Climate Smart Businesses Inc. is a social enterprise providing training, coaching, and software for businesses to measure their carbon footprint, identify opportunities for cost, energy, and carbon savings, and communicate their efforts internally and externally.

We work not as consultants, but as teachers, using a workgroup-based curriculum, top-rated software tool, and one-on-one client support. Participants leave the room able to analyze, measure and reduce their company's impact: key skills in the green economy of the future.

Climate Smart partners with local governments, linking community economic development and emissions reduction. We build resilience in local businesses to risks from volatile energy prices and climate change impacts. We catalyze innovation and new business practices. Municipalities are able to engage their local businesses in climate action that will benefit the entire community.

Climate Smart businesses cut unnecessary consumption of energy, fuel, materials and waste, tying climate action to smart business practice. Since 2008, we have helped over 700 businesses and organizations of all sizes and sectors prepare for the future.

Learn more about how Climate Smart can help your organization's move to a new, prosperous normal.

Go to www.climatesmartbusiness.com or call 1-888-688-6283.
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CONSTRUCTION AND REAL ESTATE: A KEY SECTOR

Welcome to Climate Smart’s second Industry Brief, the next in a series showcasing data and trends in greenhouse gas (GHG) management among small and medium-sized enterprises (SMEs). These organizations are taking positive steps to reduce their greenhouse gas emissions, while improving their top and bottom lines at the same time.

The series came about as a way of responding to our clients’ curiosity about their performance compared to their peers and competitors. Each Brief will address sectors with similar operational types, and as such is designed to help businesses benchmark their progress against an industry range. It is also a forum to share the wealth we have gathered: ideas generated and tested by Climate Smart businesses aiming to improve the way business is done.

This Brief focusses on the construction SME sector. Construction employs 7% of all private-sector workers in Canada; over 96,000 people in Metro Vancouver or nearly 8% of the workforce. Within the sector, SMEs have a strong showing, representing 87% of construction jobs. 98% of construction businesses employ fewer than 50 employees.

To date, 54 construction and real estate businesses have completed their Climate Smart certification. They form the basis of this study.

Learn more about how Climate Smart can help your organization get to the leading edge of the new low-carbon economy.

www.climatesmartbusiness.com
1-888-688-6283

8% of BC’s GDP comes from construction
33% of Metro Vancouver’s waste comes from construction

Statistics on this page come from StatsCan, BC Stats, and Metro Vancouver.
The businesses in this Brief fall mainly into the Construction sector as defined by the North American Industry Classification System (NAICS).

Roughly one in four businesses fall within the Real Estate Rental and Leasing sector, and have been included as they encompass property developers as well as property management firms. Many of these firms engage in new-build and renovation construction; they also illustrate some of the challenges and opportunities for carbon management not just during construction, but when the buildings are put to use afterwards.

Building construction
Primarily engaged in residential, commercial and industrial construction; new or renovation.

Heavy and civil engineering construction
Construction of entire engineering and infrastructure projects, or a specific component of such projects.

Specialty trades contractors
Trade activities generally needed in the construction of buildings and structures.

Real estate rental and leasing
Engaged in renting, leasing or otherwise allowing the use of tangible or intangible assets, including establishments that manage real estate for others (excludes offices of real estate agents/brokers).

The majority of Climate Smart construction and real estate sector businesses are small but high-revenue-generating operations. Over three-quarters of the companies have fewer than 50 full-time equivalent employees (FTEs); one in five are micro-businesses with fewer than five FTEs.

Over three-quarters (76%) report annual revenue above $1,000,000, with 12% generating over $10,000,000 annually.

12 is the median number of FTEs at a Climate Smart construction/real estate business.
We want to learn more about carbon neutrality and what it means for our office. We want to educate the community about climate change, and inspire others to take on the challenge.”

educational building management and community trust

DRIVING ACTION ON SITE
**WHY MANAGE CARBON?**

Marketing and brand lift prove to be strong motivators for carbon management within the construction and real estate industries, indicative of a competitive marketplace.

Perhaps due to a combination of these reputational drivers plus regulatory pressures, environmental practices are becoming embedded in construction operations: four in ten businesses surveyed wish to build upon their “existing green initiatives”.

At the same time, the prospect of cost savings drives four in ten businesses to look at managing their emissions as a way to cut operating expenses and improve efficiency.

Note that while only 11% of businesses cite supply chain or other pressures for environmental action, 28% believe that the future will bring more stringent requirements, motivating them to put practices in place now.

Personal interest typically ranks high on the list of motivations for carbon management, here as it does in other sectors. Carbon management as common practice within businesses appears to be in the early adopter stage, and perhaps early majority, stage of market uptake.

