



# **Energy & Environmental Consulting Inc.**

## **Action Plan October 2003**

**Canada's Climate Change  
Voluntary Challenge & Registry**

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## **1. Executive Summary**

Carbon Busters Inc.® (formerly EEC Energy and Environmental Consulting Inc.®) is a progressive company committed to providing environmental education and technical consulting services to clients so as to enable them to reduce their utility consumption and GHG emissions. The company not only carries out energy audits for clients but has also developed innovative programs such as CAPS® that help our clients in Europe and N. America reduce their GHG emissions. (The CAPS® program consists of a multi-faceted energy and water conservation program that provides facility audits, technical advice, investment recommendations, environmental education and regular progress reports to program participants.) Carbon Busters employs customized Excel spreadsheets for recording utility consumption and emissions and calculating savings achieved through conservation initiatives both in our own office and for our clients. As part of its commitment to reducing GHG emissions worldwide, Carbon Busters has registered with the national Climate Change Voluntary Challenge and Registry (VCR).

### **Base Year Period 2002-2003**

The base year period mirrors the company's fiscal year. Total CO<sub>2</sub>e emissions within the base year comprised 58.07 metric tonnes of which 8.16 metric tonnes were direct emissions and 49.91 metric tonnes were indirect emissions (14.1% and 85.9% respectively). Consumption of electricity and natural gas are responsible for similar amounts of GHG emissions, while emissions from travel are much higher.

## **2. Organizational Profile**

Energy and Environmental Consulting Inc. (EEC) was founded in Edmonton, Alberta in November 1992, and became operational in 1993. The company and its programs were conceptualized by efficiency engineer Eckhart Stoyke, who has over 30 years of experience conserving energy in industrial facilities, schools and municipal buildings. The company itself has grown from 2 employees in 1993 to 10 employees in 2003. (After its initial registration with the VCR, EEC changed its name to Carbon Busters Inc.)

EEC's mission is to assist building managers of schools and other facilities to reduce their energy consumption, utility costs and greenhouse gas emissions. EEC achieves this mission through its self-funding utility conservation and environmental education programs offered in North America and Europe: the CAPS programs (Conservation Action Program for Schools, and Conservation Action Programs for Municipalities and Industries). These programs offer energy audits, no-cost, low-cost and retrofit recommendations, training and includes a comprehensive energy and environmental education component for the building users.

Through these programs EEC has helped achieve energy savings of over \$ 11.9 million dollars and has reduced greenhouse gas emissions by 34,607 metric tonnes of CO<sub>2</sub> equivalent.

### 3. Senior Management Support

#### 3.1 Signed statement of endorsement

As a leader in energy conservation and education, EEC remains committed to reducing greenhouse gas emissions which result from its activities. EEC also commits to assisting schools, municipalities and other facilities to reduce their greenhouse gases through excellence in education and the implementation of

*G. Stoyke* sures.

Godo Stoyke  
President of EEC Inc.

#### 3.2 Commitment to regular reporting

Through the above signature EEC Inc. commits to registering an update of this action plan with results by the end of October of each year.

#### 3.3 Internal practices on climate change

EEC Energy and Environmental Consulting Inc. incorporates emissions management into daily business practices. The bulk of EEC's emissions come from business-related travel, and energy consumed in the day-to-day operations of the office. EEC has procedures in place to ensure that GHG emissions from the operation of its business are minimal.

Travel:

Car Rental Policy

EEC requires employees to rent the most efficient and economical car available. In North America this would be a Geo Metro, Toyota Prius or Honda Insight. This allows EEC to minimize GHG emissions by minimizing fuel consumption.

Business Trips:

EEC business trips are scheduled in order to complete the most possible business with the fewest people and the fewest amount of trips to each area of business. This allows us to reduce the number of trips, therefore reducing GHG emissions due to travel by automobile or airplane.

Office Emissions:

EEC's office energy management policy includes three components: low-cost retrofits, operational changes, environmental purchasing policy and employee behaviour.

Low-cost retrofits:

The office is set up in such a way as to maximize efficiency. Lights are attached to

pull strings to allow for the appropriate amount of light in the office depending on the natural light conditions. Equipment is attached to powerbars to enable complete disconnection from the power source to prevent items in standby from drawing power. Timers and motion sensors are used on certain appliances and in certain rooms. All computers are set on a timer to go into energy saver standby mode. The heating system is set at a lower temperature at night, on weekends and holidays. Window kits have been applied to surfaces to double window insulating values.

Operational changes:

Night set-backs have been reduced to 12°C.

Environmental Purchasing Policy:

Office policy states that any purchases made must be of environmentally superior products, where available. Up to 20% higher purchasing costs are automatically authorized. Equipment purchases must be the most energy efficient models possible. As a result, currently 67% of the office computers are efficient laptop models, and most future computer replacement will consist of efficient laptop models.

Employee behaviour:

EEC employees are trained to think about energy efficiency throughout the office and throughout the day. They are responsible for ensuring that equipment and lighting is turned off or in standby mode when not in use, and that all equipment and lighting is shut down at the end of the day. In order to minimize use of artificial lighting, all employee workspaces are set up so as to maximize the use of natural lighting. Employees are responsible to ensure that used paper is in the default printer trays of all the printers and copiers in the office and garbage is minimized through an intensive re-use, recycle and composting program.

