RICHMOND
SCHOOL DISTRICT NO.38

Carbon Neutral Action Report

2018

2018 Carbon Neutral Action Report
School District #38 (Richmond)

This Carbon Neutral Action Report for the period January 1st, 2018 to December 31st, 2018 summarizes our emissions profile, the total offsets to reach net-zero emissions, the actions we have taken in 2018 to reduce our greenhouse gas emissions and our plans to continue reducing emissions in 2019 and beyond.

By June 30, 2019, School District #38's final *Carbon Neutral Action Report* will be posted to our website at www.sd38.bc.ca.

Executive Summary

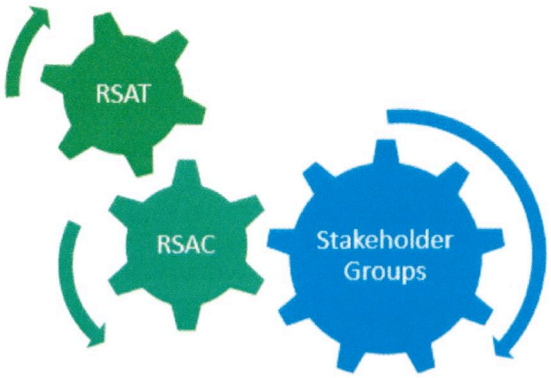
On behalf of the Board of Education, School District 38 (Richmond), I am pleased to submit our Carbon Neutral Action Report for 2018. Now in our ninth year of being carbon neutral, energy savings and greenhouse gas emissions reductions remain a priority in our ongoing commitment towards carbon neutrality. We continue to work diligently, as we have many years now, to reduce our greenhouse gas emissions while improving the learning environment for students and staff.

In 2018, we maintained the focus of our greenhouse gas (GHG) reduction initiatives on reducing our footprint from our largest emissions source: our buildings. The Richmond School District has a robust energy management program with aggressive targets and a forward-looking plan to reduce energy consumed in our buildings. Similar to 2017, we set a target in 2018 to reduce our natural gas consumption by 3% and our electricity consumption by 3% compared to the previous year.

As part of our 2018 energy conservation program, we undertook several projects that have large energy and carbon reduction benefits. We completed two boiler replacements at McRoberts Secondary, McKinney Elementary and one rooftop unit replacement project at Burnett Secondary. Along with several parking lot lighting upgrades to energy efficient LED technology, we also successfully completed a major LED lighting upgrade at McNair Secondary.

With the support of BC Hydro, we continued to realize significant electricity and natural gas savings through participation in the Continuous Optimization (C-Op) program. C-Op is a program that aims to optimize the Building Automation System of facilities. All 10

of our secondary schools and one elementary school have completed the program or are close to completion by the end of 2018. As BC Hydro introduces a second round of its C-Op program, the District will seek to continue its participation in this program after a successful first round.



Our Board-approved Environmental Stewardship Policy guides the integration of environmentally sustainable considerations in all of our business decisions. The Richmond School District continues to develop and enhance its focus on sustainability, and Environmental Stewardship is one of our four Developmental Objectives. Our commitment to sustainability is underpinned by five principles: collaboration, continuous improvement, commitment to the triple bottom line, leadership and learning for all. We continue to create and support the necessary structures for an integrated, system-wide approach to environmental sustainability through the work of the Richmond Sustainability Action Team (RSAT) and the Richmond Sustainability Advisory Committee (RSAC), comprised of representatives from all stakeholder groups. Through the actions of our site-based Green Teams, we are making great strides. We will maintain our efforts in educational programs for sustainability to give our students and staff a better understanding of the necessary practices in our operations and facilities for a better and a more sustainable future.

Emissions and Offsets Summary

Richmond School District#38
2018 Carbon Neutral Action Report

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Please refer to the following pages the Executive Summary, the two CNAR actions, the data survey data, and the District Sustainability Report.

