

2017 CARBON NEUTRAL ACTION REPORT

SCHOOL DISTRICT NO. 71 (COMOX VALLEY)



VANCOUVER ISLAND, BC



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DECLARATION STATEMENT



This Carbon Neutral Action Report (CNAR) 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, 2018 School District 71, Comox Valley's final Carbon Neutral Action Report will be posted to our website at www.sd71.bc.ca.

OVERVIEW - SD71 COMOX VALLEY

School District 71 (Comox Valley) is one of 60 school districts in British Columbia. In addition to serving the central Vancouver Island municipalities of the City of Courtenay, the Town of Comox and the Village of Cumberland, SD71 also serves students in the surrounding communities of Black Creek, Merville, Royston, Union Bay, Hornby Island and Denman Island.

QUICK FACTS – SD71 serves:

- 1 Regional District
- 2 Islands
- 7000 + students
- 3 Municipalities
- 1 First Nation



Vancouver Island, BC

Thirteen Elementary Schools: Airport, Arden, Aspen Park, Brooklyn, Courtenay, Denman Island, École Puntledge Park, École Robb Road, Hornby Island, Huband Park, Miracle Beach, Queneesh, Royston, Valley View

One Middle School: Lake Trail Middle School (Gr. 6-9)

Three Secondary Schools: Georges P. Vanier, Highland, Mark R. Isfeld

Additional Schools/Programs: Cumberland Community School (K-9), Glacier View Secondary Centre (Alternate Gr. 10-12), Nala'atsi Alternate Program, Navigate (NIDES), International Student Program

SD71's Vision and Mission Statement:

"A learning community that embraces diversity, honours relationship and prepares all learners for a changing world. To work with our educational partners to develop responsible, compassionate citizens and successful, lifelong learners."

Board of Trustees 2015 – 2018

OVERVIEW - GHG REPORTING

In 2007 the B.C. Government took a major step in the fight against climate change by setting aggressive greenhouse gas (GHG) reduction targets and making it legally binding. The Greenhouse Gas Reduction Targets Act (GGRTA) established by the B.C. Government sets legislation that all B.C. public sector organizations (PSOs) will reduce GHG emissions. Listed are the targets set for the PSOs and regulated by the Carbon Neutral Government:

- ❑ By 2020, B.C. will reduce GHG emissions by 33 per cent, compared to 2007 levels.
- ❑ By 2050, GHG emissions will be reduced by at least 80 per cent below 2007 levels.

To meet legislated targets, all public sector organizations including school districts, are required to be carbon neutral. The phrase “carbon neutral” is a way to explain and take responsibility for the GHGs emitted. As a PSO “adding” GHGs to heat buildings, the emissions can be “subtracted” by purchasing carbon offsets. These purchased offsets support innovative B.C.-based projects that create economic opportunities and fosters the use and development of clean technologies across the province. All public sector organizations follow a five-step process to become carbon neutral and have been doing so since 2010.

School District No.71 (Comox Valley) or SD71, has implemented these five steps to become carbon neutral. Firstly, **measuring** operational GHG emissions from district buildings, district vehicles and district wide paper consumption. Secondly, **reducing** emissions where possible through an integrated approach. Thirdly, **offsetting** SD71 GHG emissions by purchasing an equivalent amount of high quality, made-in-B.C. carbon offsets. Fourthly, **reporting** annually on progress through the Carbon Neutral Action Report (CNAR) and finally, **verifying** data and emissions through SMARTTool. To convert GHG emissions into a unit of measure, BC government uses the application SMARTTool. All PSOs enter their data into SMARTTool, which then converts this data into tonnes of carbon dioxide equivalents (tCO₂e).



To become carbon neutral for the 2017 calendar year, SD71 purchased carbon offsets for 2275 tonnes of carbon dioxide equivalent (tCO₂e) emitted.