### **3.4 Management system description**

As an energy and environmental consulting company, environmental management is integrated into all decision makings from day-to-day operation to business trips and long-terms goals of the company. As a small company with only 10 employees, all of the staff is involved and informed about the environmental policies and decisions. Management is committed to not only comply with environmental policies but to exceed them where possible and to reduce pollution, GHG emissions not only within the company but help others to achieve the same and continually improve performance. A team leader, or energy champion is involved in ensuring that EEC stays on track with its environmental record and will continually work towards minimizing its ecological footprint. All employees are involved in implementing these goals through the assignment of various roles and tasks in the company. Projects, performance and any issues are communicated and discussed on a regular basis through lunch-meetings involving all employees, including top management. EEC is working on a standard procedure manual to facilitate training of new employees on environmental policies and procedures for the company.

## 4. Base Year Quantification

### 4.1 Methodology

Calculation of energy consumption was based on the readings found in the utility bills. In months where no readings were taken by the utility provider or where readings had been falsely estimated, readings were interpolated based on the actual readings taken in the preceding and following months. The base year covers the period July 2002 – June 2003 (the company's fiscal year).

#### Base Year – Direct Emissions (Gas Consumption)

Although gas meter readings were not taken precisely on the first and last day of the base year period, no adjustment was required, since no consumption took place during the days in question. (The heating degree days were nil).

EEC's head office is heated in conjunction with identical office space situated on the floor below in the same building. Since both office suites share a common heating system with only one gas meter, the base year data comprises the consumption (and emissions) of the whole facility.

The base year consumption data served as the basis for calculating the base year direct GHG emissions according to the formula 1 GJ of natural gas consumed = 50.792 kg CO<sub>2</sub> (carbon dioxide) + 0.00099 kg of CH<sub>4</sub> (methane) + 0.00089 kg of N<sub>2</sub>O (nitrous oxide).

The monthly base year gas consumption was then divided in half to calculate EEC's share of facility gas consumption and emissions.

#### Baseline Heating Degree Days (HDD)

The heating degree days for the period July 2002- June 2003 will serve as the baseline for calculating the temperature correction factor for the reporting years. This correction factor represents the quotient of the reporting year HDD divided by the baseline HDD. This factor is multiplied with the base year gas consumption to obtain the corrected base year consumption as it applies to that reporting year. The corrected base year emissions are calculated in a similar manner. 50% of this total represents EEC's share of emissions.

#### Base Year – Indirect Emissions (Electricity)

No actual readings were available for the power meter for the beginning and end of the base year period, so readings were based on the estimates provided in the utility bills. Whereas EEC shares a single gas meter with other building tenants, EEC's power consumption is metered separately.

Since power consumption is affected by the number of employees, FTE staff numbers will be used as a metric for comparing subsequent consumption with the base year period and making any necessary corrections.

The power consumption data serve as the basis for calculating the base year indirect GHG emissions according to the formula 1 kWh power consumption = 0.985 kg CO<sub>2</sub>e (carbon dioxide equivalents).

**Base Year – Indirect Emissions (Travel)**

Business travel was recorded for the base year period. Emissions resulting from travel were calculated according to the following formulas:

Car travel: 1 km = 0.28 kg CO<sub>2</sub>e (carbon dioxide equivalents).

Train travel: 1 km = 0.103 kg CO<sub>2</sub>e (carbon dioxide equivalents)

Bus travel: 1 km = 0.059 kg CO<sub>2</sub>e (carbon dioxide equivalents).

Air travel: 1 km = 0.105 kg CO<sub>2</sub>e + 34.1 kg per take-off (carbon dioxide equivalents).

See appendices B.1 and B.2 for a breakdown of company business travel and the calculation of the resulting base year emissions.