Emissions and Offset Summary Table:

***Richmond School District #38*- GHG Emissions and Offset for 2018 (tCO_2e)**	
GHG Emissions created in Calendar Year 2018:	
Total Emissions (tCO_2e)	*4,926 tCO_2*
Total Offsets (tCO_2e)	*4,692 tCO_2*
Adjustments to GHG Emissions Reported in Prior Years:	
Total Emissions (tCO_2e)	*0 tCO_2*
Total Offsets (tCO_2e)	*0 tCO_2*
Grand Total Offsets for the 2018 Reporting Year:	
Grand Total Offsets (tCO_2e)	*4,692 tCO_2*

Executive sign-off:

Signature:  Date May 30 2019

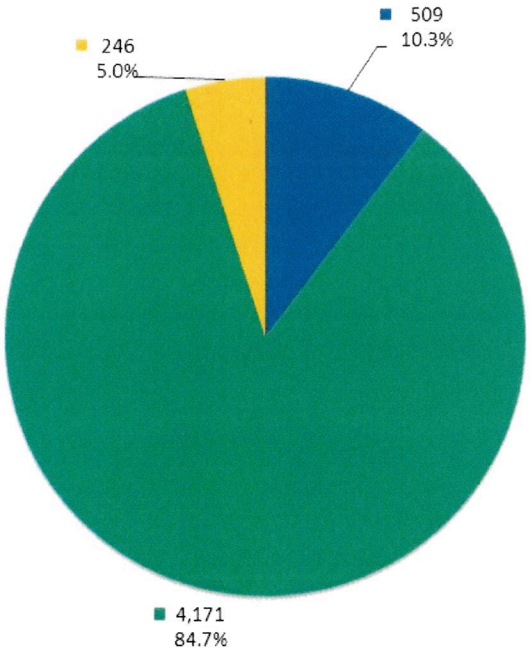
Name (please print) Roy Uyeno Title Secretary Treasurer

Overview

Greenhouse Gas Emissions:

Richmond School District #38 Total Greenhouse Gas Emissions in 2018 are represented in the graph below.

School District 38 - Richmond
Greenhouse Gas Emissions by Source
for the 2018 Calendar Year (tCO_2e*)



Total Emissions: 4,926

- Mobile Fuel Combustion (Fleet and other mobile equipment)
- Stationary Fuel Combustion (Building Heating and Generators) and Electricity
- Supplies (Paper)

Offsets Applied to Become Carbon Neutral in 2018 (Generated May 13, 2019 3:20 PM)
Total offsets required: **4,692**. Total offset investment: $**117,300**. Emissions which do not require offsets: **234** **

*Tonnes of carbon dioxide equivalent (tCO_2e) is a standard unit of measure in which all types of greenhouse gases are expressed based on their global warming potential relative to carbon dioxide.

** Under the *Carbon Neutral Government Regulation* of the *Greenhouse Gas Reduction Targets Act*, all emissions from the sources listed above must be reported. As outlined in the regulation, some emissions do not require offsets.

Offsets applied to become Carbon Neutral in 2018:

The ***4,692*** tons of Carbon Emissions (tCO_2e) offsets required above, an offset investment of ***$123,165*** *(GST included)* is required to be deemed Carbon Neutral.

Please refer to Appendix A for the 2018 GHG Emissions Source Detail Report and Appendix B for Total GHG Emissions by type.