Since SD71 began annual reporting in 2010, tCO₂e emissions have varied and shown some declining trends. The lowest tCO₂e level was in 2015 and the highest was in 2012. Historical SD71 annual levels of tCO₂e emission are as follows:

2010 – 2463 tCO₂e
 2011 – 2475 tCO₂e
 2012 – 2504 tCO₂e
 2013 – 2268 tCO₂e
 2014 – 2208 tCO₂e
 2015 – 1975 tCO₂e
 2016 – 2027 tCO₂e
 2017 – 2275 tCO₂e

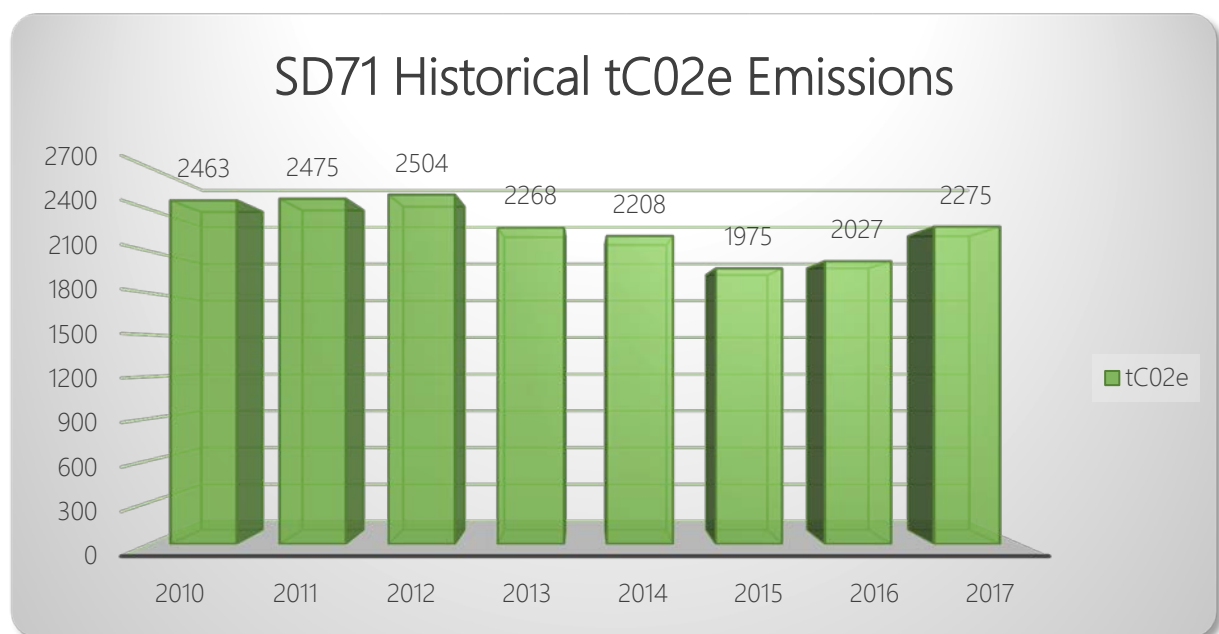


Figure 1 SD 71 Historical tCO₂e Emissions

As noted on the following page's bar chart and data (extracted from SMARTTool Reports), district wide, buildings continue to produce the majority of GHG emissions, at approximately 88% of the tCO₂e produced due to heating and lighting demands.