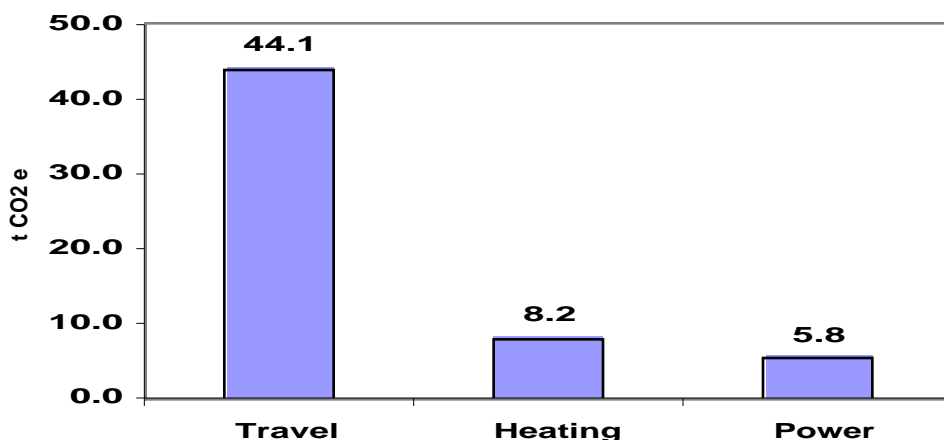
**Base Year Summary Sheets**

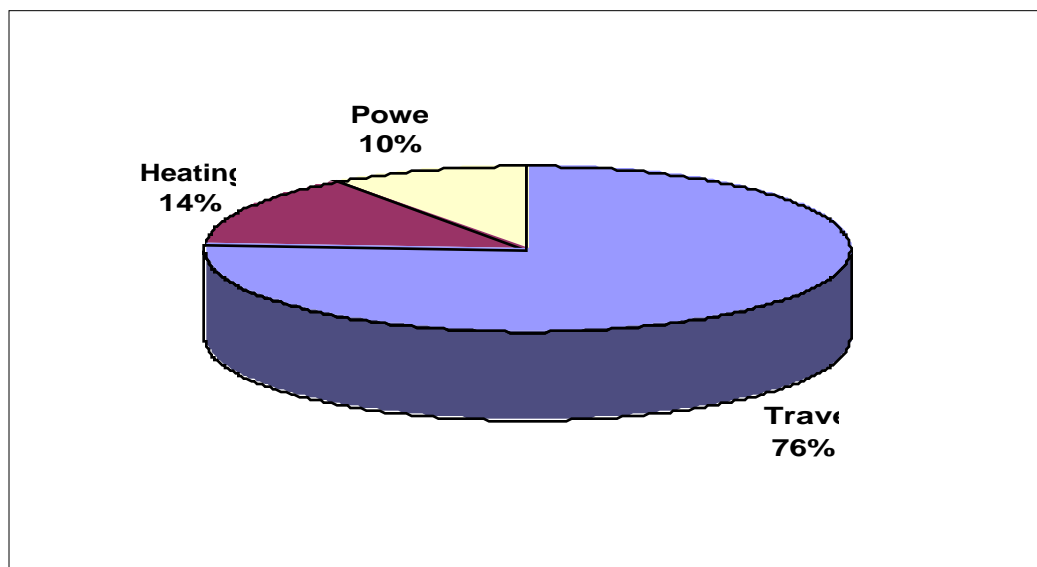
The total CO<sub>2</sub>e emissions were calculated for each of the categories listed above whereby conversion factors of 1 kg N<sub>2</sub>O = 270 kg CO<sub>2</sub> and 1 kg CH<sub>4</sub> = 11 kg CO<sub>2</sub> were assumed.

**4.2. Quantification.**

In the tables the base year GHG emissions are computed separately for each category listed above. The summary sheets provide information on the total emissions as well as consumption and emissions per m<sup>2</sup> of building area, total emissions per km of business travel, emissions per employee and emissions produced by the office per unit of emissions reduced for clients of the company. Total CO<sub>2</sub>e emissions within the base year comprised 58.07 metric tonnes including 8.16 metric tonnes of direct emissions and 49.91 metric tonnes of indirect emissions (14.1% and 85.9% respectively). Power consumption contributed 10% of the GHG emitted, travel produced 78.9% of the CO<sub>2</sub>e, while heating consumption led to emissions of 14.1% of the total emissions of the office.

During the base year period the company achieved reductions of 5,490.5 metric tonnes of CO<sub>2</sub>e for its clients. Thus office emissions comprise only 10.58 kg for every tonne that the CO<sub>2</sub>e emissions of EEC's clients were reduced.





### 4.3 GHG Emission Inventory by Gas Type and by Category

see Appendix C.1 and C.2 for this inventory.

## 5. Current Reporting Year

The current reporting year comprises the period July 2003 – June 2004.

### 5.1 Methodology.

#### Direct Emissions.

As noted above, a correction factor will be calculated on the basis of the HDD in order to correct for temperature variations affecting gas consumption.

#### Indirect Emissions.

Corrections of base year power consumption and emissions may be required to factor out fluctuations caused by changes in office staffing or the installation of additional equipment.

### 5.2 Quantification

The same criteria employed to analyse the base year data will be utilized to analyse the data in the reporting years. In addition, changes in consumption units and emissions as well as percentage changes and changes in specific consumption will be calculated and graphed.

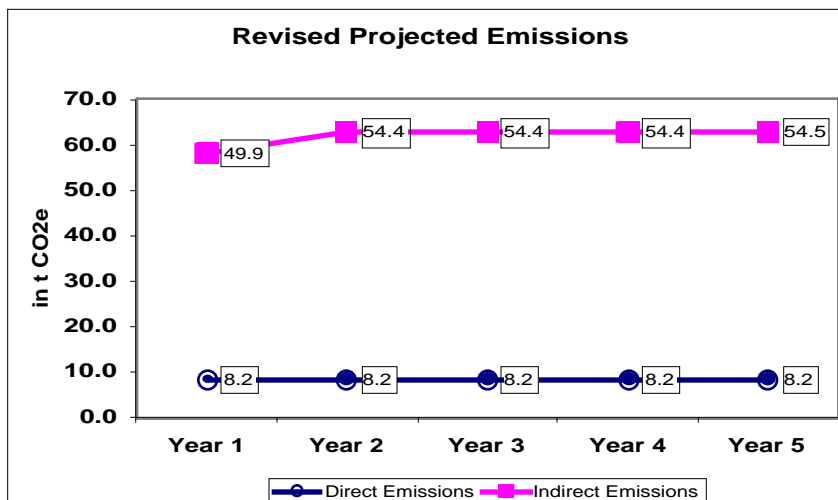
## 6. Business As Usual Projection

Within the framework of the company's business plan, consumption and emissions are expected to conform to the following projections:

**Direct emissions:** Local warming associated with global climate change should result in average annual heating degree days that are somewhat lower than those experienced in the base year. Consequently the actual gas consumption should drop by 3-5% over the next five years. However, once corrections for heating degree days are factored in, annual consumption and emissions are projected to remain flat. See the graph below and the table in Appendix D for the emissions projections described above.