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**“Why are you choosing to manage carbon?”**

Survey of construction and real estate rental and leasing businesses on entering Climate Smart program

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<table>
<thead>
<tr>
<th>Motivation</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Marketing / reputation / brand image</td>
<td>42%</td>
</tr>
<tr>
<td>Building on existing green initiatives</td>
<td>38%</td>
</tr>
<tr>
<td>Cost-cutting / efficiency</td>
<td>38%</td>
</tr>
<tr>
<td>Interest / personal motivation</td>
<td>36%</td>
</tr>
<tr>
<td>Anticipating future requirements</td>
<td>28%</td>
</tr>
<tr>
<td>Industry / community engagement</td>
<td>25%</td>
</tr>
<tr>
<td>CSR mandate</td>
<td>23%</td>
</tr>
<tr>
<td>Customer / investor / partner demand</td>
<td>17%</td>
</tr>
<tr>
<td>Supply chain / other requirements</td>
<td>11%</td>
</tr>
<tr>
<td>Networking / B2B opportunities</td>
<td>9%</td>
</tr>
<tr>
<td>Employee retention</td>
<td>4%</td>
</tr>
</tbody>
</table>

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“We are realizing that environmentally friendly work and products are the future. Our desire is to be among the first to actively implement such a program for our field.”

Heavy infrastructure construction business, Langley, BC

“The City of Surrey is our customer and they are moving towards being greener.”

Lighting contractor, Surrey, BC

“We would like to improve the energy efficiency and reduce the greenhouse gas emissions of our housing inventory.”

Property manager, Whistler, BC

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CONSTRUCTION, REAL ESTATE, AND CARBON EMISSIONS
Building construction

Building on existing green initiatives is the primary motivator in this sub-sector. With many of the participating organizations in the sample also adopting green building practices in their projects, managing carbon in their own operations appears to be a natural next step on their path to sustainability.

Specialty trade contractors

Maintaining a reputation as a sustainability-conscious business is the key driver for specialty trade contractors. Whether marketing to corporate, municipal, or residential customers, these organizations see the growing demand for greener services.

Real estate rental and leasing

Meeting corporate social responsibility mandates, and building on “existing green initiatives” are the top motivators for this sub-sector.

Buildings contribute significantly to cities’ carbon footprints; for example, building emissions account for 54% of the city’s footprint in Vancouver. Property management and development businesses and their building portfolios have ample opportunity to make a difference in their communities.

We are a green builder and want to continue to move in that direction with our operations.”

residential construction firm
Pemberton, BC

Heavy civil construction

Supply chain requirements and improving reputation and brand image appear as the top two drivers for heavy and civil engineering construction companies.

As many businesses in this sub-sector compete for contracts from local governments and municipalities, this trend is not surprising. With many municipalities—particularly in British Columbia—and the provincial government setting ambitious goals for GHG reduction, regulatory pressure will continue to be a significant factor for this sub-sector.

It aligns well with our own corporate sustainability initiatives.”

commercial property manager
Vancouver, BC

MET Fine Printers is proud to serve BC’s vibrant Architectural and Development Community. MET is one of North America’s sought-after custom printers and recognized not only for innovative craftsmanship and environmental leadership, but also for its commitment to doing the right thing within the community. The finest print quality resides in the same space as the finest environmental and social attributes: right here at MET.

We enhance our clients’ ideation process, working with their communication teams to develop an intelligent communication mix, be it Digital, Print, Outdoor or unique Dimensional Marketing activations.

MET’s innovative zero-waste program takes recycling to a new level. As a Climate Smart alumnus, we continually create environmental opportunities to share with our partners.

Invite MET into your team.
Visit www.METprinters.com or call 1-866-254-4201 for more of our story.
GHG inventories compiled through the Climate Smart program follow the GHG Protocol, an internationally recognized standard developed by the World Resources Institute and the World Business Council for Sustainable Development. According to this protocol, an organization’s emissions are divided into three categories, or scopes:

**Scope 1** comprises all direct sources of emissions (i.e., sources owned or controlled by the reporting business): fuel combustion from heating, fleet vehicles, and equipment owned or leased by the reporting company, as well as refrigerant leakage from company-owned machinery. Reporting of Scope 1 emissions is mandatory under the protocol.

**Scope 2** includes purchased electricity, heat, and steam. Reporting of Scope 2 emissions is mandatory under the protocol.

**Scope 3** comprises all other indirect emissions: materials use, waste disposal to landfill, transport of people and goods with vehicles not owned or controlled by the reporting company (business travel, third-party shipping), paper use, staff commuting, and others. Reporting of Scope 3 emissions is currently optional under the protocol; however, 96% of Climate Smart businesses choose to measure at least a portion of their Scope 3 emissions.
CARBON EMISSIONS AND OPPORTUNITIES FOR REDUCTION

Greenhouse gas emissions vary between construction sub-sectors, highlighting different opportunity areas for carbon, material, and cost reductions.