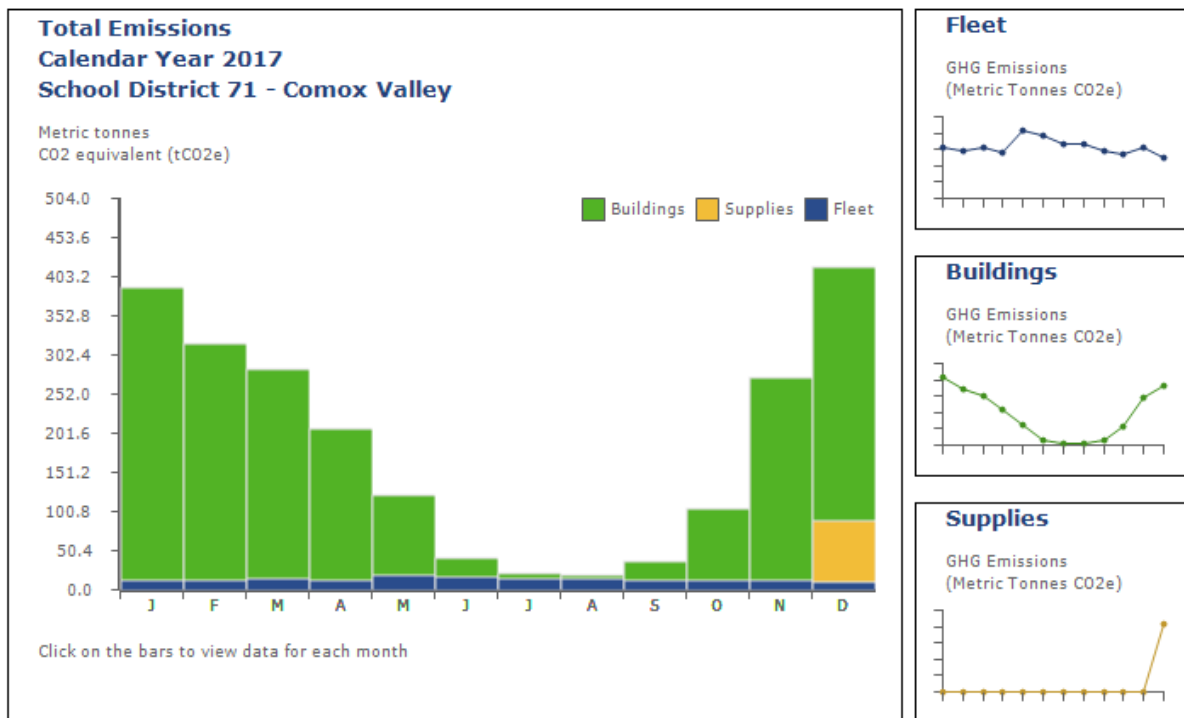


Figure 2 SMARTTool Report of Monthly tCO₂e Levels

Totals Calendar Year 2017, School District 71 - Comox Valley

| | | | 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 | 76,084.00 | 167.38 | 5.74 | 0.02 | 0.04 | 186.74 |
| Stationary Combustion, Reported ³ | GigaJoules | 38,880.65 | 1,942.44 | 0.00 | 0.04 | 0.04 | 1,955.29 |
| Scope 2 (Indirect) Emissions | | | | | | | |
| Purchased Energy, Reported ³ | GigaJoules | 19,850.51 | 59.55 | 0.00 | 0.00 | 0.00 | 59.55 |
| Scope 3 (Business Travel and Office Paper) Emissions | | | | | | | |
| Office Paper | Packages | 12,665.00 | 79.43 | 0.00 | 0.00 | 0.00 | 79.43 |
| Total Emissions, Calendar Year 2017 | | | 2,248.81 | 5.74 | 0.06 | 0.08 | 2,281 |
| Carbon Neutral or Offset Exempt | | | 0.00 | 5.74 | 0.00 | 0.00 | 6 |
| Total for Offsets ⁴ | | | 2,248.81 | 0.00 | 0.06 | 0.08 | 2,275 |

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.

Figure 3 SMARTTool Report of GHG in Tonnes, tCO₂e

OVERVIEW - KEY ACTIONS 2017

Throughout SD71 we are committed to preparing all learners for a changing world. We value healthy living and social responsibility as well as academics. Comox Valley schools have met the challenges of rising heating costs, reduced operation's budget and increased demand on aging facilities. Senior Management has played an active role in seeking out and securing funding opportunities that will result in GHG emission reductions.

The most significant GHG reduction upgrade projects completed in 2017 include:

1. Ecole Robb Road Elementary Boiler Replacement Project
2. Courtenay Elementary Boiler Replacement Project
3. Various Building and Equipment Upgrades

1. Ecole Robb Road Elementary Water Heater and Boilers Replacement Project

A 2015 Mechanical Feasibility study of Ecole Robb Road Elementary identified that the standard gas fired boilers were inefficient and were close to the end of their expected service life. The report detailed that the old standard efficiency boilers (approximately 50 to 60% efficient) should be replaced by high efficiency boilers to increase student comfort and to reduce natural gas consumption.



Figure 4 Robb Road School Boiler & Water Heater Replacements (Pumps were replaced as well)

A high-efficiency natural gas condensing boiler dramatically reduces the natural gas consumption at the school site. The photo on the previous page shows the four Viessmann high efficiency boilers that replaced the three Teledyne boilers in the summer of 2017. ESTIMATED ANNUAL 60.57 tCO₂e or 33% reduction in emissions will occur due to replacement by high efficiency condensing boiler system. This project was partially funded by Carbon Neutral Capital Program funding.