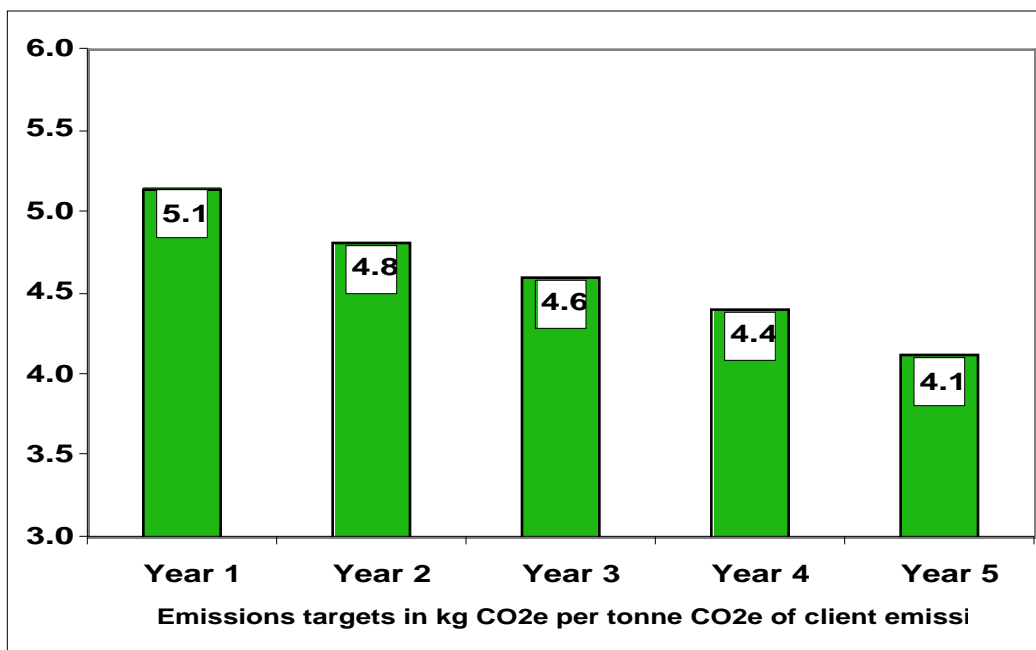
**Indirect emissions (Power):** Staff numbers (FTE) are expected to increase in the coming years as the company expands. The installation of additional electronic equipment, e.g. computers, printers, scanners may therefore be necessary. However, the resulting increase in emissions might be offset to some extent by the replacement of older less energy-efficient electronic equipment with newer more energy-efficient models. An overall net increase of approximately 1% in power consumption and the associated indirect GHG emissions is projected for the first reporting year, increasing to 3% by the fifth reporting year. However, as staff numbers increase, the total emissions per staff member are expected to fall. See the graph below and the table in Appendix D for the emissions projections described above.

**Indirect emissions (Travel):** Expansion of the company's client base in conjunction with an emphasis on sales, marketing, education and training may well result in more business travel. An overall actual net average annual increase in emissions of 10% compared to the base year is projected over the next five reporting years. The resulting increased emissions by the company will be offset by greater reductions in GHG emissions among our clients. See the tables in Appendix D for the emissions projections described above. Appendix D outlines the Business as Usual Projections for year 1 and year 5 by GHG type. Travel is the major source of GHG emissions both in the 1 and 5 year projection (see the graph below and the tables in Appendix D).



## 7. Targets

Ongoing education and training of employees should result in additional small gains in energy efficiency within the office. However, emissions reductions among our clients remain our top priority. The target for the first reporting year (2003/2004) involves reducing client GHG emissions by 11,229 metric tonnes, with the reductions increasing to 14,000 tonnes by the fifth year. This would translate into a reduction in office CO<sub>2</sub>e emissions to 5.15 kg per tonne of client CO<sub>2</sub>e reductions in the first reporting year, with a further reduction to 4.12 kg per tonne of client CO<sub>2</sub>e reductions by the fifth reporting year (2008/2009). These targets will be reviewed at the end of the first reporting year in light of the actual reductions achieved by that time. See the graph below and refer to Appendix E for further information.



### 7.1 Process for Target Review and Update

EEC will review its consumption data on a monthly basis. EEC commits to review its targets on an annual basis.

## 8. Measures to Achieve Targets

### 8.1 List Key Activities/Project

#### 8.1.1 Reducing utility consumption and greenhouse gas emissions at the office.

EEC implemented many energy efficiency upgrades and retrofits since moving into its current office space in 2000. Within the first month, light levels were determined in each office and lights were delamped when the light levels exceeded the recommended guidelines. Pull switches were installed to discourage the habitual flicking on of all lights when stepping into a room. Incandescent

lamps were replaced with compact fluorescent lights. A motion sensor was installed in the copy room, and programmable timers were installed for the water fountain, the fish aquarium and the hub. The night-, weekend- and holiday temperature setbacks for the heating and cooling systems were optimized by reprogramming the thermostat. Dark blue office walls were repainted with a friendly, bright and light reflecting yellow and the R-value of the windows was increased by adding a layer of plastic window insulation. Power bars were installed for every electronic appliance that consumes electricity when shut off or in stand-by mode.

