use of hog fuel; higher quality fuel required	◉	Low energy demand / small community. Existing heating sources are split between heating oil, wood, and propane.	◉	◉

Castlegar

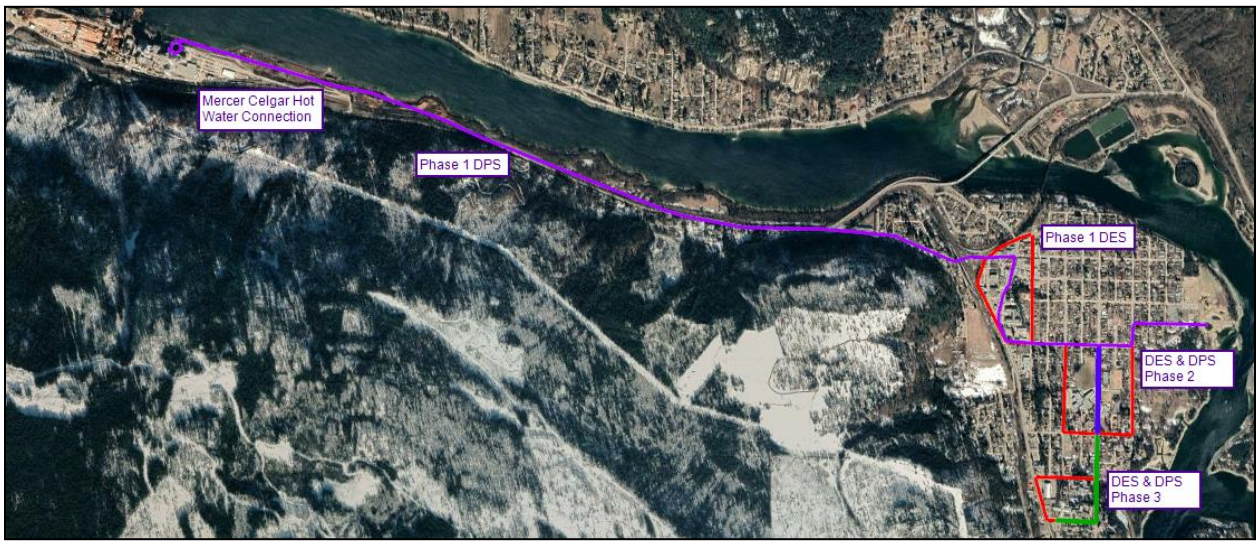
Mercer's Celgar pulp mill is an abundant source of waste heat, with a discharge of approximately 1000 L/s of 42 C hot water. Due the abundance of high temperature water currently discharged into the Columbia River at Mercer Celgar, a single high-density polyethylene for raised temperature (PE-RT) buried distribution pipe would be sufficient to serve the load centres in Castlegar. In place of a return line carrying water back to the heat source, discharging through Millennium Ponds, to create warm all-season outdoor pools, and into the Columbia River could be used to reduce the cost and bring additional benefits to the City.

A phased DE system approach for Castlegar is suggested due to separable load centres identified during screening. The Mercer Celgar mill could meet the heat needs of all these phases.

- Phase 1 – Downtown Castlegar.
- Phase 2 – Schools and surrounding residential buildings.
- Phase 3 – Health care and community centres.
- Phase 4 – Remainder of the community on the West side of the Columbia River.

Each phase of the DE system can be examined incrementally, evaluated and developed individually based on business case economics and GHG emission targets. Figure 9 below shows the load centres identified in Castlegar, in relation to Mercer's Celgar mill.

Figure 9. Mercer Celgar-Castlegar District Energy Main Lines



Each of the load centres identified for potential phases 1, 2, and 3, contain the following building types:

- Phase 1 includes a high-density area of buildings that could be heated by the DE system, and is the load centre closest to the heat source at Mercer Celgar. The buildings located in the initially proposed bounds of the phase 1 DES include restaurants, cafes, public service centres (RCMP, Fire Department, and City Hall), as well as commercial/retail stores.
- Phase 2 includes two elementary schools, a high school, a church, and surrounding residential buildings.
- Phase 3 includes health care centres and adjacent residential buildings.
- Phase 4 includes the remainder of the buildings on the West side of the Columbia River.

Selkirk College and other buildings on the East side of the Columbia River could be evaluated for connection to the main city DE system following Phase 4. Figures 10 and 11 below shows the initial boundaries considered for the DE system phases for Castlegar.

Figure 10. Potential Castlegar District Energy Development Phases 1-3

Figure 11. Potential Castlegar District Energy Development Phase 4

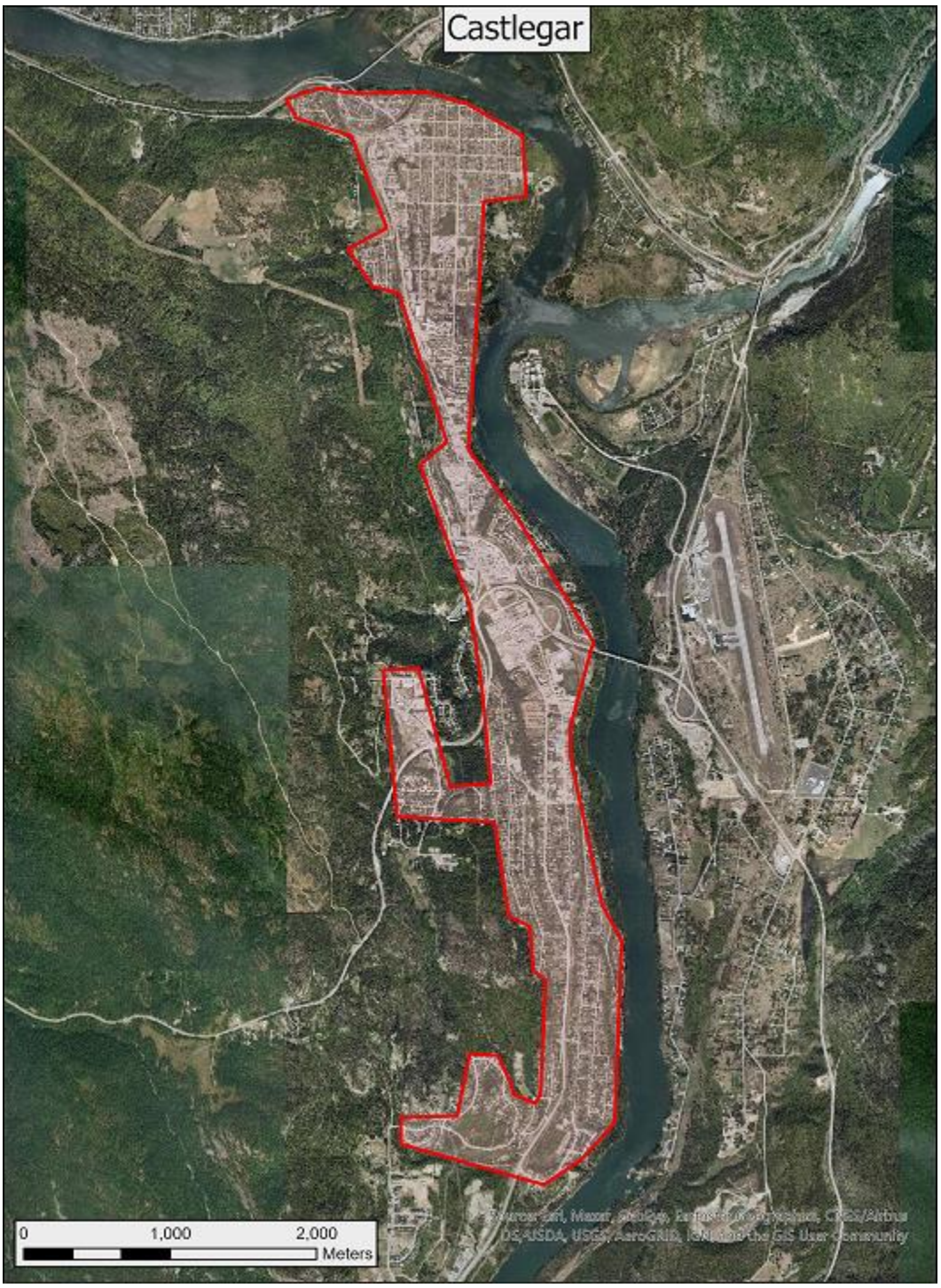


Figure 12 below shows an order of magnitude estimate for the cost to bring a distribution piping system (DPS) mainline from Mercer's Celgar pulp mill to load centres in Castlegar. The following assumptions are included:

- PE-RT pipe material is recommended for 42 C water. Due to the abundance of heat at Mercer Celgar, the insulation of PE-RT material is likely sufficient. If 80 C water were used, pre-insulated steel pipes would be required and result in a higher pipe cost;
- A cost of $1000/m for installation of a single buried PE-RT line is assumed based on KWL experience;
- All costs presented are in 2020 CAD; and
- Costs presented only allow for a mainline DPS; service branches are not included in this estimate.

Figure 12. Mercer Celgar to Castlegar – DPS Mainline Order of Magnitude Cost Estimate

Phase	Approximate Length [m]	Unit Cost [$/m]	Subtotal [$]	Contingency	Professional Fees	Total
1	6,100	1000	6,100,000	50%	10%	9,760,000
2	900	1000	900,000	50%	10%	1,440,000
3	1,300	1000	1,300,000	50%	10%	2,080,000

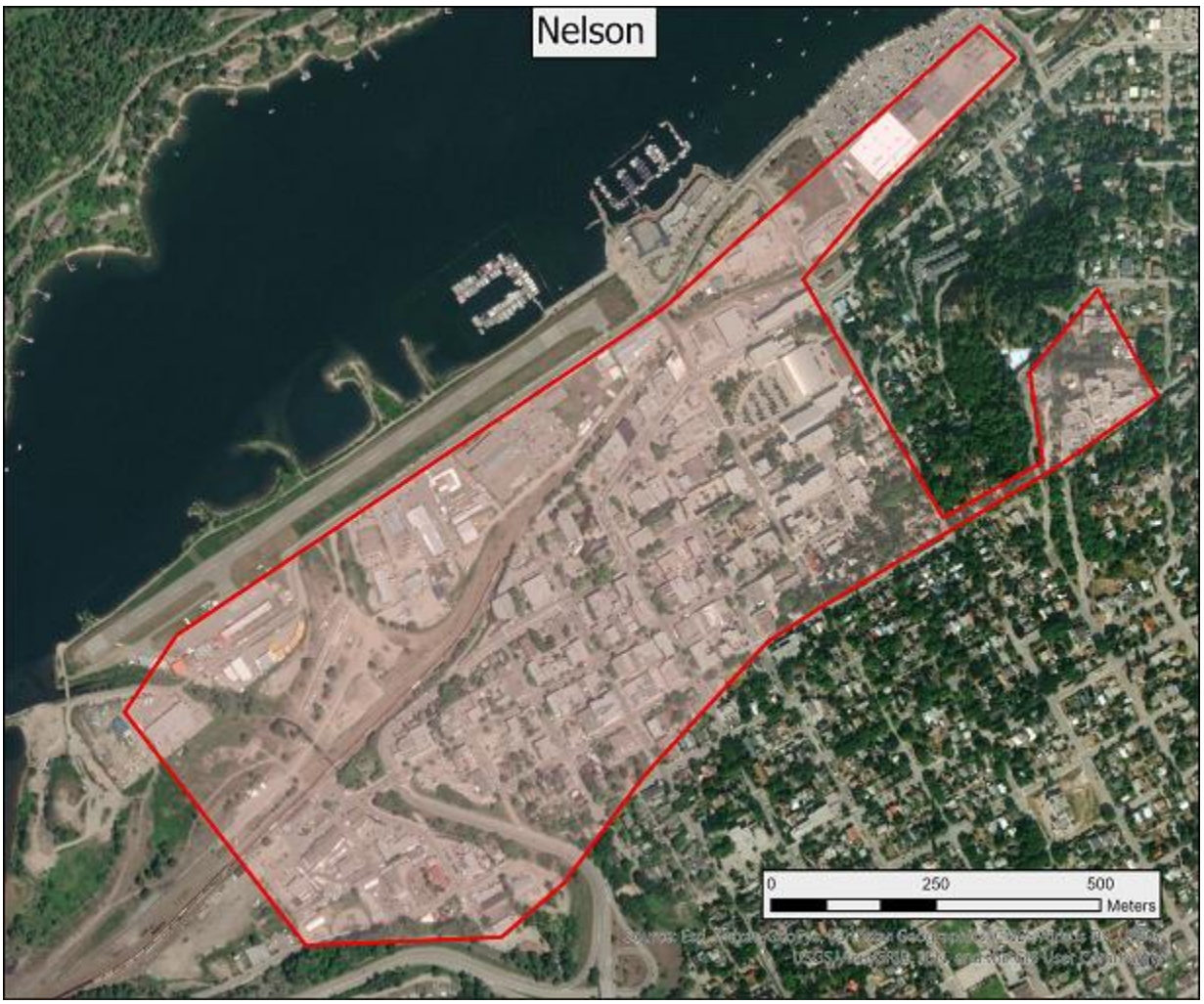
The above cost estimates are based on KWL's previous DE system experience with projects of similar scope and are intended for planning purposes. These estimates represent civil, mechanical, traffic management, and site restoration costs on a cost per linear metre basis. Actual costs for any of the presented DPS sections will depend on such factors as market conditions, competitiveness of the tendering process, contractor workloads, existing buried utilities, geotechnical conditions, and other risks. These cost estimates do not qualify as "Class" estimates under EGBC guidelines.

Natural gas purchased from FortisBC has an all-in cost of $7.60/GJ, including the cost of delivery, carbon tax, and the gas commodity cost. The total price for purchasing renewable natural gas is $16.10/GJ. Based on an annual thermal load of 361,812 GJ/year in Castlegar, the annual cost to provide low carbon heating to all of Castlegar's thermal loads with renewable natural gas is approximately $6.3 million. The annual cost to heat all of Castlegar's thermal loads with conventional natural gas is approximately $2.7 million.

