



## School District No. 6 (Rocky Mountain)

### 2010 Carbon Neutral Action Report

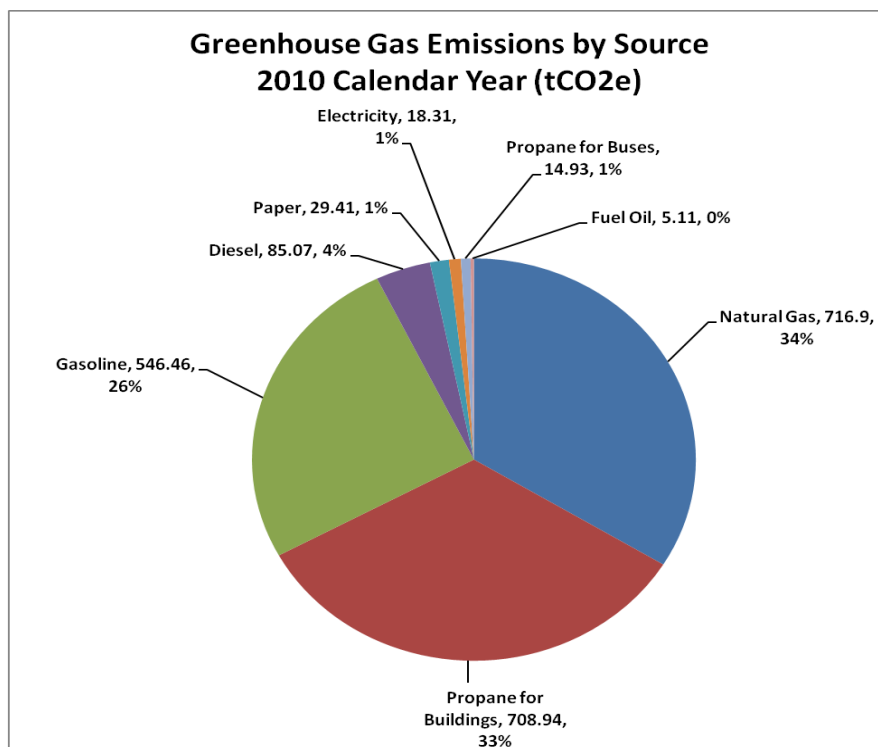
#### Executive Summary

The Rocky Mountain School District has made significant progress in reducing greenhouse gas emissions in 2010, with an overall reduction of 248 tonnes or 10% compared to last year, and a reduction of 371 tonnes or 14.3% compared to 2008. The main source of these energy and greenhouse gas savings were due to the implementation of building energy retrofit projects. The school districts executive level focus on environmental stewardship has been the key driver for success in reducing greenhouse gas emissions since it has led to the prioritisation of staffing resources, capital projects, and environmental education towards energy reduction and environmental stewardship.

Cameron Dow  
Secretary Treasurer

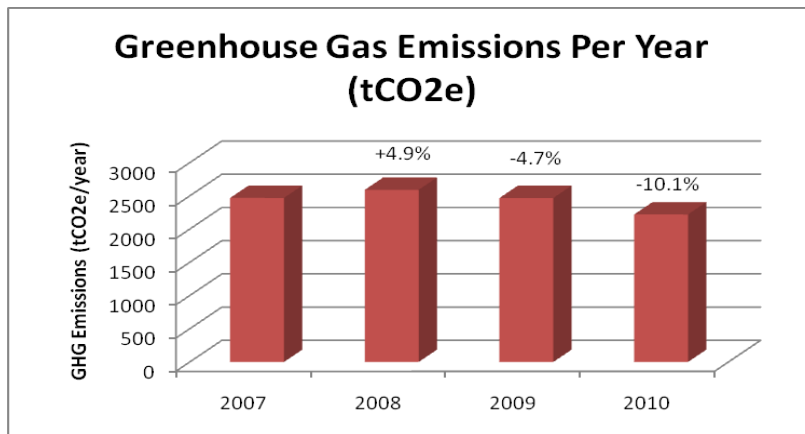
#### 2010 Greenhouse Gas Emissions

A total of 2,220.15 tonnes of greenhouse gas emissions were emitted by the school district during the 2010 calendar year, from all sources covered by the Greenhouse Gas Reduction Targets Act. A breakdown of emissions by source is included in the pie chart shown below.