To further decrease our greenhouse gas emissions, EEC is committed to implementing more measures to improve our efficiency. These measures include:

- gradually replacing all desktop computers with laptops that are more energy-efficient
- continuing the use of energy-efficient technologies such as installing programmable timers, motion sensors, and power bars for all new electronic equipment acquired
- improving the heating efficiency by adding plastic window insulation to the remaining windows
- optimizing efficient use of daylighting by re-arranging office desks
- minimizing waste creation through an internal re-use, recycle and compost program
- introducing a worm-composting box in addition to our existing composting program
- continuing the use of used paper in all printing trays
- assigning responsibilities to individual employees for ensuring that all lights are turned off and all equipment has been turned off properly at the power bars
- assigning responsibility to an employee for ensuring that the thermostat as well as the timers for the fountain, aquarium and hub are set properly and are reset for day-light-saving time
- increasing our outreach to the students and building users through our CAPS programs

#### Attitude and Behaviour:

- encouraging energy efficient behaviour at the office through continued education such as learning lunches and encouraging employees to enroll in energy or environmental classes
- switching off lights when daylight provides sufficient illumination, shut off equipment when not needed, compost organic waste
- starting a worm-composting box in office
- extending company policy to include sustainable shopping to reduce indirect greenhouse gas emissions: Employees must buy environmentally superior products, even if up to 20% more expensive. This includes shopping locally, minimizing waste, making ethical choices (fair trade, organic)
- encouraging car pooling and bicycling for commuting to work.

#### Commuting:

EEC is now offering incentives in the form of gift certificates for employees who carpool, bike and/or take public transportation to work, thereby reducing GHG

emissions from employee commuting.

**Business Trips and Travel:**

- when on a business trip, employees are required to rent the most efficient vehicle available
- when possible, employees use public transportation rather than rent a vehicle
- employees must calculate the CO<sub>2</sub> emitted during flying and driving time when on business trips.

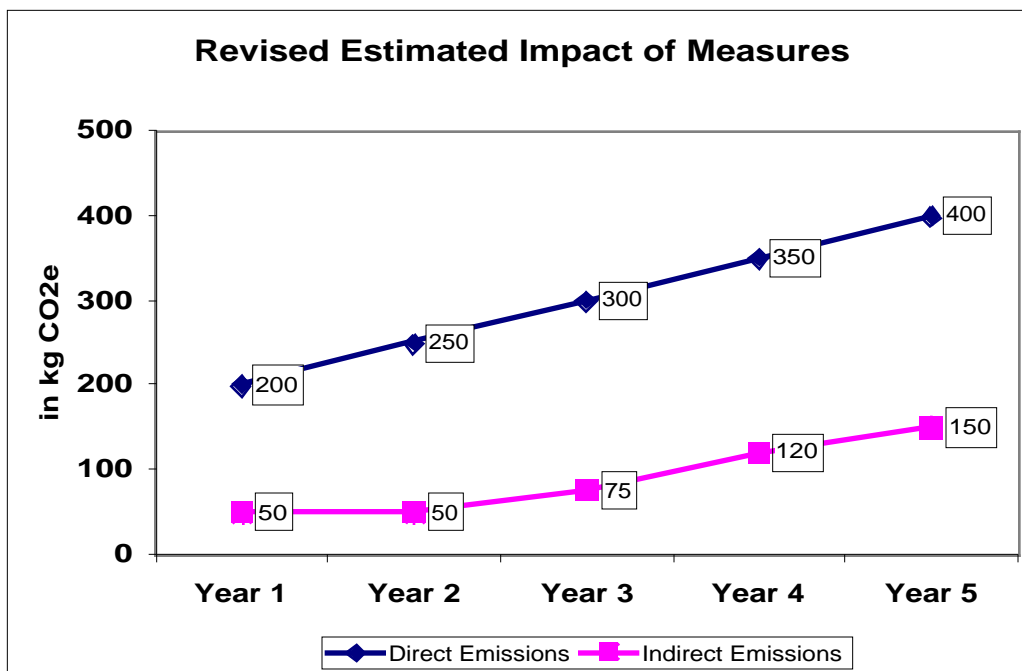
**8.1.2 Reducing utility consumption and greenhouse gas emissions through our CAPS program**

Through its CAPS program, EEC will reduce the consumption of utilities and emission of greenhouse gases in CAPS buildings by:

- improving the education of students and building users through hands-on workshops and providing more quality educational materials
- creating lesson-plans on energy-related topics for each school grade
- helping set up environmental clubs at individual schools
- holding workshops for maintenance staff and/ or custodians of CAPS buildings on a regular basis to ensure they obtain up-to-date knowledge on energy-efficiency measures

**8.2 Quantification**

The initiatives described above should help reduce GHG emissions from the office to some extent, but the majority of emissions savings will be realized by EEC’s clients. Conservation measures should lead to the direct emissions reductions of 200 kg CO<sub>2</sub>e in the first reporting year, rising to 400 kg by the fifth year. Indirect emissions savings should comprise 50 kg in the first reporting year and 150 kg in the fifth year. Total aggregate CO<sub>2</sub>e reductions would therefore amount to 250 kg in the first year and 550 kg in the fifth year. See Appendix F.1 and F.2 for the relevant tables and graphs.



## **9. Education, Training and Awareness**

### **9.1 Climate change issues explained to employees**

EEC's business is inspired by the ground-breaking work of Amory Lovins of the Rocky Mountain Institute. The underlying premise is that the technology and know-how exists in the world today to lower utility consumption by as much as 75% without compromising comfort. It is the goal of our programs to assist building users in maximizing building efficiency while educating the current and future generations of building users as to why this is important. EEC believes that this educational component is essential in making the CAPS program successful.

EEC believes in leading by example and follows the same principles in the office with EEC employees. An essential part of employee training is to encourage staff to make energy-efficient choices while emphasizing the environmental benefits of these choices. Decreased greenhouse gas emissions are an important environmental benefit of energy conservation. Employees are also encouraged to think about emissions as they relate to their everyday activities by calculating and reporting their CO<sub>2</sub> emissions when traveling on company business.