Nelson

Nelson contains a relatively high building density in its downtown area, including many restaurants and cafes which typically have high heating demands. Figure 13 shows the potential boundary for a biomass fueled DES in Nelson's downtown area.

Figure 13. Potential Downtown Nelson DE Boundary



Nelson has the largest building energy load in the RDCK. This does introduce the possibility of creating competition for fibre supply, particularly since co-generation of electricity is likely at the demand scale considered. Nelson Hydro has previously examined the feasibility of developing a downtown DE system for Nelson. Both biomass and Kootenay Lake (heat pumps) were considered as energy sources in this study, with biomass selected as the lowest cost option.

Creston

Creston has the third largest annual energy demand of the RDCK communities. A DE system in Creston has the potential advantage of containing multiple buildings with typically high heating loads in relatively close proximity. These building include multiple schools, a brewery, health care centres, and restaurants. A DE system in Creston could potentially be heated by a biomass boiler plant fueled with hog fuel from J.H. Huscroft,

located in Creston, and Wynnwood, approximately 10 kilometres to the north. Figure 14 below shows the proposed boundary for a district energy system in Creston, serving typically high load buildings.

Figure 14. Potential Downtown Nelson DE Boundary

Multi-Community, Clustered Development

Rural communities are unlikely to have a viable business case for individual community DE systems without significant grants and attracting private capital for very small municipal developments can be challenging. However, there may be interest in developing small-scale isolated community systems in the RDCK if multiple communities are clustered as a single, phased construction project, with each community being a self-contained phase of construction.

Communities that are the most likely candidates for small-scale DE development include Nakusp, Kaslo, New Denver, and Riondel. Potential areas for inclusion in a DE system are presented in Figure 15.

Figure 15. Potential District Energy Service Areas in Nakusp, Kaslo, New Denver, and Riondel

3.3 Industrial Heat

Wood, in the form of pulp black liquor, hog fuel, and cord wood, is the single largest contributor to energy consumption in the RDCK, with Mercer Celgar and Interfor the largest industrial consumers. In addition to its Celgar 550 initiative to increase pulp production capacity, Mercer has been assessing the potential to replace the natural gas used in the plant's lime kiln with syngas (carbon monoxide and hydrogen) generated from

gasification of hog fuel. The lime kiln, which regenerates the pulping chemical lime, accounts for approximately 60% of Mercer's natural gas consumption. Fuel switching to hog fuel-based syngas would reduce natural gas consumption at the pulp mill by 1,200,000 GJ per year and is the single largest GHG reduction project possible in the district. Several pulp mills in the EU already use a biomass gasifier for fuelling their lime kilns, and while the approach is technically challenging, it is commercially proven. However, the economics of replacing natural gas are difficult, with the capital cost, based upon previous installations, for a hog fuel gasifier estimated at $20-25 M. As the Government of BC has permitted FortisBC to purchase biomethane (renewable natural gas) at prices up to $30/GJ, Mercer is seeking to apply this policy to the syngas produced from the gasifier and to have FortisBC spread the higher costs across the utility's rate base. This is a significantly lower risk, higher efficiency (and hence, greater GHG reductions per tonne of fuel), and more capital efficient approach than seeking to convert the hog fuel-based syngas into biomethane for pipeline injection. However, it is anticipated Mercer will face challenges securing a purchase agreement from FortisBC and RDCK may have a role to play in making a case for this industrial heat decarbonization approach.

Additional industry wood heat opportunities include lumber drying kilns and process heat (steam) for the Columbia Brewery in Creston. A high-temperature CHP plant co-located at the latter could also serve as the source of heat for a DE system.

3.4 Transportation

As noted in Section 3, a wood-to-biofuel facility in the RDCK would provide fuel for distribution to a much larger market than the RDCK alone. Wood-to-liquid fuel technology is precommercial and is summarized in Section 4. Wood-to-liquid biofuel conversion is approximately 1/3 as efficient as thermal (heat) energy generation from wood, which means displacement of natural gas, heating oil, and propane with wood will result in greater GHG reductions per tonne of wood than production and use of liquid biofuels. If the RDCK desires to address the RDCK transportation market with wood, a focus should be placed on CHP with the power used for electric vehicles. This approach is nine times more efficient than production and use of wood-based liquid transportation biofuels.

4 TECHNOLOGY SUMMARY

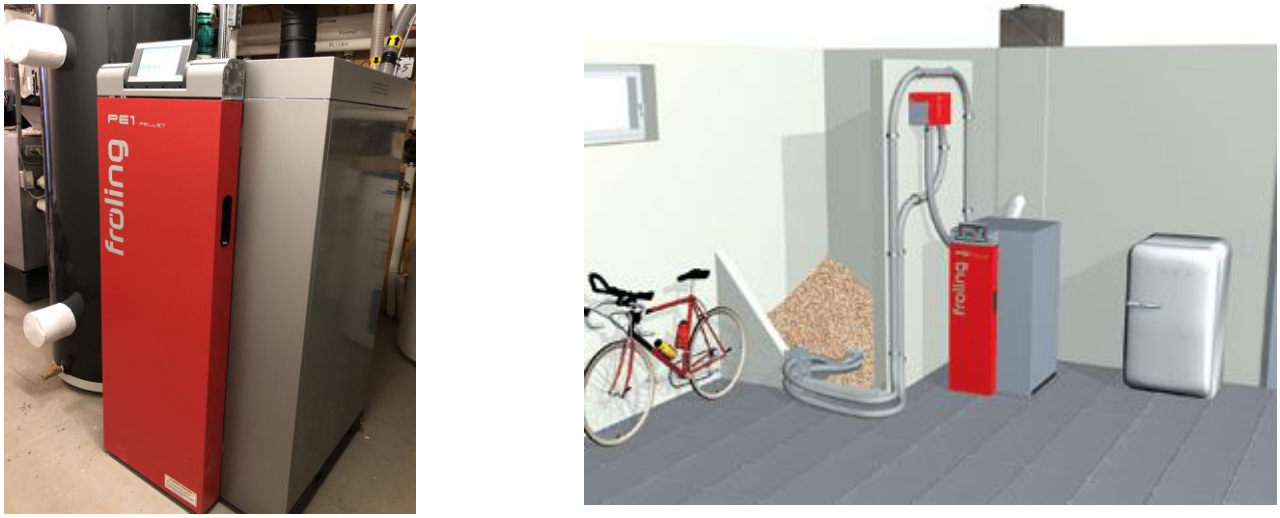
As biomass can, technically, be converted into a biological equivalent of any fossil fuel or energy resource in use today, decisions by investors and governments on strategic use of the wood resources need to focus on whether one should, rather than could, pursue any specific production pathway. The flexibility of wood as a resource for a multitude of products means companies often compete for resources and government interest.

In general, it is recommended that the RDCK focus on presently commercial technology options rather than seek to be the host to first-of-kind facilities. There have been a large number of high cost biofuel and bioproduct company and facility failures and technology risk must be a key consideration in whether to pursue unique approaches. Bioenergy is a high capital cost sector and commercialization of new technologies typically takes 10 to 20 years. In order to maximize operating jobs and wood fibre consumption, reduce GHG emissions, and have a meaningful impact on the energy consumption in RDCK, commercial technologies must be deployed at scale – which means either many small- or medium-scale projects or one or two very large projects.

4.1 Heat Only

As noted in Section 3.2.1, modern wood heating consists of boilers for primary building space and hot water heat. Wood pellets are the preferred fuel for residential homes or small C/I buildings while wood chips often have an economic advantage for larger C/I buildings and DE systems. Some off-the-shelf boilers larger than 1 MW_{th} can consume hog fuel. Residential wood pellet boilers are automated and require little human intervention beyond emptying the ash bin once every 2-3 weeks. The largest biomass boiler manufacturer in the world, Austrian company Fröling, produces over 35,000 units per year. These are available in Canada, as are boilers from ÖkoFen, another Austrian manufacturer with sales of 8,000 to 10,000 units per year. An example of a residential pellet boiler is presented in Figure 16.

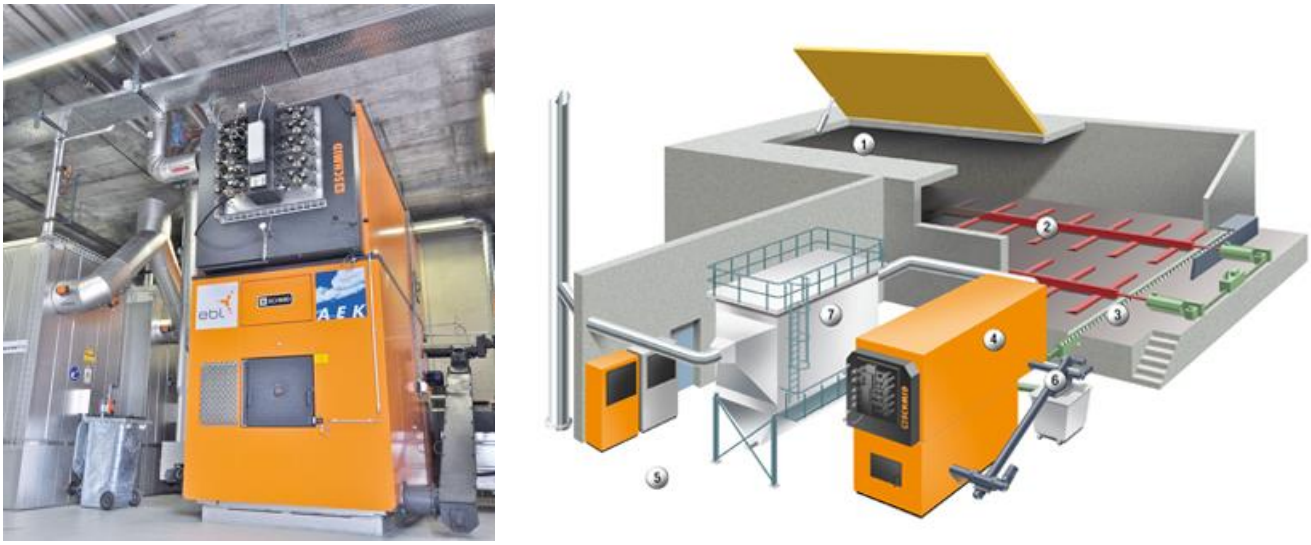
Figure 16. Fröling PE1 Wood Pellet Boiler (20 kW_{th})



Off-the-shelf wood fuel boilers are generally available up to 1.5 MW_{th} in scale. These boilers all produce hot water at <100 C. Multiple boilers can be installed at a single energy centre in a cascading manner, with

maximum energy centre capacity typically 6 MW_{th} (4 x 1.5 MW_{th} boilers). Beyond this scale, on-site custom boiler fabrication is the norm. An example of a C/I boiler is presented in Figure 17.

Figure 17. Schmid UTSR-1200 (1.2 MW_{th})

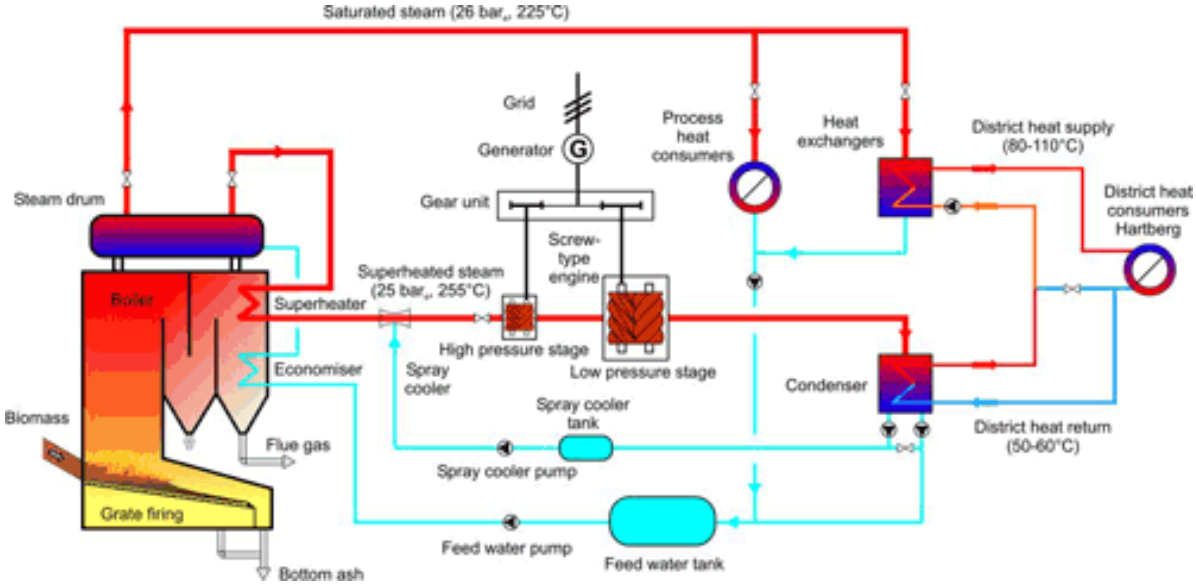


4.2 Combined Heat and Power

4.2.1 Steam-based Generation

Conventional CHP generation involves the combustion of biomass in a grate or fluidized bed boiler that generates steam. Steam is used to turn a turbine generator for electricity generation and thermal energy (heat) is recovered as steam or hot water. A simple diagram is provided in Figure 18.

