



DISTRICT OF SUMMERLAND



Incorporated: 1906

Population: 11,615

Area: 73.08 km²

Eng. Asset Value: \$538M

We are Responsible For:

- 145 km paved roads
- 15 km gravel roads
- 20 km sidewalks & walkways
- Level 4 water treatment plant
- 220 km water mains
- 6,000 water services
- 440 hydrants
- 80 km sanitary sewer pipes
- 2,400 sanitary sewer services
- 50 km of drainage pipes
- 11 dams
- 320 catch basins and drywells
- 7 lift stations
- 13 in-ground pressure reducing valve stations
- Landfill Operations
- Curbside Collection program
- 9 pump stations
- 3 in-ground storage tanks
- 20 parks
- 11 beaches and 2 boat launches
- 3 sports fields
- 50 municipal facilities
- Over 100 municipal properties
- Signage and banners
- 10 transit stops
- 170 Municipal vehicles and equipment
- 3 Cemeteries
- 2 Substations
- 344 km of conductor
- 3,923 power poles
- 1,446 transformers
- 1,368 street lights



Source: KelownaNow



Source: Similkameen Spotlight

2017 Flooding



Source: KelownaNow



Source: KelownaNow

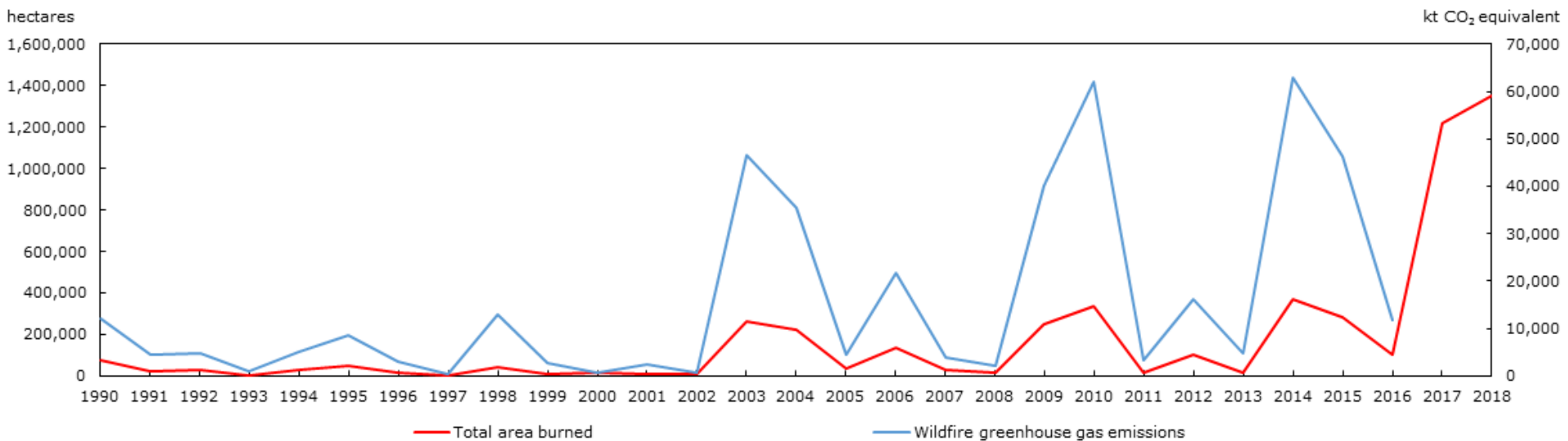


Instagram/c_kirzinger



BC Wildfire Service

Chart 1
Fire area and greenhouse gas emissions, British Columbia, 1990 to 2018



Note: The provincial greenhouse gas emission estimates are not yet available for 2017 and 2018.
Sources: National Forestry Database, 2019, *Forest area burned and number of forest fires*, www.nfdp.cfm.org/en/data/fires.php (accessed April 16, 2019); British Columbia Ministry of Forests, Lands, Natural Resource Operations and Rural Development, BC Wildfire Service, 2019, "Fire Incident Locations - Historical," *British Columbia Data Catalogue*, <https://catalogue.data.gov.bc.ca/dataset/fire-incident-locations-historical> (accessed May 6, 2019); British Columbia, 2018, *Provincial Greenhouse Gas Emissions Inventory*, <https://www2.gov.bc.ca/gov/content/environment/climate-change/data/provincial-inventory> (accessed April 1, 2019).



Source: Brandon Burchett



Source: District of Summerlan

Landslides



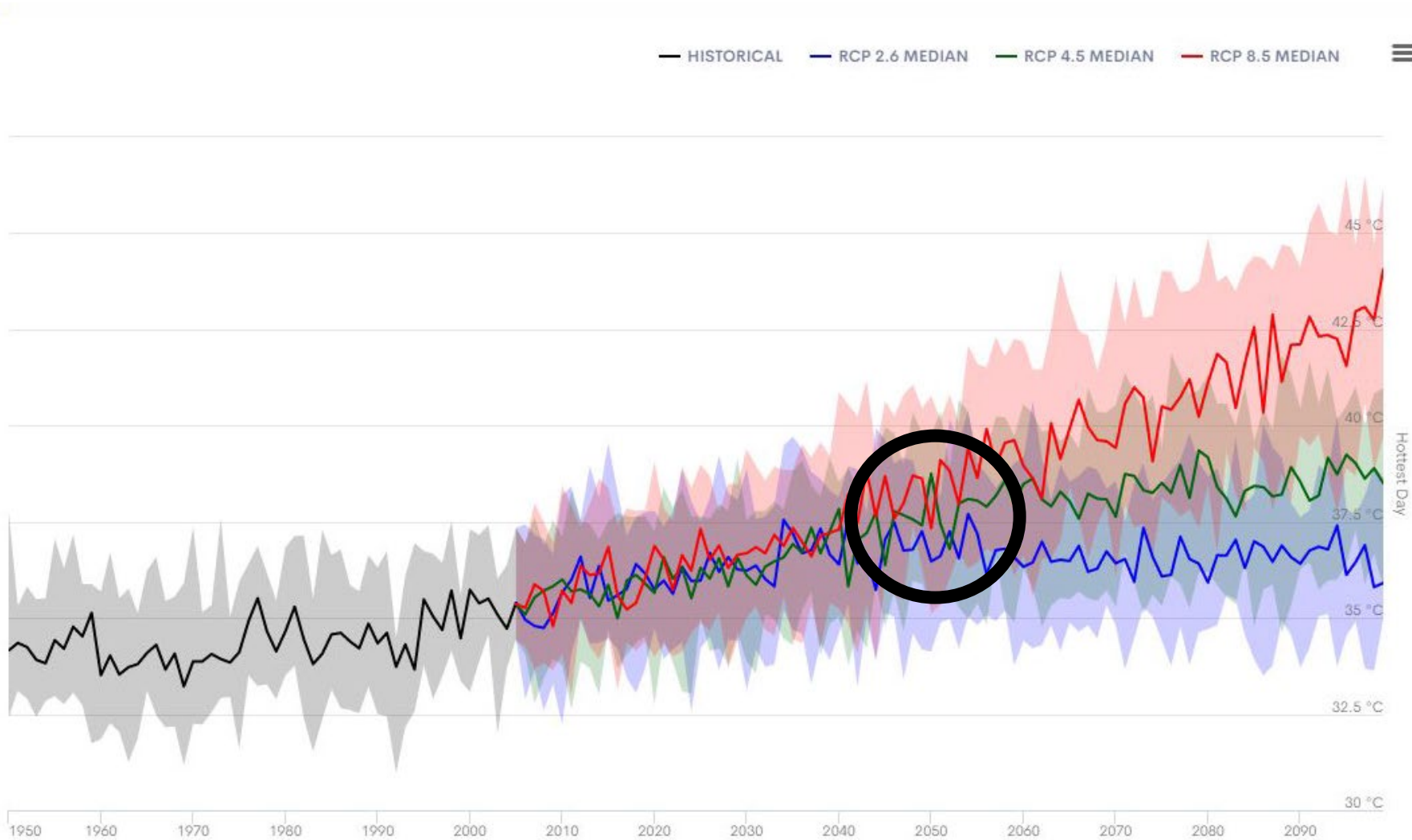
Source: Johnny Aantjes



Source: BC Ministry of Transportation

Hottest Day

Summerland, BC



Source: climatedata.ca

Adaptation involves modifying our decisions, activities and ways of thinking to adjust to a changing climate