Employee education occurs in many formats. EEC provides lunchtime learning sessions, which encourage employees to research, present and learn about a wide variety of environmental and professional topics. Employees are encouraged to enroll in relevant classes and educational programs outside the office. EEC also invests in a wide range of newspapers, magazines and journals to enable office staff to be informed on the latest developments in the industry and to become aware of current environmental issues and their implications. See Appendix A for a list of courses and conferences attended by various employees throughout the year 2003.

### **9.2 Communicating response to climate change**

From 1990 to 1999, energy efficiency in Canada improved by 8%, saving Canadians \$5.7 billion per year, and reducing greenhouse gas emissions by about 32 megatonnes.

EEC Inc. nevertheless believes that energy-efficiency can still be increased greatly. Along with the Rocky Mountain Institute in Colorado, a leading energy efficiency think-tank, EEC strongly believes that it is possible to reduce global electricity and oil consumption by up to 75% with technologies that are on the market today or are already in the prototype stage.

EEC's mission is to reduce the direct and indirect greenhouse gases the company emits and assist its clients and others in achieving significant reductions in energy consumption, utility costs and greenhouse gas emissions, while maintaining or increasing building comfort. Through its Conservation Action Program for Schools (CAPS®) and similar programs, EEC has helped schools and government

buildings in North America and Europe reduce their energy consumption by more than \$11,900,000 and over 34,600 metric tonnes of CO<sub>2</sub>.

### **9.3 Identifying opportunities for individual action**

Employees at EEC are committed to reducing the emission of greenhouse gases not only at work but also in their daily lives at home.

Following are some of the measures taken by employees:

- increasing the R-value of windows by applying plastic window insulation
- committing to biking to work, using public transportation or car pooling
- composting and recycling at home
- replacing regular light bulbs with compact fluorescent bulbs that are four times more efficient and last ten times longer
- using programmable thermostats at home to lower heat-energy consumption

### **9.4 Creating incentives for emission reductions by employees outside of work**

EEC Inc. installed a bicycle rack in 2003 to encourage workers to bicycle rather than drive to work. 3 of 10 employees are currently making use of the bike rack and are commuting consistently on their bikes, weather permitting.

EEC is currently accepting quotes for the installation of a shower at the office, to encourage this positive behaviour.

EEC offers its employees free plastic window insulation for windows. This insulation can be applied at home and reduces the heating bill of the individual.

Workers can also make use of tools such as the Watts-Up meter, or a light meter to measure the energy consumption of their appliances at home or measure the light level in different rooms. These tools help to identify the potential energy savings at home.

Education represents an important component of EEC's programs and EEC pays for courses and conferences related to energy and the environment. This knowledge often finds an application not only at the office but also at home.

### **9.5 Creating incentives for emissions reductions through supply-side management**

EEC believes that encouraging environmentally responsible behaviour in the companies with which it does business is as important as encouraging this behaviour internally.

#### **EEC's Sustainable Shopping Policy**

EEC's sustainable shopping policy directs company employees to purchase environmentally superior products even if up to 20% more expensive. All office copier and printer paper is recycled, usually with a 100% post-consumer content. This policy results in energy savings upstream as items such as recycled paper require 60-70% less energy to produce than paper from virgin pulp. The sustainable shopping policy also directs employees to shop locally, at the nearest retailers to the office, or to buy locally produced items where possible. This reduces

greenhouse gas emissions produced in the transportation of goods and services. The policy also encourages employees to minimize waste by purchasing products with a minimum of packaging and always carrying reusable shopping bags. This reduces GHG emissions by reducing the need for the production of packaging and plastic shopping bags. EEC staff are required to favour purchasing food products from low-input (“organic”) farming, which reduces GHG emissions through increased carbon sinks from organic matter build-up in soil and reducing reliance on fossil fuels. EEC believes that by demanding environmentally superior products, it encourages suppliers to invest in these products.

#### EEC’s Car Rental Policy

When traveling, EEC employees are required to obtain the most energy-efficient and economical rental car possible, such as a Geo Metro, Toyota Prius or Honda Insight in North America or a Smart or Lupo in Germany. By demanding energy-efficient cars, EEC encourages rental companies to purchase these vehicles for their rental fleets.

### **9.6 Create incentives for emissions reductions through demand-side management**

EEC offers a comprehensive energy-efficiency program (CAPS) to schools, municipalities and industries. This program incorporates in-depth energy audits, no-cost and low-cost recommendations for energy savings and a comprehensive energy and environmental education program. The CAPS program is currently offered to school districts and municipalities in Canada, the U.S. and overseas.

The CAPS program offers expertise, education and support to clients wanting to reduce the energy consumption of their operations. The environmental education component of the CAPS program encourages building users to take an interest in energy efficiency for its environmental benefits. EEC believes that this educational component increases potential energy savings by encouraging building users to modify their behaviour. It also encourages participants to use the ideas they have learned in the program in other situations. This sharing of ideas allows the CAPS program to reach a large number of people with the message of energy conservation.

The goal of EEC’s business is to encourage clients and downstream businesses to permanently reduce energy consumption through modest retrofits and behaviour modification.

