

5/30/2021

2020 PSO Climate Change Accountability Report



Shag Ti Kelly Road Secondary—Construction photo summer 2020



Learning that Enriches the Life
of Each Student

School District No. 57 (Prince George)
PROVINCE OF BRITISH COLUMBIA



School District No. 57
(Prince George)

www.sd57.bc.ca

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2020 PSO Climate Change Accountability Report

School District No. 57 (Prince George)

This Climate Change Accountability Report for the period January 1, 2020 to December 31, 2020 summarizes our emissions profile, the total offsets to reach net-zero emissions, the actions we have taken in 2020 to reduce our greenhouse gas emissions and our plans to continue reducing emissions in 2021 and beyond.

By June 30, 2021, School District No. 57 (Prince George) final 2020 Climate Change Accountability Report will be posted to our website at:

<https://www.sd57.bc.ca/Programs/DistrictDepts/Maintenance/>

or can be found on the government website at:

<https://www2.gov.bc.ca/gov/content/environment/climate-change/public-sector/cnar/annual-reports-cnars-table>

Executive Summary

School District No. 57 (Prince George) has been carbon neutral since 2010.

In 2020 we have continued our efforts to reduce our carbon footprint by;

- Upgrading inefficient, atmospheric type gas fired boiler systems with high efficient condensing units in 4 schools.
- Replacement of domestic hot water systems with condensing on-demand units in 3 schools.
- Installed new low temperature fan coils and terminal units in one school as part of a final phase HVAC upgrades.
- Replaced lighting in 2 schools with LED technology.
- Added piping insulation in various schools.
- Opened our latest replacement secondary school that is entirely heated by geo-thermal energy.

By reducing our gas emissions and electricity consumption we have reduced our carbon footprint. We will return the cost savings to use on more sustainability projects, which will result in further reductions to our carbon emissions. For 2021 and beyond we plan on continuing on the success of our past actions.

For the year 2020 our District's total emissions were 5949 tCO₂e plus 457 tCO₂e for emissions to be included for prior years.

I am pleased to present the following report outlining our efforts, to become carbon neutral.



Barry Bepple
Energy & Sustainable
Conservation Coordinator

Emissions and Offsets Summary Table:

School District No. 57 (Prince George) GHG Emissions and Offsets for 2020 (TCO2E)	
Total Emissions (tCO _{2e})	5504.5
Total BioCO ₂	12.8
Total Offsets (tCO _{2e})	5492
Adjustments to Offset Required GHG Emissions Reported in Prior Years	
Total Offsets Adjustment (tCO _{2e})	457
Grand Total Offsets for the 2020 Reporting Year	
Grand Total Offsets (tCO _{2e}) to be Retired for 2020 Reporting Year	5949
Offset Investment (\$25 per tCO _{2e})	\$148,725

Retirement of Offsets:

In accordance with the requirements of the *Climate Change Accountability Act* and Carbon Neutral Government Regulation, School District No. 57 (**the Organization**) is responsible for arranging for the retirement of the offsets obligation reported above for the 2020 calendar year, together with any adjustments reported for past calendar years (if applicable). The Organization hereby agrees that, in exchange for the Ministry of Environment Climate Change Strategy (**the Ministry**) 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:



May 20, 2021

Signature

Date

Cindy Heitman

Acting Superintendent

Name (Print)

Title

2020 Greenhouse Gas Emissions

Out of Scope Emissions

Out-of-Scope Emissions include refrigerants: R-22 (HCFC), R-401a (HCFC), MP-39 (HCFC).

Fugitive emissions are estimated to be less than one percent of the District’s emissions based on the refrigerant recharge amounts of R-134a and R-404a (HFCs) in the year 2020. Thus, these emissions are deemed to be out of scope and have not been included in the total District’s greenhouse gas emissions profile.