The school district has reduced total greenhouse gas emissions by 248 tonnes or 10.1 % compared to the previous year (2009), as shown in the graph below.



### Offsets Applied to Become Carbon Neutral in 2010

The school district purchased a total of \$41,397 (+ HST) in carbon offsets to become carbon neutral for the year 2010. Carbon offsets were purchased from the Pacific Carbon Trust at a cost of \$25 per tonne, to offset 1655.99 tonnes of greenhouse gas emissions. An additional 564.26 tonnes of greenhouse gas emissions were emitted from the operation of the district's school buses fleet, however those emissions were not offset with the purchase of carbon credits because they are out of scope under section 4(2)(c) of the Carbon Neutral Government Regulation.

### Emissions Reduction Activities

#### Actions Taken by the Rocky Mountain School District to Reduce Greenhouse Gas Emissions in 2010

An Energy Manager, hired in 2009 with the assistance of BC Hydro, lead the planning and implementation of projects to reduce energy consumption and greenhouse gas emissions in 2010. On going benchmarking of energy performance for buildings, vehicles, and other energy consumption areas was used to identify and target key opportunity areas for energy reduction. Projects to reduce energy consumption and greenhouse gas emissions implemented in 2010 included:

- Replacement of old boilers with energy efficient condensing boilers at two schools.
- The installation of a new DDC control system at one high school, and upgrades to the DDC control systems at numerous other schools.



- Re-commissioning of the control systems of schools and other buildings to optimise heating, cooling, ventilation supply, and exhaust operation and schedules.
- Lighting upgrade projects at approximately 14 schools and operations buildings
- Replacing door and window weather-stripping at schools and other buildings.
- Behavioural change by students and staff to reduce energy consumption in buildings and vehicles.
- Office and school practices were modified to reduce paper consumption and transportation energy.
- Reduction in employee travel within the district and outside the district.
- During 2010 schools continued to promote practices such as recycling, composting, operating greenhouses, and planting trees.

For more details on energy saving projects implemented in 2010 and their results, see “Energy Management Program Update, Energy Savings from Year 1 of the Energy Management Program”, attached in Appendix 1.

### **Plans to Continue Reducing Greenhouse Gas Emissions 2011 – 2013**

Reducing energy consumption and greenhouse gas emissions will continue to be a key focus for the Rocky Mountain School District over the next three years, in alignment with its focus on environmental sustainability contained in *District Directions 2008-2013*. Projects planned for the next three to five years show the potential for the school district to save approximately \$500K per year in energy costs, while significantly reducing greenhouse gas emissions and contributing towards becoming carbon neutral. Some projects planned for the next three years include:

- Installation of an integrated Solar Air ventilation system, and a solar thermal hot water system, at JA Laird Elementary School.
- Replacement of propane fired rooftop units with heat pumps at Edgewater Elementary.
- Control system upgrades throughout the district
- Boiler upgrades at a number of schools and operations buildings
- Lighting upgrades and installation of occupancy controls throughout the district
- Increased roofing insulation and wall insulation with cladding and roof upgrades at a number of buildings
- Re-commissioning of the largest buildings and monitoring of real time energy consumption to allow continuous optimisation of energy consuming systems
- Purchase of hybrid and fuel efficient district vehicles to replace less efficient vehicles
- Student and employee behavioural change education projects



## Appendix 1

### Energy Management Program Update

#### Energy Savings from Year 1 of the Energy Management Program

Our energy management program at SD6 started September 1, 2009 with the hiring of an energy manager. Below is a summary of results from the first year of the program.