2. Courtenay Elementary Boiler Replacement Project

A Mechanical Feasibility study of Courtenay Elementary identified that the standard gas fired boilers were inefficient and were close to the end of their expected service life. The report detailed that the old standard efficiency boilers (approximately 50 to 60% efficient) should be replaced by high efficiency boilers to increase student comfort and to reduce natural gas consumption.



Figure 5 Courtenay Elementary School Boiler, Pump, & Water Heater Replacements

A high-efficiency natural gas condensing boiler dramatically reduces the natural gas consumption at the school site. The photo above shows the four Viessmann high efficiency boilers that replaced the three Teledyne boilers in the summer of 2017. ESTIMATED ANNUAL 60.57 tCO₂e or 33% reduction in emissions will occur due to replacement by high efficiency condensing boiler system. This project was partially funded by Carbon Neutral Capital Program funding.

3. Various Building and Equipment Upgrades

- A. **LED Light upgrades** were completed in the **gymnasiums** of the following four schools: Lake Trail Middle School, Queneesh, Aspen, and Brooklyn Elementary schools.
- B. **LED Light upgrades** (re-lamping) of **main entrance vestibule areas** were completed at Queneesh, Aspen, and Brooklyn Elementary schools.
- C. **LED Light upgrade** (re-lamping) was completed at Georges P. Vanier Secondary's metal and wood-working shops.
- D. **Direct Digital Control (DDC) building controls upgrades** were completed at Lake Trail Middle School and Cumberland Community School's Beaufort building.
- E. **Cladding upgrade** at Courtenay Elementary is almost complete. This is integral for maintaining effective building envelope to reduce energy consumption.

IT Hardware Upgrades

The IT Department continues to replace older computers that draw more power and create more heat with newer units as a part of the district's ongoing technology replacement plan. At the same time, replacing older monitors LCD with newer LED monitors resulting in less heat generated and power lost. A CRT monitor needs 110 W to work but the new LED monitors need 17.18 W to work. **This translates to 68% power savings per Energy Star LED monitor.** Additionally, centrally located printers are replacing multiple, personal use printers.

SD71 Fleet Upgrades

Continuance of replacing and purchasing current fleet vehicles with vehicles that are newer, more fuel-efficient and produce less emissions.

OVERVIEW - SUCCESS STORIES

Roughly, 80% of SD71 buildings have fuel heating. Natural gas and propane have much higher tCO₂e emissions than electricity. Therefore, as funding and budgets allow, it is imperative to assess and plan which equipment, such as boiler plants, should be upgraded/replaced to gain better fuel efficiency and thus reduce emissions. Below are three replacements from the years 2016 and 2017.

Lake Trail Middle School Boiler Replacement – Summer 2016

Completion of the boiler replacement at Lake Trail Middle School took place in July 2016. Reported below are the last four years showing a 15% reduction in tCO₂e from 2016 to 2017.