Building construction

Fuel use in fleet vehicles and equipment is the largest emission source for a typical building construction business, equivalent to the burning of nearly five barrels of oil per employee per year. With frequent trips to construction sites and material pick-ups, this does not come as a surprise. Note that this figure reflects the direct emissions from company-owned or controlled equipment and vehicles only. Emissions from rental equipment are considered indirect (not coming directly from the business).

Waste is the second largest emission source in building construction. The figure on the right shows the emissions that could be avoided if the recyclable portion of disposed materials was diverted from the landfill: studies show that nearly three-quarters of construction waste ending up in a landfill could be diverted*.

Waste diversion (and especially construction waste) is a focus area for many local governments struggling with landfill facilities nearing end-of-life. In Metro Vancouver, landfill fees have and will continue to increase steadily.

Heating and electricity use includes offices and show homes, and comprise just over 10% of total emissions.

Building lifetime emissions

While emissions associated with building lifetime energy usage are not part of a construction company’s direct emissions, choices made in the planning and construction process will greatly influence a building’s carbon emissions over its lifetime. Building energy efficiency is one of the key areas where this sector can make a difference: in Metro Vancouver, for instance, commercial and residential buildings account for nearly 30% of total emissions.

As municipalities and the province of BC work to reduce their community-wide emissions, stricter regulations will emerge for building energy efficiency. For example, in an effort to reduce the environmental impact of buildings, City of Vancouver requires that all new buildings on rezoned sites be built to LEED Gold standard. The City of Vancouver has also established a goal for all buildings constructed from 2020 onward to be carbon neutral in their operations.

**Heavy construction and specialty trades**

Fuel used in equipment and fleet vehicles is by far the largest emission source for heavy construction and specialty trade businesses, making up over 90% of the total footprint. For heavy construction this fuel use is primarily in equipment, while for specialty trade contractors the largest fuel usage is in vehicles. In heavy construction, the typical per-employee emissions from fuel use are equivalent to filling and emptying a typical SUV fuel tank 150 times a year, or 51 barrels of oil. Again, this represents the emissions from company owned or leased equipment only—rental equipment fuel use is measured optionally. For specialty trade businesses, the fuel use is mostly for transportation, which is expected given the extensive travel to clients’ locations.

![Heavy and civil engineering construction emissions profile](image)

<table>
<thead>
<tr>
<th>Source</th>
<th>Heavy construction emissions profile</th>
<th>Specialty trades emissions profile</th>
</tr>
</thead>
<tbody>
<tr>
<td>Transport and equipment</td>
<td>92%</td>
<td>92%</td>
</tr>
<tr>
<td>Waste</td>
<td>4%</td>
<td>5%</td>
</tr>
<tr>
<td>Heat</td>
<td>3%</td>
<td>2%</td>
</tr>
<tr>
<td>Electricity</td>
<td>&gt;1%</td>
<td>1%</td>
</tr>
</tbody>
</table>

**Certified General Accountants** have served and advanced the interests of businesses, government and the general public in B.C. for more than 60 years. Today, the Certified General Accountants Association of British Columbia’s 15,000 CGA members and students continue to bring a reasoned and intelligent voice to the public debate concerning important economic and environmental issues. CGA-BC is striving to be one of BC’s most progressive professional associations in terms of reducing its environmental footprint. In fact, the Certified General Accountants Association of B.C. is very proud to be Climate Smart accredited, the first accounting body to achieve that distinction.

If “leading truly begins with learning”, the Association’s efforts to date have inspired individual action and can serve as the foundation to influence changes beyond just our members and students. By placing environmental responsibility at the centre of the organization, CGAs will not only continue to find ways to make sustainability part of the everyday way they do business, but can provide motivation for change with other people.
Real estate rental and leasing

Lessors and managers of real estate generally maintain small offices*; their main impact is in the building portfolio they manage. As such, these businesses have ample opportunity to achieve significant emissions reduction in their greatest area of influence. Buildings contribute significantly to climate change worldwide.

Other emission sources associated with buildings are waste and refrigerant leakage from the cooling systems. Given the relatively low-carbon electricity generation in British Columbia, the largest emissions source for buildings is typically heating (primarily natural gas).

For a sense of the scale of building emissions, the chart below shows profiles for three sample buildings:

- a 110-resident, 61,700 square-foot retirement home in North Vancouver
- a 72,000 square-foot shopping mall in Metro Vancouver
- a 76,600 square-foot, eight-storey office building in Victoria with retail space

Natural gas heating is the largest emission source for all these buildings, with the retirement home using the most natural gas (likely due to significant amounts of hot water for resident use).

Landfilled waste is the second largest emission source. The shopping mall generating the most waste: mainly organic material from the food court.