Figure 18. Steam-based Combined Heat and Power Generation

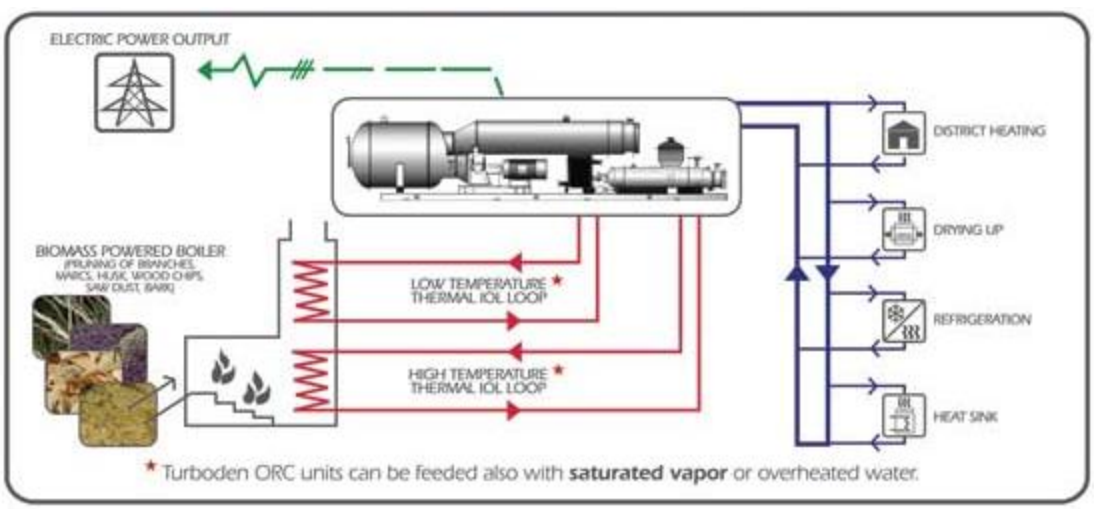


Steam-based generation is by far the most common CHP design worldwide and is the approach used by Mercer Celgar. It is also the most likely technology approach for a biomass CHP in Creston, given the process steam requirements of the Columbia Brewery. However, Canadian provinces, including British Columbia, have amongst the strictest operating requirements globally and require virtually all steam plants to be supervised 24/7 by power engineers. This places a high operating cost burden on smaller CHP plants connected to community DE systems, which are continuously monitored but often unmanned in the EU.

4.2.2 Organic Rankine Cycle and Gasification/Internal Combustion

There are two leading alternative biomass CHP technologies, both of which have already been implemented in British Columbia. The first is the combination of a thermal oil heater combustor, which heats a thermal oil to 300-340 C without vaporizing, and an organic Rankine cycle (ORC) generator. Thermal oil heat is transferred to the ORC, a heat engine which contains an organic fluid that is evaporated to drive a turbine. The organic fluid is condensed using a heat sink – typically a DE system – and completes the cycle (Figure 19). Hence, the ORC is a closed system and not subject to the same supervision operating requirements as steam. Since the ORC is a closed system, low quality fuel (e.g., hog fuel) can be used in the combustor. There are approximately 500 of these installations in the EU and West Fraser has installed ORC units at two sawmills in BC. The combination of a thermal oil heater and ORC is the most likely combination for a CHP in Nelson.

Figure 19. Turboden Organic Rankine Cycle Flow Diagram



The second CHP technology combination, which is only applicable for applications <500 kWe, is gasification followed by combustion of the resulting syngas (CO and H_2) in an internal combustion engine (ICE). Since the syngas must be combusted inside of the engine, it must have a very high purity and not contain tars: longer-chain organic molecules. Purifying the syngas is always the most challenging technology component and a

large number of projects have failed due to impure syngas. Syngas purity is strongly impacted by feedstock quality and therefore this technology combination has very strict feedstock requirements. In general, fuel must either be wood pellets or whitewood chips with a moisture content <20%. There are approximately 1,000 of these installations in the EU, but almost all are 150 kW_e or less units. In order to be economically viable, they receive substantial above-market prices (e.g., C$0.50/kWh) for the generated electricity. A gasifier and ICE was installed in the remote BC village of Kwadacha, but is not recommended for any communities in the RDCK.

4.3 Wood to Liquid Fuels and Biomethane

All wood-to-liquid biofuel and biomethane (renewable natural gas) technologies are precommercial. Despite billions of dollars invested in these technologies to date, there are no commercial-scale facilities operating at capacity on a continuous basis. The Government of Canada and provincial governments have provided significant grant funding since 2003 to commercialize cellulosic ethanol and other advanced biofuels. The most substantial fund was the $500 M NextGen Biofuels Fund, which was administered by Sustainable Development Technology Canada. Advanced biofuel technology companies that received grant funding from the Government of Canada include Enerkem, Ensyn, Iogen, Dynamotive, Lignol, Woodland Biofuels, Greenfield Global, Comet, Pond Biofuels, and Licella/Canfor. Of the Canadian grant recipients, only Enerkem and Ensyn have pioneer, first-of-kind semi-commercial plants in Canada that are currently operating. The small 10 ML/yr Ensyn wood pyrolysis plant in Renfrew, ON produces Renewable Fuel Oil (pyrolysis liquids) for the institutional U.S. space heating market but processing into transportation fuel has only been conducted in small-volume trials by its joint venture, Envergent, with oil refinery technology company UOP. Construction began on Ensyn's 40 ML Coté Nord project in Port-Cartier, QC in 2016 but the plant has not been commissioned to date. The Governments of Canada and Quebec contributed approximately 75% of the $104 M capital cost. Companies in other countries have faced similar advanced biofuel technology scale-up and commercialization challenges, including high feedstock cost, inconsistent feedstock properties, equipment non-performance, lower-than-anticipated yields, low fuel pricing, and the very large capital investments and facility required for fuels production commercial viability. Significant cost and fuel carbon intensity reductions in the conventional ethanol sector have also reduced the impetus for development of novel wood biofuels. None of the integrated cellulosic ethanol plants in the U.S. are operating successfully and numerous advanced biofuel technology company insolvencies, including Range Fuels, KiOR, and Abengoa in the U.S. and Choren in Germany, have reduced investor appetite.

Policy created an opportunity for advanced biofuels, but, to date, technology commercialization and scale-up has proven more difficult than anticipated. As an example, the U.S. Energy Security Act of 2005 specified a

blending requirement of over 60,000 ML/yr of cellulosic biofuel by 2022, with cellulosic ethanol anticipated to supply the vast majority of this volume. As of 2019, annual cellulosic ethanol production is below 25 ML/yr. Since all wood-to-liquid biofuels technologies are precommercial, they are not recommended for the RDCK.

REN Energy International has announced plans to develop a wood-to-biomethane plant in Fruitvale and has signed an offtake agreement with FortisBC. However, this offtake agreement should not be viewed as an indicator that FortisBC believes the project will be successful; it is simply an offer to purchase the biomethane if it is produced. The largest wood-to-biomethane facility completed to date is the C$225 M 20 MW_{th} GoBiGas project in Gothenburg, Sweden. The plant, which has been mothballed, involved the most experienced biomass gasification and engineering teams in the world but faced numerous challenges and was only able to operate continuously on wood pellets for less than 2,000 hours. The project report indicates a facility would need to consume 450,000 bdt/yr of whitewood chips to have a chance of being economically viable.[4] Even if a plant could operate commercially, the energy efficiency would be approximately half that of using wood directly in a boiler for heating and have a capital cost 10x that of a wood boiler. RDCK support of wood-to-biomethane is not recommended.

4.4 Heat Pumps

Heat pumps are characterized by increasing electrical loads in return for high efficiency, low carbon heating and cooling. Heat pumps can be installed into individual buildings or used in a centralized peak heating plant to upgrade water temperature for use in a DES. Use of biopower to operate heat pumps is an indirect form of bioenergy.

This summary covers three heat pump technologies which may be suitable for low carbon heating in the relatively dense cities of Castlegar and Nelson, and in the RDCK's other more remote communities:

- Air Source Heat Pumps
- Ground Source Heat Pumps
- Water Source Heat Pumps

Heat pumps can be owned by building owners or they can be operated by as a city utility with the heat pumps owned by a municipality. Large-scale (>5 MW_{th}) heat pumps are generally used for DE systems.

[4] Larsson A, Gunnasrsson I, Tengberg F. 2018. The GoBiGas project – demonstration of the production of biomethane from biomass via gasification. Göteborg Energi.

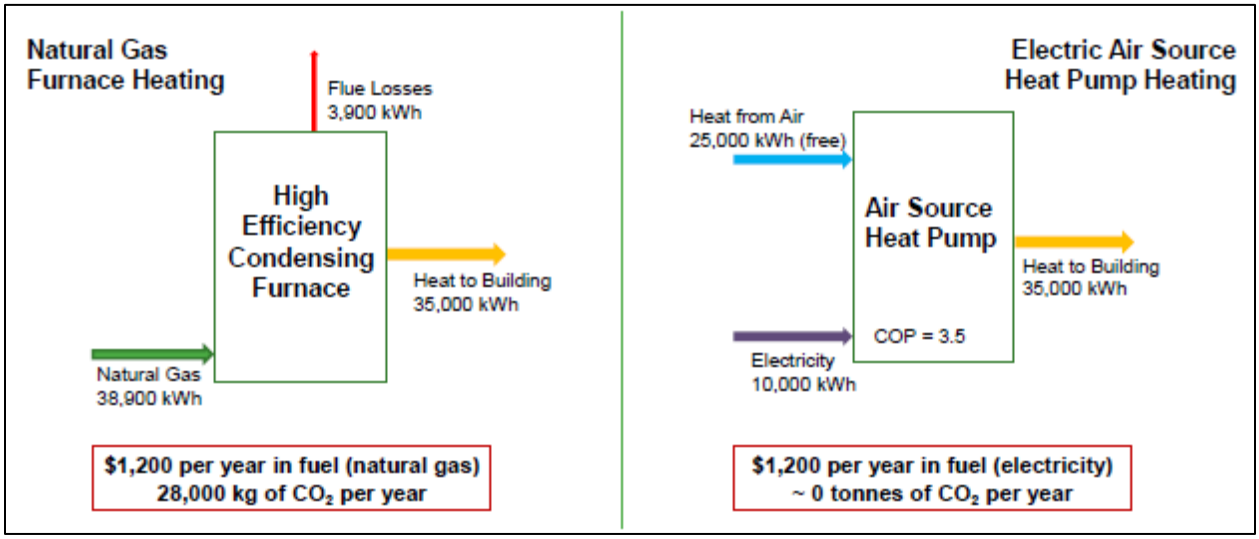
The Mercer Celgar "Celgar 550" investment presents an opportunity to lower the RDCK greenhouse gas emissions and produce electricity. This additional electrical generation could be utilized by heat pumps to further offset greenhouse gas emissions in the RDCK by offsetting fossil fuel use for heating in Castlegar.

4.4.1 Air Source Heat Pumps

Air source heat pumps (ASHP) operate by drawing energy from outside air. Heating efficiency is heavily dependant on the ambient outdoor air temperature and as outdoor air temperature declines in winter months, ASHP lose efficiency/capacity. ASHPs are typically well suited for connection to individual buildings. In the summer months, ASHPs can be run in a reversed operation to provide cooling/air conditioning.

Figure 20 below outlines an example comparison between the emissions of a typical ASHP and conventional natural gas furnace when used to heat a single building.

Figure 20. Natural Gas Furnace and Air Source Heat Pump Comparison



4.4.2 Ground-Source Heat Pumps/Geoexchange

An alternative to ASHP, ground source heat pumps (GSHP), also know as geoexchange, can be used to provide seasonal heating and cooling that is largely independent of outdoor ambient air temperature. Geoexchange operates on the principal of drawing/rejecting heat to and from the ground to through a fluid medium, typically water or a glycol/water mixture. This water/mixture is pumped through vertical or horizontal buried loops of piping to provide heating or cooling to the secondary side of the heat pump. Groups of buried geoexchange loops are referred to as "Geoexchange Fields".

Geoexchange fields have the benefit of being seasonally independent, as beyond a certain depth, ground temperatures are relative stable all year round regardless of the surface air temperature. Geoexchange fields typically have large footprints compared to other heat pump solutions, requiring more buried piping loops as heating/cooling loads increase. Additionally, the cost to install geoexchange fields is highly variable between different locations, as the geotechnical structure of the subsurface strongly impacts the complexity of laying the buried pipe loops. Land value of proposed field locations also strongly affects the cost of geoexchange heating/cooling solutions.

4.4.3 Water-Source Heat Pumps

While ASHP and GSHP can be theoretically installed anywhere with varying degrees of efficiency, water source heat pumps (WSHP) requires a significant water reservoir/source to draw heat from. This source heat can come from:

- Sewer main heat recovery, requiring specialized equipment in conjunction with WSHP to extract heat from sewer flows with temperatures on the order of 10 C.
- River/Lake water, such as the Columbia River that flows through Castlegar, or Kootenay Lake for shoreline communities such as Nelson.
- Waste industrial heat, such as the heat Mercer's Celgar pulp mill cooling water that is currently discharged into the Columbia River.

Each of the above WSHP heat sources could be utilized by RDCK's communities, depending on the water sources available to each community. In Castlegar for example, each technology could be implemented. River/Lake WSHP could draw heat from the very large flows in the Columbia River to heat individual residences that are situated near the river. Sewer heat recovery WSHP could be used to draw waste heat from the effluent in Castlegar's sewer mains/interceptors to heat buildings adjacent or near to the sewer mains.

WSHPs could also play a part in a distribution piping system such as the one previously mentioned between Mercer's Celgar mill and Castlegar's load centres. WSHPs could be used to upgrade the 42 °C wastewater temperature to higher temperatures as needed before being distributed to the load centres.

5 SUPPLY CHAIN AND OPERATIONS

As identified in Sections 3 and 4, industrial heating, individual building heat, and DE systems, heated with centralized bioheat or CHP plants, are the most viable approaches for bioenergy generation in the RDCK. Each of these three primary applications requires a unique biomass fuel supply chain that is appropriate for the

properties of the fuel(s) and technology utilized. The primary industrial heat opportunity is fuel switching from natural gas to hog fuel-based syngas in the lime kiln at Mercer Celgar. This would involve a redirection of hog fuel from Avista Kettle Falls to Mercer Celgar and result in a near three-fold increase in energy efficiency per tonne of feedstock.