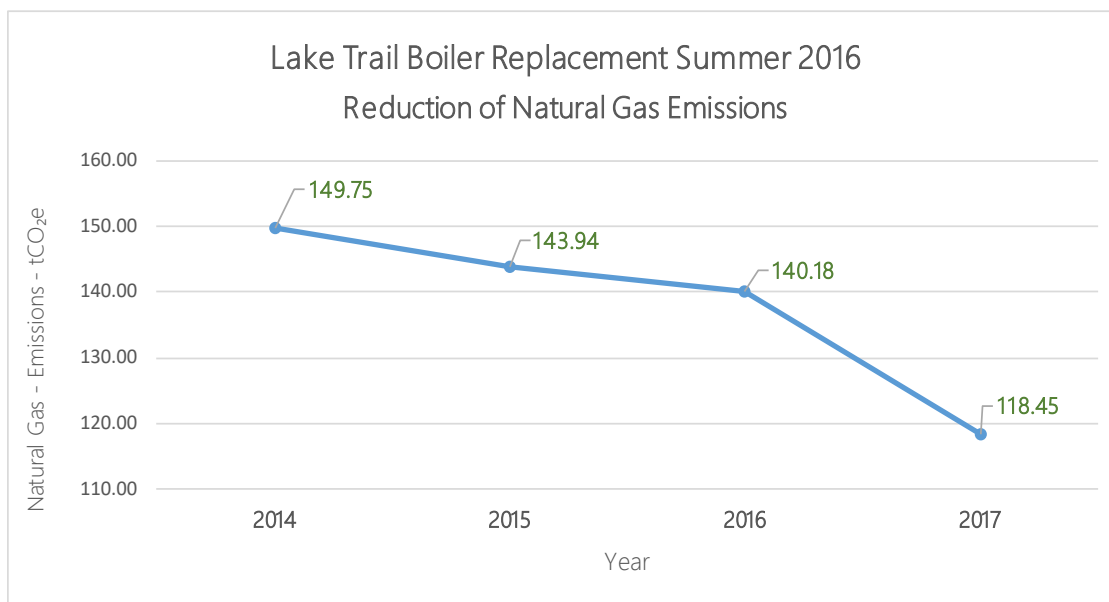


Figure 6 Lake Trail Middle School Boiler Replacement, Summer 2016

Courtenay Elementary School Boiler Replacement – Summer 2017

Completion of the Boiler replacement completion at Courtenay Elementary School took place in July 2017. Reported in Figure 7 on the following page are two six-month data reporting periods from August to January. The data shows an impressive 56% reduction in tCO₂e in the latter period of August 2017 to January 2018 as compared to the previous period of August 2016 to January 2017.

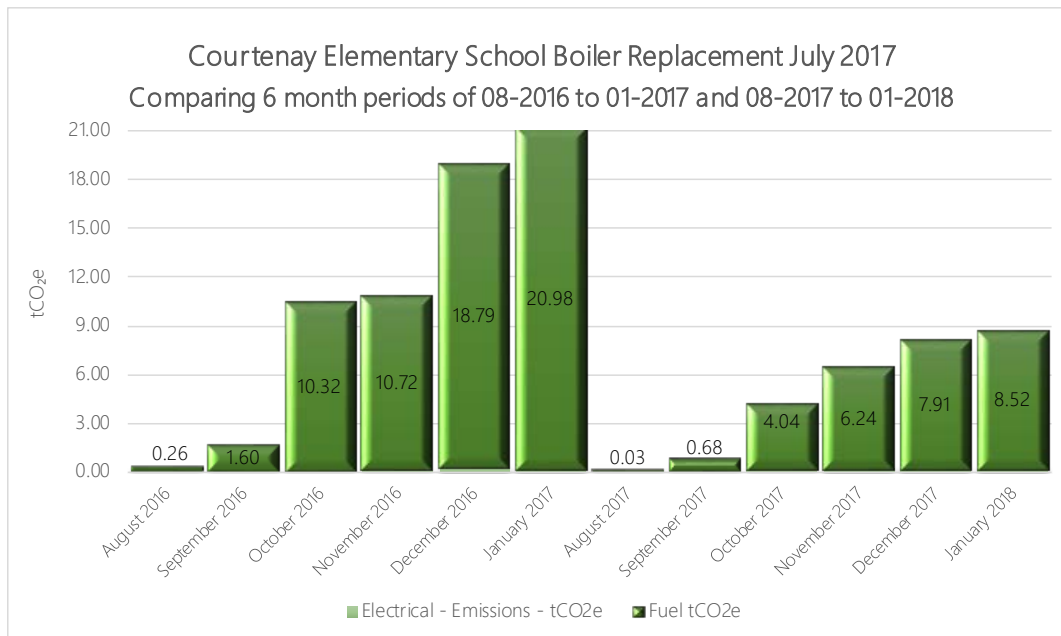


Figure 7 Courtenay Elementary School Boiler Replacement, Summer 2017

Ecole Robb Road Elementary School Boiler Replacement – Summer 2017

Ecole Robb Road Elementary School also received a boiler replacement in July 2017. Reported below are two six-month data reporting periods from August to January. The data in Figure 8 shows a 36% reduction in tCO₂e in the latter period of August 2017 to January 2018 as compared to the previous period of August 2016 to January 2017.

