



Carbon Neutral Action Report

2017

2017 Carbon Neutral Action Report

School District #38 (Richmond)

This Carbon Neutral Action Report for the period January 1st, 2017 to December 31st, 2017 summarizes our emissions profile, the total offsets to reach net-zero emissions, the actions we have taken in 2017 to reduce our greenhouse gas emissions and our plans to continue reducing emissions in 2018 and beyond.

By June 30, 2017, School District #38's final *Carbon Neutral Action Report* will be posted to our website at www.sd38.bc.ca.

Executive Summary

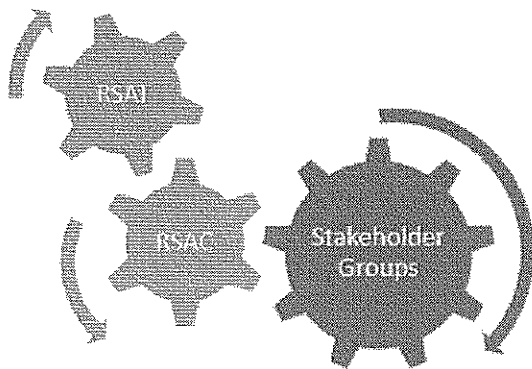
On behalf of the Board of Education, School District 38 (Richmond), I am pleased to submit our Carbon Neutral Action Report for 2017. Now in our eighth year of being carbon neutral, energy savings and greenhouse gas emissions reductions remain a priority in our ongoing commitment towards carbon neutrality. 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 2017, 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 2016, we set a target in 2017 to reduce our natural gas consumption by 3% and our electricity consumption by 3% compared to the previous year. Last year was extremely cold and based on the baseline at Energy Star Portfolio Manager and other utility tracking software, the energy consumption of schools in lower mainland increased 20% compared to last year due in part to the much colder weather than last 20 years. Because of that, we had increased in our overall utility consumption. We continue to work diligently in identifying opportunities for natural gas savings into 2017.

As part of our 2017 energy conservation program, we undertook several projects that have large energy and carbon reduction benefits. We completed three boiler replacements at Steveston-London Secondary, Lee Elementary and Gilmore Elementary. 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 (Ferris) have completed the program or are close to completion by the end of 2017. 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.

Sherry Elwood
Superintendent of Schools

Emissions and Offsets Summary

Richmond School District#38 2017 Carbon Neutral Action Report

This Carbon Neutral Action Report for the period January 1st, 2017 to December 31st, 2017 summarizes our emissions profile, the total offsets to reach net-zero emissions, the actions we have taken in 2017 to reduce our greenhouse gas emissions and our plans to continue reducing emissions in 2017 and beyond.

By June 30, 2018, Richmond School District #38 final *Carbon Neutral Action Report* will be posted to our website at www.sd38.bc.ca

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 2017 (tCO₂e)	
GHG Emissions created in Calendar Year 2017):	
Total Emissions (tCO ₂ e)	5,792 tCO ₂
Total Offsets (tCO ₂ e)	5,531 tCO ₂
Adjustments to GHG Emissions Reported in Prior Years:	
Total Emissions (tCO ₂ e)	11 tCO ₂
Total Offsets (tCO ₂ e)	11 tCO ₂
Grand Total Offsets for the 2017 Reporting Year:	
Grand Total Offsets (tCO ₂ e)	5,542 tCO ₂

Executive sign-off:

Signature:



Date May 31 2018

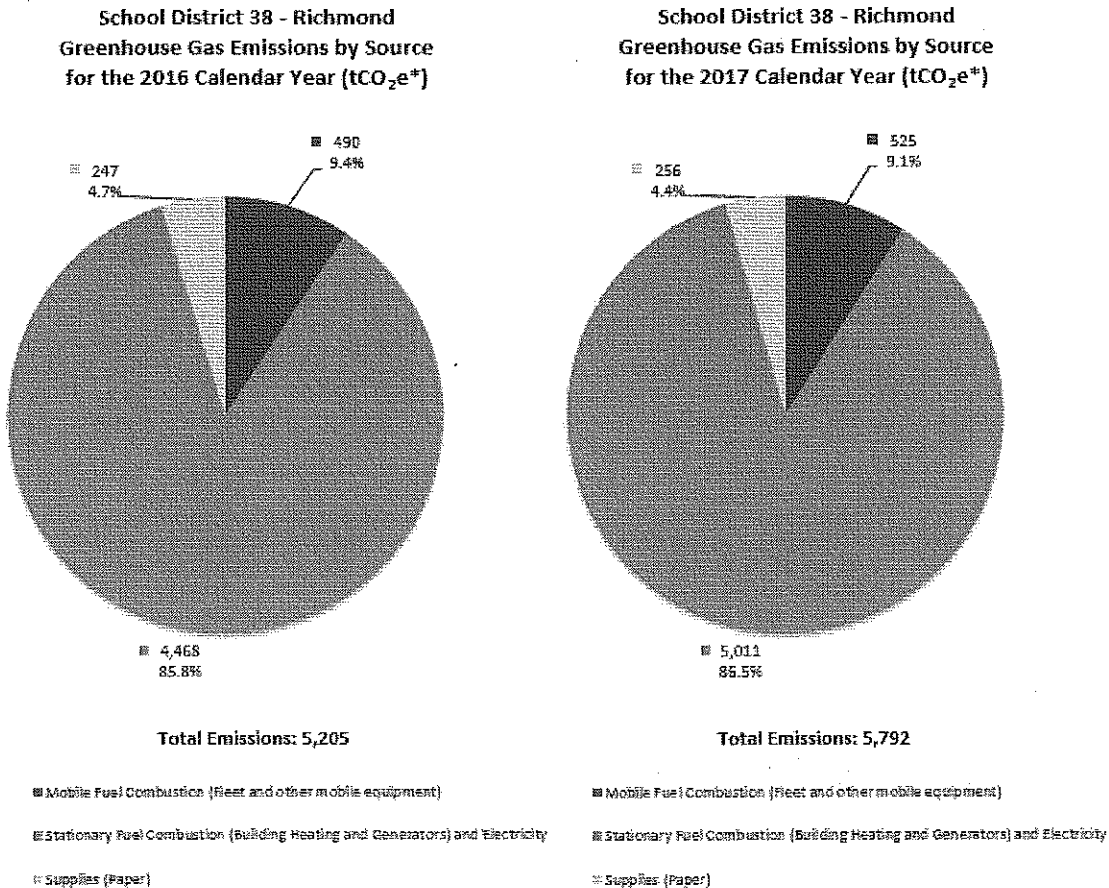
Name (please print) Roy Uyeno

Title Secretary Treasurer

Overview

Greenhouse Gas Emissions:

Richmond School District #38 Total Greenhouse Gas Emissions in 2016 (left) and 2017 (right) are represented in the graphs below.



Offsets applied to become Carbon Neutral in 2017:

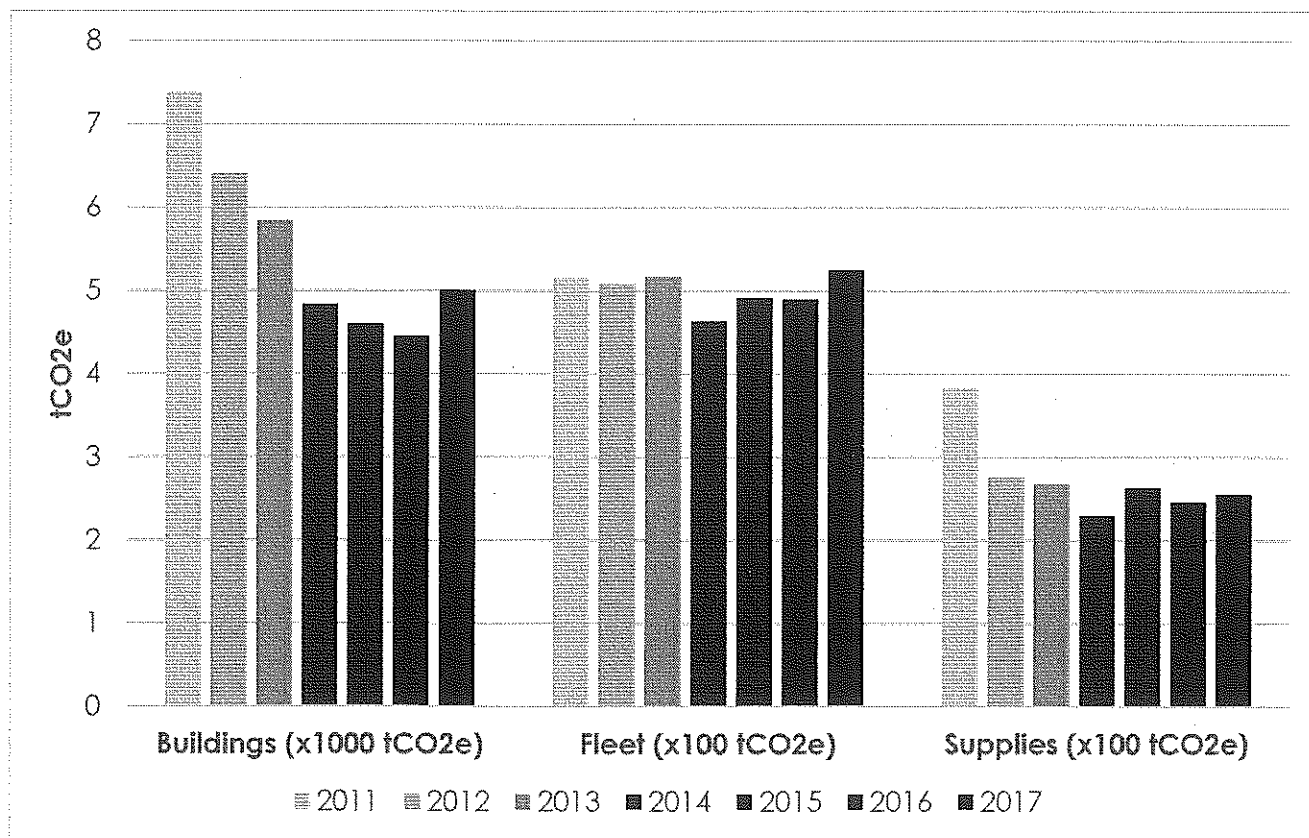
The **5,792** tons of Carbon Emissions (tCO₂e) noted above, require an offset investment of approximately **\$145,477.5** to be deemed Carbon Neutral.

Please refer to Appendix A for the 2017 GHG Emissions Source Detail Report and Appendix B for Total GHG Emissions by type

2015 Greenhouse Gas Emissions

The Richmond School District (herein, "the District") has calculated its 2017 carbon footprint, in accordance with the Greenhouse Gas Reduction Targets Act, to be 5,792 tonnes of CO₂ equivalent.

In 2017, we increased in our overall carbon footprint which it's mainly due to the extreme cold weather in last winter. During 2014, twenty-six days of teacher job action resulted in lower than expected emissions during that year. As a result, we observed an increase in emissions from supplies and fleet in 2015 versus 2014, though this was in fact due to the job action of 2014. The figure below shows the District's emissions over the past six years.



Buildings

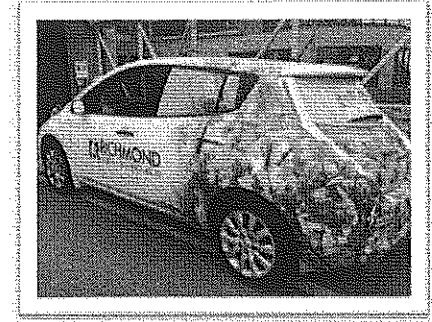


GHG emissions from buildings result from the fossil fuels consumed to provide heating and cooling, ventilation, and electricity to schools and other district facilities. These emissions account for a large majority of the District's overall emissions at 86%.