Goals



Increasing our capacity to adapt



Improving our ability to thrive under different climate conditions



Building resilience to extreme weather and climate changes

Examples



Forest protection



Infrastructure and building design



Flood protection



Changing agricultural practices
Planting different crops to respond to changing growing seasons and temperatures, or planting a variety of crops to reduce damage from pests that could migrate northward

Overlapping examples



Green infrastructure



Water and energy conservation

Mitigation aims to reduce the causes of climate change

Goal



Cut down greenhouse gas emissions

Examples



Energy efficient technology



Sustainable transportation



Industrial process improvements



Renewable energy



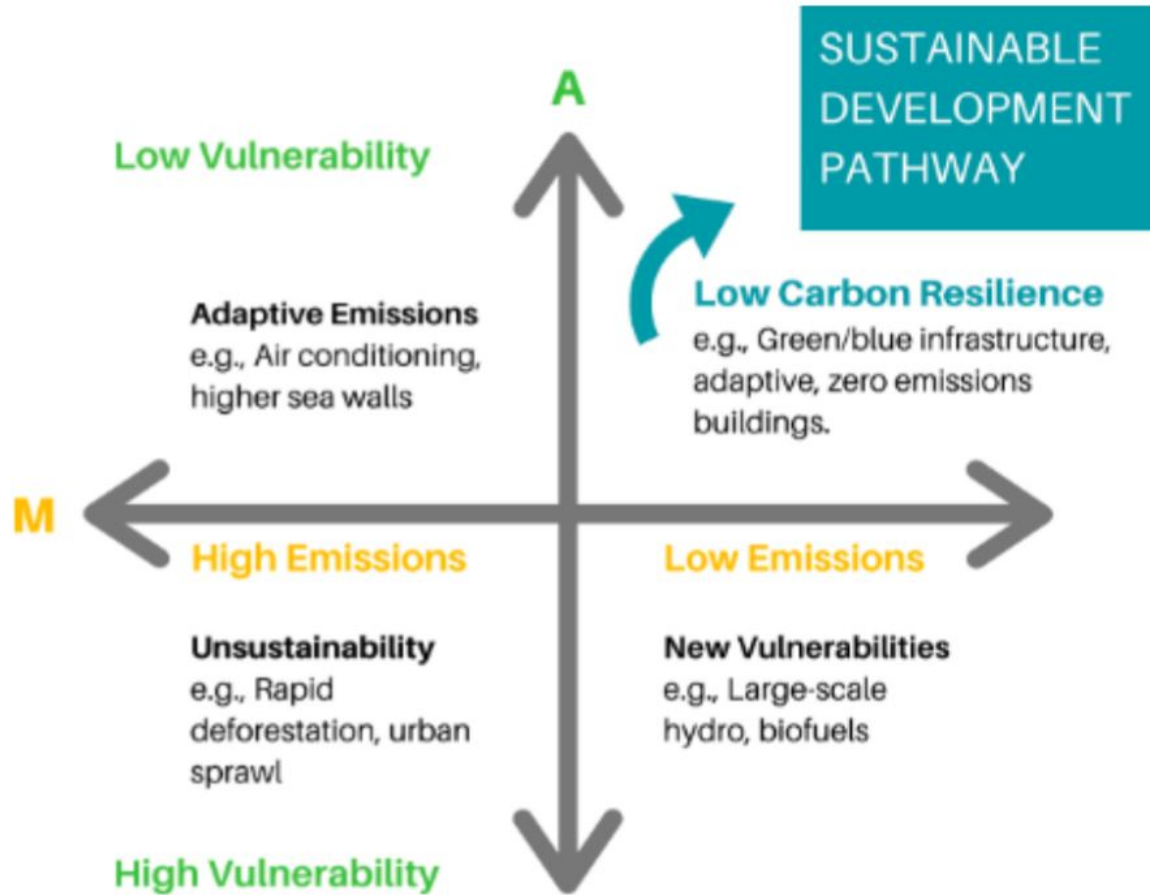
Creating community and home gardens
Increasing local agricultural capacity helps reduce the need to import food over long distances, and by extension the consumption of fossil fuels

