

BNIM 2010 Sustainability Action Plan & Progress Report

Updated: 31 March 2011 by Phaedra Svec

BNIM Philosophy:

We believe in the power of design to uplift the human spirit, serve as a robust tool for owners and stakeholders, and create a beneficial and interdependent relationship between our natural and built environments.

About BNIM:

With the support of our visionary clients, BNIM is working to redefine the realm of green planning and design. As early pioneers in the arena of sustainable design, BNIM continues to shape the national and global agenda for progressive planning, responsible architecture and design excellence. Established in 1970, the firm has emerged nationally as a leading resource for established methodologies, innovative technologies and cutting-edge research in architecture, planning, landscape architecture and workplace design.

Our process is deeply rooted in the concept of integration, where clients and collaborators work together to find solutions that are greater than the sum of individual contributions. We embrace an integrated Triple Bottom Line approach to find solutions that simultaneously satisfy the needs of people, planet and prosperity. BNIM is committed to discovering regenerative design methods that enable our communities to create construct and produce in ways that allow for the ongoing evolution and vitality of interconnected, life-supporting systems. We hope to leave every place we touch more alive than we found it. We hope to recover and restore eco-system services that were once available in nature and can be available again alongside human settlement.

The firm's work includes early pilot projects that defined the USGBC's LEED rating system, a broad portfolio of LEED and high-performance buildings, landscapes and planning projects and recent work that goes beyond LEED's highest standards to achieve Living Building certification. The Living Building concept was born and developed through BNIM collaborations and BNIM is claimed as a co-founder by the Living Building Institute. When the USGBC was ready to develop tools that would define regenerative design, they asked BNIM to provide thought leadership and a framework for tool development. The early conceptual work aims to provide place-specific priorities and strategies that connect scientific data in a systems-based cognitive modeling framework. The tool promises to help communities define quality of life in four interconnected areas: Robust and Resilient Natural Systems, High Performance Constructed Systems, Prosperous Economic Systems and Whole Social Systems. There are forty components of regenerative design which have so far been identified. This work, as it unfolds, will shape a new generation of design that aims to improve the quality of life for all life on earth.

BNIM has been recognized with the 2011 AIA National Architectural Firm Award for consistently producing distinguished architecture. BNIM is celebrated for advancing the design of sustainable architecture from nearly its inception to today, when it has become a preeminent force fundamentally re-shaping the built environment.

Sustainable Design Goals

BNIM considers sustainability as an integral part of design excellence. To that end we have set Aspirational Targets, Stretch Goals and Minimum Performance requirements for each of our projects.

Aspirational Target

Seek clients and consultants with similar values who are willing to achieve one of the following:

- Net zero energy and water use
- Living Building certification
- Participate in the One Planet Community Programme using One Planet Living principles and metrics
- Incorporate biomimetic principles and measure a restoration of ecosystem services

Stretch Goals

On every project set at least one stretch goal that will innovate in at least one area related to sustainability and high-performance design. For example, consider pushing the current state of the art forward in any of the following categories:

- Storm water quality and quantity
- Potable water consumption
- Energy use
- Human health & wellbeing
- Material footprint
- Solid waste reduction
- Operational efficiency
- Carbon footprint
- Land use patterns
- Transportation
- Food production
- Local employment & industry
- Neighborhood connection and empowerment
- Social equity and cultural heritage
- Biophilia
- Habitat

Minimum Performance Standard

Every project should set integrated, triple-bottom-line goals (social, economic and environmental) that can be tracked throughout the project. Projects should follow a design and quality assurance review process as described the BNIM Design Primer and Toolkit.

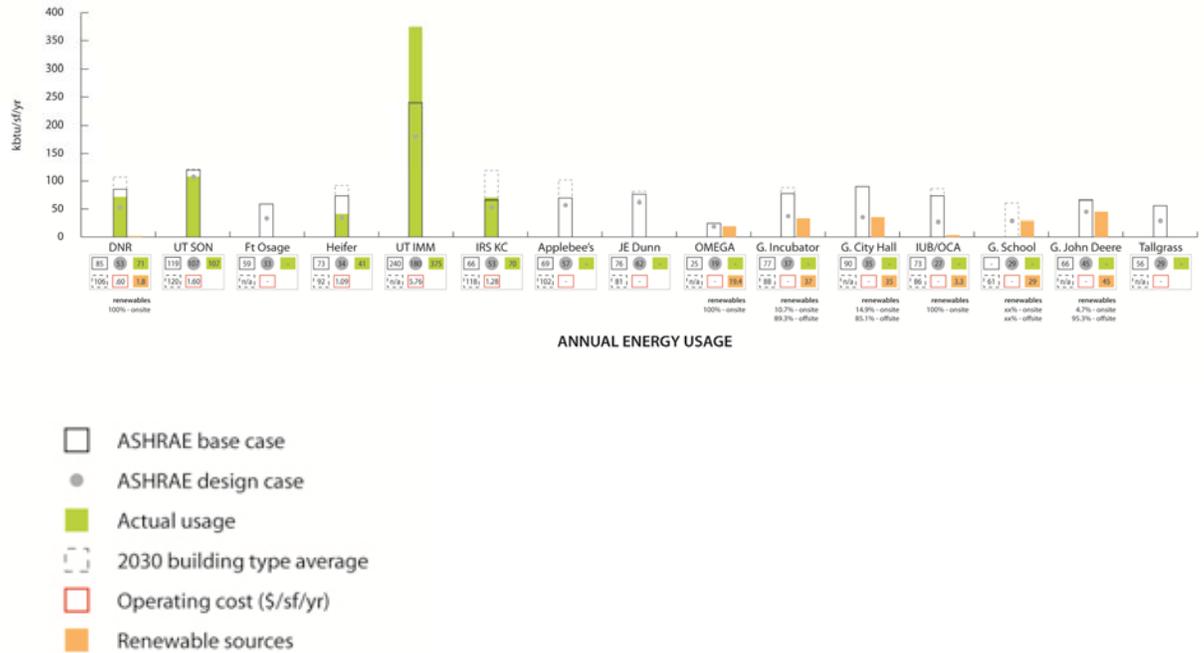
On every project eligible for reporting to the AIA 2030 Commitment, aim to achieve AIA 2030 challenge targets. For 2011 that requires a 60% reduction in predicted energy use intensity for new construction and renovations against the baseline provided within the program tools or the EPA Target Finder database. Projects with longer timelines should be planning for and stretching toward 70% to prepare for the next incremental increase. In addition, reduce by 60% potable water consumption calculated using the LEED water baseline methodology.

Accountability

In addition to the peer review process, BNIM collects actual energy usage data for significant projects over the past 10 years and compares that data to predicted energy use intensity (if available) as well as to the regional or national building type benchmarks (if available). We will expand this list of projects in 2010 to include all projects and we now have enough data to compare actual performance over time for all of the projects we have tracked in the past. A natural part of collecting data is collecting the reasons why performance may be different than predicted. We try to document

lessons learned in our Vision project database and project summary sheets. We present this information to staff periodically as case studies are developed and lessons are understood. We present the entire portfolio to staff when the annual results are refreshed.

Attached is the last graphic completed with 2009 data for the projects tracked to date. We are in the process of expanding and updating this work with 2010 data. The updated report is due at the end of second quarter 2011. In 2011 we will collect water consumption data as well.



Staff Training and Education

BNIM recruits and retains innovators who have an inner desire to learn and a drive to accomplish. Our history attracts and our culture supports an awareness of environmental and social issues as they relate to the built environment and community life. BNIM supports the ongoing development of our incredibly talented staff. It is an integral part of our nature as a firm family to celebrate leadership and accomplishment.

BNIM Education Programs

We offer a series of educational programs internally to promote shared knowledge and to foster a collaborative culture. Presentations are made by in-house experts and guest speakers who are leaders in the sustainable design field. Most programs are rich with dialog and require active participation. The program called It's Elemental: Components of Sustainable Design, is in its eleventh season. The program offers a variety of topics including building performance, rating systems, project case studies, materials, indoor air quality issues, building system modeling, regenerative design, biomimicry etc. We also offer regular monthly programs related to Building Information Modeling, quality assurance and project/practice management topics. In a given month there are generally 3-4 educational sessions offered. We are AIA continuing education provider and our programs generally qualify continuing education credits. Often these internal programs are presented in the community, at conventions, or published in various formats. Elements University was developed as a way of providing educational service outside of BNIM for regularly requested programs.