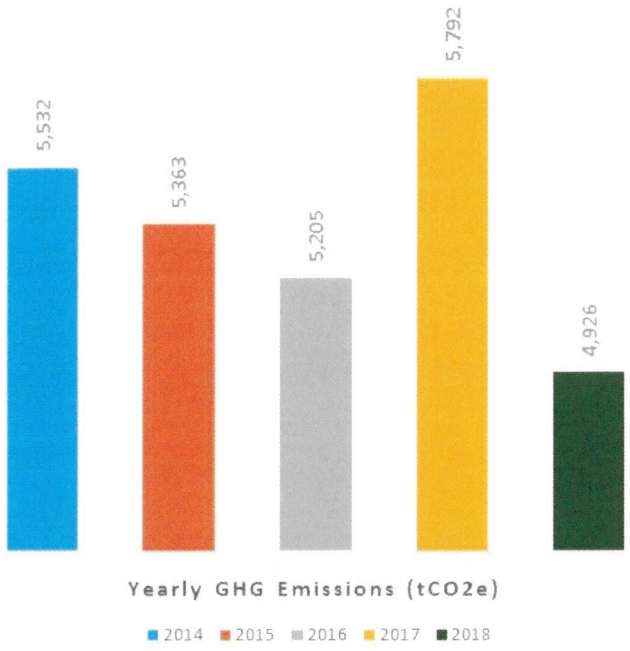
2018 Greenhouse Gas Emissions

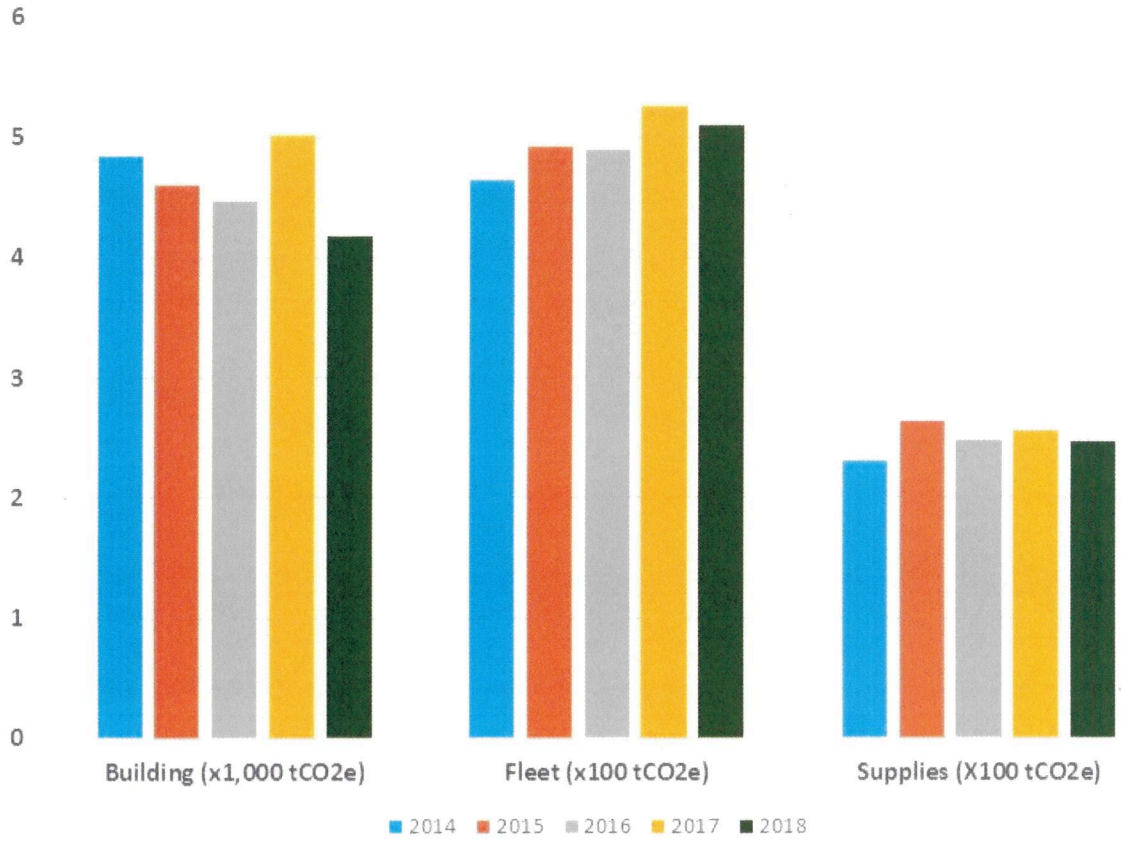
The Richmond School District (herein, "the District") has calculated its 2018 carbon footprint, in accordance with the Greenhouse Gas Reduction Targets Act, to be 4,692 tonnes of CO_2 equivalent.

In total, the Greenhouse Gas Emissions in 2018 were reduced over 10% or 866 tonnes of CO2 equivalent in comparison with 2017. All emissions from building, fleet and supplies were reduced in comparison with 2017.

This significant decrease was achieved due to continuously implementation of energy conservation efforts and sustainability initiatives.

The two graphs below show the District's emissions over the past five years.





Buildings

GHG emissions from buildings result from the fossil fuels consumed to provide heating and cooling, ventilation, and electricity to schools and other district facilities. These emissions account for a large majority of the District's overall emissions at 85% in 2018.

Fleet

The use of fossil fuels used to power the District's fleet vehicles, including maintenance vehicles and school busses, results directly in emissions. The fleet accounted for 10% of the District's overall emissions in 2018 and has reduced 3.0% in comparison with 2017. The district has approved to add 3 additional EV car to our fleet system.