Climate Change: Adaptation and Mitigation

For the whole Canada in a Changing Climate report, visit Adaptation.NRCan.gc.ca






SFU's ACT Program

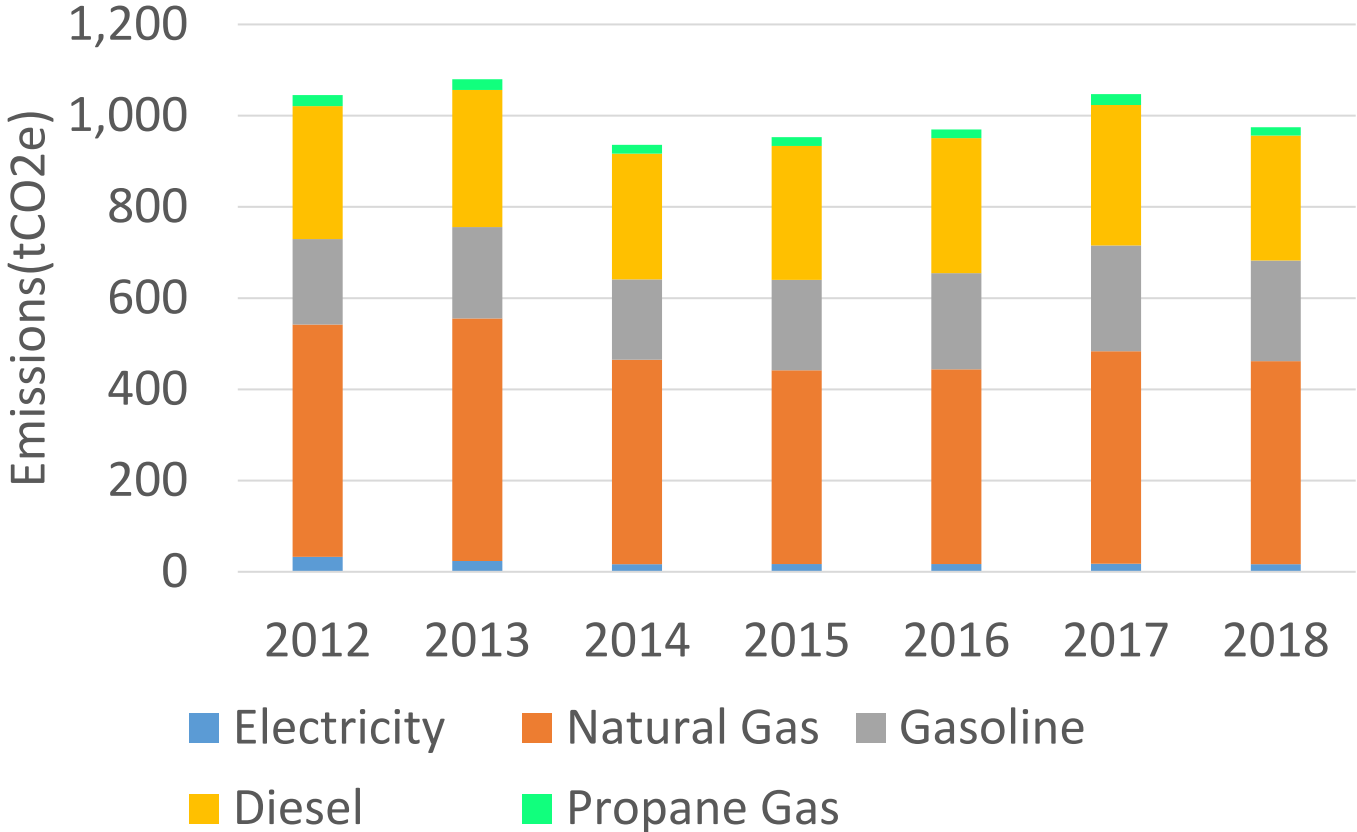


Adapted from Cohen & Waddell, 2007

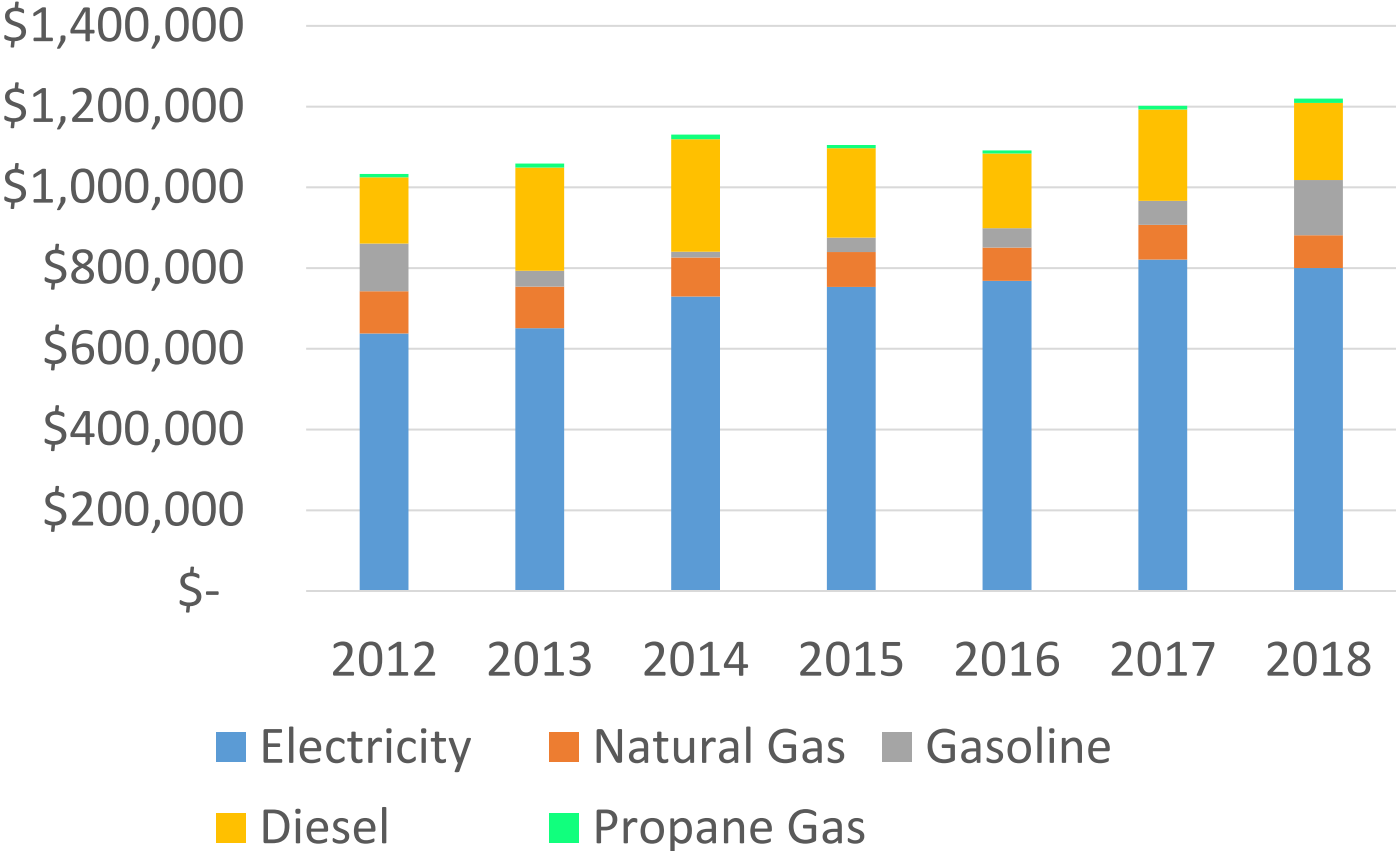
SYNERGIES AND CO-BENEFITS FROM AN LCR APPROACH

 Improved biodiversity	 Cost savings	 Local control of power
 Energy savings	 Job creation	 Increased property values
 Reduced waste	 Improved human well-being	 Reduced congestion
 Improved water retention & absorption	 Carbon sequestration	 Reduced burden on grey infrastructure
 Improved air/water quality	 Reduced extreme temperatures	 Pollutant capture
 Improved equity/improvements for vulnerable populations	 Improved access to green space and recreation	 Promotes renewable energy/technology

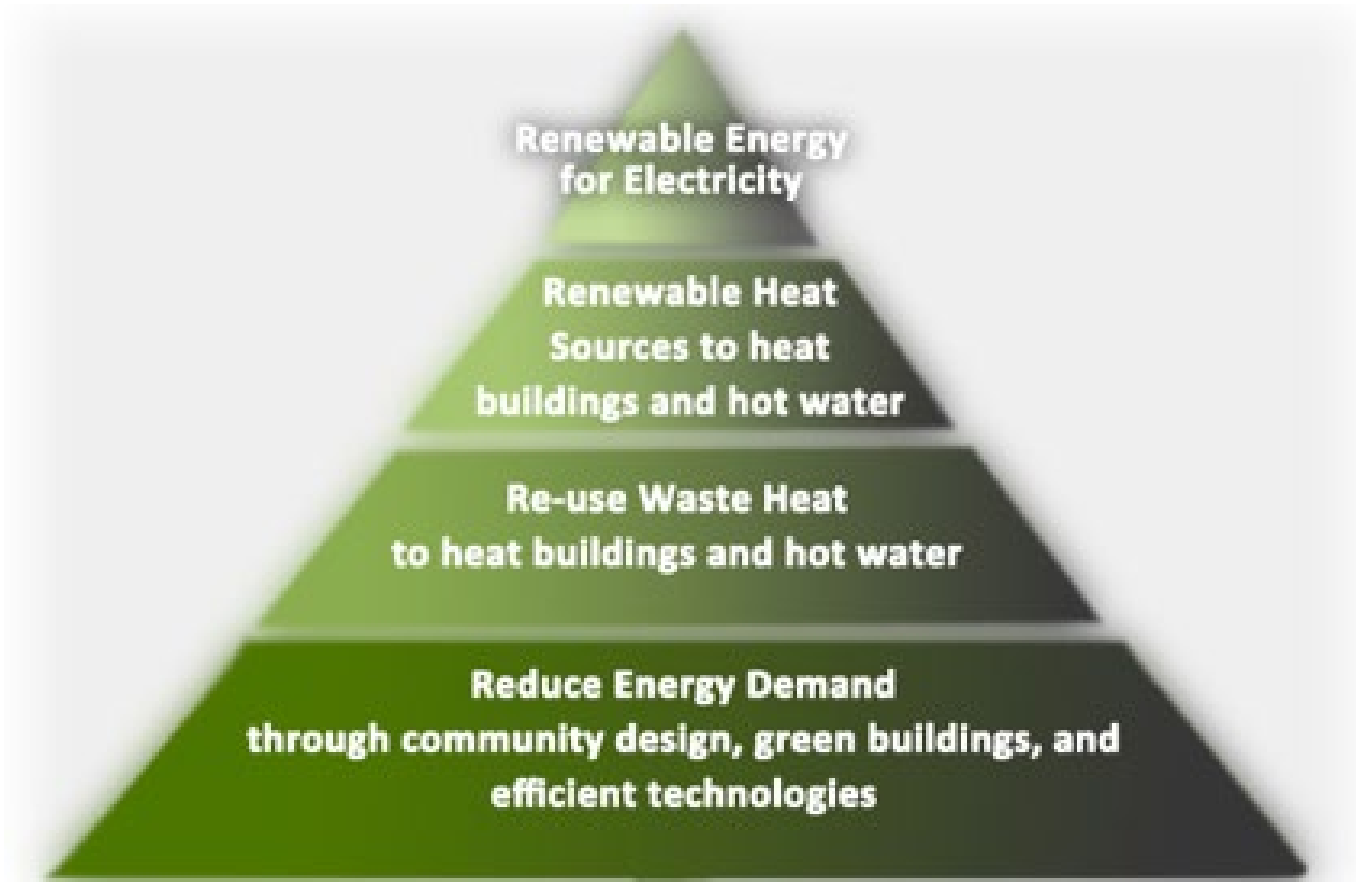
Summerland Corporate GHG Emissions 2012-2018