Professional Development

BNIM offers a number of continuing education benefits. The employees are allowed to choose their areas of interest. Employees are encouraged to present and publish at conventions. If an employee's paper or topic is accepted their expenses for attending the convention are paid in full. All employees have an annual professional development allowance whether presenting or not. The following is an excerpt from the current policy manual:

PROFESSIONAL DEVELOPMENT

BNIM recognizes the benefit to the firm and to the employee of continuing education and supports education in a wide variety of ways.

In-House Lunch and Learn

BNIM supports continuing education by hosting lunch and learn presentations. BNIM uses both in house experts and will

bring in speakers and experts in the field. Lunch is provided for all participating and the time is considered unpaid.

Seminars and Workshops

BNIM encourages attendance at relevant and timely seminars and workshops. If an employee is interested in attending a seminar, please provide a budget to accounting for approval prior to signing up for the seminar. With prior approval, an employee may be paid regular salary if attendance occurs during office hours. Prior approval will be needed from Accounting if travel is required to attend the seminar or workshop. BNIM will contribute annually up to \$250 for staff employees and \$750 to leadership employees for the costs of fees and/ or travel.

Conferences

Your desire to attend a conference such as the AIA annual conference, Green Build, etc. should be included in your annual self-review plan. If you are an elected official, presenting or have a speaking role at the conference, BNIM will pay up to agreed upon limits for attending the conference. As always, per diem limits should be followed whenever possible.

Honorariums

It is generally expected that BNIM should be reimbursed for either travel expenses or paid an honorarium for speaking engagements. Honorariums should be paid to BNIM to cover the costs of travel expenses and missed work time.

PROFESSIONAL AND CIVIC ACTIVITIES

BNIM is concerned with the welfare of our profession and actively supports the American Institute of Architects, the Institute of Business Designers, and other related professional organizations. BNIM encourages members to join professional organizations and to participate in those organizations. Employees, with approval of a supervisor, may take paid time off for professional organization activities. Such time should be appropriately noted on time sheets. For Leadership level employees, BNIM pays full AIA and IBD dues and meeting costs. For other staff members, BNIM will pay national dues, with the employee paying state and local dues. For certain individuals with specific interest or responsibilities, BNIM may pay dues to professional organizations such as Construction Specifications Institute, American Institute of Certified Public Accountants, or Society for Marketing Professional Services. Generally, only one such membership per employee is paid by BNIM.

BNIM recognizes the benefit to the employee, the community, and the firm derived from participation in civic or political activities. Generally such activity should be carried out on an employee's own time, but in certain circumstances, with the approval of management, paid time off for these activities may be granted. Some examples of civic or political activities may include but are not limited to- Downtown Council, Chamber of Commerce, COTE & Bridging the Gap.

PAID COMMUNITY SERVICE TIME

BNIM has as part of its culture a strong history of community involvement and commitment.

Every BNIM employee working 20 hours per week or more is eligible each calendar year to utilize up to 8 of their regular

work hours to participate in activities for charitable organizations. This time will be charged to Community Service (00510.00) and can be taken in increments or as a whole day. The organization(s) is the employee's choice; charitable organizations are typically not-for-profits such as Habitat for Humanity, Ronald McDonald House Charities, Boy

Scouts of America, Harvesters, etc. BNIM also encourages employees to pool their efforts by organizing groups to help a charity with an annual event, such as an annual tournament or volunteer day. Project teams working for a not-for-profit client could use their Community Service Day to help support their client's organization. During each employee's annual review, the employee will describe how they used their Community Service Day. This is an opportunity for the employee to share the organizations that they support. If you have questions, please see Human Resources. Time spent away from the office during work hours for professional purposes is not included in this policy, such as time away to attend AIA events or juries at area universities, etc. Individuals are asked to make up time away for professional purposes, except in some special instances. If you have specific questions, please see the Director of Operations.

Professional Accreditations and Licensing

BNIM encourages employees to become accredited and licensed in their area of expertise including, for example, LEED accreditation and other professional certificates. Internally we celebrate and recognized these achievements for the individual as they are earned. The following is an excerpt from the current policy manual:

PROFESSIONAL LICENSING EXAM

BNIM encourages all staff members to become fully qualified professionals and will, for employees who have completed three months employment, grant paid time-off (in addition to vacation time) for days spent in an actual professional examination session. The professional exams include the Architectural Registration Exam, NCIDQ, LARE and LEED Accreditation.

The primary beneficiary of professional licensure is the individual. However, BNIM recognizes the importance of this accomplishment for both the individual and the firm and as such, BNIM will also provide reimbursement upon the passing of each exam. This applies to the ARE, LARE and NCIDQ licensure and accreditation by USGBC LEED. The intent of this reimbursement is to recognize the individual's accomplishment.

An employee must turn in receipts associated with the fees required to sit for the exams, as well as proof of successful completion of the exams. BNIM will reimburse the employee for these costs. It is important to note that BNIM will not reimburse for a portion or portions of an exam which the employee does not successfully complete or pass. In addition, incidental expenses related to travel or meals are not reimbursable.

Design Process

BNIM's integrated design process has evolved over many decades but has only recently been recorded. BNIM is in the process of publishing the *BNIM Design Primer* (hopefully in 2011) that describes our process and details the cyclical series of reviews and feedback sessions we prescribe to ensure quality and performance. However, even in writing down this story we find that it is not easily to codify the integrated design process. The recipe for collaboration from one project to the next might be different, but there are patterns that we have noticed over decades. It is those patterns we are hoping to record in the primer.

Integrated design is not something that happens automatically simply because all the collaborative players are in the same room. The spirit of collaboration is something that must be invoked at every crossroads in the decision making process. Sometimes those crossroads can be prescribed and happen in an orderly fashion, and sometimes the opportunities are spontaneous. We recognize that the project leader's primary responsibility is for keeping the space for dialog and contribution open and safe for those who would contribute. The skills required for navigating through human nature and established habits are considerable. The skill is not easy to teach except through experience and mentorship. Fortunately BNIM has many experienced collaborators whose skills lead the industry. There is a general habit among firm's principles and associates to encourage younger staff members to develop these skills through guided experience on projects. We routinely place less experienced staff members in the position to gain the necessary experience with the support of more seasoned mentors. We find that they quickly become contributors.

Measuring Standards and Feedback Procedures

Attached to this report is a preliminary one page diagram called: *Toolkit* that describes the feedback procedures we use to ensure quality. We track and store performance data for all projects in our Vision project database.

Sustainable Operations

Immediate Actions

Attached to this report is summary called *Immediate Operational Actions*. We had incorporated most of 2030 prescribed actions prior to our signing the commitment and offer the attached report as a current status report.