Supplies

Supplies emissions are indirect, originating from the District's use of office paper. In 2018, supplies accounted for 5% of the District's overall GHG emissions and has reduced 3.9% in comparison with 2017. Some of the actions taken to reduce paper consumption have included communicating benchmarked data to schools and defaulting printers to double-sided printing.

Fugitive Emissions

As outlined in the *Carbon Neutral Government Regulation* of the Greenhouse Gas Reductions Targets Act, certain types of emissions are out-of-scope for reporting:

- Gases used for research purposes (e.g. science labs)
- Type R-22 coolant from stationary air conditioning and refrigeration units in schools
- Any emission sources that comprise less than 1% of the district's total GHGs

We estimate that in-scope fugitive emissions (HFCs released to the environment from leaks in cooling equipment) do not comprise more than 0.1% of the District's total emissions and an ongoing effort to collect or estimate emissions from this source would be disproportionately onerous. For this reason, we deem emissions from these sources to be out-of-scope and have not included it in the District's total greenhouse gas emissions profile.

Emissions Reduction Activities

Through our 'Eco-Wise' program, we continue to work towards embedding environmental stewardship in the day-to-day operations of the District, and to incorporate Environmental Stewardship into the school curriculum and into the delivery of each employee's core mandates. As defined by its Environmental Stewardship Policy, the District's sustainability plan covers eight focus areas:

Curriculum Development, Energy Conservation, Grounds Greening, Leadership, Sustainable Purchasing, Sustainable Transportation, Waste Management, and Water Conservation

With the assistance of the Richmond Sustainability Advisory Committee (RSAC), comprised of representatives from all stakeholder groups, the District continued to work towards its long-term sustainability vision by developing and implementing the short-term goals for each of the eight focus areas. We have implemented a number of short-term goals in 2018 resulting in some considerable achievements:

- Executed the Zero Waste Campaign at 14 schools nd Flexible Packaging Plastic Campaign at 20 schools since September 2018.
- Continued to implement a full waste management program comprising district-wide organics and recyclables collection in our schools and administrative buildings. Organic waste is being separated and diverted from the landfill to become 'class A' compost in all of our facilities, and recyclable materials are forming an increasing proportion of our waste stream.

- Completed 16 new raised garden beds at schools. 85% of our schools now have raised garden beds.

- Installed 10 new water bottle filling stations in eight schools to reduce the amount of waste generated by single-use disposable water bottles. The current total is 70 stations spread across most of our sites.
- Shared internal benchmarked energy, paper, and water consumption data, engaging staff to reduce their carbon and water footprint.
- Supported students participating in the Richmond Earth Day Youth-led (REaDY) summit in April 2018 and monthly Eco-Cafes on a variety of sustainability topics.

- Continued with district-wide awareness programs that support both staff and students in implementing behavior change campaigns to target energy conservation.
- Launched Garden classroom to educate teacher towards outdoor learning activities.
- Continued to develop our relationship with a wide range of external stakeholders, including City of Richmond, Fortis BC, BC Hydro, BC Green Games, David Suzuki Foundation, and Translink.

Our carbon neutral objectives and GHG reduction endeavours are inextricably linked to our environmental stewardship initiatives. Of the eight Environmental Stewardship focus areas, Energy Conservation presents the greatest opportunity for both GHG reductions and financial savings given that the largest proportion of the District's GHG emissions is from energy use in buildings. Thus, the largest proportion of our GHG reduction initiatives focus on energy conservation within our schools and administrative facilities.

Plans to Continue Reducing Greenhouse Gas Emissions

We are continuing with the District's comprehensive energy conservation program and have a number of energy efficiency projects slated for 2019/20 including:

- Solar Wall installation at McMath Secondary for natural gas saving
- Boiler replacements to high efficiency condensing boilers at two schools
- LED lighting upgrade at Burnett Secondary, following the success of the similar upgrade at MacNeill and McNair Secondary
- LED lighting upgrade at Whiteside Elementary
- Continue the rooftop unit replacement at Burnett Secondary
- Building Automation System upgrades at two schools
- Implementation of identified energy conservation measures through BC Hydro's Continuous Optimization program
- Upgrade parking lot lighting to energy efficient lighting at a minimum of two schools
- Continue to tie in corridor lighting with alarm panels so that all interior lighting can be automatically turned off when building security system is armed

Achieving Carbon Neutrality

In 2018, we were carbon neutral with respect to our operations for the ninth year in a row. We achieved this through our commitment to reducing energy consumption in our buildings, paper consumption, fleet travel emissions, and by purchasing offsets for the remaining emissions.