Summerland Corporate Energy Expenditures 2012-2018



Energy Efficiency Hierarchy

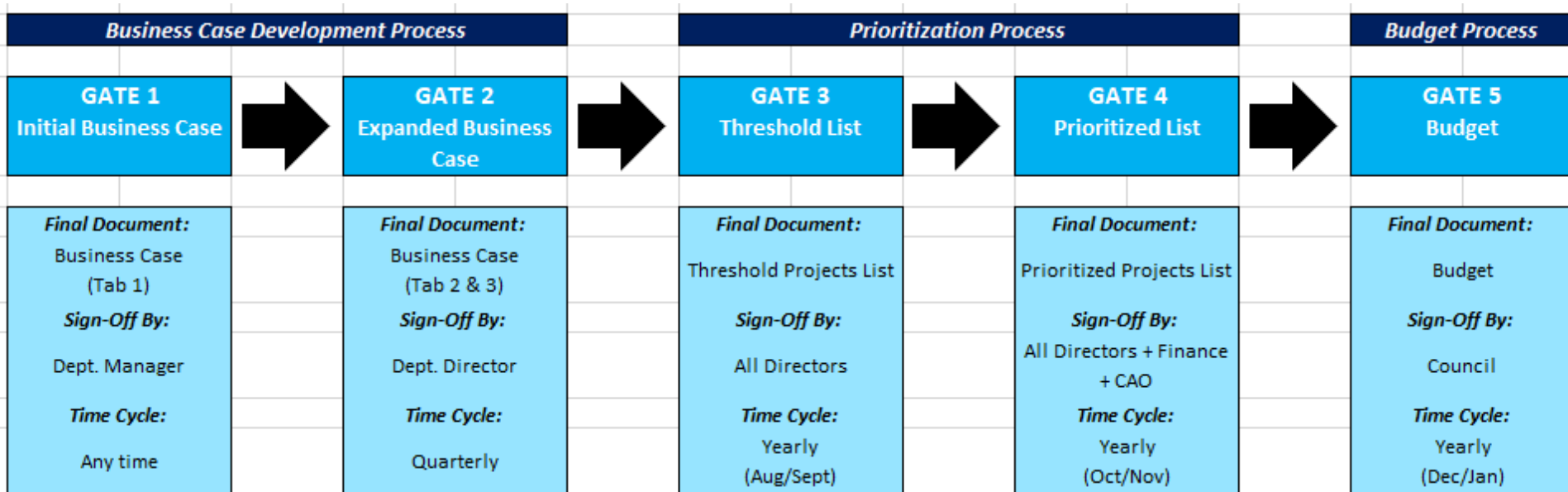


Climate Action Efforts in Summerland

- ✓ Council Leadership & Strategic Prioritization
- ✓ Dedicated Staff Position
- ✓ Integrated Solar Project**
 - ✓ Solar+Storage Project**** *(in progress)*
 - ✓ Distributed Generation Program Relaunch**
 - ✓ Energy Efficiency Education**
- ✓ Solar Now Partnership**
- ✓ EV Charging Stations**
- ✓ Fact-based Community & Corporate Climate Action Plans & Targets**
- ✓ Community & Corporate Committees
- ✓ GHG Reductions Funding Policy & Reserve Fund
- ✓ Green Revolving Fund
- ✓ Asset Management Policy & Strategy**
- ✓ Converting Diesel & Gas Equipment to Electric**

Business Case & Project Prioritization Framework

- All capital projects over \$10,000
- Completed by department staff
- Sign-off by Managers -> Directors -> Finance -> CAO -> Council



Decision Criteria Scales

Either/or Criteria

- Improve or Increase Level of Service (LOS)
- Maintain/Restore LOS (same capacity)
- Maintain/Restore LOS (increase capacity - growth)

Common Criteria

- Compliance
- Health & Safety Impact
- Resiliency
- Life-Cycle Financial Impact
 - Community Benefit
 - Environment
 - Social/Cultural
- Economic
- GHG Emissions Reductions

Supplemental Criteria (Unscored)

- Residual Risk
- Low Carbon Resilience Co-Benefits
- External Funding
- Project Interdependencies
- Strategic Alignment
- Asset Replacement Options
- Ecological Impacts

1.2 Project Rationale, Benefits and Considerations

1.2.1 Project Rationale

(i.e. what is the primary benefit of the project, or the main reason or purpose for the project?)

Improve or Increase LOS Project will deliver a sustained customer service improvement. Levels of service (LOS) will increase from current state.	Maintain or Restore LOS - Same Capacity Project will maintain existing asset reliability (i.e. avoidance of failure) AND/OR Project will maintain service performance (i.e. avoidance of service degradation) (e.g. extend useful life, refurbish/replace as required).	Maintain or Restore LOS - Increase Capacity (Growth) Project will increase capacity to meet forecast demand OR Project meets an immediate need due to development approval at the same LOS (This may include climate change adaptation requiring an increased asset capacity to maintain
--	--	---

Select from drop down list

1.2.2 Project Co-Benefits (Select all that apply)

(i.e. what are the expected additional or non-primary benefits (direct and indirect) of the project to the organization and/or the community?) *Hover over the text to see a definition of each*

Improves Biodiversity:	No	Select from drop down list
Improves Water Retention/Absorption:	No	Select from drop down list
Reduces/Captures Pollution:	No	Select from drop down list
Reduces Extreme Temperatures:	No	Select from drop down list
Creates Jobs:	No	Select from drop down list
Optimizes Energy Savings:	No	Select from drop down list
Reduces Waste; Optimizing Resources:		
Improves Local Control:		
Reduces Risks / Increases Property Value:		
Reduces Road Congestion:		

1.2.3 Can the Project be Grant Funded?

(i.e., Can the District access government funds to pay for all or part of the project?)

Unknown	Select from drop down list
---------	----------------------------

If 'Yes' you may go to "4 Section 4.1.1

TR Tami Rothery 153 ...

The project reduces the number of vehicles on the road per capita (e.g. increasing density; restricting parking; designing effective walkway and bikeway policy and infrastructure; ride-sharing programming to minimize single occupant vehicle use).

2020-07-24 8:52 AM

Edit

Reply...