The BNIM Climate Neutral Initiative

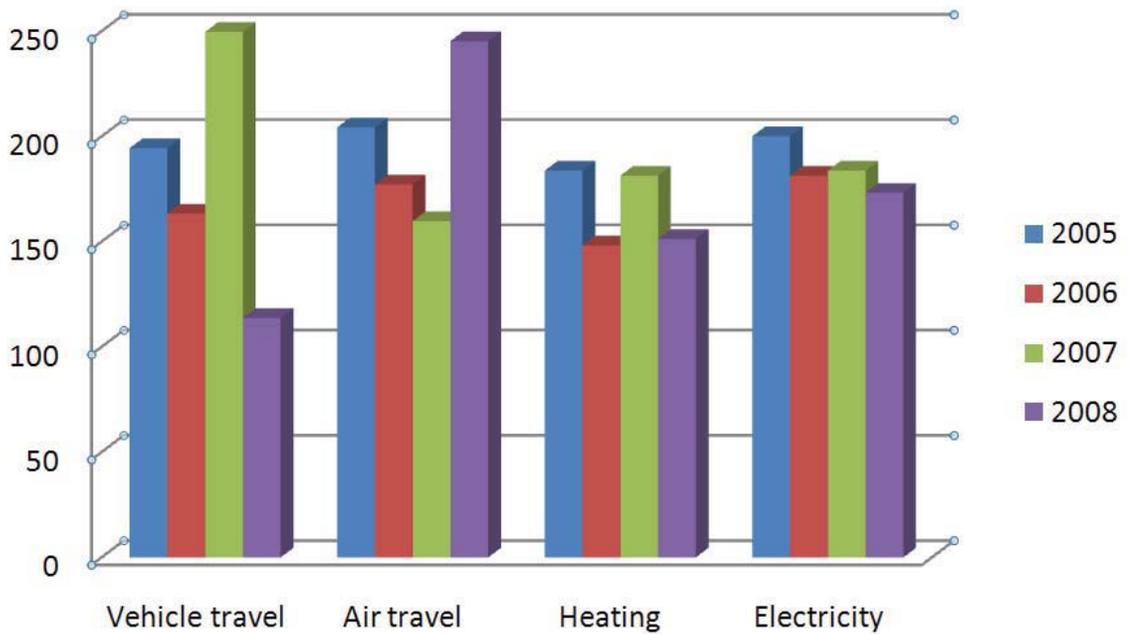
As part of BNIM's overall environmental strategy, the firm has made a commitment to reduce its greenhouse gas emission footprint. Since 2005, the firm has annually created a carbon dioxide emissions inventory to evaluate its corporate practices, utility usage and transportation impact. The resulting reports have allowed the firm to set benchmarks for reductions of its carbon footprint. Strategies developed from the carbon analyses have led the firm to reduce its emissions in flight travel, for instance, by encouraging use of teleconferences over long distance meetings and by booking more direct flights. We purchased two hybrid cars for local travel. More efficient equipment, including copiers and computers, has been purchased, saving energy. And the office now uses 100% recycled content paper, with double sided printing. We refined our parking subsidy program to include and incentivize public transportation alternatives and participate in a local bike-share program. Gradually we are becoming more flexible about where people work and making it easier for people to do some of their work at home. The process has shown us the importance of educating and influencing the local commercial real estate market toward green leases. We have also, for the first time in 40 years, considered purchasing and renovating our own living building.

BNIM's overall goal since 2005 has been to achieve a neutral, net-zero result, so that the firm is negating any carbon emissions that it is creating. This has been possible by instituting energy saving measures and by the purchase of greenhouse gas offsets. Greenhouse gas offsets provide a cost efficient and sustainable solution to climate change by increasing investment in clean technologies, creating jobs, protecting the environment and contributing to sustainable development.

The following is a timeline of progress, and setbacks, toward the BNIM Climate Neutral Initiative:

- 2006 first quarter: paid a consultant to calculate 2005 CO₂ footprint and purchased \$8,344.93 in offsets
- 2007 first quarter: paid a consultant to calculate 2006 CO₂ footprint and purchased \$6,822.97 in offsets
- 2007 (?) signed the AIA 2030 commitment
- 2008 first quarter: calculated our 2007 footprint in-house using the same methodology and purchased \$7,038.00 in offsets
- 2008 signed the Greater Kansas City Chamber of Commerce, Climate Protection Partnership agreeing to track reduce and report emissions
- 2009 first quarter: converted to the expanded GKCCOC methodology and format for calculating the 2008 CO₂ footprint
- No offsets were purchased for 2008 and a climate footprint was not completed in 2009 due to severely depressed economic conditions in 2009.
- First quarter 2011, renewed commitment to both programs and began calculating 2010 footprint with an intention to purchase offsets by second quarter 2010. The 2009 CO₂ footprint will be measured for utility usage only. The firm will consider a schedule for retroactively offsetting 2008 and 2009 as economic conditions improve.

CO2 Footprint Year over Year Comparison:



Summary:

2005 = 782.76 tons
2006 = 670.27 tons
2007 = 774.79 tons
2008 = 683.92 tons

For the complete report see: (2009, Dodd) *BNIM 2008 Carbon Dioxide Emission Report*.

BNIM Carbon Footprint Reduction Goals for 2011:

- Consolidate reduced staff into less space and explore reductions in energy use before we move
- Plan to achieve Living Building certification and net-zero energy use either through lease negotiations or by purchasing and modifying an existing building when BNIM Kansas City headquarters moves
- Incentivize ride-sharing, bus ridership, biking and walking in new and innovative ways
- Track material purchasing (not previously calculated)
- Determine if BNIM waste and water consumption can be deduced from whole building data
- Translate annual usage to a per capita and per square foot figures for comparison
- Develop a plan for retroactively offsetting 2008 and 2009 emissions
- Streamline the data collection process and incorporate tracking methods for efficient data gathering
- Present results to the staff for dialog and an annual brainstorming session

PROPOSED REDUCTIONS FROM 2008 BASELINE

Category	2012	2020	2030
Reduce Emissions due to employee commute	10%	50%*	90%*
Energy Use**	Net zero with 25% fewer offsets	Net Zero with 50% fewer offsets + on-site renewable	Net zero with on-site renewable
Sustainable Purchasing	Establish a baseline	Improve by 50%	Improve by 90%
Solid Waste	Establish baseline	Reduce by 50%	Reduce by 75%
Potable Water consumption**	Net zero with collected water	Net zero with collected water	Net zero with collected water

* Assumes KC Lightrail or BRT infrastructure come to pass (otherwise 25% by 2020 and 50% by 2030)

**Assumes BNIM Kansas City moves into a new building.

Develop a Business Strategy

BNIM has for at least a decade developed an excellent track record for making the business case for sustainable design. As the authors of the landmark *David and Lucile Packard Foundation Sustainability Report and Matrix* we have published and presented extensively on this subject. We have been committed to making this information available in person and on our website as well as in our many published works.

For recent works please see:

www.bnim.com/bookshelf

as well as

www.bnim.com/services/core-service-research

Our marketing materials document sustainable design goals and accomplishments on each project sheet. We also track and document our accredited professionals, building certifications, AIA Top Ten Green awards and the many published works and individual accomplishments of our dedicated staff.

In 2008 BNIM began tracking actual performance data for a number of model high performance buildings. From 2010 forward we intend to track actual performance data for all projects qualified to report for the 2030 commitment. This takes considerable time and energy with no source of revenue directly associated with this effort. We are constantly striving to find cost effective ways to make this a part of our routine process.

We see the benefit of tracking actual building performance data coming primarily in the form of an extended relationship with our clients and in finding opportunities to continue to serve them toward better performance. There is an ancillary benefit in learning the lessons and adding to our institutional knowledge about how to deliver high performance design efficiently and reliably. And finally there is a benefit in being able to respond with actual performance data for our projects when prompted by prospective clients. We see the time required to capture data and with our clients as well worth the investment.

Sustainable Action Plan Team

The champions for the 2011 BNIM Sustainability Action Plan are: Steve McDowell, Laura Lesniewski, Craig Scranton, Kristin Atkinson, Joshua Hemberger, Kara Bouillette, and Phaedra Svec.

T O O L K I T

GOAL SETTING	TYPES OF REVIEW	PURPOSE	PARTICIPANTS	TIMING	LOCATION
PROGRESS	initial Vision	Set the Goals, Self-check on concept/parti	Project Stakeholders (Entire Team)	At the beginning of the project / Can be a singular meeting or a series of meetings with a dedicated time investment	Big Room
	Storytelling	What is the back story of the project that we wish to communicate to the world?	Project Team (BNIM)	Before any presentation takes place or meeting with a client	Room with Pin-up Space
	LEAN Goal Setting	Set project milestones	Project Stakeholders (Entire Team)	At the beginning of the project	Big Room
	ongoing Vision	Make sure Vision is on course; concept/parti is intact	Project Stakeholders (Entire Team)	As needed / 15 minute Vision checks	Room with Pin-up Space
	Desk Crit	Quick check-in	2 or more people; may or may not be from the same Studio or Project	When one is stuck or needs a second opinion / 30 minutes	Desk
	Team	What is everyone developing? Get it on the wall!	Project Team (including P if available/applicable)	Weekly or Bi-Weekly / No more than one hour	Obeya or "Wall of Work"
	Parking Lot	Address issues that have been put on hold from other meetings	Project Team (BNIM)	As needed / No more than one hour	TBD
	Studio	Solicit ideas from a number of people; share work; hone presentation skills	Entire Studio (in which the Project resides)	Monthly / No more than 2 hours	Conference Room; Common Table; Restaurant (Lunch is good)
	Blind Peer	Fresh, unbiased set of eyes to provide natural feedback; reading the project (Variant: Nuts and Bolts B.P.)	Someone outside Project Team along with Project Team	Any stage / As needed by Project Team	Room with Pin-up Space
	AAR after action	What was supposed to happen? What actually happened? Why were there differences?	Could range from P/PM/PA to entire team	Immediately after a major Project milestone, including Project completion	Office, bar, street corner...
FUTURE STATE	LEAN Review	Provides insight as to whether or not the project met its LEAN goals	Core Team	TBD	TBD
	APR after project	What was supposed to happen? What actually happened? Why were there differences? Lessons learned...	Entire Office	End of a Project	All-Staff Meeting / Office Display