#### 1) Annual Energy Use and Greenhouse Gas Emissions

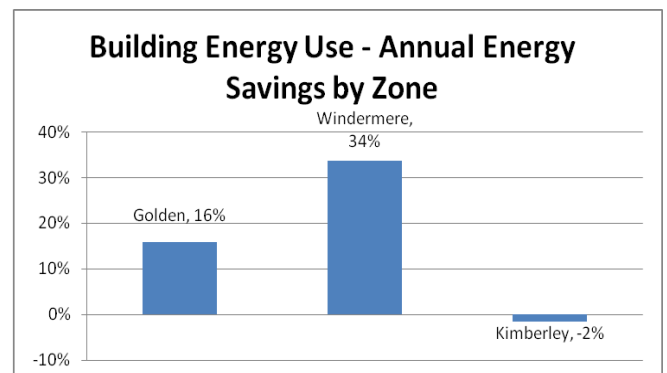
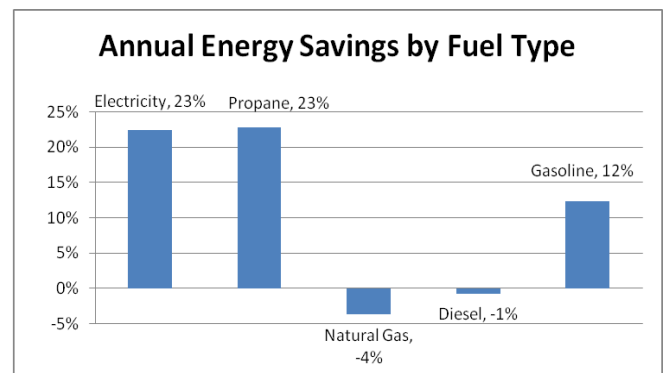
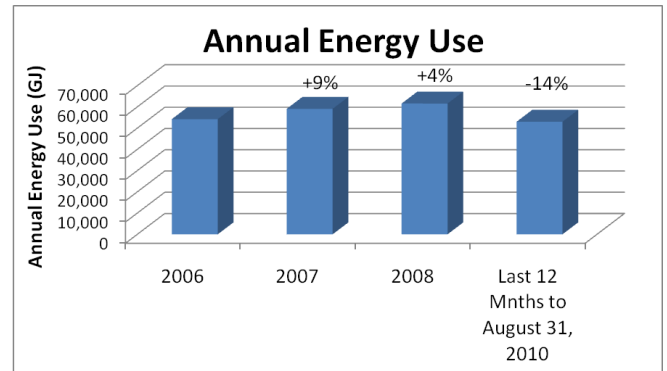
While annual energy use for the school district had been trending upwards over the last several years, energy consumption over the first year of the energy manager program (Sept 1/09 to August 31/10) decreased by 14% for all energy types compared to 2008 (See upper figure). Greenhouse gas emissions from combustion of fuel decreased by 275 tonnes, or 11% compared to 2008.

Consumption of electricity and propane each dropped by 23%, and gasoline dropped by 12%, while consumption of natural gas and diesel have each increased slightly (center figure).

Energy savings for energy used in buildings (electricity, propane, natural gas, and oil), were the greatest in the Windermere zone (34% savings), followed by Golden Zone (16% savings), and energy consumption increased slightly (2% increase) in the Kimberley zone (lower figure).

The main energy projects contributing to these energy savings were:

- lighting retrofits & installation of lighting occupancy sensors
- power factor correction
- door weather-stripping and other air sealing
- roof insulation (DTSS)
- installation of programmable thermostats
- repair of ventilation dampers and heating control valves.



Building	Energy Reduction
Edgewater	46%
Columbia Valley	45%
Windermere	42%
David Thompson SS	41%
Wasa	40%
Inv Open Doors	40%
J.A. Laird	32%
Invermere Bus Shop	31%
Nicholson	19%
Eileen Madson	18%
Golden SS	18%
Invermere Maintenance	17%
District Admin Office	17%
Martin Morigeau	15%
Alexander Park	14%
Golden Zone Office	13%
Lady Grey	7%
Marysville	7%
McKim	5%
Radium Elementary	5%
Nicholson Teacherage	1%
Kimberley Maintenance	0%
Lindsay Park	-1%
Selkirk SS	-5%
Kimberley Con Ed	-6%
Blarchmont	-15%
Kimberley Zone Office	-21%
Field*	-42%

\*Propane overbilling likely and is being investigated

Changes in the operation of buildings by the maintenance personnel and building occupants also contributed to these savings.

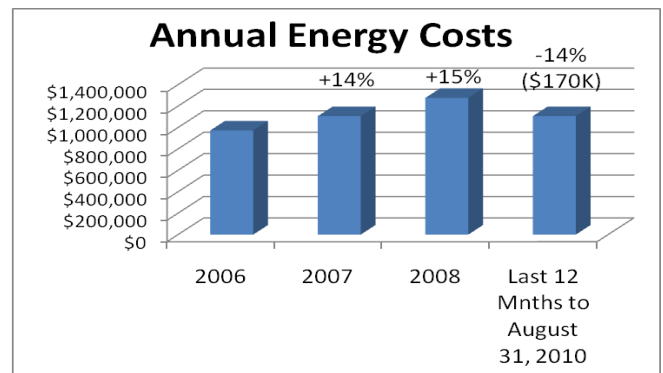
They included:

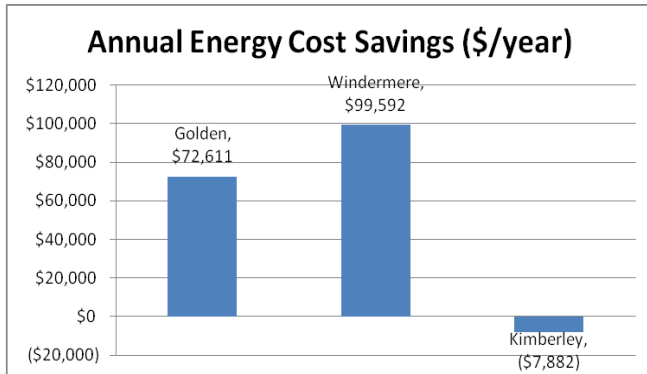
- efforts from staff and students to turn off lights, TV's, computers, and other equipment when not in use
- shutting down unused boilers, fans, air conditioners, and other equipment over the summer break and winter holidays
- tightening up occupancy schedules to only heat or cool buildings when they are occupied
- modifying computerized building control systems to achieve improved equipment efficiency.

The energy savings achieved for each individual building, comparing total energy use during the first year of the energy management program to 2008, is shown in the table at left. Green indicates energy savings while red indicates increased energy consumption.

## 2) Annual Energy Costs

Our overall annual energy costs have been increasing every year as a result of increasing energy consumption and changing fuel prices. During the first year of the energy manager program, thanks to the efforts of school district personnel, the energy costs for all fuel types decreased by \$170K compared to 2008 (right figure). On top of that an additional \$7,000 cost savings was achieved, from not having to purchase carbon credits for the 275 tonnes of greenhouse gas emissions avoided.

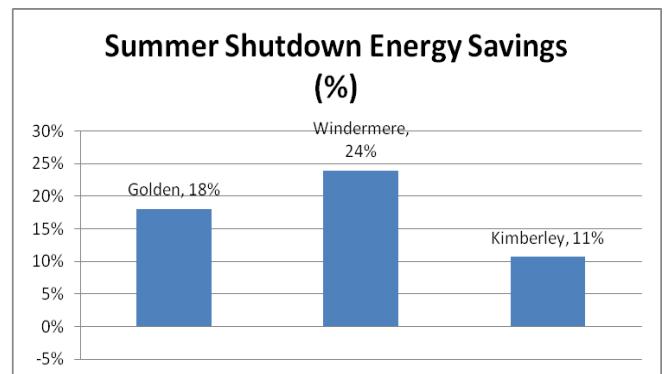
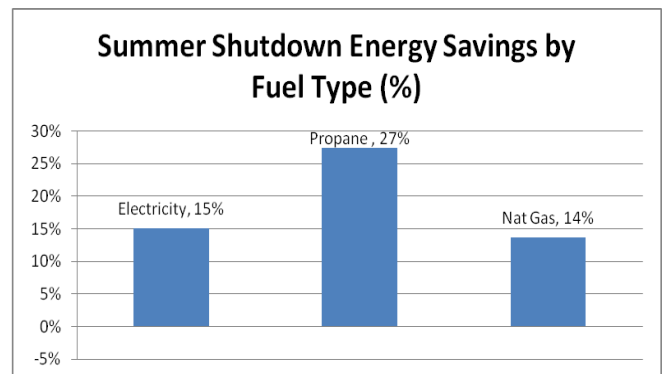




Energy cost savings for all energy types were the greatest in the Windermere zone (\$100K savings), followed by Golden Zone (\$73K savings), and energy costs increased slightly (\$8K increase) in the Kimberley zone (left figure).

### 3) Summer Shutdown

During the summer school break of 2010 building operators were asked to shut down unused equipment to save energy. Energy consumption for the months of July and August 2010 were compared to July and August 2009. As a result of our efforts, overall energy consumption for electricity, propane, and natural gas decreased by 18% for the entire district, with the greatest energy savings for propane, followed by electricity, and then natural gas. As shown in the figure below the energy savings achieved by zone were 24% for Windermere, 18% for Golden, and 11% for Kimberley.