GHG Reductions – Common Criteria

3.2.8	GHG Reduction	Project results in increased or reduced GHG emissions	+ / - GHG Emissions over 20 yr period	
1 - Significant Negative (--) Significant ongoing additional GHG emissions expected as a result of project	2 - Negative Impact (-) Ongoing moderate additional GHG emissions or large, short-term additional GHG emissions expected as a result of project	3 - No Impact No additional GHG emissions and no reduction in GHG emissions expected as a result of project	4 - Positive Impact (+) Ongoing moderate reduction in GHG emissions or large, short-term reduction in GHG emissions expected as a result of project	5 - Significant Positive (++) Ongoing significant reduction in GHG emissions expected as a result of project
3	Select from drop down list			

Our Experience So Far

Challenges

- χ New concept and language for many
- χ Being succinct
- χ Distinguishing between topics (environmental benefit vs. GHGs vs. resilience)
- χ Default settings to 'no'
- χ Negotiation of relative weighting

What's Working

- ✓ Application on every project >\$10k
- ✓ Creating conversation amongst staff
- ✓ Developing literacy
- ✓ Generating interest from external bodies

Financial Policies

Climate Action – Funding the Reduction of Greenhouse Gases & Corporate Carbon Neutrality

- 0.001x District's annual operating budget allocated to Climate Action
- BC's Climate Action Revenue Incentive Program (CARIP) funding allocated to Climate Action
 - 100% rebate on carbon taxes paid in operations
- All unspent funds go to Climate Action Reserve Fund
- Reserve Fund may only be used for GHG reductions
- 90% of spending is designated for corporate emissions reductions

Green Revolving Fund

- Est. 2019 - \$50,000 seed funding from Climate Action Reserve Fund
- 1st CDN governmental body to join the Billion Dollar Green Challenge
 - BDGC provides support, resources, and software (GRITS) to support development and management of green revolving funds

Key GRF Policy Elements

- Project eligibility
- Fund administration
- Application process
- Application scoring criteria

Primary: 1. Potential to decrease the District's GHG emissions
2. Ability to repay the GRF

Secondary: resources conserved; pollution reduction; impacts to health and safety; availability of funds; life cycle cost benefit; economic benefit to community; visibility; cost effectiveness; schedule and start date; available external sources of funding

- Funding agreement
- Project implementation responsibilities
- Tracking, reporting, and repayment



Process

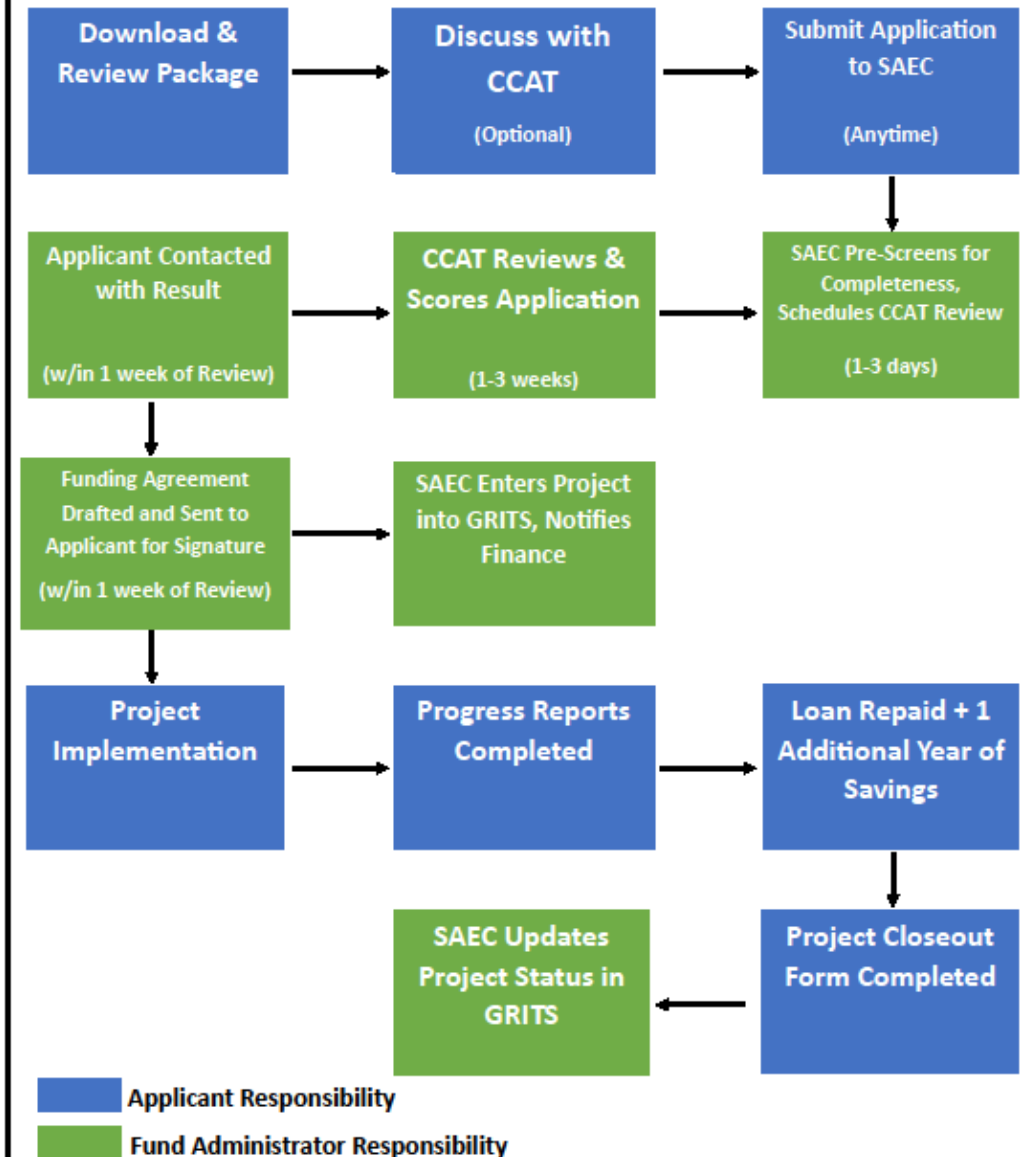
- Concept/research
- Application
- Review/Scoring
- Funding Agreement
- Administrative Setup
- Implementation
- Progress Reports
- Repayment
- Project Closeout

SAEC = Sustainability / Alternative Energy Coordinator

CCAT = Corporate Climate Action Team



Green Revolving Fund Process Flowchart



Challenges & Opportunities

- Initial buy-in from SMT
 - Balancing detail and brevity
 - Getting agreement on scoring criteria
 - Having multiple pathways to funding may deter usage of GRF
 - Timing of implementation – Covid-19
-
- ✓ Dedicated staff & team to administer
 - ✓ Billion Dollar Green Challenge network & GRITS tool
 - ✓ Developing robust forms and process with guidance
 - ✓ Allows reserve fund to continue to grow over time
 - ✓ Effective tool for communicating with staff

Climate Action Planning Highlights

Corporate Energy & Emissions Management Plan (CEEMP) update

- Building energy audits (ASHRAE Level 2) completed in all 12 major buildings
 - 52 priority actions
- Green Fleet Study undertaken
 - 28 priority actions

Community Energy & Emissions Reduction Plan (CEERP) update

- 26 priority actions

	New <i>community</i> target from CEERP, reduction from 2007 levels	New <i>corporate</i> target in CEEMP, reduction from 2012 levels
2025	18%	25%
2030 *	30%	35%
2050	80%	80%