Immediate Operational Actions

Office Energy Use

- Track and report energy use in the office – In 2005 BNIM committed to calculate annual carbon footprints and purchase carbon offsets from Climate Trust annually. We have followed this commitment for 2005, 2006 and 2007. In 2008 we calculated a footprint but could not afford to offsets. In 2009 due to a severely depressed economic condition we did not calculate a footprint. We are in the process of calculating the 2010 footprint and intend to purchase offsets for 2010 and possibly for 2008.
- Procurement of Energy Star rated equipment – It is our office standard to purchase all energy and water using equipment that is Energy Start rated.
- CRT to LCD monitors – We no longer have any CRT monitors in the office, all CRT monitors have been replaced with LCD monitors.
- Incandescent lamps to fluorescent – All lights have been replaced with Fluorescent lights and meet the office lighting design standards. The design standard for the office is T-5 lamps for general lighting and task lighting.
- Establish a timeline for ultimately purchasing 100% green power – see above.

Water Reduction and Supplies

- Reduce paper consumption by using electronic documents and forms – All internal forms and documents (i.e. vacation requests, time sheets, employee's manuals, design primer, technical service bulletins, staff meeting minutes etc.) are posted on the intranet rather than distributed. The intranet houses reference material for programs and office set up. Electronic markups for drawings and notes can be made through our Newforma communications software program.
- Printing policies – All printers are set up to default with 2-sided and black and white printing. All floors have an 11x17 printer to encourage printing half-sized sets of drawings instead of full size. All printers have a simple toner cartridge mechanism that uses recycled toner cartridges.
- Firm-wide recycling – The firm recycles all plastic drink bottles, cans, cardboard and glass. We use rechargeable batteries. Plastic, cans, and cardboard are recycled by the office supply company, while glass is taken to a local glass recycler. When possible the company provides drinks in large containers rather than individual containers. Plastic drink bottles are not supplied. The company charges a small fee for soda and coffee but purified water is free to encourage healthier behavior. We track soda and coffee consumption annually and notice a downward trend in use.
- Office supplies – Whenever possible, all purchased office supplies are environmentally friendly. 100% recycled 8.5x11 printing paper, 30% recycled 11x17 and 30% recycled plotter paper are standards for purchasing.
- Kitchen supplies – Whenever possible, environmentally friendly kitchen supplies are purchased. 100% recycled paper towels are an office standard for example. We use durable goods rather than disposable plates, cutlery, glasses, mugs and bowls. Our coffee is sometimes fair trade organic. When we cater we ask caterers to provide family style platters rather than individual boxed lunches with

- disposable packaging. We tend to favor locally owned restaurants and food providers who source locally.
- Cleaning supplies –All cleaning products that are purchased by the firm are Greenworks (biodegradable, natural ingredients, and recycled packaging). Custodial services are provided by the building manager and our lease does not include a clause for green cleaning. Our lease will be renegotiated at the end of 2011.
 - Office furniture – We purchased demountable walls and office systems furniture that includes recycled content steel panels which are more durable than fabric panels and do not require adhesives or adversely affect indoor air quality. They provide a magnetic surface for hanging drawings reducing the need for upholstered tack surfaces. The furniture is infinitely flexible and has accommodated many furniture reconfigurations over the years. We own the furniture so that we can take it with us when/if we move. It sits lightly on the historic travertine floors so that when it is removed it will not have impacted the historic finishes of the space. We worked with the manufacturer to custom design table surfaces that could be formaldehyde free and recycled content MDF with powder coating to eliminate the need for laminated surfaces. The furniture was purchased before Greenguard and other furniture certifications existed from a manufacturer who had meet the requirements of our extensive sustainability questionnaires for furniture. This company today routinely provides certified furniture. We reused chairs from a previous office when we moved into this building 10 years ago.

Transportation

- Incentives for ride share, walk, or bike – People are encouraged to share rides with others in the office and others who work in the vicinity. The rate of usership is tracked from year to year by survey. Bus Ridership has steadily increased and walking and biking are also gaining popularity. The firm subsidizes the monthly bus fee by 70% for those who wish to purchase a bus pass. A bike closet is located in the firm for those who bike to and from the office. Loaner bikes and helmets are provided by the firm for those wishing to make short trips by bicycle throughout the day.
- Toyota Prius policy – When traveling by car within the region, people are asked to first use one of the two company owned hybrid cars. When possible, a hybrid vehicle is the first choice of a rental car.
- Policy for offsetting firm travel – both business travel and employee commutes (determined by survey) are included in our firm-wide carbon foot print calculations and offsets are purchased.

Meeting Procedures

- Encourage virtual meetings when possible - As a firm we have Lifesize software and video conferencing equipment to communicate between Houston, Des Moines, California, and Kansas City offices as well as with clients who also have the program. We routinely use Skype, Webex, and Go 2 Meeting for meetings with clients and for initial interviews with prospective employees. There is no

formal policy for encouraging virtual meetings. We find there is a natural quality of life and economic incentive not to travel if it is not necessary.

- Coordinate travel plans and airport ride-shares – We don't have a formal policy, but it is the general practice for employees traveling together to share travel as much as possible. There is a natural economic incentive to reduce travel and parking expenses as our airport is 50 minutes from downtown. There are secure garage spaces for those who choose to leave their cars at the office and share a ride with co-workers to the airport. When guests arrive we have a practice of helping them to arrange travel together with other guests arriving at the same time.

BNIM Architects

2008
CARBON DIOXIDE EMISSIONS REPORT



Document prepared by
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Data Collection Process

The data collection process involved the following:

- Communication and collection of data with Paul Weigel, Laura Bellis, Shelley Edie, Ruthie Harrison, Amy Allen, James Reed and other employees of BNIM.
- Design of 2008 vehicle travel questionnaire (see Appendix A).
- Electronic distribution of questionnaire to BNIM employees.
- Collection and analysis of vehicle travel.
- Collection and analysis of heating and electricity bills and energy source information.
- Compilation and input of data into the Greater Kansas City Chamber of Commerce's Carbon Footprint Calculator.
- Comparison of the 2008 findings to the 2005, 2006 and 2007 results.

2008 Survey Facts

The online travel survey was conducted in February and March 2009.

An average of 106 people were employed at BNIM during 2008. At the time this survey was distributed in early 2009, 102 people were employed at the firm. Out of 102 employees, 72, or 71%, completed the survey. 30 employees did not complete the survey.