Summer shutdown activities that contributed to these savings included the following:

- Shutting down boilers and heating system pumps.
- Shutting down and turn off power to all air handling units, rooftop units, and air conditioning units. Leaving air conditioning and ventilation systems on only in offices for the periods of time when the offices are occupied.
- Turning off all domestic hot water heaters except for during the summer cleaning period.
- Turning off all computers, computer monitors, televisions, printers, photocopiers, fax machines, sound equipment, telephones, and other electronic equipment that uses energy in standby mode (phantom power loss).
- Unplugging all refrigerators, freezers, water coolers, and vending machines.

#### 4) What's Next

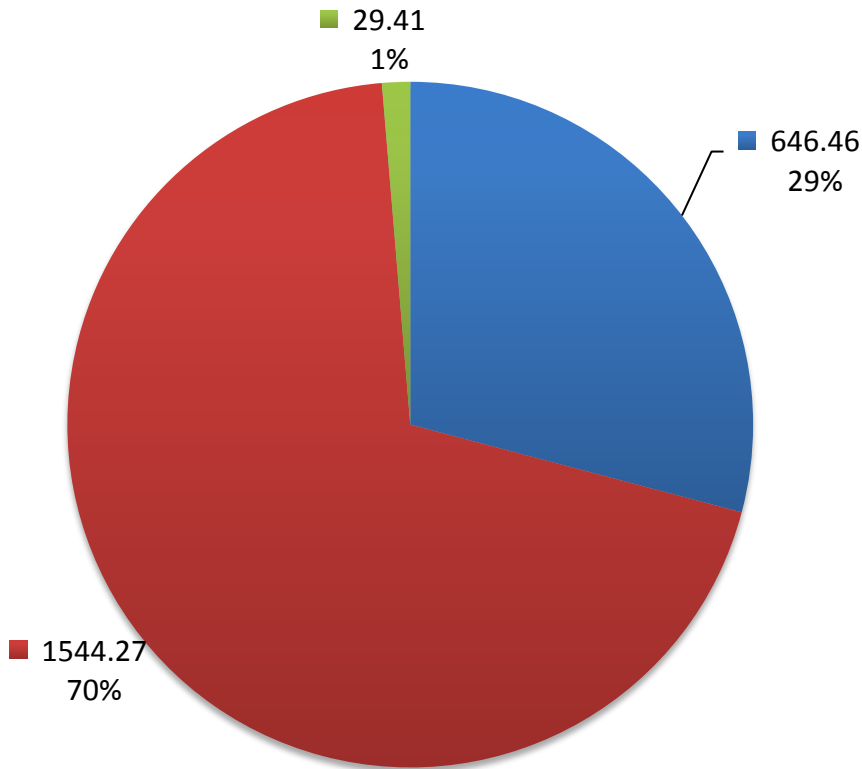
A few larger energy projects were completed over the summer of 2010, including new boilers and control systems at Golden Secondary and JA Laird, and lighting retrofit projects at our three secondary schools (Golden, David Thompson, and Selkirk) and a number of Windermere zone buildings. The impact of these projects do not show up in the energy savings shown here because the projects had not been completed at the end of the first year reporting period.

Additional energy management projects planned for the near future include:

- Solar thermal domestic hot water heating system for JA Laird Elementary
- Solar Wall ventilation preheat system at JA Laird Elementary (Pending PSECA funding)
- Air source heat pumps for the Kimberley Skills Center
- Heat pumps replacing propane fired rooftop units at Edgewater Elementary (Pending PSECA funding)
- Lighting upgrade projects for a few more buildings (planning underway for Kimberley Maintenance and Marysville Elementary)
- Control system upgrades for the District Admin building and David Thompson Secondary
- Re-commissioning of HVAC systems at McKim Middle School
- Real time energy monitoring systems and software for Golden Secondary, David Thompson Secondary, and McKim Middle School.
- Low flow toilets to replace all Golden and Windermere Zone tank toilets.

# School District No 6 (Rocky Mountain)

## Greenhouse Gas Emissions by Source for the 2010 Calendar Year (tCO<sub>2</sub>e\*)



**Total Emissions: 2220.14**

- Mobile Fuel Combustion (Fleet and other mobile equipment)
- Stationary Fuel Combustion and Electricity (Buildings)
- Supplies (Paper)

### Offsets Applied to Become Carbon Neutral in 2010

Total offsets purchased: **1655.88**. Total offset investment: **\$41,397.00**. Emissions which do not require offsets: **564.26** \*\*

\*Tonnes of carbon dioxide equivalent (tCO<sub>2</sub>e) 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.