2021 Building and Fleet Action Details

Building / Category	ECM # / Action #	Description	GHG Emission Savings (Tonnes e-CO2/yr)	Total Savings - Energy, O&M, CO2 (\$/yr)	Total Estimated Actual Cost (capital, install, design, Incentives) (\$)	Total Incremental Estimated Cost (capital, install, design, incentives) (\$)	Notes
2021							
Buildings							
All	All	Lighting	0.1	\$50,393	\$218,499	\$218,499	<ul style="list-style-type: none"> Budgeted for design and planning to begin in 2021 (carry-over from 2020), with installation in early 2022 Some replacements have already started as part of building maintenance efforts
Municipal Hall	M5-10	Re-Commission Programmable Thermostats (all)	8.2	\$1,931	\$1,500	\$1,500	<ul style="list-style-type: none"> To be completed as part of HVAC system upgrade 2021 Repeat following major HVAC redesign/upgrade (after space planning complete)
Museum	M4	Install Programmable Thermostats to Control Heating and Cooling Systems and Implement Schedule to Reflect Actual Occupancy	1.2	\$203	\$600	\$600	<ul style="list-style-type: none"> Included in 2021 rooftop unit project (Museum M6)
Museum	M6	Replace Existing Gas Fired Roof Top Units with Hybrid High Efficiency Air Source Heat Pump Make Up Air Units Complete with Gas Fired Back-Up	8.2	\$1,377	\$82,500	\$10,500	<ul style="list-style-type: none"> Budgeted for in 2021 (carry-over from 2020)
Works & Infrastructure	M4	Interlock the Unit Heaters with the External Roller Shutter Door complete with Notification Alarm (Flush Truck Bay, Mechanics Bay)	4.6	\$964	\$4,400	\$4,400	<ul style="list-style-type: none"> To be completed as part of HVAC system upgrade 2021
VVWTP	M6	Install Variable Frequency Drives to Glycol Pumps serving Air Handling Units (Process Building)	3.5	\$1,281	\$11,100	\$11,100	<ul style="list-style-type: none"> Budgeted for in 2021 (carry-over from 2020)
Fleet							
Management	GF3	Dedicate additional resources to overseeing and managing the fleet system					<ul style="list-style-type: none"> Currently fleet management is shared amongst staff, and sits amidst several competing priorities Grants may be available to support in short-term; longer-term investment is needed to achieve meaningful results
Management	GF4	Right-size fleet vehicles for the tasks they are intended to perform					<ul style="list-style-type: none"> Vehicle performance and staff duties must match Reconsider current system of handing-down vehicles Combine with GF5, GF6, GF14
Management	GF5	Identify units that are underutilized & explore actions to dispose of, more fully utilize and/or find alternate means of getting the job done					<ul style="list-style-type: none"> Smart car is under used and has safety concerns No spare vehicle at Works Yard identified as a challenge Combine with GF4, GF6, GF14
Management	GF6	Complete a unit-by-unit assessment of the fleet to determine a 5-year capital plan for vehicle replacement					<ul style="list-style-type: none"> Savings in operations but may be capital expense increase Consider leasing as a short-term option to assist with renewal Combine with GF4, GF5, GF14
Procurement	GF14	Consider and prioritize battery-electric and other zero-emission vehicles and equipment where available and practical					<ul style="list-style-type: none"> Infrastructure needs to be closely assessed before purchase Initial purchase cost may be high. High operational cost savings. Current fleet consists primarily of pickup trucks. EV trucks not likely readily available for small municipalities for several years. Combine with GF4, GF5, GF6

Streetlight LED Retrofit

- 885 streetlights (approx. 70%) converted to LEDs
- Reduce consumption by ~600,000 kWh (80%) each year
- Expected annual savings of over \$72,000
- Payback period of 4.6 years (w/rebate)
- Photometric design for better quality of light
- Full turnkey project
- Provincial shared services = locked-in pricing on fixtures



Solar Now – North Growth Foundation



- 50% funding provided
- Turnkey project
- We approached them
- Long-term relationship potential



Summerland Solar+Storage Project

1MW solar; 2MW/4.5MWh BESS

Number of solar panels: ~3200

Project costs: \$6,980,000

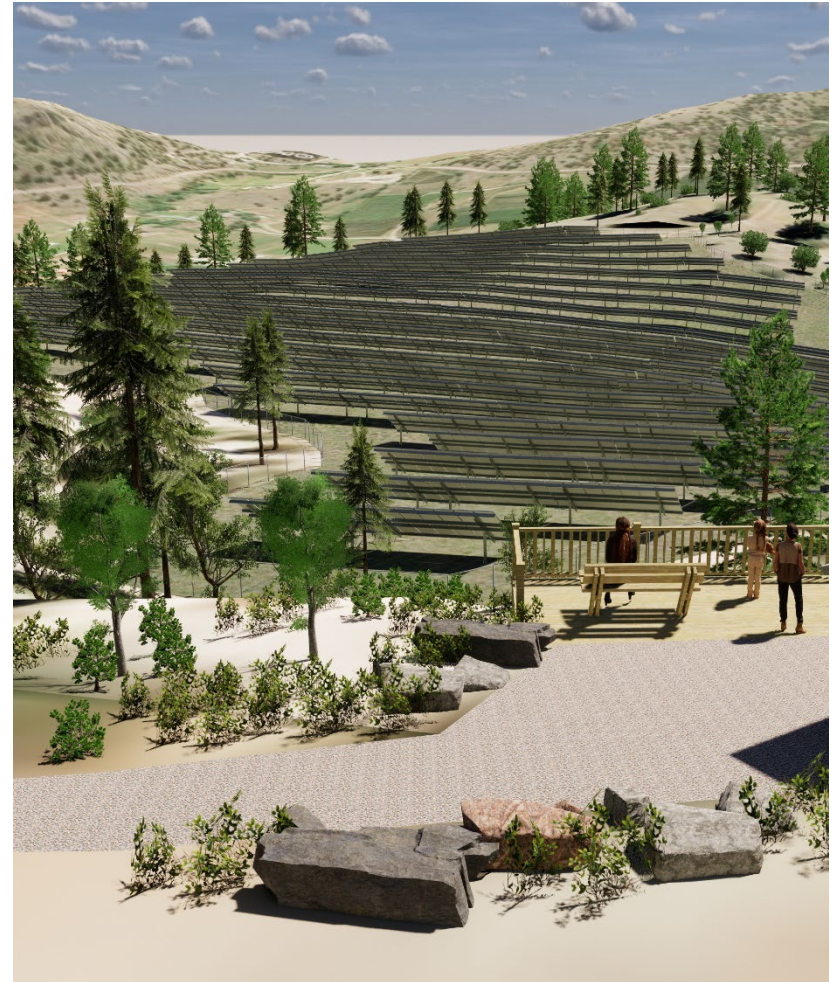
\$6M Grant Funding

- Started with \$100k project

Expected payback for District utility contribution (\$980k):
4-5 years

Land required: 5 acres

Annual energy production:
1,288,000 kWh (1,288 MWh)



Project Benefits

For Utility:

- Get experience with generating & selling early on
- Positioned to better adapt to changes to business model (DES)
- Easier to capitalize on new opportunities
- System resiliency
- Peak shaving potential
- Predictable costs
- Positive customer relations
- Continue building on history

For Community:

- Energy independence & resiliency
- Cost savings to ratepayers
- Economic diversification & reinvestment
- Reduce GHGs* & address climate change
- Reputation for leadership and innovation
- Educational opportunities for local schools & researchers
- Increased interest in visiting, working, and living in Summerland
- Potential for investment opportunity
- Brownfield improvements