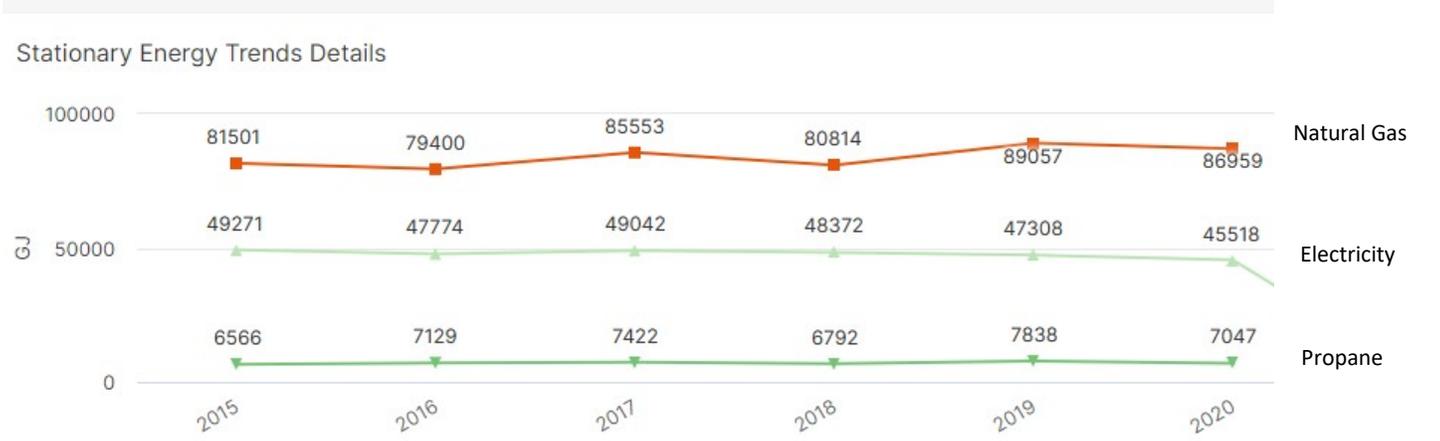
Climate and Emissions

Direct Fuel Combustion, natural and propane gas emissions, account for the majority of GHG emissions in our district at 86.7%. Electricity, mobile fuel and paper only amount to 13.3% combined.

Our focus has been on reducing natural and propane gas consumption through modernization and efficiency improvements of the equipment. Stationary Energy Trends show increasing propane usage, while slightly reducing electricity and natural gas consumption since 2015.

We did expect to see some increases in 2018 through to 2020 due to the construction of the new Shaq Ti Kelly Road Secondary and will see the subsequent reduction when the project completes in the spring of 2021.

COVID requirements impacted both direct and indirect fuel consumption for 2020. However, with the modernization of our systems, these increases were minimal. Mobile fuel consumption is a concern as the consumption for 2020 was the highest since 2015.



GHG & Biogenic Emissions by Source	School District 57 - Prince George		
	t Bio CO2e, ...	t CO2e, GH...	Total
2020			
Direct Fuel Combustion	0	4768	4768
Purchased Energy		137	137
Mobile Energy Use	12.8	390	403
Office Paper		192	192
Fugitive Emissions			

Year	Mobile Energy Use
2015	156958
2016	156054
2017	160584
2018	156271
2019	156992
2020	161771

School District 57 - Prince George, 2020

- Direct Fuel Combustion, t CO2e, GHG, All
- Purchased Energy, t CO2e, GHG, All
- Mobile Energy Use, t CO2e, GHG, All
- Office Paper, t CO2e, GHG, All
- Fugitive Emissions, t CO2e, GHG, All