# School District No 6 (Rocky Mountain) - 2010 Carbon Neutral Action Report

## Actions Towards Carbon Neutrality

The actions listed below contribute to a reduction in greenhouse gas emissions from sources for which public sector organizations are responsible under the carbon neutral government regulation of the *Greenhouse Gas Reduction Targets Act*.

Action	Status (as of 12/31/10)	Performance to Date (as of 12/31/10)		Steps Taken in 2010	Steps Planned for 2011 -2013	Start Year	End Year
<b>Mobile Fuel Combustion (Fleet and other mobile equipment)</b>							
<b>Vehicle fuel efficiency</b>							
Replace vehicles with more fuel-efficient models	In Development				Purchase of more fuel efficient small district vehicles and fuel efficient school buses upon replacement.	2010	No End Date (Continuous)
Replace larger vehicles with smaller models according to fleet "right-sizing" principles	In Development				Replacing vans used by IT department with right sized smaller vehicles.	2011	No End Date (Continuous)
<b>Behaviour change program</b>							
Provide fleet driver training to reduce fuel use	Ongoing/In Progress	20	% of current drivers are trained	SmartDriver for School Bus Programs - NRCan	SmartDriver for School Bus Programs - NRCan	2008	No End Date (Continuous)
<b>Stationary Fuel Combustion, Electricity and Fugitive Emissions (Buildings)</b>							
<b>Planning/management</b>							
Install a real time metering system (e.g. Pulse, Reliable Controls, Houle Controls)	In Development	10	% of buildings have a real time metering system installed	Starting installing real time energy monitoring systems in David Thompson Secondary School, McKim Middle School, and Golden Secondary School. Consultant started recommissioning McKim Middle School.	Complete installation of real time energy monitoring systems at three schools. Complete recommissioning studies at the three schools.	2009	No End Date (Continuous)
<b>Owned buildings</b>							
Establish energy performance baseline for owned buildings	Ongoing/In Progress	100	% of owned buildings have an established energy performance baseline	Energy performance baseline completed for all buildings.	Energy performance baseline regularly updated for all buildings.	2009	No End Date (Continuous)
Incorporate integrated design process into new construction or during renovations of owned buildings	Ongoing/In Progress	100	% of buildings built or renovated since start year indicated used the integrated design process	Integrated design process used for major renovations.	Integrated design process used for major renovations.	2009	No End Date (Continuous)
Complete energy retrofits on existing, owned buildings	Ongoing/In Progress	80	% of owned buildings have undergone energy retrofits since start year indicated	Boiler replacment and control system upgrades at two schools. Lighting retrofits, control system improvements, weatherstripping, insulation, completed at a number of schools.	Solar air ventilation preheat system for JA Laird Elementary. Replacing propane fired rooftop units with heat pumps at Edgewater Elementary. Solar thermal system installation at JA Laird Elementary. Installation of DDC control systems at numerous buildings. Continuation of lighting upgrades, control system modifications, roof insulation upgrades and boiler system retrofits for numerous buildings.	2005	No End Date (Continuous)
<b>Retrofitting owned buildings</b>							
Upgrade mechanical systems (heating, cooling, ventilation) during retrofits	Ongoing/In Progress	20	% of retrofits since start year indicated had heating, cooling, and ventilation systems upgrades	Boiler systems replaced with high efficiency condensing boilers systems at Golden Secondary and JA Laird Elementary.	Mechanical system upgrades at Edgewater Elementary, Blarchmont Elementary, Kimberly Board office, Kimberley Maintenance, Selkirk Secondary.	2005	No End Date (Continuous)