### **9.7 Participating in life-cycle analysis or other activities to influence external contacts**

Paper is an essential supply in offices across Canada. It is a necessary tool for correspondence and is used extensively for printing, copying and faxing. At the EEC Inc. office, paper is also used in the form of newspapers, magazines, catalogues, letters, books, and packaging. It is estimated that each Canadian uses an

average of 335 kg of paper per year. Because paper is so widely used, and used extensively in our own office, EEC Inc. attempts to reduce the amount of greenhouse gases emitted through the production and use of paper by analyzing all aspects of the life cycle of its office paper.

Despite the huge amounts of paper Canadians use, the demand for recycled paper is relatively low. For office use, EEC Inc. purchases only 100% post-consumer, 100% recycled paper. By purchasing only 100% recycled paper, EEC Inc. helps to create demand for the production of recycled paper. And by insisting on purchasing 100% post-consumer recycled paper, this ensures that the content of the paper has been used before, and is not recycled from unpurchased newspapers, magazines or from mill waste. This encourages paper manufacturers to purchase paper for recycling from programs such as Edmonton's Blue Bag Recycling program, which in turn, encourages more people to recycle.

The blue-bag program is a user-friendly curbside recycling program. All household recyclables are collected in the same bag so sorting is not required from the users. Edmonton's blue bags contain 92% paper products (65% newsprint, 10% cardboard and 17% mixed paper). The materials collected in the blue bags are transported to the Material Recovery Facility at the Edmonton Waste Management Centre. Since the blue-bag program is not available to offices, EEC Inc. sorts its own paper for recycling into three categories (boxboard, low-grade paper and high-grade paper) before transferring it to the Waste Management Centre. There, unsorted material is sorted and the used paper is pressed into bales. By keeping high-grade paper separate from low-grade paper and boxboard, it can be recycled more times. Once sorted, the paper is shipped to different companies in Alberta for recycling.

One company that receives recycled paper from the Edmonton Waste Management Centre is the Alberta Newsprint Company in Whitecourt. Alberta Newsprint receives old newsprint and magazines from Edmonton to make new newsprint. It is important that the paper bales are uncontaminated, because contamination reduces the efficiency of the screening and cleaning process and the quality of the new paper. The old paper is broken down by a pulper and then cleaned and ink is removed. The ink particles go to a waste effluent treatment system. Both deink pulp and wood chip pulp is manufactured on the site. The fibre which finally goes into the paper machine consists of 95% wood chip pulp and 5% deink pulp. About 720 tonnes of newsprint are manufactured by the Alberta Newsprint Company per day. It takes Alberta Newsprint 86% less energy to produce newsprint from recycled paper than from recycled mill scraps. This results in substantial greenhouse gas savings in the production of new newsprint.

In general, recycling paper saves resources and reduces air pollution. The process of making paper from waste paper instead of from virgin pulp may reduce energy consumption by up to 70% and water consumption by up to 55%.

In addition to the external recycling of office paper, EEC Inc. reuses paper internally. All printing and photocopying for in-house use is done on the unused side of office scrap paper. This reduces the total amount of paper purchased for the

office, and indirectly reduces GHG emissions by reducing the demand for paper.

Recycling paper saves wood, energy, water and landfill space. This reduces greenhouse gas emissions in many different ways. By reducing the amount of trees harvested to produce paper, more trees are left to absorb carbon from the atmosphere. Because less energy and water are used in the production of recycled paper, GHG emissions are reduced in energy production and in water treatment. And by reducing the amount of waste sent to the landfill, the amount of methane produced through decomposition of landfill waste is also reduced.

By recycling office paper, purchasing recycled office paper, and reusing paper within the office, EEC Inc. participates in all stages of the paper lifecycle and in doing so, contributes to a substantial reduction in GHG emissions.

## **9.8 Undertaking public education**

Through its programs, EEC is heavily involved in educating the public about climate change, greenhouse gas emissions, energy conservation measures and other environmentally related issues. The team of environmental educators at EEC reaches students and staff through presentations, workshops and information material. EEC is currently developing lesson plans adapted to the curriculum of various provinces to facilitate the teaching of energy issues. Schools are provided with posters and stickers and essay writing contests are held on an annual basis. At workshops students and staff learn what they can do to reduce energy consumption and greenhouse gas emissions at their school.

EEC also participated in the 2003 GEOEC Conference (Global, Environmental & Outdoor Education Council). The goal of the GEOEC group is to promote quality professional development for teachers in the area of global, environmental, and outdoor education. In 2003, EEC participated in the “Let the Spirit Soar” conference in Canmore, AB (May 8-11, 2003) presenting an entertaining interactive workshop: Greenhouse Busters – Putting Your School on a Low-carb Diet . During the workshop teachers learned about energy use at school and the effects on the environment. The participants received hands-on experience by measuring the light levels in various rooms and the energy consumption of various appliances.