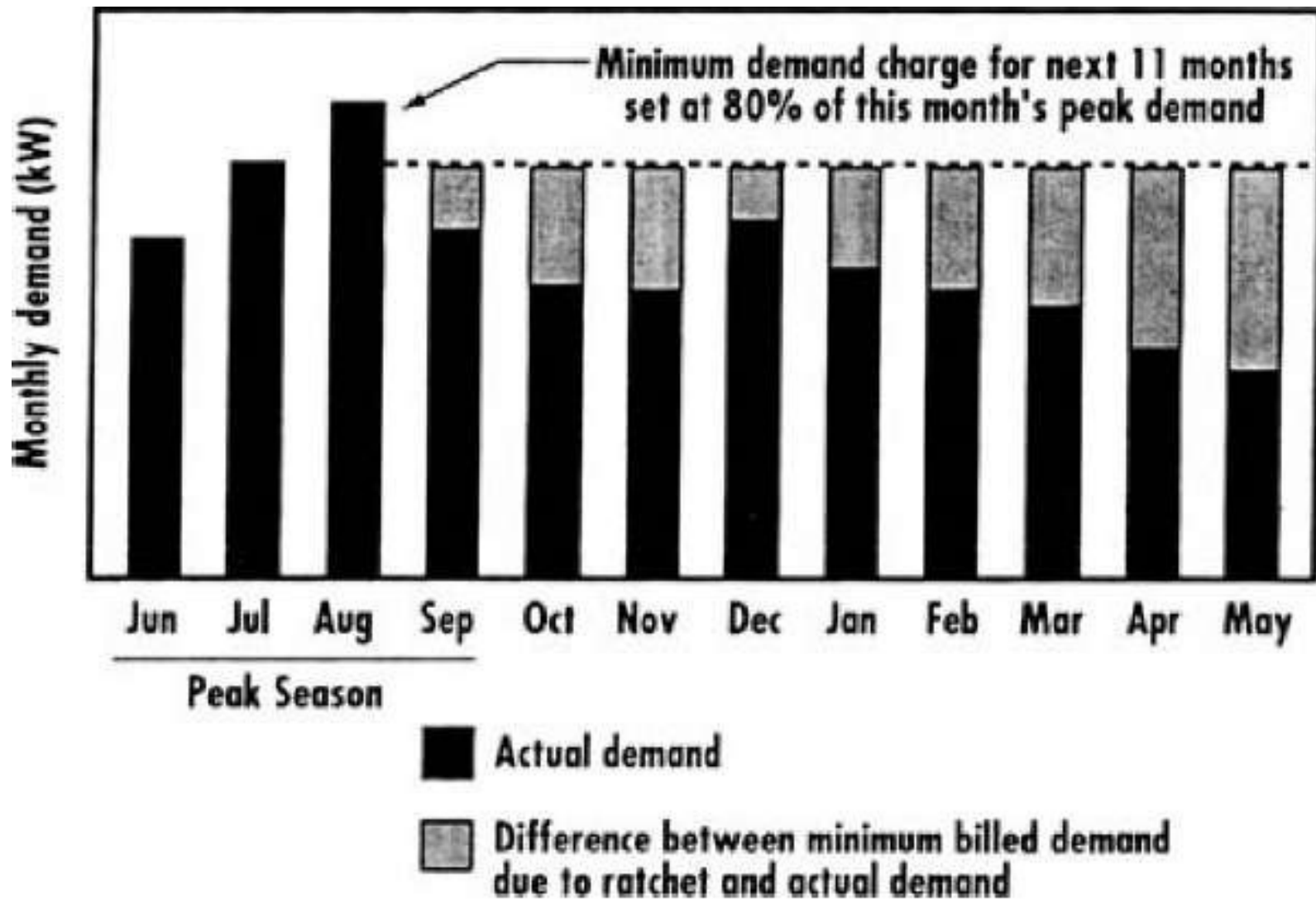
Viewing Deck & Info Kiosk

Battery Energy Storage System

Parking Area

Existing Informal Trail Network

Site Overview
**FOR ILLUSTRATION
PURPOSES ONLY**



EV Charging Network Expansion

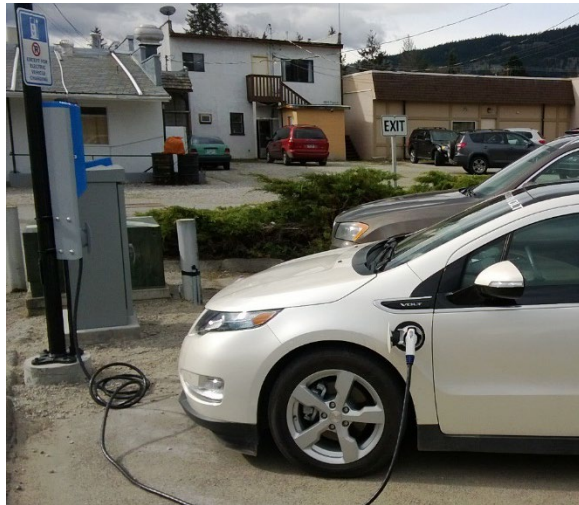
Three Level-2 stations installed in 2013 (grant-funded)

New NRCan funding opportunity and possible locations brought to Council for discussion/decision

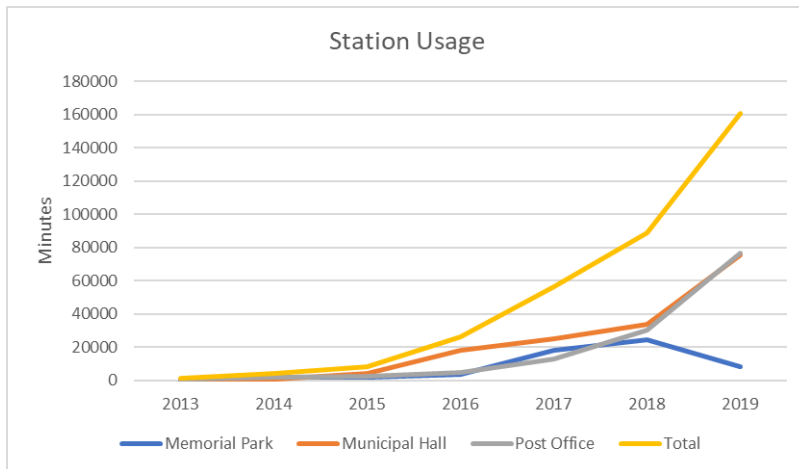
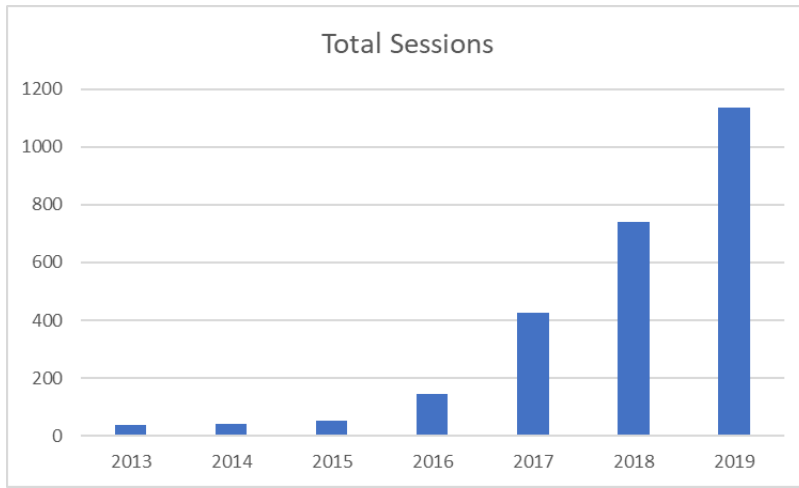
- Minimum 20 stations for application

Locations strategically selected based on economic impacts, visibility, and revenue-generation potential

- Sixteen Level-2 stations
- Six Level-3 stations



EV Charging Stations Usage Trends



Who is using the stations?