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 9% of the District's overall emissions in 2017. The proportion of fleet emissions has gradually been increasing over time, from 6.2% in 2011, as building emissions have decreased.



Supplies



Supplies emissions are indirect, originating from the District's use of office paper. In 2017, supplies accounted for 4.4% of the District's overall GHG emissions. The proportion of paper emissions has fluctuated from a low of 3.8% in 2012 to a high of 5.1% in 2015. 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



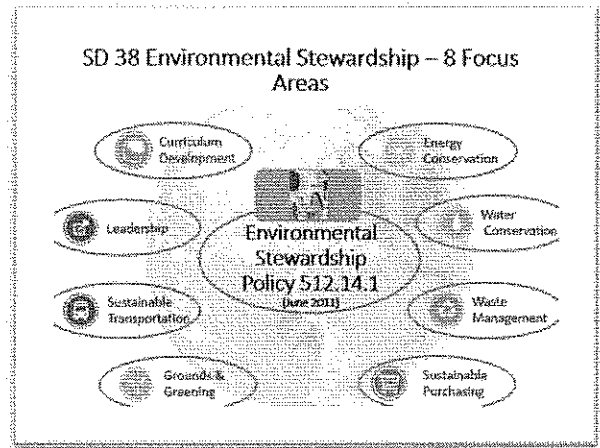
As outlined in the *Carbon Neutral Government Regulation of the Greenhouse Gas Reductions Targets Act*, certain types of emissions are out-of-scope for reporting:

- 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

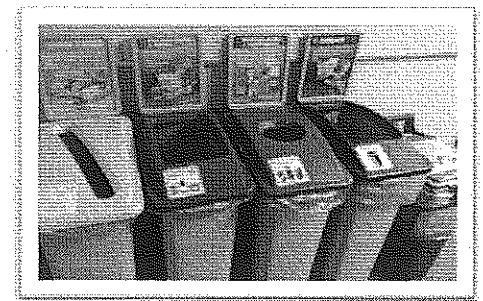
Through our 'Eco-Wise' program, we continue to work towards embedding environmental stewardship in the day-to-day operations of the District, and to incorporate Environmental Stewardship into the school curriculum and into the delivery of each employee's core mandates. As defined by its Environmental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



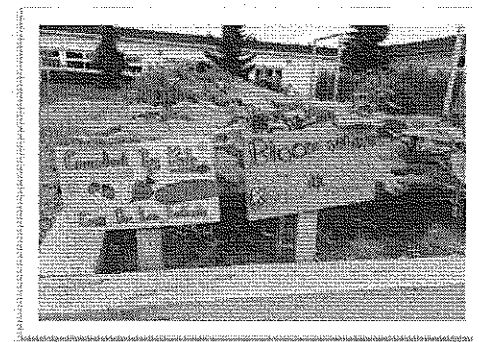
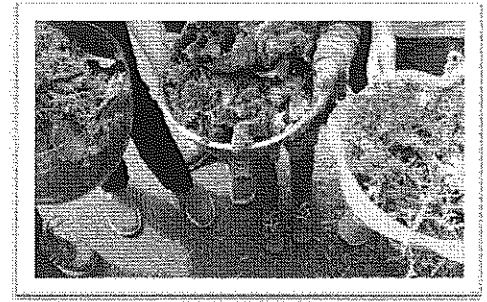
Curriculum Development, Energy Conservation, Grounds Greening, Leadership, Sustainable Purchasing, Sustainable Transportation, Waste Management, and Water Conservation

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 2017 resulting in some considerable achievements:

- Continued the delivery of over 1000 recycling containers to all our facilities to provide dedicated 'waste & recycling' stations at each location. 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 (41 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 2017 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, and Translink.
- Facilitated the transfer of utility data from all of our buildings to Energy Star Portfolio Manager in order that our schools and offices can be benchmarked against similar facilities across Canada.