5.1 Wood Pellet Production and Distribution Hubs

There is currently no wood pellet production in the RDCK, although a significant volume – likely more than 80,000 t/yr – of sawdust and shavings from mills in the RDCK is used to make wood pellets at plants in Lavington and Princeton. Although a long trucking distance, the cost is manageable as transportation is a backhaul of the primary wood chip delivery to Mercer Celgar. Multiple organizations and leaders in the RDCK have expressed an interest in establishing wood pellet production in the district, which could supply local consumers. While this is a possibility, the current lack of local demand makes financing and constructing a new pellet plant difficult. Currently, over 99% of British Columbia's wood pellet production is exported and almost all the plants were financed based upon overseas offtake agreements. The current backhaul situation with sawdust and shavings from Interfor, Kalesnikoff, and Mercer Celgar makes construction of a large pellet plant in the western part of the district supplying overseas markets quite unlikely. In the Creston area, small-scale pellet production could be considered if sufficient local demand was already present. For example, a 15,000 t/yr plant would need to have a market of 1,800 to 2,000 homes using pellets as the primary (boiler) fuel. A small-scale plant is unlikely to supply overseas markets and, in general, production costs will be higher per tonne than large plants due to poor economies-of-scale on capital and operations. However, targeting the residential pellet market, as compared to the industrial pellet market served by most pellet producers in BC, could make a pellet plant modestly viable. J.H. Huscroft and Wynnwood would be the primary feedstock suppliers. Taking into consideration the small volume of sawdust and shavings generated in the Creston area and the modest local wood pellet demand at present, a more likely scenario would be combining these feedstocks with feedstock from other mills in the Kootenay River valley for a large-scale plant near Cranbrook.

Most consumers know of bagged wood pellets, but for primary heating appliances, which meet all the space and hot water heat needs of a house or other type of building, the volume of pellet consumption makes bagged pellets physically demanding and, in many cases, impractical. Bulk residential delivery of wood pellets, which mirrors delivery of propane or heating oil, is very common in Europe and the Northeast U.S. Pellets are blown from a delivery truck into a bulk pellet storage hopper, which is usually located in the basement or garage (Figure 21). Storage can also be located underground or outside in durable bins. The combination of wood

pellet boilers and bulk delivery is the primary proven approach for replacing propane, heating oil, and electricity in homes not connected to DE systems.

Figure 21. Bulk Pellet Delivery

Although forest product producers in the RDCK do not foresee development of a pellet plant within the district in the near- to medium-term, the pellet plants in Lavington and Princeton have a combined capacity of over 410,000 t/yr. Given the distance from these plants to many buildings in the RDCK, direct delivery from the plant to homes is not likely to be economically viable. Instead, pellets could be trucked using high capacity (40 t) b-trains to strategically-located pellet storage hubs in the RDCK. Smaller local distribution bulk delivery trucks, carrying 12-18 t, could deliver pellets from these bulk hubs to homes and C/I buildings. Based upon a preliminary analysis, a three-hub network of New Denver, Castlegar, and Creston could supply almost all buildings in the RDCK with a maximum 100 km service area (Figure 22).

5.2 Hog Fuel Delivery for District Energy Systems

Bark-dominated hog fuel, produced by sawmills and the ATCO veneer mill, is the lowest cost wood fuel in the RDCK. Hog fuel can serve as a feedstock for bioheat and CHP plants larger than 500 kW_{th}, although it is typically used for projects 1 MW_{th} and up. In the RDCK, this will be predominantly DE systems rather than individual C/I buildings. Based upon the energy demand analysis, the most likely locations for DE systems that could use hog fuel are Nelson, Creston, Nakusp, Kaslo, and New Denver. The smaller centres of Silverton, Slocan, and unincorporated communities are more likely to use wood chips from harvest residues or wood pellets due to the fuel property requirements of smaller boilers. The closest sawmill to Nelson, Nakusp, Kaslo, and New Denver is the Kalesnikoff Lumber mill. A map showing transportation distances is presented in Figure 23. The identification of Kalesnikoff as a potential supplier is not intended to indicate a mill preference; the map simply shows the shortest hog fuel transportation distance for these communities. Hog fuel could be combined with chipped harvest residues to supply the same DE system energy centre.

Figure 22. Potential Pellet Hubs and Supply Areas

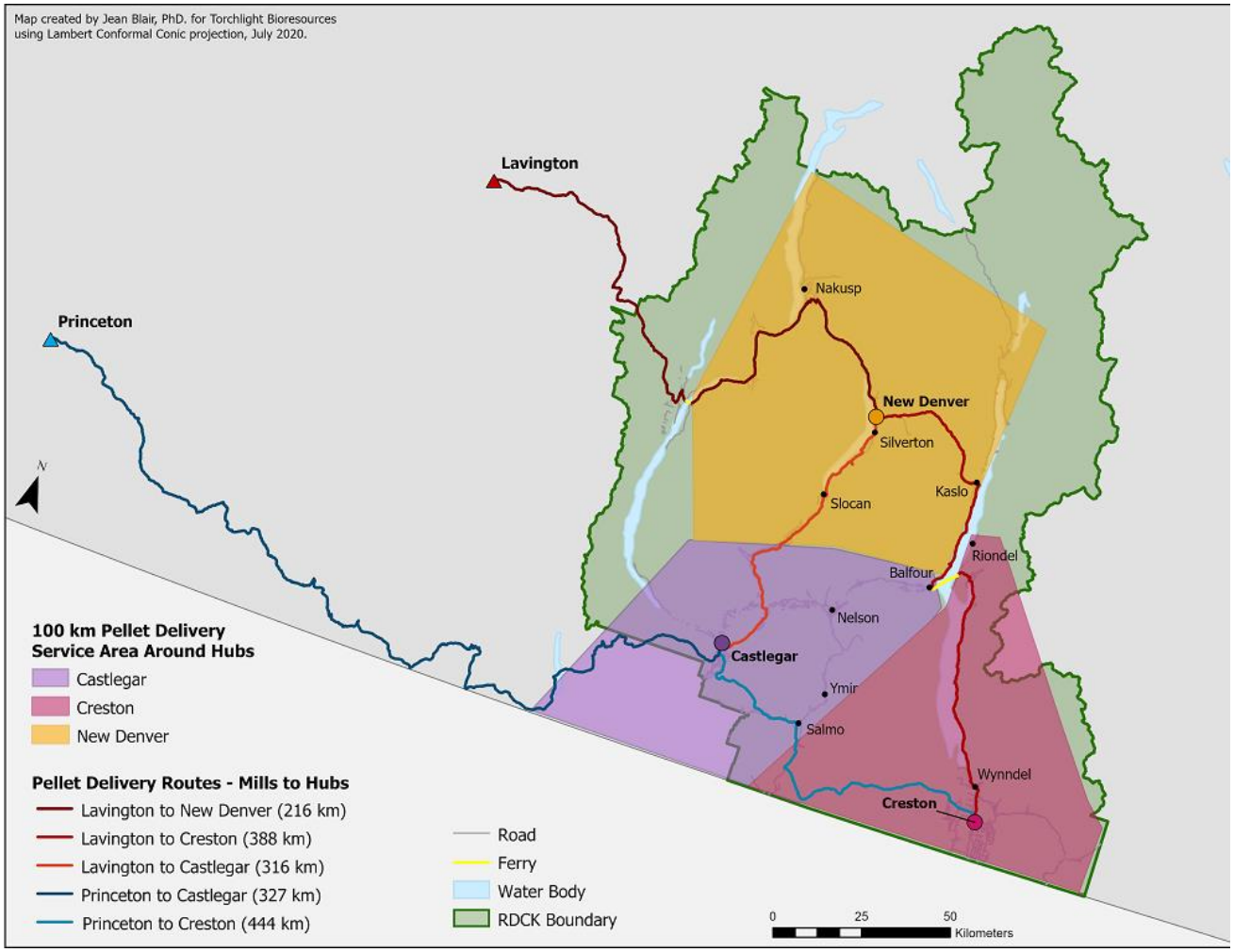
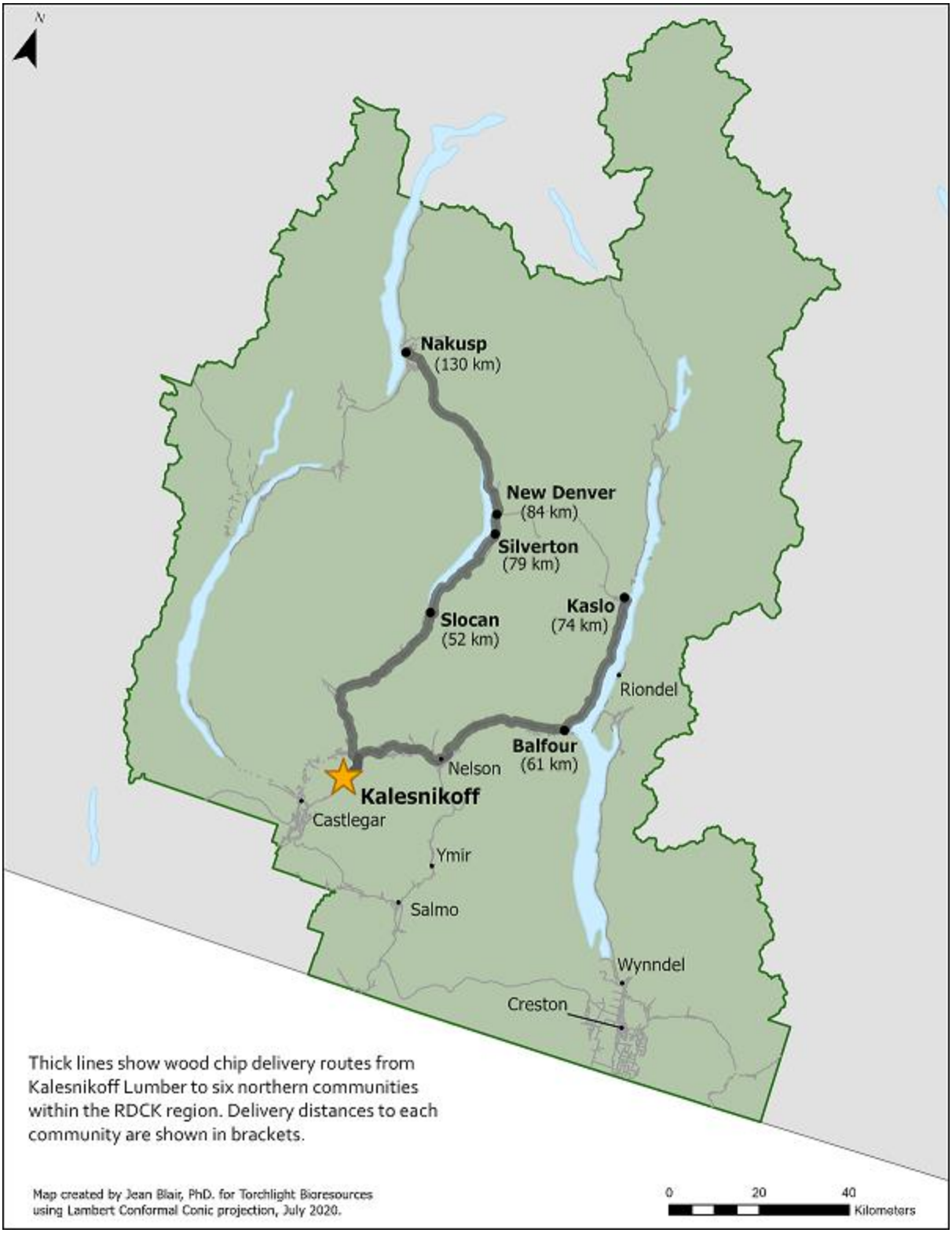


Figure 23. Hog Fuel Delivery Distances from Kalesnikoff Lumber



5.3 Harvest Residues

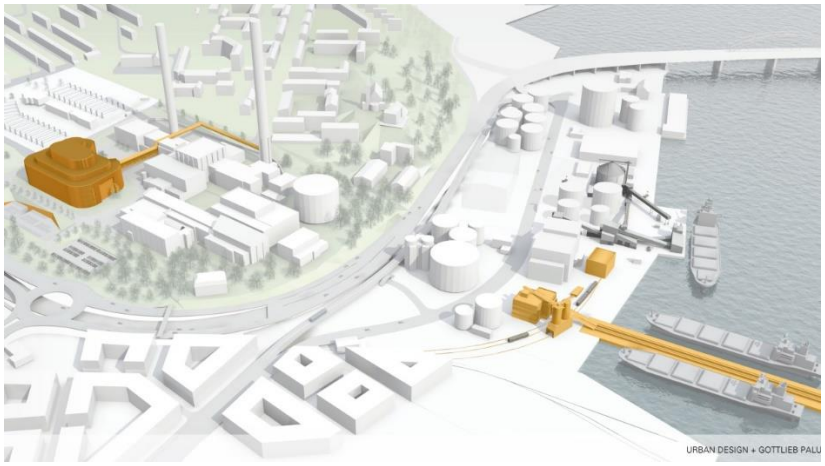
Collection and processing of harvest residues in RDCK is likely to be higher cost that many other regions of BC due to the challenging terrain. In discussions with mill operators, a delivered cost of $70-110/bdt was deemed reasonable. This is approximately $4-6/GJ, which means harvest residues, unlike hog fuel, do not provide a significant fuel cost savings relative to natural gas at current carbon price levels. Combined with a significantly higher capital cost, particularly for new DE systems, the business case for use of harvest residues to displace natural gas will be difficult. The primary caveat to this statement is if harvest residue collection is financially supported by other activities or a third party. The most promising source of funding to support harvest residue collection operations is the Forest Enhancement Society of British Columbia (FESBC), which has allocated $235 M for 250 fire risk reduction and forest improvement projects to date. Mercer's Celgar 550 initiative is the other major potential contributor to biomass residue collection support. Under Mercer's plan, 75% of the wood fibre collected from current harvest residues would be used for pulp production and the remaining 25%, which would be the bark-dominated stream, would be used for energy. This approach essentially uses the higher value pulp fibre to financially support collection of low-grade harvest residues.