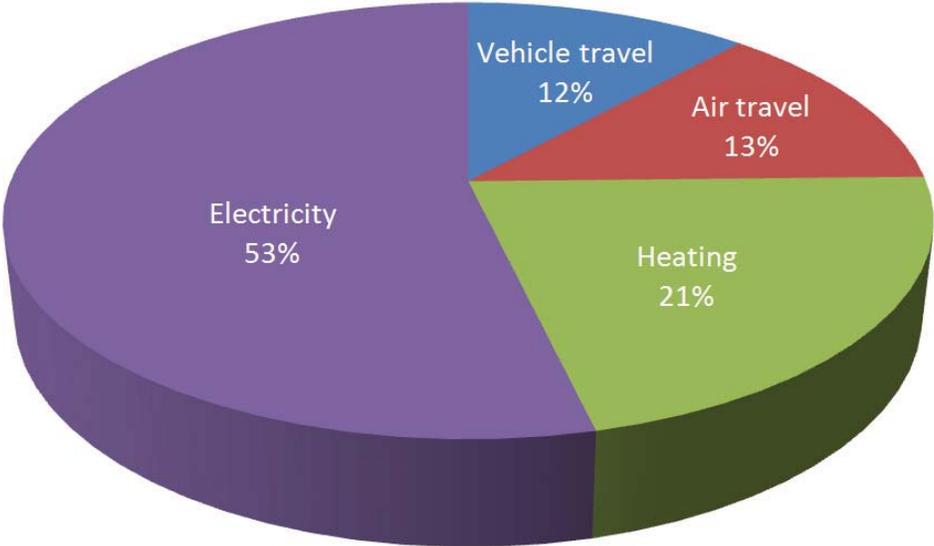
For purposes of the survey, average mileage and fuel consumption was used to calculate the transportation impacts of 34 people who didn't participate in the survey (counting the 2008 average of 106).

Factors and calculations for this report were based on the Greater Kansas City Climate Protection Partnership Carbon Footprint Calculator. Data gathered for previous years (2005, 2006 and 2007) were analyzed by a method developed by consultant Melissa Berrisford, so the calculations vary (see page 6). Data from 2008 has been analyzed with both the new tool and the previously used method so an apples-to-apples comparison could be made.

Summary of Results

BNIM Carbon Dioxide (CO2) Emissions Results - 2008

In the course of its 2008 operations, BNIM released a total of 788 tons of carbon dioxide emissions into the atmosphere from vehicle and flight travel and from heating and electricity for their office buildings in Kansas City, Houston and Des Moines.



Overall CO2 Emissions in 2008 (in tons of CO2)

1. Vehicle travel impact.....	103.25
2. Flight travel impact.....	113.79
3. Heating impact	190.55
4. Electricity impact	472.54
Total CO2 Emissions.....	880.13 tons of CO2

CHANGES IN CALCULATIONS

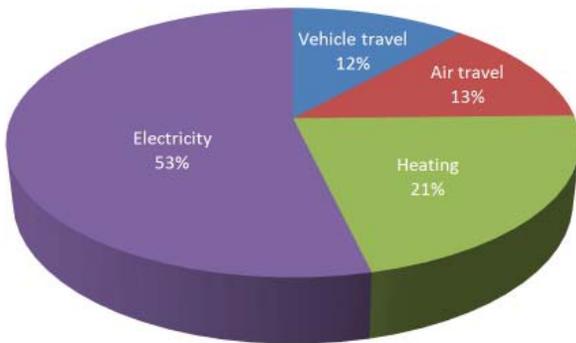
Since 2005, BNIM has calculated its carbon footprint based on a method created by consultant Melissa Berrisford. This year we're using a new product -- the Greater Kansas City Chamber of Commerce's Carbon Footprint Analysis tool, developed by the city of Seattle and adopted by Kansas City. There are some differences in both calculations and overall results.

The components measured and calculations are similar, but the overall results differ because of the factors used (see Appendix A, page 12). This is especially apparent in the calculations for electricity. For the past three years, BNIM's overall footprint has been fairly evenly divided between electricity, heating, vehicle travel and air travel. Using the new tool, electricity use is shown having a significantly greater impact than in previous years. Differences appear in all other categories as well.

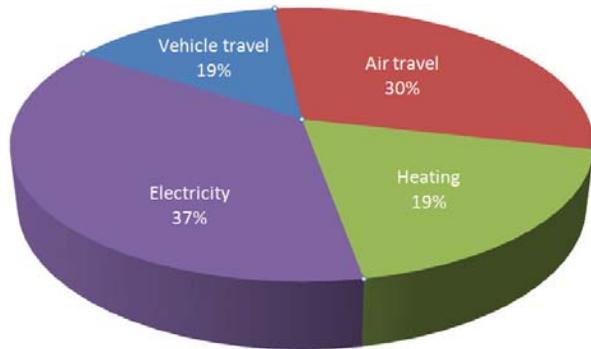
The travel survey issued to BNIM employees in February 2009 was changed, too. It was adapted for the information used in the new tool. As a result some of the questions asked in earlier surveys was not included. In 2008, personal vehicle use for business purposes was discouraged since the firm provided two company vehicles for that purpose so questions relating to that were not asked because we expected results to be limited.

The Chamber tool results (Appendix B, page 15) include material purchases (office paper) and waste disposal and recycling in BNIM's footprint. Because we did not have complete figures for these categories and didn't feel that the automatic calculations based on office size and population would be accurate, we did not include these figures in our overall results. This information was not previously calculated.

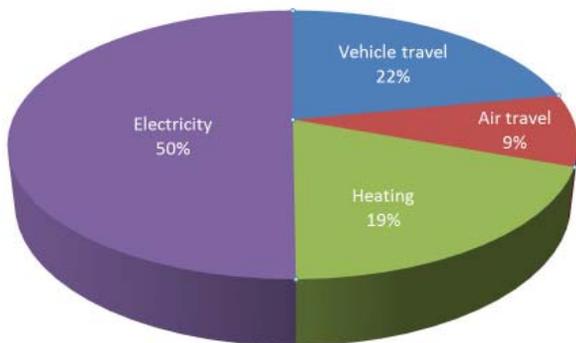
2008 footprint using new tool
(without material purchasing and waste)



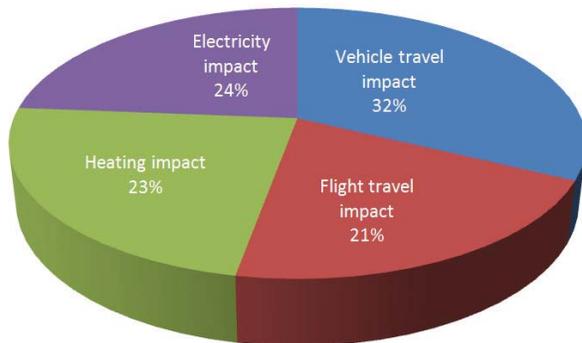
2008 footprint using the Berrisford Method
(without material purchasing and waste)



2007 footprint using new tool
(without material purchasing and waste)



2007 footprint using the Berrisford Method
(without material purchasing and waste)



TRANSPORTATION

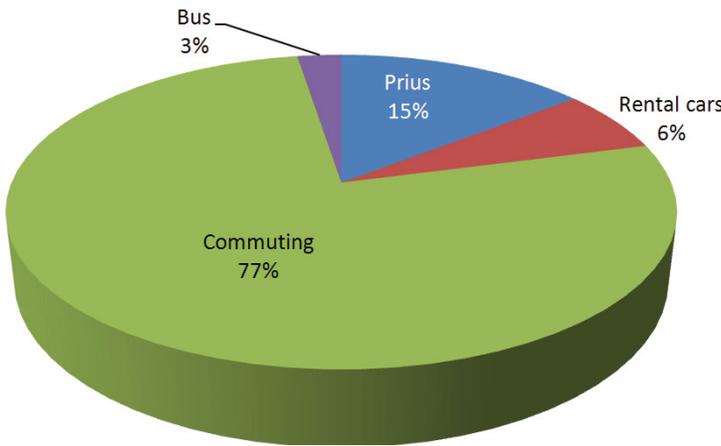
VEHICLE TRAVEL IMPACT

The following information on vehicle travel is based on the data provided by 72 out of 102 employees who answered the travel survey and on 34 employees who did not answer the survey or were no longer employed by the firm. For the 34, average commuting mileage for the Kansas City area and national fuel consumption was used to calculate the transportation impacts. This survey did not factor in trips around town for business, as had been done in previous years.