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 2018/19 including:

- Boiler replacements to high efficiency condensing boilers at three schools
- LED lighting upgrade at Burnett Secondary, following the success of the similar upgrade at MacNeill and McNair Secondary
- Rooftop unit replacement at Burnett Secondary
- Building Automation System upgrades at two schools, including major upgrade at Richmond Secondary
- 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 2017, we were carbon neutral with respect to our operations for the eight 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 2017, the Board of Education of School District 38 (Richmond) purchased carbon offsets from the Pacific Carbon Trust for 5,542 tonnes of CO₂e.

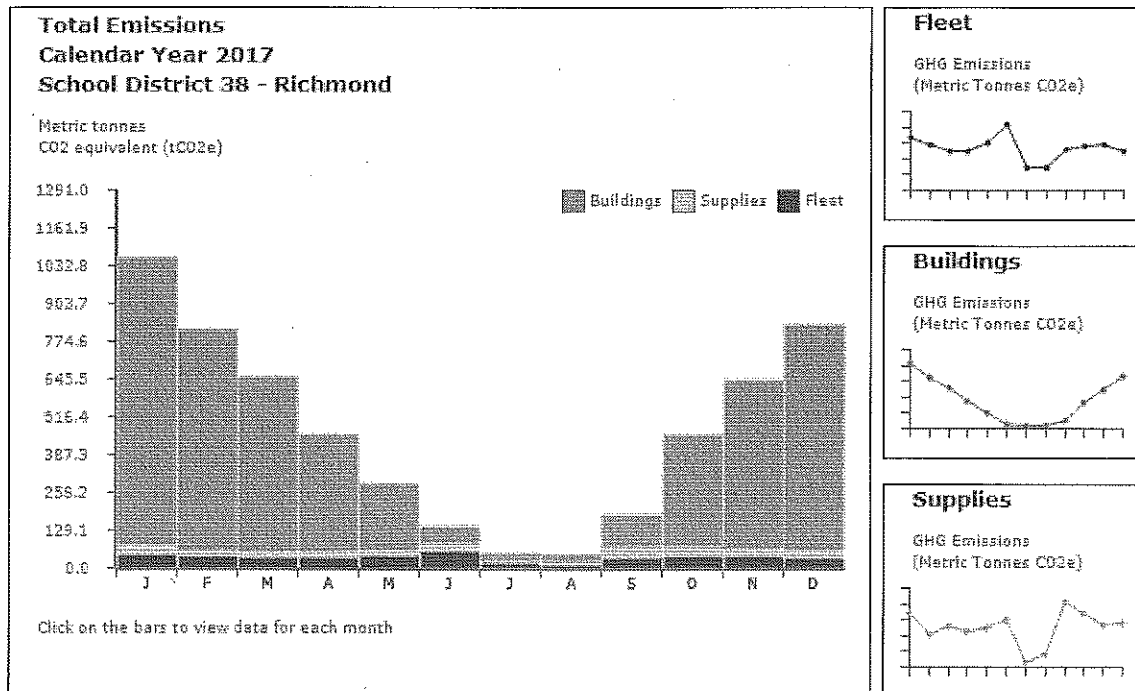
As required by Section 5 of the Carbon Neutral Government Regulation, 248 tonnes CO₂e of emissions resulting from the operation of school buses were reported as part of our greenhouse gas emissions profile in 2015. These emissions from school busses were not offset as they are out-of-scope under section 4(2)(c) of the Carbon Neutral Government Regulation.

Appendix A:

Total GHG Emissions source detail report 2017

School District 38 - Richmond						
Greenhouse Gas Emissions Source Detail Report for the 2017 Calendar Year						
Generated: May 18, 2018						
Source		Quantity	Greenhouse Gases In Tonnes			
			CO ₂	CH ₄	N ₂ O	tCO ₂ e *
Stationary Fuel Combustion (Building Heating and Generators) and Electricity						
Offset Required	Fuel Combustion **	96,977.50 GJ	4,821.43	0.10	0.09	4,851.17
	Purchased Energy	53,226.58 GJ	159.68	0.00	0.00	159.68
	Offset Required Sub Total		4,981.11	0.10	0.09	5,010.85
	TOTAL STATIONARY EMISSIONS		4,981.11	0.10	0.09	5,011
Mobile Fuel Combustion (Fleet and other mobile equipment)						
Offset Required	Fuel Combustion **	107,990.80 L	251.37	0.02	0.04	263.52
	Offset Required Sub Total		251.37	0.02	0.04	263.52
Offset Exempt	School Bus	94,432.80 L	238.58	0.01	0.01	243.28
	CO ₂ from Biogenic Fuel Combustion		18.03	N/A	N/A	18.03
	Offset Exempt Sub Total		256.61	0.01	0.01	261.30
	TOTAL MOBILE EMISSIONS		507.98	0.03	0.05	525
Supplies (Paper)						
Offset Required	Non-recycled Content Paper	4,957 Pkg	33.05	0.00	0.00	33.05
	Recycled Content Copy Paper	37,986 Pkg	223.12	0.00	0.00	223.12
	Offset Required Sub Total		256.17	0.00	0.00	256.17
	TOTAL SUPPLIES EMISSIONS		256.17	0.00	0.00	256
	Total Offset Exempt		256.61	0.01	0.01	261
	Total Offset Required		5,488.64	0.12	0.13	5,531
	TOTAL EMISSIONS		5,745.25	0.13	0.15	5,792
* Each greenhouse gas has been converted to a standard measurement (tCO ₂ e) 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 ₂ O) is 298.						
The Totals for tCO ₂ e are shown here rounded to the nearest whole metric tonne as only whole tonnes of tCO ₂ e can be purchased for offsets.						
** Includes Fossil Fuels and CH ₄ and N ₂ O from Biogenic Fuels						

Appendix B: Total GHG Emissions by type



Totals Calendar Year 2017, School District 38 - Richmond

		Greenhouse Gases in Tonnes						
	Measure	Quantity	CO ₂	BioCO ₂	CH ₄	N ₂ O	tCO ₂ e ¹	
Scope 1 (Direct) Emissions								
	Mobile Combustion (Fleet)	Litres	202,423.60	489.95	18.03	0.03	0.05	524.82
	Stationary Combustion, Estimated ²	Gigajoules	555.18	27.53	0.00	0.00	0.00	27.69
	Stationary Combustion, Reported ³	Gigajoules	86,422.32	4,793.90	0.00	0.10	0.09	4,823.48
Scope 2 (Indirect) Emissions								
	Purchased Energy, Estimated ²	Gigajoules	423.27	1.27	0.00	0.00	0.00	1.27
	Purchased Energy, Reported ³	Gigajoules	52,803.31	156.41	0.00	0.00	0.00	158.41
Scope 3 (Business Travel and Office Paper) Emissions								
	Office Paper	Packages	42,943.00	256.17	0.00	0.00	0.00	256.17
Total Emissions, Calendar Year 2017			5,727.22	18.03	0.13	0.15	5,792	
Carbon Neutral or Offset Exempt			238.58	18.03	0.01	0.01	261	
Total for Offsets ⁴			5,488.64	0.00	0.12	0.13	5,531	

1. Each greenhouse gas has been converted to a standard measurement (tCO₂e) by multiplying its emissions by its global warming potential (GWP). The GWP of carbon dioxide (CO₂) from both anthropogenic and biogenic sources is 1; methane (CH₄) is 25, and nitrous oxide (N₂O) is 298. The Totals for tCO₂e are shown here rounded to the nearest whole metric tonne as only whole tonnes of tCO₂e can be purchased for offsets.

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.

4. The tCO₂e value from the "Total for Offsets" line represents the quantity of offset purchases required to become carbon neutral.