## Appendix A.

### **Courses, Workshops and Classes attended by EEC staff within the last year:**

Canada Green Building Council LEED Training Level I	- October 30, 2003
Solar Water Heating and Heat Recovery Systems in Canada,	- October 23, 2003
Tour of the Rocky Mountain Institute in Colorado	- September 2003
Natural Resources Canada: Spot the Energy Savings Opportunity	- September 24, 2003
Visit to the Edmonton Waste Management & Recycling Facility	- August 7, 2003
Natural Resources Canada: Energy Monitoring & Tracking Workshop	- April 23, 2003
Hannover Messe, Hannover Germany	- April 2003
Eco-Solar Home Tour, Edmonton, AB	- November 2002
Green & Gold Eco-Conference	- November 2002

## Appendix B.1: CO<sub>2</sub> Emissions from Business Travel Base Year 2002/2003

Date	Staff FTE	Country/ Destination	Mode	Total km	Emissions kg CO <sub>2</sub> e
July, 2002	6	Canada	car	55.0	15.4
August, 2002	5	Canada	car	5.9	1.65
August, 2002		Canada	car	10.0	2.80
September, 2002	7	Germany	plane	17603	2011.77
October, 2002	7	Germany	plane	15680	1776.53
October, 2002		Germany	plane	54348	6094.0
October, 2002		Germany	plane	17899	2008.64
October, 2002		Germany	plane	18116	2031.33
October, 2002		Germany	car	1237.3	346.44
October, 2002		Germany	train	27	2.79
November, 2002	7	Germany	plane	17899	2008.64
November, 2002		Canada	car	190.5	53.34
November, 2002		Germany	plane	16567	1869.31
November, 2002		Germany	car	322.6	90.34
November, 2002		Germany	plane	16567	1869.31
November, 2002		Germany	car	1692.7	473.96
November, 2002		Germany	plane	15680	1776.53
November, 2002		Germany	car	1921.1	537.91
December, 2002	7	Canada	car	85.3	23.88
December, 2002		Germany	car	1834.4	513.62
January, 2003	6	USA	plane	21788	2551.82
January, 2003		Canada	car	111	31.08
February, 2003	6	Canada	car	1600	448.0
February, 2003		Canada	car	1644	460.3
February, 2003		Germany	plane	17330	1983.22
March, 2003	7	Germany	car	1053.8	295.06
March, 2003		Germany	plane	17580	2009.37
March, 2003		Germany	plane	17280	1977.99
March, 2003		Germany	car	532.7	149.17
March, 2003		Germany	car	241.3	67.57
March, 2003		Canada	car	3108	870.24
March, 2003		USA	plane	5382	699.36
March, 2003		Germany	train	2020.3	208.69
March, 2003		Germany	car	412.0	115.36
March, 2003		Canada	plane	6238	788.89
March, 2003		Canada	plane	5694	663.79
March, 2003		Canada	car	46.1	12.9
April, 2003	7	Canada	car	253.9	71.1
April, 2003		Canada	car	78	21.8
May, 2003	8	Canada	car	2549	713.7
May, 2003		Canada	car	1738	486.64
May, 2003		Canada	car	50	14.0
May, 2003		Germany	plane	15120	1649.75
May, 2003		Canada	car	880	246.4
June, 2003	8	Canada	car	156	43.7
June, 2003		Canada	bus	310	18.20
June, 2003		Canada	bus	85.2	5.00
June, 2003		Canada	plane	280	63.39
June, 2003		Germany	plane	16604	1907.3
June, 2003		Germany	car	386.4	108.18
June, 2003		Germany	car	143.5	40.17
June, 2003		Germany	train	2893	298.85
June, 2003		Germany	car	42.5	11.91
June, 2003		Canada	car	633	177.24
June, 2003		USA	car	60	16.8
June, 2003		Canada	car	44	12.3
June, 2003		USA	plane	7954	1002.5
June, 2003		Canada	car	198.9	55.68
June, 2003		Canada	car	711	199.08
June, 2003		Canada	car	216	60.48
<b>Total:</b>				<b>351,188.3</b>	<b>44,065.2</b>

## Appendix B.2: CO<sub>2</sub> Emissions Conversion Factors

<b>Emissions Conversion Factors:</b>			
<b>Mode of Transportation</b>		<b>Units</b>	<b>Emissions (Kg)</b>
Car	per	1 km -->	0.280
Gasoline (car)	per	1 L -->	2.360
Diesel (car)	per	1 L -->	2.730
Train	per	1 km -->	0.103
Bus	per	1 km -->	0.059
Plane	per	Take-off	34.100
		+ 1 km -->	0.105

**Appendix C.1: GHG Emissions Inventory by Gas Type**

## Appendix C.2: GHG Emissions Inventory by Category

## Appendix D: Projection for Business as Usual

## Appendix E: Target Setting

## Appendix F.1: Potential Impacts of Measures - Year 1

### Head Office



#### Year 1 (2003/2004) Estimated Impact of Conservation Measures

Power Emissions Reductions in (kg CO2e)	Heating Emissions Reductions in (kg CO2)	Heating Emissions Reductions in (kg CH4)	Heating Emissions Reductions in (kg N2O)	Travel Emissions Reductions in (kg CO2e)	Total Emissions Reductions in (kg CO2e)
50	200	0.0	0.0	0	250
Year 1 Total Direct CO2 e Emissions Reductions in (kg)	Year 1 Total Indirect CO2 e Emissions Reductions in (kg)	Year 1 Total CO2 e Emissions Reductions in (kg)			
200	50	250			

## Appendix F.2: Potential Impacts of Measures - Year 5

### Head Office



#### Year 5 (2007/2008) Estimated Cumulative Impact of Conservation Measures

Power Emissions Reductions in (kg CO2e)	Heating Emissions Reductions in (kg CO2)	Heating Emissions Reductions in (kg CH4)	Heating Emissions Reductions in (kg N2O)	Travel Emissions Reductions in (kg CO2e)	Total Emissions Reductions in (kg CO2e)
150	387	0	0	0	537
Year 5 Total Direct CO2 e Emissions Reductions in (kg)	Year 5 Total Indirect CO2 e Emissions Reductions in (kg)	Year 5 Total CO2 e Emissions Reductions in (kg)			
387	150	537			

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