Electricity is the smallest source of emissions, given relatively clean hydroelectric power generation in British Columbia. However, electricity can represent a significant cost for building owners and occupants. In the case of the three sample buildings, the highest cost amongst operational costs measured comes from electricity: a strong business-case incentive for reducing usage.

* Real estate lessors and managers more closely resemble office-based businesses in their normal operations. See Offices and Carbon Emissions: A Climate Smart Industry Brief for more details.

In the city of Vancouver, the electricity and natural gas used by buildings account for an estimated 55% of total community emissions.

*City of Vancouver, 2020 Greenest City Action Plan, 2012*
Unsurprisingly, even “typical” emissions within a single construction sub-sector can vary greatly. To remove size of business as a factor, Climate Smart measures emissions across organizations of different sizes using GHGs per full-time-equivalent employee (FTE). Within a sector, FTEs serve as a proxy for size and productivity, on the premise that businesses typically have similar numbers of employees in similar roles, using resources and affecting operations in similar ways.

**How to use these graphs**

The following graphs show the emissions per FTE measured across Climate Smart’s client organizations in the construction sector.

- **Median**: half the businesses measured above those values; half measured below.
- **Percentiles**: values are given for the thick band in each graph, representing range of emissions measured by the middle 50% of the surveyed businesses.
- **Outliers**: extreme values that were not included in median and percentile calculations.

Some graphs have no thick band. Sample sizes were too small for percentiles to be calculated. In these cases, maximum and minimum values are given.

**Annual emissions per FTE**

<table>
<thead>
<tr>
<th>75th percentile</th>
<th>maximum value</th>
<th>median</th>
<th>25th percentile</th>
<th>minimum value</th>
</tr>
</thead>
</table>

**Emissions are known**

Dividing your firm’s emissions by number of FTEs allows you to compare against industry norms.

If emissions fall above the upper value, significant opportunities to reduce those emissions may exist.

If emissions fall below the lower value, it is possible that effective reduction programs are already in place, or that your organization is inherently efficient in that particular business-activity type.

**Emissions are unknown**

Multiplying your FTE count by the upper and lower values in the graph gives a possible range for your business’ emissions.

Note this will not give actual emissions: only an indication of likelihood and potential areas to tackle. Measuring an organization’s emissions accurately is a rigorous process, but not a difficult one. Contact Climate Smart for more information.

BTY Group is one of North America’s leading consultancies for Cost Management, Project Monitoring, Public-Private Partnership Advisory, and Management Consulting services.

Over the past three decades, BTY Group has earned a reputation for high calibre service delivery and a proven commitment to industry innovation for construction cost consultancy and sustainable design and building. In addition to advising clients on LEED and the commercial impact of sustainability, the firm is also integrating sustainability practices in its internal office operations.

BTY Group’s carbon-reduction strategy plan for Green House Gas emissions includes implementing video conferencing to reduce air and ground travel, corporate car sharing programs, switching to 100% recycled content paper, reviewing alternatives for organic waste disposal, adopting a green desktop policy, and purchasing carbon offsets.
Many businesses who undertake GHG management also look at indirect emissions from sources not owned or controlled by the firm. In addition to waste, some of the most commonly included emission sources are business travel, reimbursed mileage or gas for employees that commute to work sites, air travel, shipping, paper use, and staff commuting. While the measurement of these emissions is optional under the GHG Protocol, they often correspond to significant emissions and costs. For instance, in the specialty-trade sector, any of these activities can easily exceed emissions from heating, electricity use, or landfilled waste.

Emissions from paper were not plotted here, but range between 0.01–0.37 tonnes of CO\textsubscript{2}e per FTE annually.

The benchmarking graphs highlight potential areas of high carbon output for construction companies to tackle.

- A specialty-trade firm of 50 employees can emit as much as 258 tonnes CO\textsubscript{2}e from transportation and equipment alone: equivalent to 600 barrels of oil. Specialty trades operate fleets and travel extensively between sites: more efficient vehicles may have significant cost and carbon benefits.

- The majority of emissions from heavy construction firms will stem from their vehicle and equipment use (for a firm of 25 FTEs, this constitutes 280–690 tonnes CO\textsubscript{2}e).

- A building-construction firm of 30 FTEs generates 38–140 tonnes CO\textsubscript{2}e from waste sent to landfill. This especially is an activity area where firms have a high degree of control and can realize carbon and cost savings, typically through increasing recycling rates for site waste.

### Indirect emissions sources (Scope 3)

Many businesses who undertake GHG management also look at indirect emissions from sources not owned or controlled by the firm. In addition to waste, some of the most commonly included emission sources are business travel, reimbursed mileage or gas for employees that commute to work sites, air travel, shipping, paper use, and staff commuting. While the measurement of these emissions is optional under the GHG Protocol, they often correspond to significant emissions and costs. For instance, in the specialty-trade sector, any of these activities can easily exceed emissions from heating, electricity use, or landfilled waste.