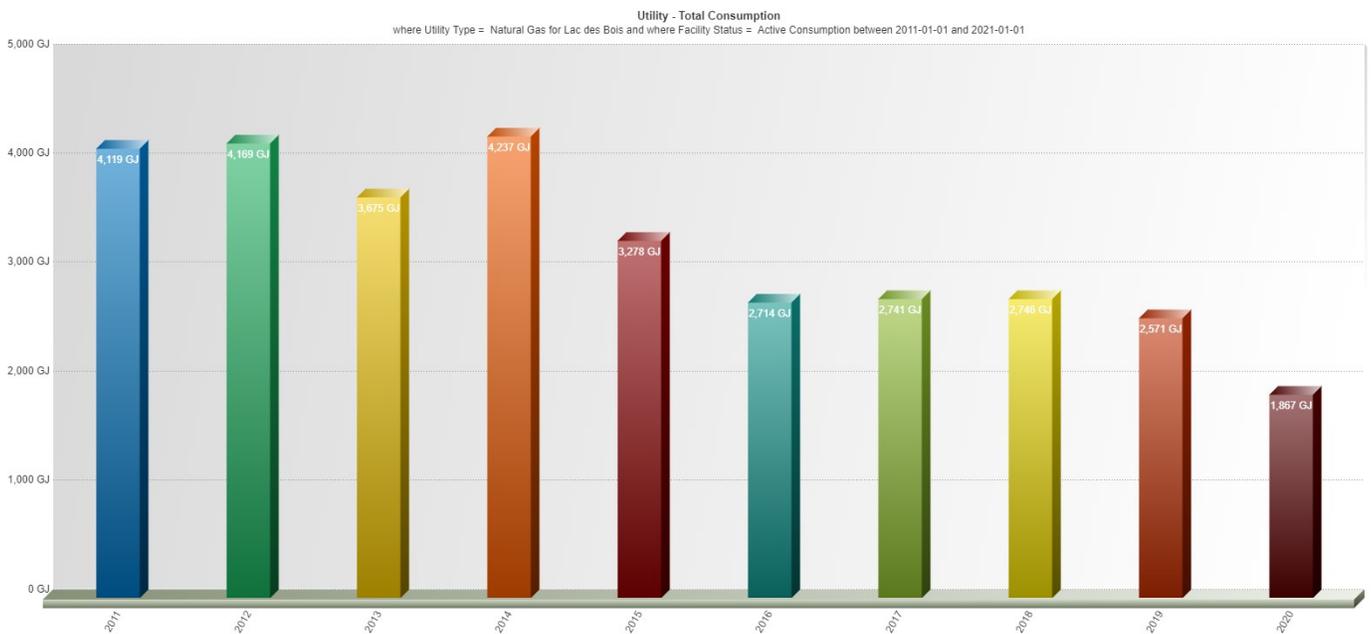
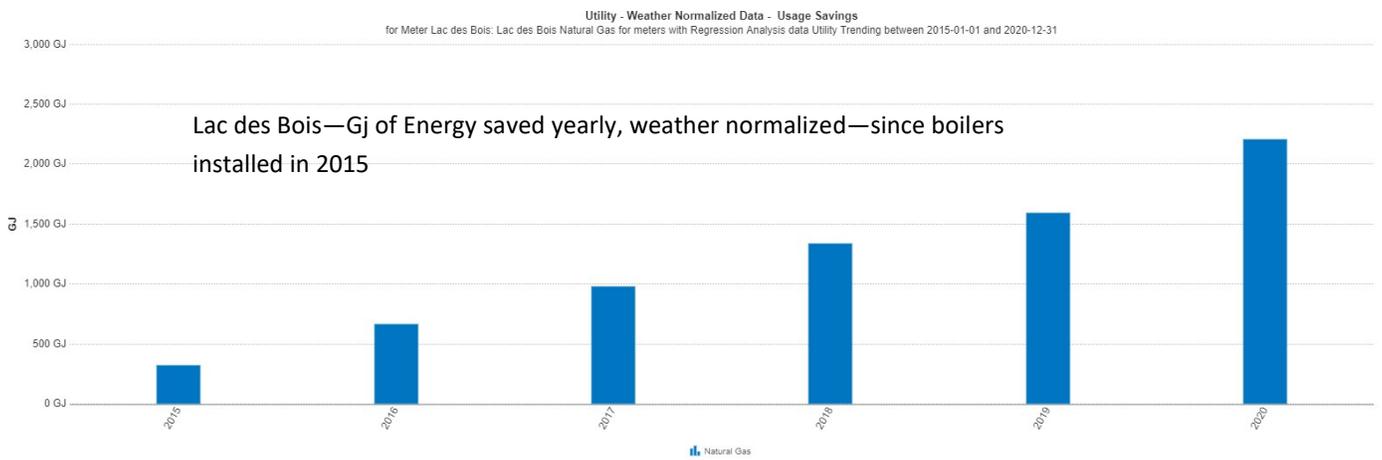
Graphics and charts courtesy of the Clean Government Reporting Tool