BNIM's CO2 emissions from vehicle travel 2008

Average car fuel efficiency of the 72 respondents: **25.86 miles per gallon.**

CO2 emissions (in pounds) released in the atmosphere as a result of:



Commuting to and from work with individual vehicle:
225,455 miles = 170,398.89 lbs of CO2

Commuting to and from work by public transit:
7,412 miles = 6,853.72 lbs of CO2

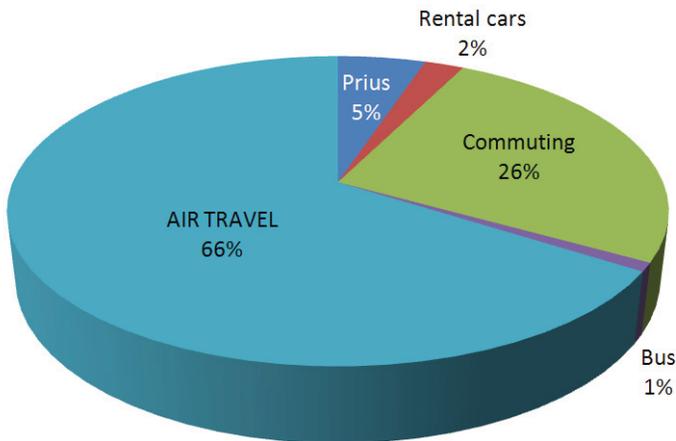
Rental car business trips:
19,072.8 miles = 14,415.13 lbs of CO2

Business travel in the two BNIM Priuses:
42,510 miles = 14,836.65 lbs of CO2

Total CO2 emissions from vehicle travel for 106 employees:

294,450.23 miles = 206,504.40 lbs of CO2 or 103.25 tons of CO2

FLIGHT TRAVEL IMPACT



Information from the David Suzuki Foundation: Although aviation is a relatively small industry, it has a disproportionately large impact on the climate system. It presently accounts for 4-9% of the total climate change impact of human activity.

545,276 air miles traveled in 2008

Total CO2 emissions from flight travel:
227,578 lbs of CO2 or 113.79 tons of CO2

UTILITIES

HEATING IMPACT

The majority of BNIM offices are located within the Power & Light (P&L) Building in Kansas City. BNIM office space accounts for 11.55% of the total square-footage of the P&L Building. However, the P&L Building is not 100% occupied and therefore BNIM may assume responsibility for 20% of the total building costs for heat and electricity.

The P&L Building is heated by steam provided from Trigen-Kansas City Energy Corporation.

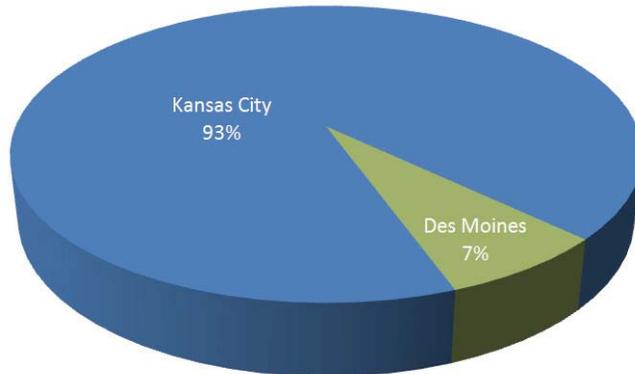
Kansas City: 20% of P&L Building: 1,429 thousand pounds of steam, producing 160,093 kg/thousand lbs of CO₂, or 352,944.2 lbs of CO₂, or 176.47 tons of CO₂.

Houston: Leased space in an all-electric building.

Des Moines, 1301 Locust St., Suite E: 2,000 sf of leased space within a 32,000 sf building (6.25% of the building). Because the building director would not provide steam usage, figures from 2007 were used. Steam heat is included in the rent and specific numbers were not provided. Estimated amounts are: Total estimated Therms used in building: 38,507.69 For the 6.25% of the building that BNIM occupies, approximate use was **2,406.73** Therms, which produced 28,014.35 lbs. of CO₂, or 14.01 tons of CO₂.

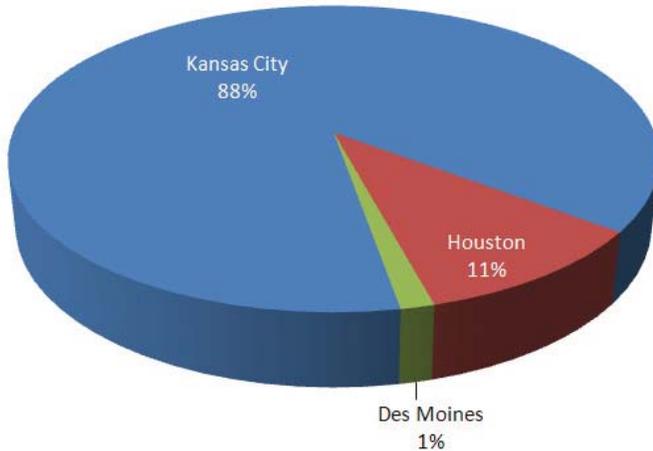
Total CO₂ emissions from heating:
381,097.2 lbs of CO₂ or 190.55 tons of CO₂

BNIM's CO₂ emissions from heating (steam and natural gas), 2008



UTILITIES

BNIM's CO2 emissions
from electricity, 2008



ELECTRICITY IMPACT (cooling included)

P&L Building: 2,358,686 kWh for the year for the entire building
BNIM's 20% share: 471,737.2 kWh
337,390 kg of CO2
832,001.54 lbs of CO2
416 tons of CO2

Houston office: 70,014.00 kWh
Note: The Houston office is 100% electric.
45,115 kg of CO2
99,461.43 lbs of CO2
49.73 tons of CO2

Des Moines office: 7,505 kWh
6,175 kg of CO2
13,613.53 lbs of CO2
6.81 tons of CO2

Total CO2 emissions from electricity:

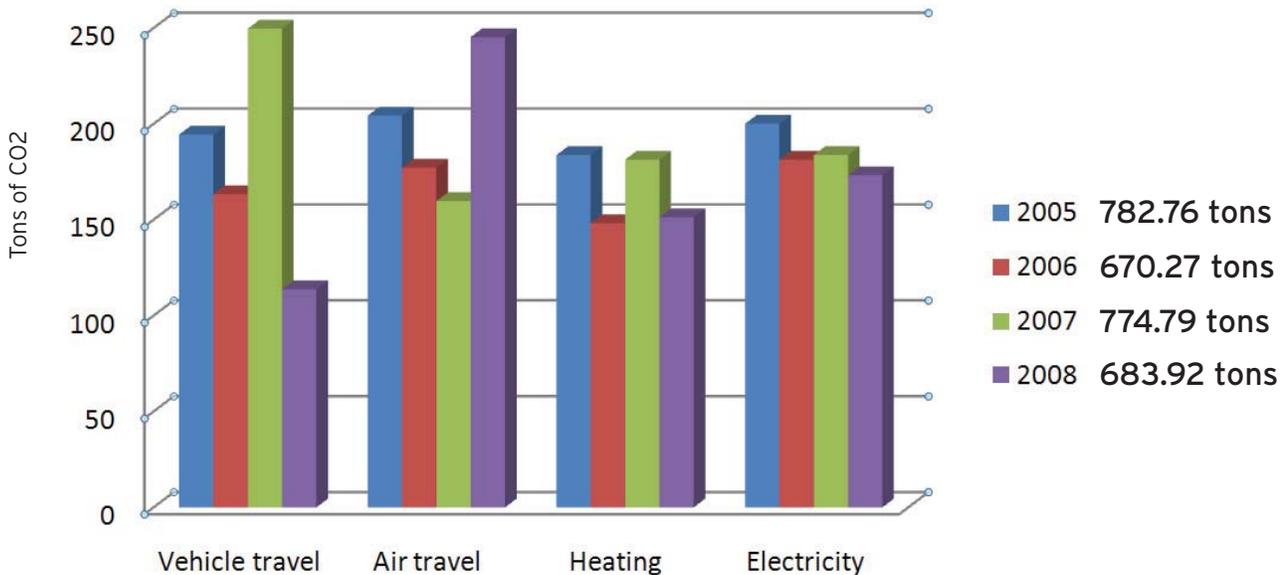
549,256 kWh all offices

428,680 kg of CO2

945,076.50 lbs of CO2 or 472.54 tons of CO2

YEAR OVER YEAR COMPARISON

Carbon emissions comparisons to previous years were made based upon results calculated using the Berrisford Method because hard figures were not available to accurately calculate the data.



The following information is based on information provided by the employees who responded to the questionnaires in 2008.