Emissions from paper were not plotted here, but range between 0.01–0.37 tonnes of CO\textsubscript{2}e per FTE annually.
$7,800

Projected cost of carbon-emitting activities to a construction firm, per FTE, in Canadian dollars

For a typical construction firm of 12 FTEs this cost breaks down into:

- $54,200 for third-party transportation and equipment
- $28,500 for company fleet and equipment
- $5,500 for air travel
- $4,000 for electricity and heat
- $1,400 for waste
- $300 for paper

Lowering emissions builds future growth.
Driver behaviour change is a low-cost way of targeting the largest emission source for construction businesses: fuel use. Many businesses take up initiatives such as driver training and anti-idling as a policy, as well as equipment solutions such as GPS tracking for their fleet. After measuring with Climate Smart, over 40% of businesses choose to upgrade or replace their vehicles with more fuel-efficient models.

Many companies realize the significant impact of their construction waste and develop strategies to increase the proportion of waste diverted from landfill by expanding their recycling programs and educating staff on waste separation.

After their first year of emissions measurement with Climate Smart, many construction businesses choose to target paper use. Although paper use forms a very small part of a construction business’ footprint, paper reduction strategies are often easy to implement and touch everyone in the organization, helping to engage employees and build a culture of conservation.

Many construction businesses are also acknowledging that their impact goes beyond their direct emissions, and are working on improving energy efficiency of their buildings once operational. They are also finding that homes with reduced lifetime operating emissions and costs are more highly valued by their customers.

We have implemented driver training and our drivers have participated in the first two of three steps. Fuel savings of up to 19% were demonstrated by our drivers after training.

*plumbing and gas contractor, Whistler*
We will continue to construct homes that have a minimum of 80 Energuide rating (an 80 Energuide rating can be obtained with the use of triple pane windows, spray-in-place insulation, and an HRV system). We actively sell potential buyers on the benefits of utilizing these passive systems, as well as alternate heat sources such as solar, geothermal, or wind. These new homes are not reflected in our carbon footprint, but these features do reduce the carbon footprint of the homes we build for many years to come.

*home builder, Whistler*

We are switching to 100% recycled paper and running a ‘Double Your Fun’ print double-sided campaign in the office.

*wall panel installer, North Vancouver*

We have installed four GPS tracking units to track mileage, route dispersal, idling and to monitor overall fleet behaviour and vehicle use. We’ve also implemented a no-idling policy. So far our estimated fuel reduction is 5 to 8%.

*plumbing contractor, Burnaby*

We are switching our service vehicles to propane. One van is completed, and two more are in progress. This should cut our emissions by 20% and save over 30% in fuel costs.

*heating and cooling contractor, Fraser Valley*

Waste disposal is easily our largest GHG emitter. We will continue recycling on site in new subdivisions, and transition from single waste bins to three bins: general construction garbage, wood recycling, cardboard and paper recycling.

*residential building contractor, North Vancouver*
For businesses in the rental and leasing sub-sector, buildings represent the largest opportunity for emissions reduction and cost savings.

According to a report by the Intergovernmental Panel on Climate Change, buildings may not only help reduce emissions on a global scale, but can do so more cost-effectively than other industries*.

We are introducing broader recycling and composting programs to reduce garbage tonnage and expanding our recycling program to include all plastics from the building and all milk cartons.

“Companies in this sector adopt a wide variety of strategies after their first year of measurement in the Climate Smart program. Behaviour change around electricity use and simple electric equipment upgrades to reduce power consumption are among the most popular strategies. While electricity in BC has relatively low emissions, it is often represents the highest operating cost. These strategies often involve tenant engagement and education.”

property manager, Metro Vancouver


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**Chosen reduction strategies: real estate rental and leasing**

<table>
<thead>
<tr>
<th>Category</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Behaviour Change</td>
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</tr>
<tr>
<td>Simple Equipment</td>
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</tr>
<tr>
<td>Capital Equipment</td>
<td>30%</td>
</tr>
<tr>
<td>Behaviour Change</td>
<td>50%</td>
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<td>Simple Equipment</td>
<td>40%</td>
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<tr>
<td>Capital Equipment</td>
<td>30%</td>
</tr>
<tr>
<td>Reduce Paper Use</td>
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</tr>
<tr>
<td>Diverting Waste</td>
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<td>Vehicle Fuel Switching</td>
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<td>Reducing Business Travel</td>
<td>10%</td>
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<tr>
<td>Alternative Staff Commuting</td>
<td>30%</td>
</tr>
<tr>
<td>Targeting Third-Party Shipping</td>
<td>0%</td>
</tr>
</tbody>
</table>

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**Contribution of emission sources**

- **Electricity**: 80%
- **Heat**: 70%
- **Waste**: 50%
- **Transport and equipment**: 30%
70% of participating businesses target waste diversion after their first year of measurement, acknowledging the impact of waste on their footprint.