Emissions Reduction Programs

Low Temperature Terminal Units/Fan Coils

Unit ventilators at Ecole Lac des Bois Elementary have been systematically replaced in phases since 2015, with 2020 being the final phase. This final phase enabled us to fully utilize the condensing boilers installed in the first phase, resulting in a **27%** decrease in greenhouse gas emissions in 2020 when compared to 2016—2019 emissions. Having an unified low temperature hydronic system gives you the ability to utilize the condensing boilers fully. Between 2011 and 2014 we averaged 4,050 GJ per year. In 2020 we consumed 1,867 GJ for a savings of **53.9%** energy use when compared to years prior to 2015.

Having a dedicated unit ventilator for each occupied space results in more control for client comfort and will improve the indoor air quality, while providing GHG emission reductions and an overall lower energy footprint. This is possible using low temperature coils and demand controlled ventilation strategies with CO² sensors.



Lac des Bois—Last 10 years of Natural Gas Consumption—data from AssetPlanner

Geo-Thermal Project—Shaḡ Ti Kelly Road Secondary

Shaḡ Ti Kelly Road Secondary opened September 2020 and is our second geo-thermally heated facility. A four pipe hydronic system provides both hot and cold water to a single coil controlled by a six way valve to independent unit ventilators in each room. Office and theatre areas are served by a roof top air handling unit that has two coils to provide temperature control, with an additional re-heat coil for each space. The facility has an 80 ton geo-thermal field with condensing boiler backup to supply thermal energy.

Expected annual electricity savings of 448,029 kWh are to be achieved each year. (figures from the New Construction Program submission to BC Hydro). These estimates are being borne out by the actual consumption data.

The old Kelly Road Secondary school emitted an average of 357 Tonnes of CO2 between 2011 and 2017. These are the years prior to construction of the new Shaḡ Ti Kelly Road Secondary. For the 6 months of 2020 that the new school was opened we emitted 23.7 Tonnes of CO2. This is a savings of 333.3 Tonnes of CO2.

Furthermore, the old Kelly Road Secondary school consumed 416,185 kWh of electricity between Sept and Dec 2017 and 3,074 GJ of Natural Gas, while the new Shaḡ Ti Kelly Road Secondary consumed only 223,362 kWh of electricity and 186 GJ of Natural Gas in 2020. This is a savings of **192,823 kWh** of electricity and **2,888 GJ** of natural gas in a **four (4) month period**.



Not for the faint of heart, the 80 ton geo-thermal field required digging up the entire football field in its construction. 128 vertically drilled boreholes connected in series for 64 flow paths of a depth of 76.2m, created the field.

In Conclusion

In 2020 we continued to reduce our carbon footprint by installing more efficient heating and lighting systems and then controlling the operation and schedule of them. Four further boiler replacement projects are planned for 2021. Additional low temperature unit ventilator installations, DDC controls upgrades and improved control strategies are being implemented as we do so. These improvements should continue to substantially reduce our use of fossil fuels. Further savings are expected on electricity consumption with the planned replacement of 1,750 lighting fixtures for the spring and summer of 2021.

In 2020, the COVID pandemic created additional energy use as we provided more ventilation and longer facility operating times.

We continue to strive for the most efficient operation of the facilities and will be engaging our partners in education - the Principals, Staff and Students - to accomplish our goals.

We will look forward to another exciting year as we look back at the accomplishments in 2020.

Sincerely,



Barry Bepple
Energy and Sustainable Conservation Coordinator
School District No. 57, Prince George

*** MEASURE * REDUCE * OFFSET * REPORT * PLAN**