Following discussions with forest operations managers in the region, the most likely operational approach to increase low-grade fibre removal from harvest sites is reducing the topping diameter to >2 inches and forwarding these 'rat tail' stems to a central chipping site. With the RDCK terrain and use of cable yarding, forwarding branches to a landing is likely infeasible at a significant number of cut blocks. Reducing the topping diameter is anticipated to permit the collection of the majority of currently discarded/burned material.

5.4 Large Urban Decarbonization

Copenhagen and Stockholm will be the first cities in the world to reach 'Net Zero' emissions and are both doing so using large, city-wide DE systems connected to central wood and waste-fuelled CHP plants. The 410 MW_{th} Värtaverket plant in downtown Stockholm consumes 1 million tonnes per year of wood residues, heats 190,000 residences, generates enough electricity for 150,000 electric vehicles, and reduces GHG emissions by 650,000 t CO_2e/yr. Approximately 40% of wood residues consumed by Värtaverket are delivered by rail and 60% are delivered by ship (Figure 23). Should Vancouver, Calgary, Surrey, or another large urban centre take the action required to significantly decarbonize, a large urban market for wood residues could be created. Rail transportation is the most likely method of delivery to downtown wood-fuelled CHP plants. However, Canadian cities have not, to date, taken the actions required for significant decarbonization and a large urban market for wood residues is not likely to be established in the near-term.

Figure 24. Stockholm Värtaverket Wood-Fuelled CHP Plant and Supply Chain



6 LEADING PROJECTS AND INITIATIVES

6.1 Overview

Based upon the assessment of wood fibre resources, RDCK energy market, energy demand by community, and provincial energy policy, five potential bioenergy projects/initiatives are considered worthy of further investigation. An initiative is defined as multiple small- or medium-scale energy projects of similar scope and technology approach (e.g., wood pellet boilers in multiple homes). These five projects/initiatives were presented to the RDCK Community Sustainable Living Advisory Committee (CSLAC) on August 18th, 2020.

1. **Wood Pellet Boiler Network**

   This initiative would seek to install 200 or more wood pellet boilers in homes and commercial/institutional buildings outside of towns and villages considered viable for DE. One or more bulk pellet supply hubs would be created within the RDCK, with New Denver proposed as the first potential site. Pellets would be delivered to storage depots from Lavington and/or Princeton in high capacity b-train trucks. Smaller bulk delivery trucks would deliver pellets to customers throughout the service area. The pellet boilers can be viewed as 'decentralized infrastructure' that is more applicable to rural areas than DE systems. Wood pellet boilers would significantly decrease the electricity demand in areas subject to power outages. The pellet boiler network could be combined with an initiative to install electricity storage (battery) infrastructure, resulting in a resilient heating system.

2. **District Energy in Castlegar**

   The large amount of waste heat released by Mercer Celgar into the Columbia River presents the most attractive DE opportunity in the RDCK. A DE system in Castlegar would require installation of a 5 km mainline hot water pipe from the pulp mill. While installation of the DE system would undoubtedly have a high capital cost, the fuel and operational costs of the system are likely to be significantly lower than natural gas. This would also lead to a large decrease in GHG emissions and make Castlegar a national leader in decarbonization. Numerous towns and cities in the EU are heated with pulp mill waste heat.

3. **Rural Community District Energy Systems**

   Developing DE systems in a number of small communities under the umbrella of a single project will provide economies-of-scale and make development more attractive to investors. Based upon a preliminary analysis, the most attractive small communities for DE development are Nakusp, Kaslo, New Denver, and Riondel. The first three of these have sufficient heat demand that a community-wide

DE system could be fuelled with low cost hog fuel. Riondel is likely to require wood pellets or high quality wood chips. In all cases, it should be recognized that DE systems are generally higher cost in communities with a low population density but that wood fuel is generally more competitive with propane and heating oil than natural gas.

4. **Urban District Energy in Creston and Nelson**

   Creston and Nelson have the highest building density of communities in the RDCK, which makes them potential candidates for downtown DE systems fuelled by hog fuel. Given their scale, co-generation of electricity for local demand is likely to improve the economics of development. While Nelson has the significantly larger number of large heat loads (buildings), Creston is home to the Columbia Brewery. The brewery needs process heat (steam) for brewing and other facility operations, which suggests a steam-based CHP plant could be an option. Condensed steam would provide the heat required for the hot water DE system. Both sites will be challenged economically due to the availability of low-cost natural gas.

5. **Mercer Celgar 550 and Gasifier**

   Mercer's plan to increase pulp production capacity would rely heavily on increased harvest residue utilization. In addition to economic benefits to the region and decreased slash pile burning, it would also result in a new stream of fuel-quality wood fibre being removed from harvest sites. Of the two potential bioenergy projects considered by Mercer, increased electricity production and displacement of lime kiln natural gas, it is the latter that will have much great GHG benefits and higher efficiency. Fueling the lime kiln with syngas generated from a hog fuel gasifier would be the equivalent of eliminating 100% of natural gas presently consumed by buildings in the RDCK. In contrast, additional electricity generation would add more electricity to an oversupplied market and would not result in any GHG reductions within the RDCK. The RDCK could have an important role to play by influencing provincial renewable gas policy.

Following a discussion and deliberation, CSLAC recommended projects/initiatives 1, 2, and 3 – wood pellet boilers, Castlegar DE, and rural community DE systems – be investigated further and described in greater detail. These are presented in Sections 6.3 – 6.5.

6.2 Potential RDCK Role in Nelson, Creston, and Mercer Celgar Projects

Development of DE systems in Creston and Nelson were not chosen to be in the top three due to the presence of low-cost natural gas in these larger centres and the difficulty for wood-fuelled DE systems to compete

economically with natural gas under current energy and carbon price markets/policies. Of the three larger urban centres in the RDCK with natural gas, Castlegar is considered the priority opportunity for DE development due to the waste heat generated by Mercer Celgar. Despite the economic challenges, Nelson Hydro is pursuing development of a small wood-fuelled DE system connecting several city-owned buildings in Nelson. This project has received some grant funding from the Government of Canada but may also require provincial support to be economically viable. The RDCK may want to support a City of Nelson and/or Nelson Hydro application for additional grant support (e.g., Investing in Canada Infrastructure Program/CleanBC). A DE system in Creston is likely to benefit from participation of the Labatt-owned Columbia Brewery, which requires steam for beer production. The brewery should be engaged from the start if Creston is interested in developing a DE system. However, like Nelson, substantial grant support is likely required to make a project economically viable.

The exclusion of Mercer Celgar 550 and lime kiln gasifier from the top three is not an indication of the merits of the projects but of the limited role for the RDCK in development. However, the RDCK could contribute to a positive investment decision by Mercer by engaging the provincial government on two fronts. The first is on grading (classification) of wood fibre and the stumpage associated with that fibre. An impediment to Mercer implementing full forest fibre utilization, which would increase the amount of wood, including harvest residues, delivered to Mercer Celgar, is the risk of low value wood being graded as sawlogs. This grading results in a much higher stumpage than pulpwood or biomass and can lead to uneconomical pulp production. The RDCK, working with Mercer, could consider advocating for changes to BC's stumpage system that would enable greater fibre removal from harvest blocks and a reduction in slash pile burning. This could be justified on the basis of both health and economic benefits to RDCK residents. The second role for RDCK is in advocating for equivalent policy treatment of syngas (H_2 & CO) and renewable natural gas/biomethane (CH_4). The Greenhouse Gas Reduction (Clean Energy) Regulation of the British Columbia Clean Energy Act permits FortisBC to purchase biomethane at prices of up to $30/GJ. However, this regulation does not permit FortisBC to purchase syngas or provide a financial incentive for syngas production/use. As discussed in Section 4.3, conversion of wood-based syngas to biomethane is precommercial, high capital cost, high technology risk, and results in a significant decrease in efficiency. Therefore, it is preferable both economically and environmentally for Mercer to consume wood-based syngas directly to replace natural gas rather than try to convert it into biomethane. If this syngas could flow through a dedicated pipeline owned by FortisBC, FortisBC signed renewable gas supply purchase and supply agreements with Mercer, and BC treated syngas and biomethane equivalently, fuel switching from natural gas to hog fuel would be economically attractive for Mercer. This project should be considered a priority for GHG reduction within the RDCK.

6.3 Wood Pellet Boiler Network

6.3.1 Purpose and Success

The wood pellet network would establish a local bulk wood pellet storage and delivery logistics system. This would be coupled with rapid adoption of wood pellet boilers in residential, commercial, and institutional buildings that could be operated collectively as a 'distributed utility'. Small DE networks of a few buildings, heated with small (<500 kW_{th}) central boilers, could also be wood pellet consumers. The focus would be on areas that lack natural gas access, are at risk of electricity supply disruptions, and have high rates of propane and heating oil consumption. This implies predominantly unincorporated areas in the RDCK. As an example, an initial distributed utility network of 200 boilers, with a capital cost of $5-6 M, could support broader adoption across the region and prove the business model.

Pellets would be delivered by large bulk trucks (b-train) from existing pellet mills in Lavington and Princeton to distribution hubs in the RDCK, with New Denver proposed as the first hub, followed by Castlegar and Creston. From these distribution hubs, small (e.g., 13-18 t) bulk pellet delivery trucks would deliver pellets to boilers in the pellet network. This bulk delivery approach is widespread in Europe and has been adopted in the U.S. northeast as well. Pellets delivered at a cost of $250/t is the equivalent of $14/GJ ($0.35/L) for propane or $60/MWh for electricity on a useful heat fuel cost basis.

6.3.2 Proposed Development Approach

Pellet boilers have a high capital cost relative to air-source heat pumps and propane and heating oil furnaces. The capital cost is generally lower than ground-source heat pumps. Over the 20-30 year life of a residential pellet boiler, the levelized cost of energy is usually lower than heating oil and electricity due to the lower fuel price of wood pellets. The need for a government-coordinated pellet network exists because building owners do not typically have a 20-30 year time horizon for ownership their building or boiler capital cost recovery. Government-owned DE system utilities are generally well understood, but DE systems will not be viable for rural, widely distributed buildings. The proposed wood pellet network has many similarities to DE system heat utilities, but without the pipes connecting each building. In this regard, the wood pellet network of many individual boilers at separated buildings could be considered a decentralized or distributed utility.

In order for wood pellet boilers to be widely adopted in a short time period, a development approach that requires little or no building owner investment is required. The proposed approach is to source infrastructure funding from the Governments of British Columbia and Canada, likely via the Investing in Canada Infrastructure Program, to cover 73.3% of the capital cost of the boilers, wood pellet storage, and bulk delivery truck(s). The

remaining 26.7% of the capital cost could be financed by debt from the Municipal Finance Authority of BC or a private sector partner. The rate of return of the private sector financing partner could be fixed under the terms of a partnership or concession agreement.

It is recommended that boiler installations and network operation be carried out by a publicly-owned utility company managed by a contracted party or by the private sector financing partner. The RDCK could be the sole shareholder of the distributed utility company or ownership could be shared with municipalities in the region. Given the costs of operating and managing a utility company, it is recommended that small rural municipalities collaborate with the RDCK and each other, rather than seek to establish a separate utility corporation for each municipality.

6.3.3 Role of the RDCK

As most of the buildings that are not candidates for connection to DE systems are in unincorporated areas, the RDCK is the local representative government. Even for wood pellet-heated buildings within small, rural incorporated municipalities, it is logical for the RDCK to play a leadership role in utility creation and oversight due to the pellet network spanning multiple municipalities. The RDCK could seek to bring together multiple municipalities to become shareholders in a single, region-wide 'Central Kootenay Bioheat Utility' (CKBU). The RDCK can serve as a shareholder of the CKBU, with a specific focus on representation of unincorporated areas. Incorporated municipalities can also be shareholders in the CKBU. The board of directors of the CKBU would be composed of representatives from the public shareholders, along with potential independent directors. Achieving scale with the CKBU would permit professional energy managers and staff to be hired to operate the utility. If each municipality sought to establish its own heat utility, they would be unlikely to have sufficient revenues to justify dedicated utility staff and would therefore have to rely upon existing municipal staff.

For the pellet heat network to succeed, the RDCK needs to lead efforts to secure bioheat infrastructure grant funding from federal and provincial governments. The high upfront cost of pellet boilers will inhibit adoption in the absence of grant funding. Project planning and grant applications can be done using internal resources or selecting a preferred private sector development partner to secure the grants. As a precedence example, TorchLight Bioresources secured $2.8 M from the Government of Ontario for the Municipality of Dysart et al in Ontario to develop a bioheat utility. This funding flowed to the municipality and TorchLight was able to prepare the grant funding application and required prefeasibility study without a cash cost to the Municipality of Dysart et al due to agreement between the municipality and TorchLight on selection of TorchLight as the private sector development partner in the event of a successful grant application.

6.4 District Energy in Castlegar

6.4.1 Purpose and Success

Castlegar has a unique opportunity to utilize, via a DE system, the waste heat of the Mercer Celgar pulp mill to displace natural gas in building heat supply. As the cost of waste heat is anticipated to be low, the primary hurdle to DE development is the high capital cost – particularly given the 3.5 km distance between Mercer Celgar and Castlegar. The system would use a heat pump to boost the temperature of the mill waste heat prior to distribution to buildings in the City of Castlegar if the 42 C discharge water from Mercer Celgar was used as the primary heat source. With an infrastructure grant from the federal and provincial governments, waste heat DE in Castlegar is anticipated to have a lower levelized cost of energy than natural gas.