Heating (primarily natural-gas fired in this pool of businesses) has shown to be the largest emitting activity for most buildings. 30% of participating businesses have decided to make capital upgrades to heating equipment to lower emissions and costs. 50% have chosen to augment that with behaviour-change campaigns and occupant engagement.

We will work with local retailers to establish tenant discounts that would apply to household items that help reduce tenants' energy output (i.e., light bulbs, low-flow shower heads). We have created a New Tenant Information Package outlining different ways new tenants can reduce their footprint: access to composting and recycling through our housing society, car pool and transit opportunities, and ways to reduce energy consumption within units. We will keep the tenants informed of outside opportunities for tenants to take advantage of rebates, incentives, and energy audits: we have already sent out information to tenants on how to become members of BC Hydro’s Power Smart program.

Gateway Property Management Corporation is one of Canada's largest privately owned residential property management companies. Our management portfolio includes residential rental, strata, condominium and commercial properties.

Our commitment to an Environmental Policy was officially endorsed in 2005 by CEO, Scott Ullrich. The commitment includes conducting operations in a manner that protects clients’ assets; the environment; the health and safety of our employees, on-site staff, contractors, building occupants; and the communities in which we do business.

Since then Gateway has become an officially recognized Climate Smart business. We’ve implemented mandatory training for all new employees on our own Environment Management Program. And we continue to work closely with our clients to implement their environmental targets and achieve various green certifications on the properties they own.
What is a carbon neutral building?

While there is no broadly-accepted definition of a carbon neutral building at this point, it generally includes not only building design, but continuing green practices in the building's operation as well.

For example, the City of Vancouver defines a “carbon-neutral building” in its Greenest City Action Plan as one that achieves net-zero emissions over each year it operates.

“Net zero energy” building is a term often used interchangeably with carbon neutral building and implies that the building harnesses energy from the sun, wind, or earth to balance or exceed its annual energy demand.

One of the most well-established standards for net zero buildings is the Net Zero Energy Building Certification developed by the International Living Future Institute.

The Living Building Challenge is another, stricter standard that includes net zero energy, net zero water (all water needed for the building is collected and treated on site), and addresses other environmental issues such as embodied carbon footprint and conservation and reuse of construction materials.

Designed by Perkins+Will, a Climate Smart company, the VanDusen Botanical Garden Visitor Centre is the first building in Canada to apply for the Living Building Challenge (LBC).

For more information on both Net Zero and LBC standards and the list of certified projects, go to www.living-future.org.

Serving the community for 29 years, Perkins+Will Vancouver is a multi-disciplinary design firm known for excellence and innovation, approaching architectural, interior and urban design challenges with a global vision and unmatched resources. With strong leadership providing a range of expertise and diverse perspectives, Perkins+Will Vancouver maximizes our clients’ vision, transforming ideas into built excellence, on time and on budget.

We believe design has the power to transform lives and enhance society. We are deeply connected to the community, donating 1% of our design services to local, non-profit organizations every year. Committed to the 2030 Challenge, we are ranked among North America’s leading green practices with one of the largest portfolios of completed, deeply sustainable buildings, interior spaces and urban plans.

Committed to excellence, Perkins+Will Vancouver has received more than 200 honours, including 6 Governor General’s Medals in Architecture, 13 Lieutenant Governor of British Columbia Awards in Architecture, the Royal Architectural Institute of Canada Firm of the Year Award, numerous Canada’s Greenest Employers and a 2013 BC Top Employer award.
VanDusen Botanical Garden Visitor Centre

Photo: Nic Lehoux / Courtesy: Perkins+Will
Over the past three years of reporting our emissions, we have been privileged to have the opportunity to work with Climate Smart. They’ve provided us with valuable guidance on how best to collect and analyze our emissions data and the opportunity to learn from other member companies."

Brian McCaulay
President and Chief Operating Officer
Concert Properties
Concert Properties highlights:

**Construction site waste diversion**

**LEED Gold on all new projects**

**Energy-saving retrofits showcased at headquarters**

Concert has been developing and managing real estate for almost 25 years: rental apartments, condominium homes, retirement communities and commercial properties. Concert is involved in development, construction, sales and leasing, and property management.

Concert has worked with Climate Smart to inventory their greenhouse gas emissions since 2010, and is working towards a 20% reduction by 2020.

They have made a number of changes at 1190 Hornby Street, the office building that serves as their headquarters, to showcase how much energy can be saved with the right upgrades. A film applied to all windows reduces solar heat gain, helping to improve occupant comfort and reduce the energy needed to cool the building. Additionally, the boilers and chillers in their HVAC system were changed to high-efficiency models. Adding Direct Digital Control technology to their HVAC system allows the building operator to monitor and adjust energy performance throughout the building in real time. These initiatives and others have reduced 1190 Hornby’s electricity usage by 25%, and their natural gas consumption by 50%.