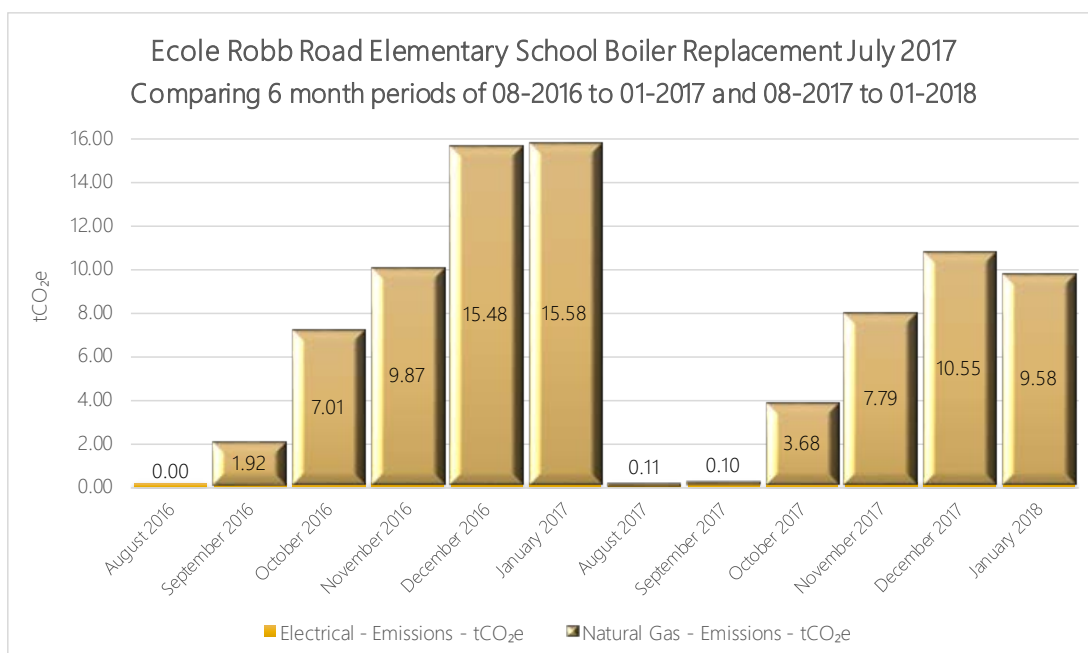


Figure 8 Ecole Robb Road Elementary School Boiler Replacement, Summer 2017

OVERVIEW - FUTURE EMISSIONS REDUCTION

Since 2010, over half of PSOs throughout BC have achieved a 15% reduction in emissions and over one quarter have reduced emissions by approximately 25% or more. SD71 aims to contribute to the 2050 emission reductions targets as set out by the BC government by reducing the GHG emissions.

The largest portion of the School District's GHG emissions originate from the energy used to heat and power the schools, maintenance, and administration buildings. Consequently, the largest GHG reduction initiatives and applications for funding are directed towards reducing the energy consumption from buildings. Some key strategies include assessing the energy performance of each school site and identifying future energy efficiency projects that will reduce consumption in the district facilities. These assessments will factor in the *Annual Facility Grant (AFG)* project planning process, the *Annual Capital Plan, Long Range Facilities Plan (LRFP)*, and the *Carbon Neutral Capital Program (CNCP)* funding requests.




Planned Energy Efficiency Projects for 2018:

- ❑ Completion of **energy efficient LED lighting system** in the gymnasiums of Highland Secondary, G.P. Vanier Secondary, and Cumberland Community School.
- ❑ Installation of **high efficiency boiler plant** at Valley View Elementary. SD71 will receive some funding for this project from the provincial *Carbon Neutral Capital Program*.
- ❑ Installation of **HVAC and fire sprinkler system (mechanical) upgrades** at Royston Elementary due in part to receiving funds from the *School Enhancement Program*.
- ❑ **Direct Digital Control (DDC) building controls upgrades** Valley View Elementary and Royston Elementary.

Planned Energy Efficiency Projects for 2019:

- ❑ Installation of **HVAC (mechanical) upgrades** at Mark R. Isfeld Secondary.
- ❑ Installation of **HVAC (mechanical) upgrades** at Cumberland Community School – junior secondary building.
- ❑ **Direct Digital Control (DDC) replacement** at Ecole Puntledge Park.