- There has been an **increase in the average car fuel efficiency** from 2007 from 22.4 to 25.86, due in large part to the increased number of hybrid vehicles owned by employees and the new Prius purchased by the firm.
- There was a **decrease in vehicle travel mileage**, which may be attributed to less travel between Kansas City and Greensburg and Des Moines. The economic downturn affected the nation and the firm in fall 2008, resulting in less office travel. And changes in the travel survey questionnaire did not include in-town and out-of-town travel in employee vehicles. Employees were encouraged to use the firm Priuses for any business travel, however.
- There overall number of employees remained close to the same as that used in the 2007 analysis. More people were employed at the firm throughout 2008 but due to attrition and economic constraints, the overall population at the time of the travel survey was slightly lower.
- Approximately the same number of people use alternate forms of transportation to get to work as in 2007. 12 people use the bus some or all of the time (13 did in 2007). Eight people ride a bicycle to work some or part of the time. Five employees carpool. One rides a motorcycle.
- There was an increase of over 94,000 miles in air miles traveled in 2008.
- There was a decrease in the amount of heating (steam and natural gas) and electricity used.

Conclusion

In the course of its 2008 operations, BNIM was responsible for releasing a total of 770 metric tons (848 tons) of carbon dioxide emissions into the atmosphere. The primary sources of the emissions were vehicle and flight travel, and heating and electricity for its office buildings in Kansas City, Houston and Des Moines. Emissions created by air travel increased significantly in 2008. Based on the current market cost of \$10 USD per ton of CO₂, the cost for BNIM to offset its carbon dioxide emissions for 2008 is \$8,480.

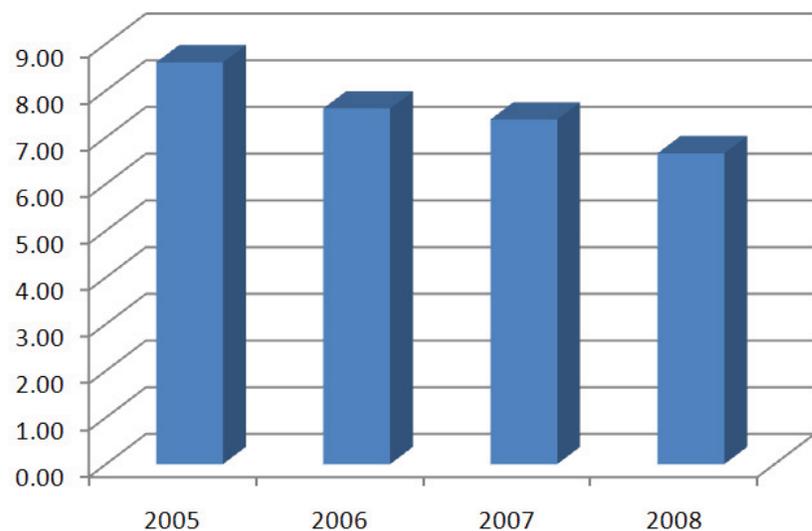
Purchasing Carbon Offsets:

In its fourth year of offsetting its carbon emissions, BNIM should now take seriously reducing its own carbon impact by establishing a goal for carbon reduction by the end of 2009. This can be accomplished through a series of office-wide strategies carried out by all employees.

With a growing number of offset retailers entering the market, it is important to choose an organization that is reputable, accountable, and transparent. There are a number of things to consider when selecting a carbon offset retailer. Some options to factor into offset selection may be whether to purchase offsets from a local, national, or international source, to support a for-profit or non-profit, to sequester carbon or opt for renewable energy. BNIM's interests and values should figure into the relative quality of the offsets. BNIM should conduct research and select an offset that offers projects that BNIM finds relevant and reputable.

BNIM may consider purchasing carbon offsets from a number of reputable organizations in the US such as The Climate Trust (www.climatetrust.org), the Solar Electric Light Fund (www.self.org), or Native Energy (www.nativeenergy.com). A list of international offset retailers is available upon request.

BNIM carbon emissions per employee



Appendix A: Conversion Factors

VEHICLE TRAVEL

Berrisford analysis:

Every gallon of gasoline burned releases 20 lbs of CO₂

Equation: Divide number of miles travelled by average mpg. Multiply gallons x 20.

Average car fuel efficiency of the 105 respondents: 22.4 miles per gallon

GKCCPP tool:

Every gallon of gasoline burned releases 18.1 lbs of CO₂ (average)

Equation: Factor emissions by the vehicle's fuel efficiency per mile.

- BNIM Priuses: .16 kgCO₂/mile (avg. 56 mpg)
- Other vehicles: .34 kgCO₂/mile (avg. 22.5-25.86 mpg) = .75 lbsCO₂/mile
- Buses (KCMO and Johnson County): .42 kg/CO₂/mile
- Average car fuel efficiency of the 72 respondents: 25.86 miles per gallon (based on survey results)
- Average car fuel efficiency of the 34 non-respondents: 22.5 miles per gallon (based on EPA averages for 2008)

	Miles	CO2 in kg	CO2 in lb	Tons	Factor
Prius	42,510.00	6,729.80	14,836.65	7.42	0.16
Rental cars	19,072.80	6,538.60	14,415.13	7.21	0.34
Commuting	225,455.43	77,291.73	170,398.89	85.20	0.34
Bus	7,412.00	3,108.80	6,853.72	3.43	0.42
TOTAL	294,450.23	93,668.93	206,504.40	103.25	

AIR TRAVEL

Berrisford analysis:

0.9 lbs CO₂/mile of air travel.

GKCCPP tool:

Emissions factors were determined by the length of the flights: Short (less than 300 miles), medium (300-1,000 miles) or long (1,000 miles +).

	Miles	CO2 in kg	CO2 in lb	Tons	Factor
Short	14,291.00	3,429.80	7,561.40	3.78	0.24
Medium	422,074.67	80,194.20	176,797.70	88.40	0.19
Long	108,910.53	19,603.90	43,219.15	21.61	0.18
TOTAL	545,276.20	103,227.90	227,578.25	113.79	

UTILITIES

Heating

1 Therm of natural gas produces 11.64 lbs of CO₂

1 Therm of coal produces 19.788 lbs of CO₂

Equation: For P&L building, convert Mlbs of steam to therms. (from 2007 report:

Trigen's record indicates that approximately 80% coal and 20% gas were burned in its plant to heat the P&L building). Multiply according to the percentages for coal

and gas.

Des Moines: 2,000 sf of leased space within a 32,000 sf building (6.25% of the building). Steam heat created by natural gas is included in the rent and specific numbers were not provided. For the 6.25% of the building that BNIM occupies, approximate use was **2,406.73** Therms, which produced 28,014.35 lbs. of CO₂, or 14.01 tons of CO₂. Repeated from 2007 figures.

GKCCPP tool:

P&L Building: Factor for Trigen provided steam was 112 kgCO₂/klb

HEATING

	Steam/gas	CO2 in kg	CO2 in lb	Tons	Factor
KC	1,429.00	160,093.00	352,944.20	176.47	112
DM	2,407.00	12,770.00	28,153.00	14.08	5.31
	3,836.00	172,863.00	381,097.20	190.55	

ELECTRICITY

Berrisford analysis:

Equation: Multiply kWh x emissions factor based on where electricity is generated.,

Factors for Kansas City and Des Moines: .65

Factor for Houston: .5

GKCCPP tool:

Factors for Kansas City: .89

Factor for Des Moines: .82

Factor for Houston: .64

	kWh	CO2 in kg	CO2 in lb	tons	Factor
KC	488,923.8	437,213	61,868.6	480.93	.89
Houston	83,275.67	53,660	118,052	59.03	.64
DM	7,485	6,158	13,547.6	6.7738	.82
	579,684.47	497,031	1,093,468.2	546.73	

Appendix B: Travel Survey

Appendix A: Employee Travel Survey

BNIM Architects - Carbon Dioxide Emissions Analysis for 2008

1. BNIM Architects - Carbon Dioxide Emissions Analysis for 2008

In a continued effort to combat the negative effects of global climate change caused by the release of greenhouse gases into the atmosphere, BNIM Architects is for the fourth year in a row conducting an inventory of the carbon dioxide equivalent emissions produced by its business operations. Measuring this data and developing solutions for improving on the findings is a core part of our values as a triple bottom line company.