All new Concert developments target LEED Gold or equivalent sustainability construction standards. An example is their new Axis rental development recently completed at the University of British Columbia: Concert aimed for a Gold rating under the UBC-specific Residential Environmental Assessment Program (REAP). One of the requirements of these programs is the diversion and recycling of construction waste: wood, metal, cardboard, plastics, and drywall. At Axis, Concert set a goal of 75% waste diverted from landfill. They engaged their trade subcontractors to ensure everyone involved in the project understood how their actions affect Concert’s sustainability goals. By placing the responsibility of diversion on their subtrades, and monitoring waste diversion throughout the project, Concert achieved nearly 80% diversion from landfill.

With many different properties and many facets of their business where change could be achieved, it was important to engage staff from across the organization. The creation of a dedicated Sustainability Manager position, to act as a resource for different departments across the organization, highlights the degree to which sustainability is embedded at Concert.

Working with Climate Smart has helped draw the link between operational expenses and carbon/energy performance, and has catalyzed the development of internal systems for energy data management. For instance, gathering building energy data from across their portfolio, Concert now monitors energy use per square metre, and can identify particular properties on which to focus their efficiency efforts.

Concert sees an additional benefit in the collaborative Climate Smart network of like-minded businesses. Knowledge-sharing with other companies yields strategies that they can implement within Concert’s own operations.

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Reductions achieved from baseline year (2010):

- 41% waste overall
- 37% air travel
- 25% electricity at 1190 Hornby
- 50% heat at 1190 Hornby

For Concert Properties’ 2013 Report on Sustainability: http://www.concertproperties.com/about/sustainability

For a video case study highlighting Concert’s achievements, go to: http://bit.ly/Concert_CaseStudy
At Climate Smart, we are continually inspired by our local entrepreneurs and businesses. They are essential partners in any plan to respond to the climate challenges we face today, and help create resilient, regenerative communities that we can proudly call home.

If you are a business, we need your help to change the way business is done.

**Find out where you stand**

If your operation spends **more** on energy, waste, or travel than your peers, we welcome the opportunity to help find creative, more efficient ways to deliver your product or service with less environmental impact.

**Share your story**

Your leadership matters. Be generous with what does and doesn’t work. Tell your staff, clients, suppliers and community. If you spend **less** on energy, waste, or travel than your peers, you may have a story to share with the world, and we can help you tell it.

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**A special thank you**

to our construction and real estate industry clients, for working with us to collectively develop and share the business practices of tomorrow.

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**Bolded businesses** have recertified with Climate Smart and made an ongoing commitment to sustainability.
British Columbia is recognized as a global leader in the fight against climate change and global warming, demonstrating to the world that a strong economy and environmental sustainability can in fact go hand in hand.

2012 marks the third consecutive year that B.C. has achieved carbon neutrality, an unprecedented achievement for provincial or state government in North America. Carbon Neutral Government is fundamentally about leadership. We are working to put our government’s carbon emissions house in order as we ask businesses, communities and individuals to do the same.

Through Carbon Neutral Government, we are demonstrating viable energy efficiency and conservation technologies, engaging British Columbians with a sustainability message, while working hard to reduce our own carbon footprint. The province is proud of our achievements to date and want to recognize the efforts of all public sector organizations across the province.

Together, we will build on our success and continue to lead in reducing our emissions while ensuring the next generation of British Columbians may also enjoy a clean, healthy environment.

Okanagan College (photo credit: Climate Action Secretariat)
Reducing your carbon footprint can take many forms. But what’s one action that a select yet diverse mix of businesses and organizations share? They’ve participated in FortisBC’s Energy Efficiency and Conservation programs.

From no-cost energy assessments to rebates on efficient natural gas water heaters, boilers and even cooking equipment, businesses and organizations are reducing their greenhouse gas emissions and, in some cases, experiencing substantial savings.

When Ryan Martin, manager of the Hume Hotel in Nelson, B.C. had to replace a water heater due to a flood, he took the opportunity to reduce their carbon footprint as well. “We decided to go high-efficiency and lessen our impact on the environment at the same time,” says Martin. Plus the hotel was rewarded with a $4,500 rebate from FortisBC.

The one high school in the Rocky Mountain town of Elkford, B.C. can attest to significant energy savings and money back from FortisBC. After the school upgraded insulation and replaced its aging furnaces with three high-efficiency boilers, the energy savings from one year to the next were more than 40 per cent. Plus the school qualified for a $48,000 boiler rebate from FortisBC.