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

2. Stationary Sources (eg. Buildings, Power Generators): Fuel Combustion, Electricity use, Fugitive Emissions.

During 2017, did your organization take any of the following actions to support emissions reductions from buildings? (please select all that apply)

Conducted an energy audit/study of building(s) in the organization's portfolio.; Performed energy retrofits of the organization's building(s)

If you selected "*Performed energy retrofits of the organization's building(s)*":

How many buildings were retrofitted?: 7

If you selected "*Built, or are building new LEED Gold or other "Green" buildings*":

How many new "Green" buildings?:

Did your Organization perform any retrofits during 2017? Please describe briefly:

As part of our 2017 energy conservation program, we undertook several projects that have large energy and carbon reduction benefits. We completed three boiler replacements at Steveston-London Secondary, Lee Elementary and Gilmore Elementary. Along with several parking lot lighting upgrades to energy efficient LED technology, we also successfully completed a major LED lighting upgrade at McNair Secondary. We also implemented 2 major DDC upgrade.

2a. Stationary Sources (eg. Buildings, Power Generators): Fuel Combustion, Electricity use, Fugitive Emissions.

Please briefly describe your organization's plans to continue reducing emissions from its stationary sources:

a) Over the next 1-5 years

Future energy management activities will include:

- Heating plant retrofits
- Building Automation System Upgrade
- LED upgrade
- Solar initiatives including solar wall and solar panel
- Implementing of Sustainable Energy Management plan
- Having Energy Manager, Energy Specialist and Teacher consultant position in the district to support the energy conservation initiatives.

b) Over the following 6-10 years

We will evaluate our programs in 5 years and will continue with emission reductions programs.

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

During 2017, did your organization take any of the following actions to support emission reductions from its mobile sources? (please select all that apply)

None of the above

If you selected "*Replaced existing vehicles with more fuel efficient vehicles (gas/diesel)*":

How many vehicles?:

If you selected "*Replaced existing vehicles with hybrid or electric vehicles*":

How many vehicles?:

3a. Mobile Sources (Vehicles, Off-road/portable Equipment): Fuel Combustion:

Please briefly describe your organization's plans to continue reducing emissions from its mobile sources:

a) Over the next 1-5 years

- Install electric charger at 10 sites
- Replace old vehicle with electric or hybrid car
- Run behavioral programs to educate staff in regards emission associated with using vehicle

b) Over the following 6-10 years

- Install electric charger at all of our sites
- Replace old vehicle with electric or hybrid car
- Run behavioral programs to educate staff in regards emission associated with using vehicle

4. Supplies (Paper): Indicate which actions your PSO took in 2017:

During 2017, did your organization take any of the following actions to support emissions reductions from paper supplies? (please select all the apply)

Had an awareness campaign focused on reducing office paper use; None of the above

4) Supplies (Paper): Indicate which actions your PSO took in 2017: - Other? Please describe briefly:: We are replacing our printers to have a centralize unit to start tracking consumption in 2018/2019

If you selected "*Had a policy requiring the purchase of recycled content paper*":

State the required recycled content here (30%, 50%, 100%):

If you selected "*Had a policy requiring the purchase of alternate source paper (bamboo, hemp, wheat, etc)*", which type of alternate source paper did you use?

Please briefly describe your organization's plans to continue reducing emissions associated with its office paper use in future years.

centralize printer strategy with linked to staff ID. Run behavioral campaigns associated with paper reduction

5. Other Sustainability Actions

a) Business Travel

During 2017, did your organization take any of the following actions to support emissions reductions from business travel? (please select all that apply)

Encouraged alternative travel for business (e.g. bicycles, public transit, walking)

5) Other Sustainability Actions - Other? Please specify:: Run TravelSmart programs for student and staff

b) Education/Awareness

During 2017, did your organization have any of the following programs or initiatives to support sustainability education and awareness? (please select all that apply)

A Green, Sustainability or Climate Action Team; Support for professional development on sustainability (e.g. workshops, conferences, training); Supported or provided education to staff about the science of climate change, conservation of water, energy and/or raw materials

c) Other Sustainability Actions

During 2017, did your organization have any of the following programs or initiatives to support sustainability? (please select all that apply)

An operations policy or program to facilitate the reduction and diversion of building occupant waste (e.g., composting, collection of plastics, batteries) from landfills or incineration facilities; Green procurement standards for goods (e.g., office furniture, etc.)