A DE system in Castlegar is likely to be developed in stages, with the first stage consisting of the main supply line from Mercer Celgar to Castlegar and connection of major commercial and institutional buildings near City Hall. The supply of heat from Mercer Celgar is dramatically higher than all the building energy demands of Castlegar, making access to capital for infrastructure expansion the key determinant for system expansion to other large buildings and ultimately, single family detached homes. A Castlegar DE system would generate income for the City and make it a national leader in decarbonization.

6.4.2 Proposed Development Approach

A full feasibility study is required to determine the capital and operating costs of a multi-stage DE development in Castlegar. Currently, the Federation of Canadian Municipalities (FCM) offers grant funding to cover 50% of the costs of DE feasibility studies. For the remaining 50%, Natural Resources Canada offers grant funding via the Investments in Forest Industry Transformation (IFIT) fund for forest industry participants to complete feasibility studies on bioenergy and bioproduct developments. Mercer Celgar would be eligible for this fund. While these together total 100% of study costs, FCM requires municipalities to contribute 10% of the cash costs of feasibility study completion. Given the potential large income and decarbonization potential, it is recommended the City of Castlegar contribute this 10%, which is likely to be between $35,000 and $40,000. If FCM grant applications are prepared by the City of Castlegar and Mercer Celgar, a competitive process could be held to select a feasibility study team. Alternatively, a consulting team could prepare the grant funding applications, with the understanding they would be awarded the work upon acceptance of the proposals by FCM and Natural Resources Canada. Mercer Celgar may have a preferred consultant, in which case the City of Castlegar may wish to follow Mercer Celgar's recommendation.

Upon completion of the DE feasibility study and a positive business case outcome, the consulting team, in collaboration with the City of Castlegar, Mercer Celgar, and potentially, the RDCK, could prepare an application for infrastructure grant funding. The most likely source of a public infrastructure grant for a waste heat DE system is the CleanBC/Investing in Canada Infrastructure Program. This program provides 73.3% of infrastructure capital costs as a grant if funds flow to municipalities or regional districts. More federal infrastructure funding may be available as part of a COVID-19 economic recovery plan. It is recommended that a competitive process for a private sector development partner occur prior to application for grant funding.

The recommended business structure is a 100% municipal and/or regional district-owned heat utility, with development, construction, operation, and maintenance by a private sector partner. The private sector partner would also be responsible for financing 26.7% of the project capital cost. Full public sector ownership of the DE assets is possible via a multi-decade concession agreement with the private sector partner. This concession agreement would detail the permitted rate of return on capital deployed and terms for recovering operation and maintenance expenses from the customer base. The concession agreement could include a clause to permit the City of Castlegar to take over operation and maintenance of the DE system in the future. Potential DE finance, development, operation, and maintenance partners include:

- CreativEnergy – owner of Vancouver DE system and backed by investment fund InstarAGF
- Corix – BC Investment Management Corporation entity and active DE developer/operator in BC
- Enwave – Brookfield Infrastructure company; owner of Toronto, Seattle, and London, ON DE systems
- Anbaric – DE investment vehicle for Ontario Teachers Pension Plan
- Engie – French utility company with concession to develop and operate Ottawa DE system

6.4.3 Role of the RDCK

Development of a DE system in Castlegar will require an active leadership role by the City. However, the RDCK could ensure a development in Castlegar benefits smaller, rural communities in the district by linking the financing, development, and operation of a Castlegar DE system with that of smaller DE systems in the district. This inclusion of multiple systems under a single development and ownership umbrella could be accomplished by requiring the private sector partner to participate in the development multiple systems and/or include the Castlegar DE system as an asset of the Central Kootenay Bioheat Utility. As with the Alectra Utilities, which is an electrical utility in Ontario owned by multiple cities and municipalities, the City of Castlegar would likely have a larger shareholding than smaller municipalities due to the higher value of the assets in the City than smaller centres.

6.5 Rural Community District Bioenergy Systems

6.5.1 Purpose and Success

Numerous rural communities in Central Kootenay lack access to natural gas, resulting in use of high cost propane, heating oil, and electricity for building heat. Several small population centres, including Nakusp, Kaslo, New Denver, Riondel, and Silverton, could establish wood-fuelled DE systems to lower energy costs, reduce GHG emissions, and improve air quality for residents, businesses, and institutions. To keep delivered energy cost low, the dominant fuel is likely to be hog fuel from sawmills, although harvest residues may be feasible – particularly if FESBC financial support is secured. Community DE systems fueled by low-grade wood fibre would also reduce community reliance on electricity and could be operated during power outages with modest electricity backup for pumps. The small number of commercial/institutional buildings in most rural communities means single family detached homes are likely to be connected to the system from the start.

Successful rural community DE systems would improve the energy security of communities while ensuring energy expenditures stay in the community. Establishing an alternative market for sawmill hog fuel would also support the forest industry in the district and reduce the industry's reliance on the Kettle Falls, WA power plant. The rural community DE systems would be complementary to the wood pellet boiler network and the preferable bioheat approach – DE system or individual building boiler – would be determined on a building-by-building basis. As an order-of-magnitude example, the capital cost of a bioheat energy centre and DE system connecting 50 buildings may be in the order of $4-5 M. The capital cost will likely be higher per building than individual boiler installation, but the scale of a multi-building DE system permits the use of much lower cost fuel (hog fuel) than wood pellets. Hog fuel at $15/t has a useful heat cost of $1.50/GJ or $5.50/MWh.

6.5.2 Proposed Development Approach

As with a Castlegar DE system, DE systems in rural communities will also need full feasibility studies to secure infrastructure grant funding. Given the small scale of these systems, it is recommended that systems in multiple communities be included within the scope of a single feasibility study. While other sources of funding, such as Natural Resources Canada's Clean Energy for Rural and Remote Communities fund, are available to cover the costs of a full feasibility study, the most likely sources are the same as the proposed Castlegar DE feasibility study: FCM Green Municipal Fund DE study stream and Natural Resources Canada's Investments in Forest Industry Transformation fund. In the case of IFIT funding, the most likely forest industry lead is not Mercer Celgar but the solid wood product mills: Interfor, Kalesnikoff Lumber, Porcupine Wood Products, Wynnwood (Canfor), J.H. Huscroft, and ATCO Wood Products. Based upon the scale of operation and mill

proximity to potential rural DE communities, Interfor and Kalesnikoff are recommended as the two primary industry partner options.

Following completion of a feasibility study and upon identifying an attractive business case for one or more DE systems, infrastructure funding can be sought from the Investing in Canada Infrastructure Program. In addition to the 'Green Stream', which is an option for all bioheat projects, rural community DE projects would also be eligible for the 'Rural and Northern Communities Stream'. While an application to the Green Stream could include multiple DE systems under a single proposal, the funding limit cap for the Rural and Northern Communities Stream makes individual DE system applications more likely.

The administrative, management, and personnel costs of a single small rural community DE system will be high compared to larger systems. To benefit from economies-of-scale and ensure energy prices are as low as possible for consumers, it is recommended multiple systems be managed by a single utility company. As identified, a Central Kootenay Bioheat Utility corporation could own multiple bioheat DE systems in addition to distributed utility individual building boilers. Municipalities hosting a DE system would be shareholders in the utility, with RDCK acting as shareholder for unincorporated areas.

Similar to the Castlegar DE system, rural community DE systems could be co-financed, developed, constructed, operated, and maintained by a private sector entity. This could include First Nations-owned companies. To attract large DE operators to small communities in Central Kootenay, it is likely necessary to utilize a single concession agreement for multiple systems to achieve sufficient scale, lower specific transactions costs, and make investment feasible.

6.5.3 Role of the RDCK

The RDCK is the entity that can make economies-of-scale in rural DE system development possible by bringing together multiple communities, incorporated and unincorporated, under a single umbrella. This should result in lower heating costs for all residents and businesses connected to the systems than would be the case if each system operated as its own utility corporation. The RDCK's involvement is also essential for residents and businesses in unincorporated communities to participate in DE development, since the RDCK is the most local/lowest level of government for these communities. The human resources and management capacity of the RDCK is also likely to exceed that of many small communities.

6.6 Summary Recommendations

Based upon this analysis of the Central Kootenay forest sector, energy systems and markets, and potential projects, the following five actions by the RDCK are recommended:

1. **Seek infrastructure funding for a distributed wood pellet bioheat utility**

   The CleanBC/Investing in Canada Infrastructure Program is the most likely source of grants, although new funds may be made available in support of COVID-19 economic recovery. Selecting a private sector preferred distributed utility development partner early in the process is recommended. The private sector partner should lead completion of a prefeasibility study on the wood pellet network prior to grant application.

2. **Support feasibility studies for rural district energy systems**

   Similar to recommendation #1, infrastructure funding is required to economically develop small district energy systems in rural communities such as Nakusp and Kaslo. However, a full feasibility study, including DE system layout and engineering, is necessary to apply for infrastructure funding. The RDCK should select a preferred partner to secure grant funding, which would cover 90% of project costs, from FCM and Natural Resources Canada to complete these feasibility studies. The RDCK would need to provide the remaining 10%, as per FCM rules. Ultimately, the partner could also work with the RDCK to secure infrastructure funding. The DE systems, along with the wood pellet boilers, can be included as assets of the Central Kootenay Bioheat Utility.

3. **Support a feasibility study for a Castlegar district energy system**

   Working with Mercer Celgar and the City of Castlegar, the RDCK can support the completion of a feasibility study on a pulp mill waste heat-fuelled DE system in Castlegar. A DE development partner, likely with access to institutional capital, should be selected via a competitive process after engineering feasibility study completion. The most likely feasibility study funding approach is similar to the rural DE systems, with 90% of costs covered by FCM and Natural Resources Canada, although it is the City of Castlegar that would be the preferred 10% study cost contributor instead of the RDCK.

4. **Engage with Mercer Celgar on Celgar 550 and lime kiln gasifier advocacy**

   While Mercer Celgar will be the owner and operator of developments at the pulp mill, the RDCK can play an important role in moving these projects forward. Both are challenged by provincial policy design and the RDCK could advocate for changes based upon the potential benefits of the projects to residents of the RDCK. The place to start is a conversation with Mercer on the provincial policy changes the company wishes to see enacted.

5. Create a publicly-owned Central Kootenay Bioheat Utility corporation

Involvement of the RDCK in bioheat sector development in the district will be best handled by an arm's length utility corporation tasked with developing, owning, and operating (potentially by private partners) assets. These include both DE systems and individual building boilers. The CKBU Corporation could initially be 100% owned by the RDCK, but municipalities could become shareholders as DE systems were developed and added to the inventory of assets.

APPENDIX A: SUMMARY OF RECOMMENDED PROJECTS

Project	Proposed Development Approach	Role of the RDCK	Funding Requirements & Actions
Pellet Boiler Network	• Complete feasibility study and business plan for installation and operation, including bulk fueling, of 200 boilers • Apply for infrastructure funding from CleanBC/Investing in Canada Infrastructure Program (Green or Rural and Remote Streams)	• RDCK would establish a Central Kootenay Bioheat Utility (CKBU) company, with RDCK and municipalities as shareholders • Develop business plan internally, by contracting consultants, or by selecting preferred utility company partner via RFP – with selected partner completing business plan	• If RDCK wants to contract a consultant for the business plan, likely ~$100,000 • If RDCK wants to develop CKBU with partner, launch RFP to select preferred partner • CleanBC application for 200 boilers, bulk storage, and truck likely $3.7-4.4 M (73.3% of total project cost)
District Energy in Castlegar	• Complete feasibility study for multiple zone, staged DE build-out using waste heat from Mercer Celgar • DE system to be 100% publicly owned, but potential private partner co-financing, developing, operating, maintaining • Apply for infrastructure funding from CleanBC/ICIP (Green Stream)	• Engage with Mercer Celgar on heat supply and support City of Castlegar in selection of consultants • Encourage City of Castlegar to be major shareholder of CKBU and include the Castlegar DE system as an asset of the utility company • Assist in selection of private partner (if desired)	• Establish MOU with Mercer on heat supply and feasibility study • Mercer to submit IFIT study funding application to NRCan (50% of study cost) • City of Castlegar to submit DE feasibility study funding application to FCM (40% of study cost) • 10% ($35,000 – 40,000) of costs must be covered by City of Castlegar and/or RDCK • CleanBC application likely >$15 M
Rural Community District Bioenergy	• Complete biomass heat (wood chip) DE feasibility studies for multiple rural communities • Apply for infrastructure funding (e.g., $15 M) from CleanBC/ICIP (Green or Rural and Remote) • Municipalities to be shareholders in CKBU	• RDCK to lead process to complete multiple DE utility feasibility studies • Establish relationship with preferred feedstock supplier(s) • Incorporate CKBU and represent unincorporated communities as shareholder	• Establish MOU with wood chip fuel supplier(s), with Interfor and Kalesnikoff most likely • Fuel supplier to submit IFIT application • RDCK to submit FCM application • 10% ($35,000 – 40,000) of costs for four systems must be covered by RDCK
District Energy in Nelson & Creston	• Development of downtown (high building density) wood-fuelled biomass CHP & DE systems in Nelson and Creston	• Support Nelson and Creston as required • Consider inclusion of DE systems as asset of CKBU; Nelson and Creston as shareholders	• Feasibility studies can be funded using a combination of IFIT and FCM grants (90%), combined with 10% from municipalities
Mercer Celgar 550 and Gasifier	• Mercer desires to increase pulp capacity and fuel switch lime kiln from natural gas to hog fuel and harvest residues • The lime kiln gasifier would be the largest GHG reduction project in Central Kootenay, while Celgar 550 would reduce slash pile burning	• Engage with Mercer to determine provincial policy change requirements: 1) Greenhouse Gas Reduction (Clean Energy) Regulation of the British Columbia Clean Energy Act for equal treatment of syngas and biomethane; 2) harvest residue grading and stumpage	• No funding from RDCK required • Advocate for provincial policy change on behalf of Central Kootenay residents that would benefit environmentally and economically from reduce slash pile burning and fuel switching away from natural gas