“Our Energy Efficiency and Conservation Programs help commercial customers incorporate energy efficient measures with rebates for high-efficiency natural gas boilers, water heaters and cooking equipment and even tailored solutions such as building re-commissioning,” says Ramsay Cook, commercial and industrial EEC program manager at FortisBC.

For more information on how FortisBC can help your organization save energy and receive money back, visit fortisbc.com/businessoffers.
Smart + fab: Lanefab gets Climate Smart

Lanefab Design/Build Ltd., designs and builds laneway homes that epitomize the best of energy-efficient design – from super-insulated walls to heat recovery systems. When co-owners Bryn Davidson and Mat Turner needed to open a business account for Lanefab, Vancity was the natural choice because they value the credit union’s support for social and environmental business and community development.

Lanefab’s specialization in low-impact laneway homes is helping to make green design the new normal. For Lanefab and hundreds of other businesses, measuring their carbon footprint has also become a standard business practice.

“Lanefab builds homes with a smaller carbon footprint. Taking the Climate Smart program helped us to establish a protocol for measuring our greenhouse gas impact, and to look at ways to reduce the carbon emissions of our operations,” said Bryn Davidson.

Vancity supports businesses that embrace green management practices, and is a proud partner of Climate Smart Businesses. Since 2007, Vancity has provided scholarships to more than 150 small businesses, co-operatives, and not-for-profit organizations to measure and reduce their greenhouse gas emissions through Climate Smart training.

If you’re a Vancity business member and want to measure and manage your carbon footprint, visit: vancity.com/climatesmart or email greenbusiness@vancity.com to find out about our scholarships for Climate Smart training.
Vancouver’s Greenest City 2020 Action Plan aims to double the size of the Green Economy and make Vancouver the greenest city in the world by 2020. These goals seek to grow Vancouver’s economy, while increasing competitiveness and innovation of Vancouver businesses through sustainability strategies.

The good news is even small and medium-sized companies can benefit from greener practices. Eight 1/2 Restaurant owner-operator Mike Wiebe does not like to waste anything—time, energy, not even pickle jars. So he made it his goal to reduce or eliminate waste from the restaurant’s operations, and to become one of the greenest restaurants around. A Business Energy Advisor went in to talk about energy, and how the business could start saving as well as leverage BC Hydro’s Product Incentive Program. The restaurant decided to replace their old dishwasher, which Wiebe says was probably their biggest energy user, with an ENERGYSTAR®, low-water, low-temperature model. Later they changed 50 incandescent lights to LEDs, saving energy and maintenance time. Wiebe says he used to have to replace bulbs every two weeks due to overheating. “With the new lights, we haven’t changed any yet.”

There are numerous economic advantages to greener business practices, and it all begins with an understanding of how environmental performance relates to your business operations and bottom line.

Data from Climate Smart can help you understand how your construction business compares with others in your sector. It also highlights the approaches that other leading construction and property management businesses are using to successfully reduce their costs. These businesses are becoming greener businesses and benefiting from brand lift, employee retention and new clients. The City of Vancouver also supports the Business Energy Advisor program, offering free advice for less than an hour of your time. The program has already provided dozens of energy saving suggestions and helped over 200 businesses save thousands of dollars.

For more information on programs to help you green your business, visit http://vancouver.ca/green-vancouver/how-you-can-green-your-business.aspx.
Sustainability and climate action have long been a part of the City of North Vancouver’s core values, policies and programs. To build a resilient community, we must not only lead by example, but provide opportunities for residents and businesses to play a role.

The Living City initiative is an opportunity to share what we are doing, connect with others, and help people participate in our climate action efforts. Living City includes initiatives in five areas: Sustainable Energy, Zero Waste, Transportation, Urban Agriculture, and Natural Capital.

Each of us can do our part to create a Living City. Go to www.cnv.org/livingcity for more information.

The Capital Regional District (CRD) is a “community of communities” committed to working together to create a vibrant, livable and sustainable region for years to come. In practice, this means that our services aim to support a good quality of life as well as a strong, resilient regional economy. It also means that we have a commitment to climate action.

The CRD Climate Action Program philosophy is based on three pillars: engage, reduce and prepare. The program works to support the necessary shifts in policy, infrastructure, behaviour and planning that are required to create a vibrant, healthy and low-carbon capital region.

For more information, go to www.crd.bc.ca/climatechange.
The CIRS building demonstrates the possibilities in sustainable design and construction, serving as a catalyst for change. It was designed by Perkins+Will, a Climate Smart company, to be the most sustainable building in North America upon completion.

Exceeding LEED Platinum status, CIRS was designed to be ‘net positive’ in seven different ways: energy, structural carbon, operational carbon, and water, turning passive occupants into active inhabitants while promoting health, productivity, and happiness.
CONSTRUCTION, REAL ESTATE, AND CARBON EMISSIONS

A CLIMATE SMART™ INDUSTRY BRIEF

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