In order to become carbon neutral for 2018, the Board of Education of School District 38 (Richmond) purchased carbon offsets from the Pacific Carbon Trust for 4,692 tonnes of CO2e.

As required by Section 5 of the Carbon Neutral Government Regulation, 234 tonnes CO2e of emissions resulting from the operation of school buses were reported as part of our greenhouse gas emissions profile in 2018. These emissions from school busses were not offset as they are out-of-scope under section 4(2)(c) of the Carbon Neutral Government Regulation.

Appendix A: Total GHG Emissions source detail report 2018

School District 38 - Richmond
Greenhouse Gas Emissions Source Detail Report for the 2018 Calendar Year
Generated: May 13, 2019

Source		Quantity	Greenhouse Gases In Tonnes			
			CO_2	CH_4	N_2O	tCO_2e *
Stationary Fuel Combustion (Building Heating and Generators) and Electricity						
Offset Required	Fuel Combustion **	80,230.90 GJ	3,988.37	0.08	0.08	4,012.93
	Purchased Energy	52,672.13 GJ	158.02	0.00	0.00	158.02
	Offset Required Sub Total		4,146.39	0.08	0.08	4,170.95
	TOTAL STATIONARY EMISSIONS		4,146.39	0.08	0.08	4,171
Mobile Fuel Combustion (Fleet and other mobile equipment)						
Offset Required	Fuel Combustion **	112,240.40 L	262.18	0.02	0.04	274.93
	Offset Required Sub Total		262.18	0.02	0.04	274.93
Offset Exempt	School Bus	83,455.01 L	212.29	0.01	0.01	216.39
	CO_2 from Biogenic Fuel Combustion		17.48	N/A	N/A	17.48
	Offset Exempt Sub Total		229.77	0.01	0.01	233.87
	TOTAL MOBILE EMISSIONS		491.95	0.03	0.05	509
Supplies (Paper)						
Offset Required	Non-recycled Content Paper	4,449 Pkg	29.82	0.00	0.00	29.82
	Recycled Content Copy Paper	36,564 Pkg	216.10	0.00	0.00	216.10
	Offset Required Sub Total		245.92	0.00	0.00	245.92
	TOTAL SUPPLIES EMISSIONS		245.92	0.00	0.00	246
	Total Offset Exempt		229.77	0.01	0.01	234
	Total Offset Required		4,654.49	0.10	0.12	4,692
	TOTAL EMISSIONS		4,884.27	0.11	0.13	4,926

* Each greenhouse gas has been converted to a standard measurement (tCO_2e) by multiplying its emissions by its global warming potential (GWP).

The GWP of carbon dioxide (CO_2) from both anthropogenic and biogenic sources is 1; methane (CH_4) is 25, and nitrous oxide (N_2O) is 298.

The Totals for tCO_2e are shown here rounded to the nearest whole metric tonne as only whole tonnes of tCO_2e can be purchased for offsets.