ATTACHMENT B: SUMMARY OF RECOMMENDED PROJECTS

Project	Proposed Development Approach	Role of the RDCK	Funding Requirements & Actions
Pellet Boiler Network	• Complete feasibility study and business plan for installation and operation, including bulk fueling, of 200 boilers • Apply for infrastructure funding from CleanBC/Investing in Canada Infrastructure Program (Green or Rural and Remote Streams)	• RDCK would establish a Central Kootenay Bioheat Utility (CKBU) company, with RDCK and municipalities as shareholders • Support development of a residential pellet market • Develop business plan internally, by contracting consultants, or by selecting preferred utility company partner via RFP – with selected partner completing business plan	• If RDCK wants to contract a consultant for the business plan, likely ~$100,000 • If RDCK wants to develop CKBU with partner, launch RFP to select preferred partner • CleanBC application for 200 boilers, bulk storage, and truck likely $3.7-4.4 M (73.3% of total project cost)
District Energy in Castlegar	• Complete feasibility study for multiple zone, staged DE build-out using waste heat from Mercer Celgar • DE system to be 100% publicly owned, but potential private partner co-financing, developing, operating, maintaining • Apply for infrastructure funding from CleanBC/ICIP (Green Stream)	• Engage with Mercer Celgar on heat supply and support City of Castlegar in selection of consultants • Encourage City of Castlegar to be major shareholder of CKBU and include the Castlegar DE system as an asset of the utility company • Assist in selection of private partner (if desired)	• Establish MOU with Mercer on heat supply and feasibility study • Mercer to submit IFIT study funding application to NRCan (50% of study cost) • City of Castlegar to submit DE feasibility study funding application to FCM (40% of study cost) • 10% ($35,000 – 40,000) of costs must be covered by City of Castlegar and/or RDCK • CleanBC application likely >$15 M
Rural Community District Bioenergy	• Complete biomass heat (wood chip) DE feasibility studies for multiple rural communities • Apply for infrastructure funding (e.g., $15 M) from CleanBC/ICIP (Green or Rural and Remote) • Municipalities to be shareholders in CKBU	• RDCK to lead process to complete multiple DE utility feasibility studies • Establish relationship with preferred feedstock supplier(s) • Incorporate CKBU and represent unincorporated communities as shareholder	• Establish MOU with wood chip fuel supplier(s), with Interfor and Kalesnikoff most likely • Fuel supplier to submit IFIT application • RDCK to submit FCM application • 10% ($35,000 – 40,000) of costs for five systems must be covered by RDCK
District Energy in Nelson & Creston	• Development of downtown (high building density) wood-fueled biomass CHP & DE systems in Nelson and Creston	• Support Nelson and Creston as required • Consider inclusion of DE systems as asset of CKBU; Nelson and Creston as shareholders	• Feasibility studies can be funded using a combination of IFIT and FCM grants (90%), combined with 10% from municipalities
Mercer Celgar 550 and Gasifier	• Mercer desires to increase pulp capacity and fuel switch lime kiln from natural gas to hog fuel and harvest residues • The lime kiln gasifier would be the largest GHG reduction project in Central Kootenay, while Celgar 550 would reduce slash pile burning	• Engage with Mercer to determine provincial policy change requirements: 1) Greenhouse Gas Reduction (Clean Energy) Regulation of the British Columbia Clean Energy Act for equal treatment of syngas and biomethane; 2) harvest residue grading and stumpage	• No funding from RDCK required • Advocate for provincial policy change on behalf of Central Kootenay residents that would benefit environmentally and economically from reduce slash pile burning and fuel switching away from natural gas

CSLAC Watershed Governance Initiative Workshop

October 13, 2020

Purpose	Deliverables
• Reaffirm common agenda, clarity about where we are going and a sense of inspiration for future work	• Agreement on direction of the WGI project • Agreement on how to proceed

Activity
What do we know? – lay out the problem statement, issues and concerns. Reference the Scoping Study report, Act Now survey results, meeting notes Goal – to (re) establish common foundation
What do we want to do? – present a vision for the WGI – what is it we are working towards.
Small group discussion of the vision for how to protect watersheds where drinking water sources are at risk Goal – ensure the proposed WGI plan aligns with CSLAC vision
How will we get there? What is the proposed approach? Present the approach developed with focus on providing accessible information, building relationship and sharing knowledge
Large group discussion of proposed approaches Goal – get support for project plan with Act Now response
Wrap up with process of next steps & review of recommendation/August resolution

Watershed Governance Initiative
Project Workshop
October 2020

Goals for today

Establish common understanding of :

1. **challenges and pressures** facing drinking water watersheds: what do we know?

2. **vision** for how to respond: what do we want to do?

3. **pathways** for how to move towards that vision, both short and long term: strategies for success

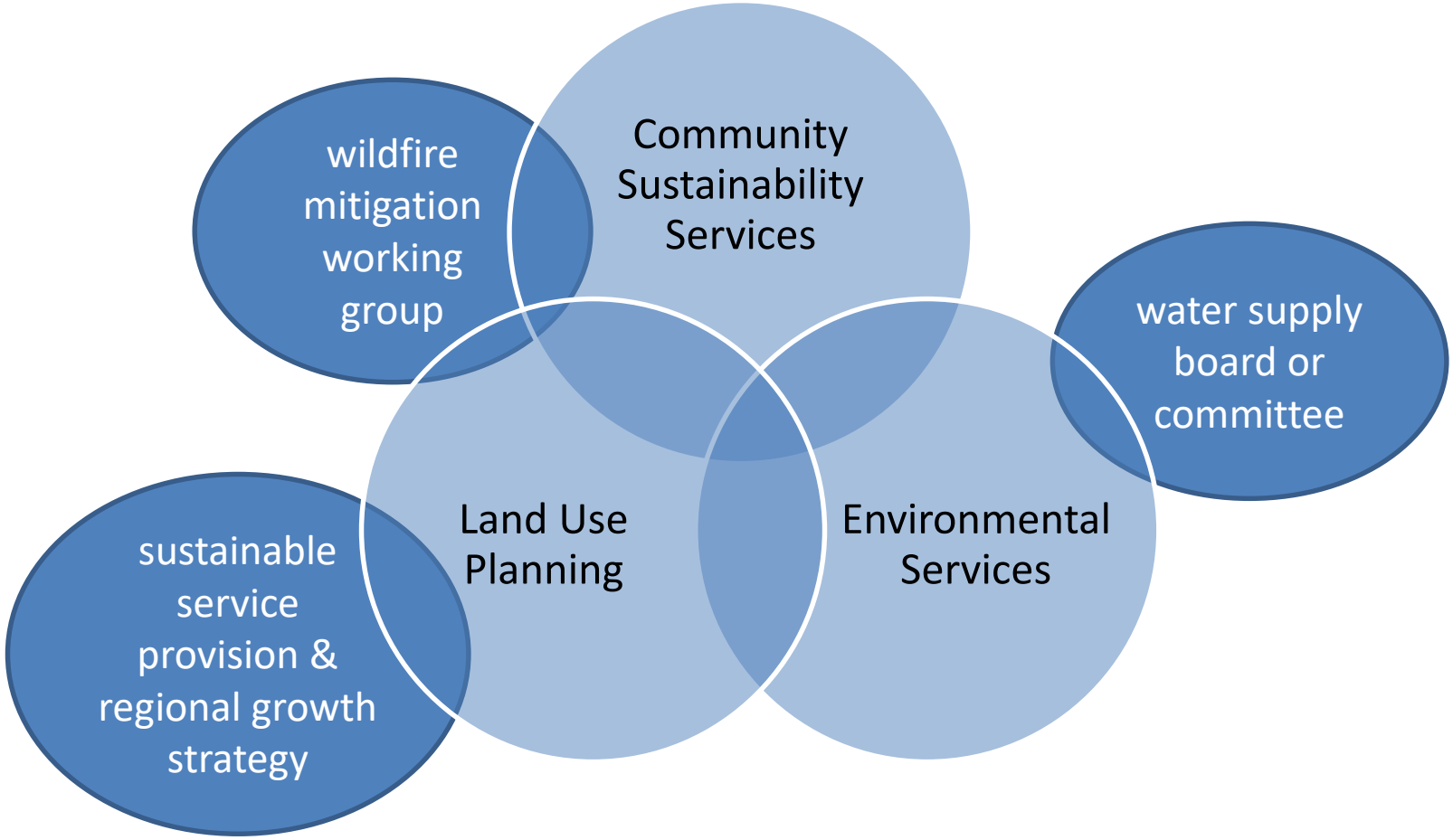
What do we know?

- RDCK represents a land mass that is diverse & large:
  - 3 major watersheds – Pend D`oreille, Columbia, Lower Kootenay
  - Possibly the region with greatest number of source water sources in the province

- Currents systems for land use planning are not working
  - 2014 Water Sustainability Act is inactive and limited as it does not recognize Indigenous rights, Drinking Water Protection Plans exist but are difficult to enact, Crown land use planning doesn`t support collaborative decision making

What do we know?

What do we know?



What do we know?

In lieu of specific guidance from the Province, how does the RDCK influence land use?

1. Identify clear and documented need;
2. Enable coordination and collaboration among the community; and,
3. Support respectful relationships with other levels of government, including First Nations

What do we want to do?

The Regional Watershed Governance Initiative Scoping Study is investigating the RDCK`s role in watershed governance with the primary intent and goal to protect watersheds where consumptive water sources are at risk

What do we want to do?

Create conditions to support collaborative decision-making

1. Create internal capacity within the RDCK organisation to support the following recommendations – in process
2. Strengthen relationships with partners and community – in process
3. Create a cross-jurisdictional and multi-stakeholder forum to support improved collaboration in watershed management – drafting the Terms of Reference
4. Develop an action plan for a regional watershed initiative stakeholders – 2021
5. Pursue sustainable funding for a regional watershed initiative – Community Works Funding can support the WGI budget

What do we want to do?

Create conditions to support collaborative decision-making:

a. Create internal capacity within the RDCK organisation to support the WGI Report`s recommendations

b. Roll out 3-year plan based on:

   1. building relationships,
   2. creating cross-jurisdictional and multi-stakeholder forum to support improved collaboration in watershed management
   3. develop an action plan for a regional watershed initiative
   4. pursue sustainable funding for a regional watershed initiative

c. Act now

What do we want to do?

WHAT IS YOUR VISION FOR HOW TO PROTECT WATERSHEDS WHERE CONSUMPTIVE WATER SOURCES ARE AT RISK?

OPPORTUNITY TO SHARE YOUR VISION –
BREAK INTO SMALL GROUPS TO DISCUSS YOUR VISION

20 minute discussion

How do we get there? (with a reminder of where we have been)

May 2018
RDCK elected officials participate in an afternoon workshop with the POLIS Water Sustainability Project

June to November 2018
Staff prepare the project plan and scope of work for Watershed Governance Initiative (WGI)

June 2018
RDCK Board directs staff to "develop a Regional Watershed Governance Initiative project plan and identify an allocation for GMDS and SC time to implement the project plan for consideration in the draft 2019 five year financial plan with General Administration S100``

December 2018 Staff present WGI plan and are directed to ``seek funding to **launch and coordinate a scoping study to better understand the potential watershed governance roles and responsibilities of the RDCK**; with areas for the study to be determined by the Community Sustainable Living Advisory Committee at the January committee meeting``

February 2019, the RDCK Board approves "funds in the amount of $26,250 from S105 Community Sustainable Living Advisory Service for the Watershed Governance Initiative scoping study, to complement the work being done in Area H and I's ground water studies, for the following watersheds:

Bourke, Sitkum & Duhamel Community Watershed (Area F); Arrow Creek Community Watershed (Area B); Ymir Community Watershed (Area G); Argenta Watershed (Area D); Harrop (Area E); and, Deer Creek (Area J)"

June 2019
$18,750 received from the Real Estate Foundation (REF) for WGI Scoping Study

June to November 2019
Elucidate Consulting complete the RDCK Watershed Governance Initiative Report

December 2019
RDCK Board and staff participate in a workshop to discuss recommendations the Report & provide feedback to consultants

April 2020
Final WGI report received & staff are directed ``to prepare a workplan to determine the organizational capacity of the Community Sustainability Services and Water Services staff to pursue the recommendations of the RDCK Regional Watershed Governance Initiative report dated January 2020.

How do we get there? (with a reminder of where we have been)

April 2020
Final WGI report received & staff are directed ``to prepare a workplan to determine the organizational capacity of the Community Sustainability Services and Water Services staff to pursue the recommendations of the RDCK Regional Watershed Governance Initiative report dated January 2020.

August 2020
That the Board direct staff to pursue a community collaborative planning pilot, in watersheds of identified need, as a part of the Watershed Governance Initiative Act Now response, that will include community members, First Nations, and stakeholders of associated government agencies to assess immediate needs and with recommendations that lead to a watershed protection plan.