From July 1, 2018 to July 27, 2019:

- 67% of all charging events were by locals
- Visitors charged 407 times at our stations
- Memorial Park saw highest percentage of visitors (54%)
- Visitor origins include: Okanagan (Lake Country to Osoyoos); Kimberley; Revelstoke; Bowen Island; Invermere; Langley; Victoria; N. Vancouver; Delta.....

Overview Map

EV Charging Station Layout

Legend

-  Level 2 Station - Existing
-  Level 2 Station - Planned
-  Level 3 Station - Planned



Cold House? High Bills? We Can Help!



Nov 21 6pm: FREE Solar Energy & Energy Conservation Workshop

Join us for a hands-on workshop with industry experts where you'll learn:

- **Easy and low-cost** ways to make your home more comfortable & **start saving energy immediately**
- How to **decide if a solar energy system is cost-effective** for your home
- **Where to get rebates and free advice** for energy improvements

Door prizes will be given out, including \$250 for a home energy audit.
Light refreshments will be provided.
Both homeowners and renters are welcome!

Spots are limited and registration is required. Contact climate.action@summerland.ca to reserve your spot or to find out more about solar energy & energy



HOMEOWNER INFORMATION SHEET

ENERGUIDE

Your EnerGuide® rating and this report are based on data collected and, where necessary, presumed, from your home evaluation. Rating calculations are made using standard operating conditions.



Rating: **0** (GJ/year)

Heated floor area: 210.2 m² (2262.2 ft²)
Rated energy intensity: 0.24 GJ/m²/year
Evaluated by: Capital Home Energy
File number: 5130P00045
Data collected: February 24, 2017
Year built: 2017

NRCan.gc.ca/myenerguide

HOW YOUR RATING IS CALCULATED:

- Rated annual energy consumption: 51 GJ/year
- Minus renewable energy contribution: -51 GJ/year
Equals your **EnerGuide** rating: = 0 GJ/year

I. Your rated annual energy consumption is the total amount of energy your house would use in a year based on the EnerGuide Rating System standard operating conditions. For your house, this includes 21.35 GJ of passive solar gain.

Energy Sources	Rated Consumption (GJ/year)	Equivalent Units (per year)	Greenhouse Gas Emissions (tonnes/year)
Electricity	51	14182.6 kWh	0.0
Natural gas	0	7.2 m ³	0.0
Total	51	0.0	0.0

II. On-site renewable power generation systems can offset some or even all of your home's energy consumption. Renewable energy contributions are factored differently for your rating and your greenhouse gas emissions calculations.

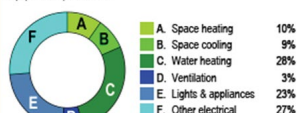
On-Site Renewable Energy	Estimated Contribution (GJ/year)	Equivalent Units (per year)	Offset Greenhouse Gas Emissions (tonnes/year)
Electricity	52	14462.4 kWh	0.0
Solar water heating	0	0.0	0.3
Total	52	0.0	0.0

YOUR RATED GREENHOUSE GAS EMISSIONS CALCULATION:

Total greenhouse gas emissions: 0.0 tonnes/year
Minus emissions offset by on-site renewables: -0.0 tonnes/year
Equals your **rated greenhouse gas emissions**: = 0.0 tonnes/year

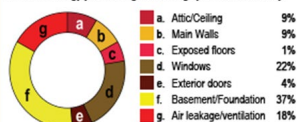
HOW YOUR RATED ENERGY IS USED:

The chart below represents the breakdown of rated annual energy consumption in your home under standard operating conditions. You can use these figures as a guide to help identify where you can lower home energy costs through proper home maintenance, efficient home operation, energy efficiency renovations or equipment replacement.



WHERE YOUR HOME LOSES HEAT:

Houses lose heat through their exterior shell, or building envelope. The chart below shows where and how your home loses heat. The quality and upkeep of your home can have a major impact on the amount of energy your heating and cooling systems use annually.



*EnerGuide is an official mark of Natural Resources Canada. Refer to the glossary section for an explanation of relevant terms.

GOING SOLAR

OPTIONS FOR HOMEOWNERS

SOLAR LIGHT TUBES FOR DAYLIGHTING

Bring natural daylight into deeper interior spaces with solar light tubes.

AVERAGE PAYBACK: 5-7 years*

PHOTOVOLTAICS

Generate some or all of your electricity with a solar PV system.

AVERAGE PAYBACK: 0-23 years, depending on factors including financing, ownership, utility retail electricity rates, and incentives.†

SKYLIGHTS

Bring natural daylight into rooms with skylights.

AVERAGE PAYBACK: Highly variable, depending on design, performance, and other variables, including home resale value.

PLANT DECIDUOUS TREES

Planting deciduous trees on the east, south, and/or west sides of your home keeps the hot sun out during summer but lets the light and its warmth in during winter.

AVERAGE PAYBACK: variable*

INSTALL AWNINGS & BLINDS ON WINDOWS

Keep the summer sun from heating your house by installing awnings and/or blinds on windows that face east, south, and/or west.

AVERAGE PAYBACK: 1-4 years*

CLOTHESLINE

Use the sun to dry your clothes—possibly the simplest and most affordable use of solar power.

AVERAGE PAYBACK: Immediate

APPLY LOW-E WINDOW FILM

Let light, but not much else, into your home with low-e window films that reflect up to 90% or more of heat.

AVERAGE PAYBACK: 2-5 years*

SOLAR LANDSCAPE & PATH LIGHTING

Light walkways, patios, and landscaping with inexpensive, solar-powered lights.

AVERAGE PAYBACK: 2 years*

SOLAR POOL HEATING

Heat your pool with solar hot water systems.

AVERAGE PAYBACK: 1.5-4 years*

POOL COVER / BLANKET

Let the sun heat your pool and keep that heat in at night with a black solar cover / blanket.

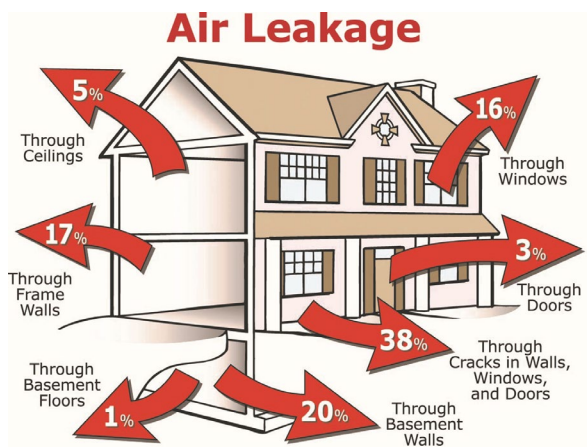
AVERAGE PAYBACK: <1 year*

SOLAR HOT WATER

Heat your water with a solar water heating system, saving 50-80% off water heating bills.

AVERAGE PAYBACK: 6-10 years, depending on cost of gas or electricity and how much solar offsets the total hot water bill.†

* Average payback = simple payback on project cost using energy savings/generation, and does not take into account increased home resale value of home.
† Rocky Mountain Institute, Net Zero Energy Building, August 2012.
Sources: 1. Solar Energy World 2. SolarEnergyWorld.org 3. Energy.gov 4. FreddieMac.com 5. Energy.gov, HomeEnergySource.org 6. Buildings.gov 7. Forrester.com 8. HomeAdvisor.com 9. SolarEnergyWorld.org



Drawing courtesy of Touch 'n Foam Insulating Sealants

In the End, It's All About People

Directly linked:

- Climate Change
- The Built Environment
- Human Health & Wellbeing



Source: Healthy Built Environment Linkages Toolkit, BC Centre for Disease Control

Thank You

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Sustainability / Alternative Energy Coordinator
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