## School District No 6 (Rocky Mountain) - 2010 Carbon Neutral Action Report

Action	Status (as of 12/31/10)	Performance to Date (as of 12/31/10)		Steps Taken in 2010	Steps Planned for 2011 -2013	Start Year	End Year
Upgrade lighting systems during retrofits	Ongoing/In Progress	80	% of retrofits since start year indicated had lighting systems upgrades	Lighting upgrades at Golden Secondary, Lady Grey Elementary, Edgewater Elementary, Field Elementary, David Thompson Secondary, JA Laird Elementary, Windermere Elementary, Selkirk Secondary, Invermere Maintenance, Invermere bus shop.	Lighting upgrades at Field Elementary, Marysville Elementary, Blarchmont Elementary, Kimberley Maintenance, and other buildings.	2005	No End Date (Continuous)
Upgrade/adjust control systems during retrofits	Ongoing/In Progress	30	% of retrofits since start year indicated had control system upgrades or adjustments	New DDC system installed at Golden Secondary. Upgrades to DDC systems at David Thompson Secondary and JA Laird Elementary. New web based server installed to access controls centrally. Re-commissioning of the control systems of schools and other buildings to optimise heating, cooling, ventilation supply, and exhaust operation and schedules.	Re-commissioning of the largest buildings and installation of real time energy consumption software to allow continuous optimisation of energy consuming systems, DDC control system upgrades planned throughout the district.	2005	No End Date (Continuous)
Improve building insulation (including windows) during retrofits	Ongoing/In Progress	30	% of retrofits since start year indicated had insulation improvements	Window and door weatherstripping.	Increasing roof insulation with re-roofing projects.	2005	No End Date (Continuous)
Install an on-site renewable energy demonstration project	In Development	10	% of retrofits since start year indicated had on-site renewable energy components		Installation of two solar systems at JA Laird Elementary - Solar air system for preheating ventilation air, and a solar thermal system for pre heating hot water.	2008	No End Date (Continuous)
<b>Leased buildings</b>							
Establish energy performance baseline for leased buildings	Ongoing/In Progress	100	% of leased buildings have an established energy performance baseline	Regularly updating energy performance baseline for leased buildings.	Regularly updating energy performance baseline for leased buildings.	2009	No End Date (Continuous)
<b>IT power management</b>							
Replace computers with ENERGY STAR models during regular computer upgrades	Ongoing/In Progress	20	% of computers are ENERGY STAR rated	Replacement of computer monitors with LCD monitors.	Replacement of computer monitors with LCD monitors.	2007	No End Date (Continuous)
<b>Appliances and electronic devices</b>							
Replace refrigerators with ENERGY STAR models or source ENERGY STAR models for future purchases	Ongoing/In Progress	2	% of fridges are ENERGY STAR rated	Purchased energy star refrigerators and dishwashers.	Purchase energy star refrigerators and dishwashers.	2010	No End Date (Continuous)
<b>Supplies (Paper)</b>							
<b>Paper Type</b>							
Purchase 30% post-consumer recycled paper	Ongoing/In Progress	30	% of total paper purchased contains 30% recycled content	Some schools switched to 30% recycled.	More schools switching to 100% recycled.	2009	No End Date (Continuous)
Purchase 100% post-consumer recycled paper	Ongoing/In Progress	30	% of total paper purchased contains 100% recycled content	Some schools switched to 100% recycled.	More schools switching to 100% recycled.	2010	No End Date (Continuous)
<b>Electronic media in place of paper</b>							
Use electronic document library for filing common documents	Ongoing/In Progress			More documents filed electronically.	More documents filed electronically.	2009	No End Date (Continuous)
Post materials online that were previously printed	Ongoing/In Progress			More documents posted to web.	More documents posted to web.	2009	No End Date (Continuous)

**School District No 6 (Rocky Mountain) - 2010 Carbon Neutral Action Report**

**Actions to Reduce Provincial Emissions and Improve Sustainability**

The actions listed below contribute to a reduction in greenhouse gas emissions from sources that fall outside of the reporting requirements defined in the carbon neutral government regulation of the *Greenhouse Gas Reduction Targets Act*. Public sector organizations can optionally use this section to report on actions that will help British Columbia meet its provincial greenhouse gas reduction targets, engage the public, and improve environmental sustainability across all aspects of their organization.

Action	Status (as of 12/31/10)	Performance to Date (as of 12/31/10)	Steps Taken in 2010	Steps Planned for 2011 -2013	Start Year	End Year
<b>Other Sustainability Actions</b>						
<b>Water conservation</b>						
Establish a water conservation strategy which includes a plan or policy for replacing water fixtures with efficient models	Ongoing/In Progress		13 L/flush Tank toilets in Windermere and Golden Zone buildings replaced with ultra low flush 4.8 L/flush models.	Ongoing replacement of toilets with low flow models.	2009	No End Date (Continuous)