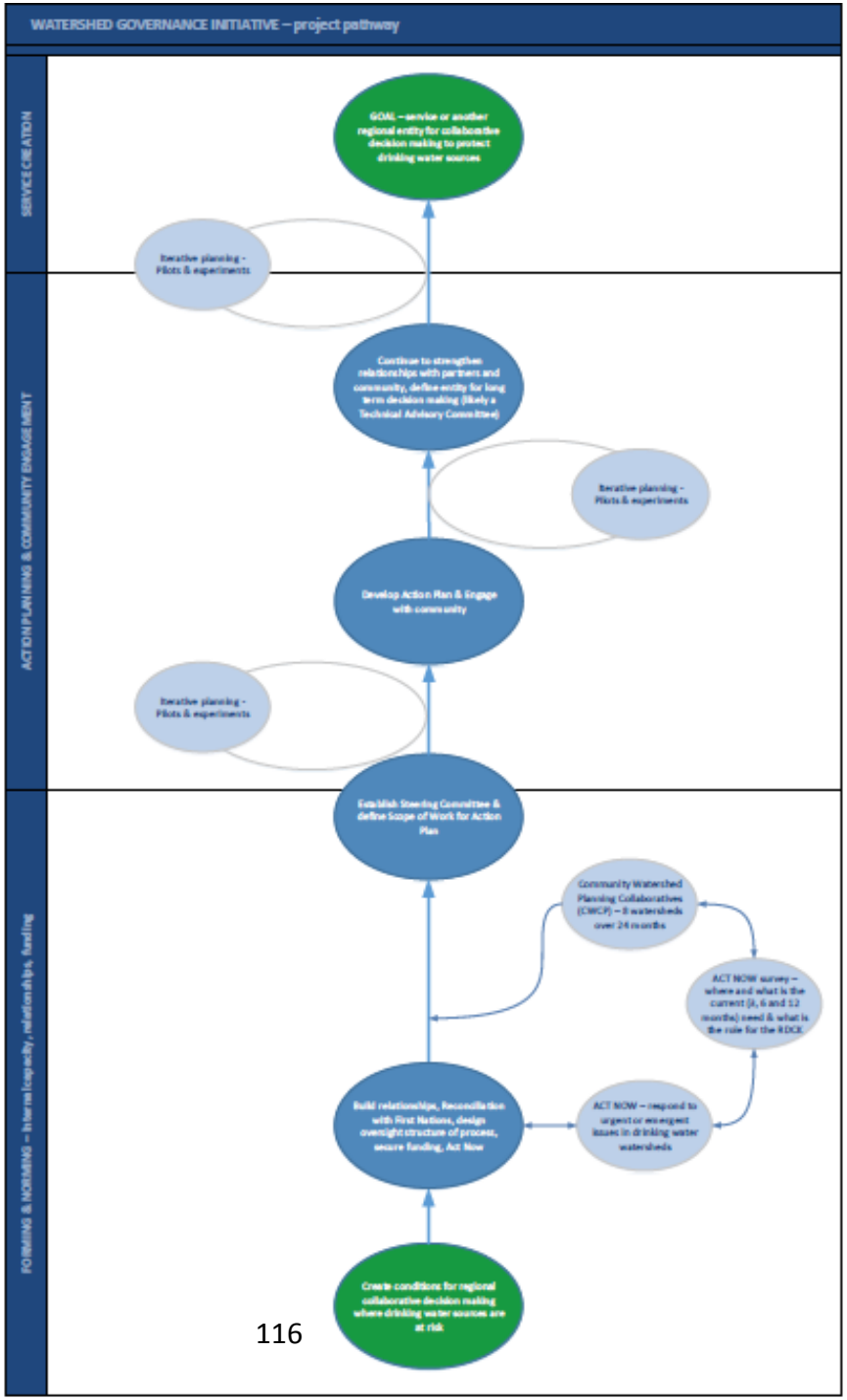
June 2020
That the Board endorse the Watershed Governance Initiative Project Plan (May 2020) and direct staff to pursue the Project Plan as a collaboration between Community Sustainability and Water Services staff.

October 2020

We are here

December 2022

WGI project plan



	Deliverables	Timing (projected over April 2020 to Dec 2022)	Staff hours (estimate)	Costs (estimate)	Notes
Phase 1	Establish **organisational capacity, engage RDCK connections,** develop **terms of reference for Steering Committee**	April to October 2020	170	n/a	
	Act now to respond to immediate and urgent regional watershed issues	June to October 2020	100	tbd	
Phase 2	Establish **Steering Committee** and scope of work for **action plan**	October 2020	160	$15,000	Includes meeting + travel costs
Phase 3	Develop **action plan** and **engage community**	April 2021 to April 2022	195	$80,000	Includes cost of consultant to write report
Phase 4	**Continued community engagement** working towards establishment of governance entity	April to December 2022	200	$55,000	Includes community forums
On-going	**Strengthen relationships** with partners and community stakeholders	On-going	400	$100,000	Includes communication support + graphic design
On-going	Pursue **sustainable funding**	On-going	175	$15,000	Matching funding to pursue grants
	TOTAL		1400	$265,000	

WGI project plan

Timeline: 3 years – June 2020 to December 2022

Structure: 4 phases with opportunities for review and revision at each milestone

Coordinated action with Development and Community Sustainability Services and Environmental Services staff

Deliverables: Act now, Relationship Building, establishment of a Steering Committee, Action Planning and Seeking Sustainable Funding.

Cost: currently estimated at $305,000

Staff time: 200 days or a 0.5 FTE

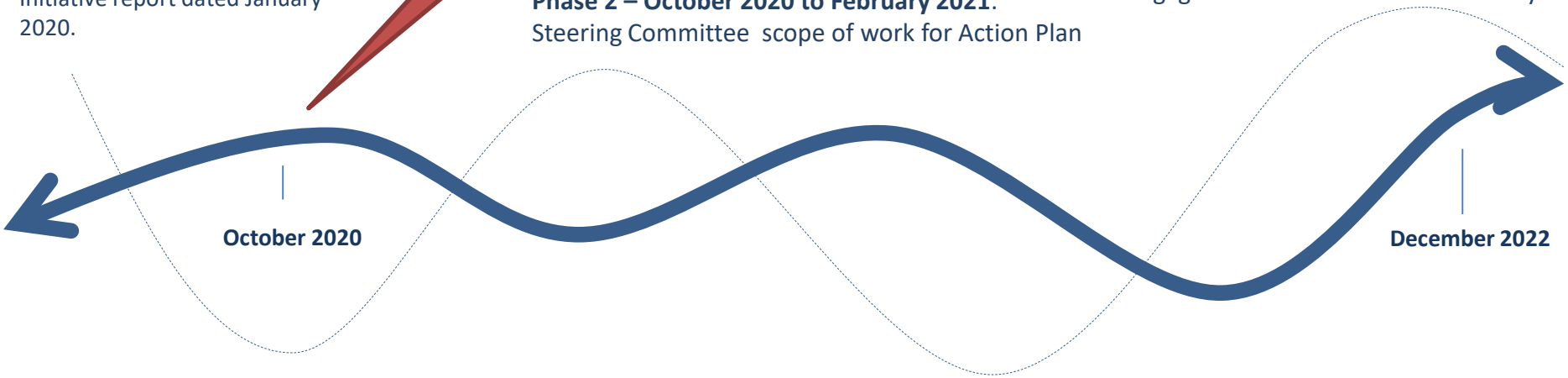
WGI project phases

April 2020
Final WGI report received & staff are directed ``to prepare a workplan to determine the organizational capacity of the Community Sustainability Services and Water Services staff to pursue the recommendations of the RDCK Regional Watershed Governance Initiative report dated January 2020.

We are here

Phase 2 – October 2020 to February 2021:
Steering Committee scope of work for Action Plan

Phase 4 - April to December 2022:
Engagement and establishment entity



Phase 1 – April to October 2020:
Board approval, initial engagement, terms of reference for Steering Committee

Phase 3 - February 2021 to April 2022:
Action planning & engagement

Act Now – this is your watershed

This is the story of your watershed will build information sharing systems for communities at 2 scales:

1. **community by community** with the 8 watersheds we have identified (though for Area E would focus on Blewett & the West Arm (Queens Bay to Kokanee Creek)
2. **regionally** - sub-regional forums that bring in a diversity of water perspectives and experts

Act Now – this is your watershed

1. **Community by community - foster watershed understanding and information access to:**
   a. manage expectations
   b. identify **points of entry** and introduce the data available through the RDCK for community use;
   c. improve **distribution of information** - sharing recommendations based on data and community consultations, providing accessible, easily digestible briefs of relevant materials for community;
   d. introduce some of the **tools available to communities** – eg - natural asset management inventories, ecosystem based planning, green mapping;
   e. connecting communities with organizations such as Selkirk College, Living Lakes and Columbia Basin Watershed Network who are doing mapping and data collection that may be helpful to communities; and,
   f. articulating **models of governance** – work with the communities to understand the needs, strengths, opportunities and challenges

Act Now – this is your watershed

2. Regionally – support broad learning and engagement by:

a. connecting with First Nations and share information and process
b. hosting sub-regional This is the Story of Your Watershed forums in early 2021
c. connecting and partnering with regional entities like Living Lakes who are doing similar work

	Deliverables	Timing (projected over April 2020 to Dec 2022)	Staff hours (estimate)	Costs (estimate)	Notes
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On-going	**Strengthen relationships** with partners and community stakeholders	On-going	400	$100,000	Includes communication support + graphic design
On-going	Pursue **sustainable funding**	On-going	175	$15,000	Matching
	TOTAL		1400	$265,000	

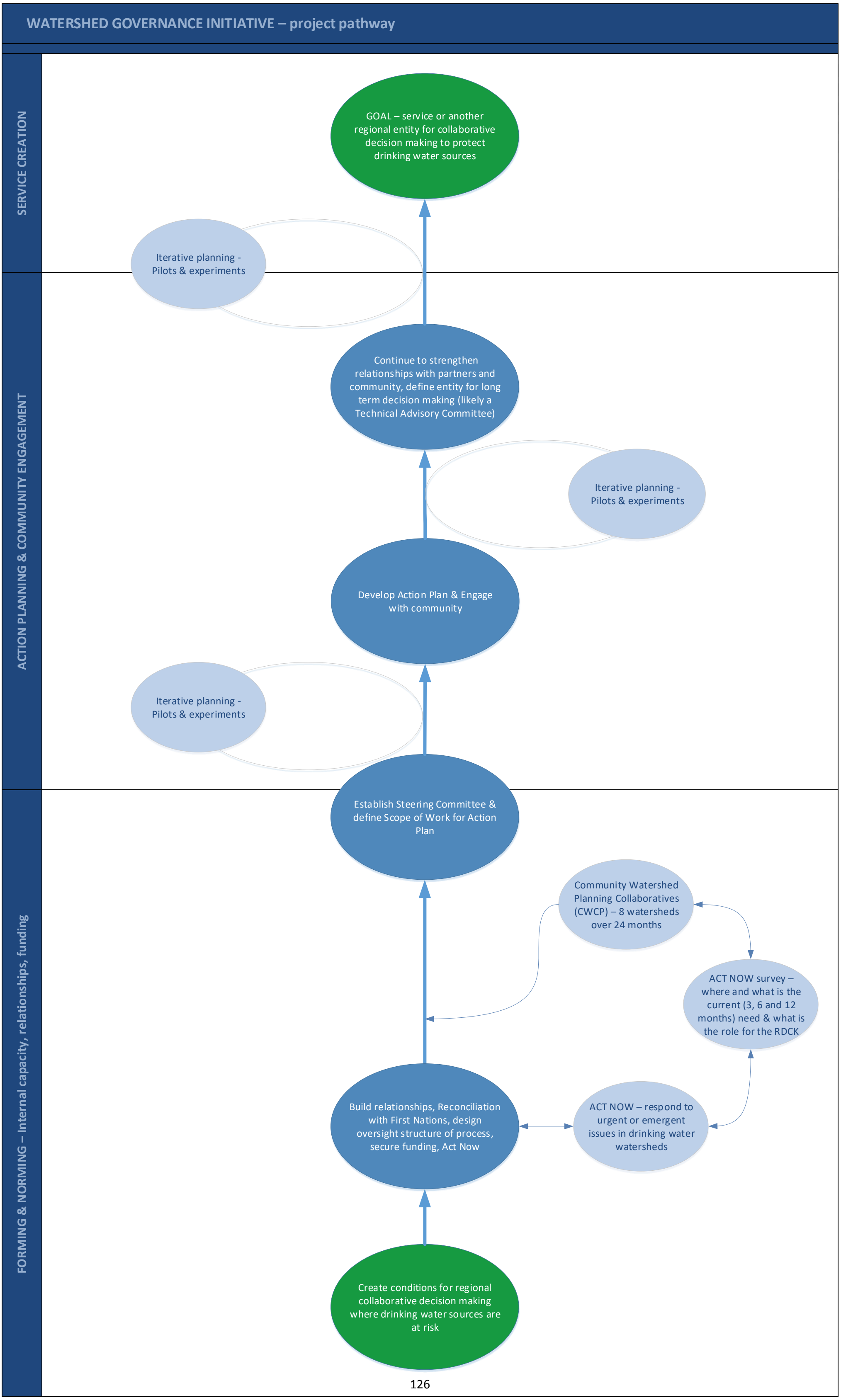
+$40,000 for Act Now

Recommendation

That the Board direct staff to pursue community collaborative planning pilots in watersheds of identified need and regional forums, as a part of the Watershed Governance Initiative Act Now response to assess immediate needs, provide information and make recommendations that lead to a watershed protection plan.

Thank you

End of workshop


WATERSHED GOVERNANCE INITIATIVE – project pathway
SERVICE CREATION
ACTION PLANNING & COMMUNITY ENGAGEMENT
FORMING & NORMING – Internal capacity, relationships, funding
GOAL – service or another regional entity for collaborative decision making to protect drinking water sources
Iterative planning - Pilots & experiments
Continue to strengthen relationships with partners and community, define entity for long term decision making (likely a Technical Advisory Committee)
Iterative planning - Pilots & experiments
Develop Action Plan & Engage with community
Iterative planning - Pilots & experiments
Establish Steering Committee & define Scope of Work for Action Plan
Community Watershed Planning Collaboratives (CWCP) – 8 watersheds over 24 months
ACT NOW survey – where and what is the current (3, 6 and 12 months) need & what is the role for the RDCK
Build relationships, Reconciliation with First Nations, design oversight structure of process, secure funding, Act Now
ACT NOW – respond to urgent or emergent issues in drinking water watersheds
Create conditions for regional collaborative decision making where drinking water sources are at risk