** Includes Fossil Fuels and CH_4 and N_2O from Biogenic Fuels

Appendix B: Total GHG Emissions by type

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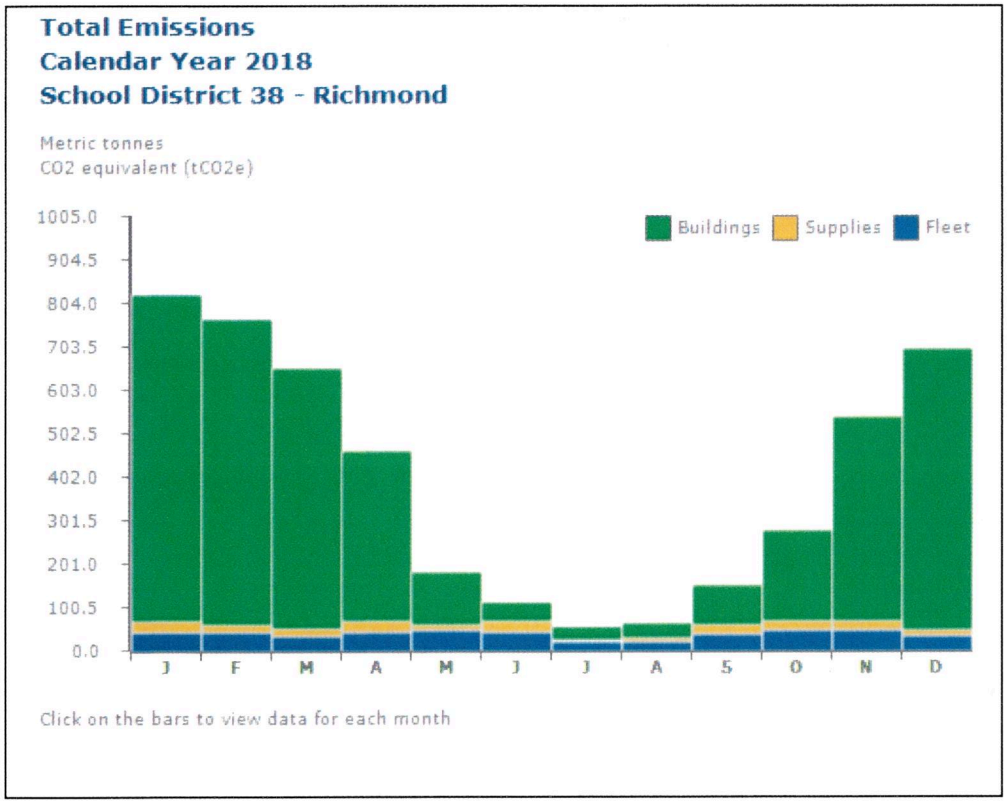
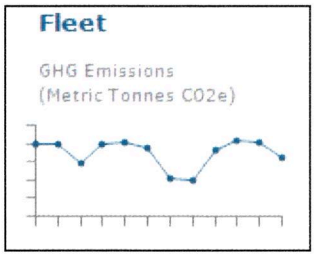
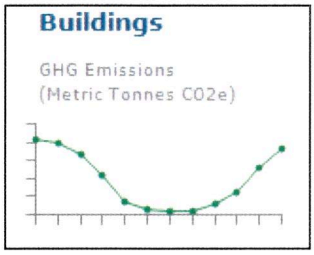
May 13, 2019

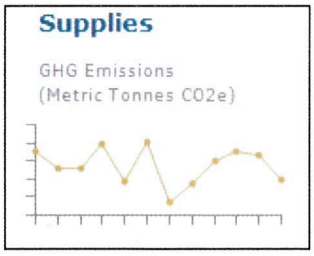
Reporting Unit:

School District 38 - Richmond ▾ Calendar Year 2018 ▾ Show Report









Reporting Entity: School District 38 - Richmond
Reporting Year: Calendar Year 2018

	Measure	Quantity	Greenhouse Gases in Tonnes CO_2	CH_4	N_2O	tCO_2e[1]
Scope 1 (Direct) Emissions						
Mobile Combustion (Fleet)	Litres	195,695.41	474.47	0.03	0.05	**491.32**
Stationary Combustion, Estimated [2]	GigaJoules	555.18	27.53	0.00	0.00	**27.69**
Stationary Combustion, Reported [3]	GigaJoules	79,675.72	3,960.85	0.08	0.08	**3,985.24**
Total Scope 1 Emissions			**4,462.85**	**0.11**	**0.13**	**4,504.25**
Scope 2 (Indirect) Emissions						
Purchased Energy, Estimated [2]	GigaJoules	423.27	1.27	0.00	0.00	**1.27**
Purchased Energy, Reported [3]	GigaJoules	52,248.86	156.75	0.00	0.00	**156.75**
Total Scope 2 Emissions			**158.02**	**0.00**	**0.00**	**158.02**
Scope 3 Emissions						
Business Travel and Office Paper						
Office Paper	Packages	41,013.00	245.92	0.00	0.00	**245.92**
Total Scope 3 Emissions			**245.92**	**0.00**	**0.00**	**245.92**
Emissions from Biomass						
Total Biomass Emissions			**17.48**	**0.00**	**0.00**	**17.48**
Total Emissions, Calendar Year 2018			**4,884.27**	**0.11**	**0.13**	**4,925.67**

1. Global Warming Potential (GWP) has been applied only to the tCO_2e values.
2. Estimated data has been calculated based on the methods described in the Methodology Document.
3. Reported data refers to consumption which has been directly billed to the organization.