Furthermore, SD71 senior management and teaching staff will continue to support parents and students in their green initiatives and activities throughout the school district and community. Some related events are now annual events or have gone from one-day to weeklong celebrations, and include:

| | |
|---|--|
|  | <input type="checkbox"/> SD71 School Community Gardens Conference |
|  | <input type="checkbox"/> Earth Week Celebrations at Various Schools |
|  | <input type="checkbox"/> Bike Rodeo and iRide - Bike Skills Training Program |



EMISSIONS & OFFSETS SUMMARY

School District 71, Comox Valley GHG Emissions and Offset for 2017 (tCO₂e)

GHG Emissions created in Calendar Year 2017

| | |
|--------------------------------------|------|
| Total Emissions (tCO ₂ e) | 2281 |
| Total Offsets (tCO ₂ e) | 2275 |

Adjustments to GHG Emissions Reported in Prior Years

| | |
|--------------------------------------|---|
| Total Emissions (tCO ₂ e) | 2 |
| Total Offsets (tCO ₂ e) | 2 |

Grand Total Offsets for the 2017 Reporting Year

| | |
|--|------|
| Grand Total Offsets (tCO ₂ e) | 2277 |
|--|------|

Retirement of Offsets:

In accordance with the requirements of the Greenhouse Gas Reduction Targets Act and Carbon Neutral Government Regulation, *School District 71, Comox Valley* is responsible for arranging for the retirement of the offsets obligation reported above for the 2017 calendar year, together with any adjustments reported for past calendar years. The Organization hereby agrees that, in exchange for the Ministry of Environment ensuring that these offsets are retired on the Organization's behalf, the Organization will pay within 30 days, the associated invoice to be issued by the Ministry in an amount equal to \$25 per tonne of offsets retired on its behalf plus GST.

Executive sign-off:

Signature: _____



Date: May 1st, 2018

Name: Mr. Dean Lindquist

Title: Superintendent of Schools

APPENDIX A:

Greenhouse Gas Emissions Source Report - Climate Action Secretariat will append to this Carbon Neutral Action Report (CNAR) on June 30th, 2018

Part 1: CNAR Survey

1. General Information

Name: Marlene Leach

Contact Email: marlene.leach@sd71.bc.ca

Organization Name: Comox Valley School District 71

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)

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?: 3

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:

1. Ecole Robb Road Elementary Water Heater and Boilers Replacement Project
2. Courtenay Elementary Boiler Replacement Projects
3. LED Light upgrades were completed in the gymnasiums of four schools
4. LED Light upgrades (re-lamping) of main entrance/vestibule areas at three schools and 2 high school trade workshops
5. Direct Digital Control (DDC) building controls upgrades at two schools
6. Cladding upgrade at one elementary is almost complete

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

Planned Energy Efficiency Projects for 2018: Completion of energy efficient LED lighting system in the gymnasiums of three schools. Installation of high efficiency boiler plant at one school. Installation of HVAC and fire sprinkler system (mechanical) upgrades at one school. Direct Digital Control (DDC) building controls upgrades at two schools. Planned Energy Efficiency Projects for 2019: Installation of HVAC (mechanical) upgrades at two schools and Direct Digital Control replace at one school

b) Over the following 6-10 years

The largest portion of the School District's GHG emissions originate from the energy used to heat and power the schools, maintenance, and administration buildings. Consequently, the largest GHG reduction initiatives and applications for funding are directed towards reducing the energy consumption from buildings. Some key strategies include assessing the energy performance of each school site and identifying future energy efficiency projects that will reduce consumption in the district facilities

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)

Replaced existing vehicles with more fuel efficient vehicles (gas/diesel); Took steps to drive less than previous years

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

How many vehicles?: 3

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

Continuance of replacing and purchasing current fleet vehicles with vehicles that are newer, more fuel-efficient and produce less emissions.

b) Over the following 6-10 years

Continuance of replacing and purchasing current fleet vehicles with vehicles that are newer, more fuel-efficient and produce less emissions.

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)

None of the above

4) Supplies (Paper): Indicate which actions your PSO took in 2017: - Other? Please describe briefly:: We centralized photo copying and printing services to reduce paper consumption.

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.

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)

None of the above

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)

A water conservation strategy which may include a plan or policy for replacing water fixtures with efficient models; 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; Lifecycle costing of new construction or renovations