This information is provided by the Government of British Columbia, and is subject to verification.

Part 1: CNAR Survey

1. General Information

Name: Poroshat Assadian

Contact Email: passadian@sd38.bc.ca

Organization Name: Richmond School District #38

Sector: School District

Role - Please select your role(s) below.
If more than one individual completed the survey, multiple categories may be selected:

Energy Manager: Yes

Sustainability Coordinator: No

Administrative Assistant: No

Facilities/Operations Manager/Coordinator: No

CEO/President/Exec Director: No

Treasurer/Accounting: No

Superintendent: No

A. Stationary Sources (e.g. Buildings, Power Generators): Fuel Combustion, Electricity use, Fugitive Emissions.

1. Actions taken by your organization in 2018 to support emissions reductions from buildings.

a) Do you have a strategy to reduce emissions from stationary sources?

Yes

If yes above, what are the main goals?: - Reduce the energy consumption
- Reduce the wastes generated and increase the diversion rate

b) Whether you have a strategy or not (1.a), briefly describe your organization's plans to continue reducing emissions from stationary sources:

I. Over the medium-term term (1-5 years)

- Conduct energy audits to identify energy saving opportunities
- Perform energy retrofit projects
- Building renovations
- Apply best practices in building management

II. Over the long term (6-10 years)

- Execute the long-term facility planning
- Integrate building management into energy management using smart controls

c) Please describe your strategy's goals (if any) related to energy audits.

- energy consumption analysis
- energy saving and GHG emissions reduction opportunities

I. What % on average of your building portfolio has an energy audit completed each year (if any)?: 10

I. What % on average of your building portfolio is retrofitted each year in the following categories (if any) - click here for further information:

Minor retrofits (e.g., low cost, easy to implement measures including caulking, lighting, adding roof insulation, etc.) (%): 15

Major retrofits (e.g., replacing windows and doors, equipment replacement such as boilers, etc.) (%): 10

Deep retrofits (e.g., replacing roof, replacing the heating, ventilation and air-conditioning system with a renewable technology like a ground-source heat pump, etc.) (%): 5

I. What % on average of your building portfolio do you recommission each year?: 3

f) Do you keep records of Refrigerant gases category and refilling volumes?

No

g) How many newly constructed buildings received at least LEED Gold certification in 2018: 0

B. Mobile Sources (Vehicles, Off-road/portable Equipment): Fuel Combustion:

3. Actions taken by your organization in 2018 to support emissions reductions from mobile sources.

a) Do you have a strategy to reduce emissions from mobile sources?

Yes

I. If yes, what are its goals?

- Bike and walk more, drive less

b) Whether you have a strategy or not (3.a), briefly describe your organization's plans to continue reducing emissions from mobile sources:

I. Over the medium-term term (1-5 years)

- Preventive maintenance of the fleet
- Explore opportunity to expand our electric fleet

II. Over the long term (6-10 years)

- More electric fleet

4. Please indicate the number of the vehicles in the following vehicle classes that are in your current fleet (including any purchased in 2018):

Definitions:

• Light duty vehicles (LDVs) are designated primarily for transport of passengers <13 and GVWR<3900kg
• Light duty trucks (LDTs) are designated primarily for transport of light-weight cargo or that are equipped with special features such as four-wheel drive for off-road operation (include SUVs, vans, trucks with a GVWR<3,900kg)
• Heavy duty vehicles (HDV) includes vehicles with a GVWR>3,900 kg (e.g. ¾ tonne pick-up truck, transport trucks)

a) Light duty vehicles (LDVs)

Electric Vehicles – EV - (e.g., Nissan Leaf, Chevy Bolt): 10

C. Office Paper: Indicate which actions your PSO took in 2018:

6. Actions taken by your organization in 2018 to support emissions reductions from paper supplies.

a) Do you have an Office Paper strategy?

No

b) Whether you have a strategy or not (6.a), briefly describe your organization's plans to continue reducing emissions from paper use:

I. Over the medium-term (1-5 years)

- Reduce printing demand
- Double-sided printing default set up

II. Over the long term (6-10 years)

- Increase high recycled content

c) Have an awareness campaign focused on reducing office paper use

Yes

d) Purchased alternate source paper (bamboo, hemp, wheat, etc.)

Yes