All BNIM current employees who worked for the firm during any portion of 2008 are asked to complete the following questionnaire to assist in the process of measuring the amount of carbon dioxide produced by each employee's commuting and corporate travel during 2008.

Completing the survey should take no more than 15 minutes of your time. Enhancements in the survey technology allow you to start the survey and then continue at another time if necessary. For convenience the survey can be accessed from any internet connection.

You do not have to participate in this effort -- it is your choice. But your help in completing this survey will provide a more accurate and comprehensive picture of our firm. Urge your co-workers to participate, too! Please complete the survey as accurately as possible by March 1.

NOTE: All information collected in the questionnaires is considered confidential; no names or individual data will be published in the final report.

Before you start, it might be helpful to gather one piece of knowledge: The roundtrip distance from your dwelling to your BNIM office location. <http://maps.google.com>.

If you need assistance with the survey website, please contact James Reed at jreed@bnim.com or x1623.

If you need clarifications about the survey questions please contact Jean Dodd, jdodd@bnim.com or x1675.

2. Section 1 - General Commuting Information

3. Employee I.D. number:

(Your employee ID is the three or four-digit number that you use to unlock the plotter or check out a book from the library. It's not your social security number. Clue: It's the order in which you were hired in BNIM in any given year. Example 2206 -- the 22nd person hired in 2006.)

4. If your average commuting patterns changed significantly during 2008, try to capture this variation in your responses. If this isn't possible, please explain in the box below.
5. On average, how many total miles do you commute to work each day (one way)? Please enter your answer as a number (e.g., 3.2), not as text. Use <http://maps.google.com> or another similar program if you aren't sure of the distance.
6. On average, how many days a week do you work (including telecommuting from home)?
7. On average, how many weeks a year do you work, excluding vacation? (There are 52 weeks in a year. So, if you take two weeks of vacation, enter 50.) Enter your result as a number, not text.
8. In addition to vacation days, how many holidays and personal (e.g., sick) days do you take off from work each year? (Note: At BNIM, we have eight holidays)
9. On average, how many work days each year do you work from home? (Please enter as a number, not text.)
10. On average, how many work days each year are you away on company business (without coming to the office)?
11. Besides vacation time, have you taken any extended leave this year (such as maternity leave)? If so, please indicate how many weeks.

12. Section 2 - Going to Work by Car

13. Do you drive on your way to work (all or part of the way)? If no, skip to question 16. Yes. No.

14. How many days per week do you drive on your way to work?
15. How many miles do you drive one way (on the way to work)?
16. On average, what is the number of commuters in your vehicle, including yourself?
17. What is the average fuel economy of your vehicle? If not sure, use these averages: small car = 29 mpg; medium car = 26 mpg; large car = 21.5 mpg; hybrid = 56 mpg; 8-person passenger van = 18 mpg.
18. What is the fuel source of your vehicle? Gas. Diesel. Biodiesel.
19. **Section 3 - Going to Work by Bus**
20. Do you take a bus on your way to work (all or part of the way)? If no, skip to question 19. Yes. No.
21. How many days per week do you take the bus on the way to work?
22. Which type of bus do you take to work?
 Kansas City Area Transportation Authority
 Unified Gov't of Wyandotte County
 Johnson County Transit
 Other (outside region)
 Metropolitan Transit Authority (Houston)
 Des Moines Area Regional Transit
23. **Section 4 - Going to Work on Foot or Bicycle**
24. Do you walk or bike on your way to work (all or part of the way)? If no, skip to question 22. Yes. No.
25. How many days per week do you walk or bike on the way to work?
26. How many miles do you walk or bike one way (on the way to work)?
27. Do you usually travel home using the same method as you do to travel to work? If you check "Yes", skip to question 36 in the survey. If you check "No" you will be asked a series of questions about your average commute home in the next section. Yes. No.
28. **Section 5 - Going Home by Car**
29. Do you drive on your way home from work? Yes No.
30. How many days per week do you drive on your way home from work?
31. How many miles do you drive one way (on your way home from work)?
32. On average, what is the number of commuters in your vehicle, including yourself?
33. What is the average fuel economy of your vehicle? If not sure, use these averages: small car = 29 mpg; medium car = 26 mpg; large car = 21.5 mpg; hybrid = 56 mpg; 8-person passenger van = 18 mpg.
34. What is the fuel source of your vehicle? Gas. Diesel. Biodiesel.
35. **Section 6 - Going Home by Bus**
36. Do you take a bus on your way home from work? If no, skip to question 33. Yes. No.
37. How many days per week do you take the bus on your way home from work?
38. How many miles do you take the bus one way (on your way home from work)?
39. Which type of bus do you take on your way home from work?
 Kansas City Area Transportation Authority
 Unified Gov't of Wyandotte County
 Johnson County Transit
 Other (outside region)
 Metropolitan Transit Authority (Houston)
 Des Moines Area Regional Transit
40. **Section 7 - Going Home by Foot or Bicycle**
41. Do you walk or bike on your way home from work? If no, skip to question 36. Yes. NO.
42. How many days per week do you walk or bike on the way home from work?

43. How many miles do you walk or bike one way (on your way home from work)?
44. Section 8 - Airplane and Rental Car Use
45. If you booked your own airline arrangements for BNIM business trips in 2008, what was the total distance (in miles) you traveled? (This only includes any travel you booked yourself)
46. If you were the primary renter of a rental car used on a BNIM business trip in 2008, please provide approximate total mileage you accumulated.
47. Is there any other important information about your average commuting habits that has not been captured in the survey questions?
48. Thank you for taking the 2008 BNIM travel survey.

Appendix C: Carbon Footprint Tool results

Following is the data used to compile BNIM's carbon footprint using the Greater Kansas City Chamber of Commerce's Carbon Footprint Tool. The figures used are metric -- kg and metric tonnes of CO₂. Those figures have been converted in this analysis to pounds and tons of CO₂.

The tool has inputs for material purchases and waste disposal and recycling. That data is included in the results herein but is not included in this analysis because the automatic calculations are thought inaccurate.



THE CHAMBER
Greater Kansas City Chamber of Commerce

Carbon Footprint Calculator

Welcome!

This carbon footprint calculator is intended to provide users with a planning-level greenhouse gas emissions footprint to assist in prioritizing and implementing reduction strategies. The tool allows you to estimate greenhouse gas (GHG) emissions for your company by entering data about your business activities. It is intended primarily for use by Kansas City-area businesses interested in benchmarking and reducing their greenhouse gas emissions. This tool focuses on four types of activities that tend to have significant greenhouse gas impacts: transportation, energy use, materials purchasing, and waste generation.

Cascadia Consulting Group of Seattle, Washington developed this tool for the Greater Kansas City Chamber of Commerce based on a previous tool developed for the Seattle Climate Partnership. The firm drew inspiration from several greenhouse gas calculating spreadsheets developed by the World Resources Institute and the World Business Council for Sustainable Development, available at www.ghgprotocol.org.

To use this tool, first enter the data in the *Company Info* worksheet, and then into the *Transportation*, *Energy*, *Materials*, and *Waste* worksheets. Based on the data you enter in these worksheets, the workbook will calculate and report your emissions on the *Results* worksheet.

Calculator created by Cascadia Consulting Group of Seattle, Washington in February 2008 based on a similar calculator developed for the Seattle Climate Partnership. The original calculator for the Seattle Climate Partnership was developed by Cascadia Consulting Group with assistance from Sustainable Business Consulting.

Carbon Footprint Calculator

Company Information Worksheet



Please enter information about your company below. These data are essential for other calculations to work correctly. If you have more than 5 facilities, you can "unhide" additional rows (between rows 16 and 112) to accommodate up to 100 facilities. Capacity for more facilities is also available on other pages by un hiding the appropriate rows.

COMPANY INFORMATION

Facility info

	Facility Name (if applicable)	Avg. # of employees (FTEs) ¹	Facility type	Electricity Provider <i>(see below for definitions of service areas outside Kansas City area)</i>	Facility heat source ²
Facility 1	Kansas City	90	Office - Other professional	Kansas City Power & Light	electric
Facility 2	Des Moines	8	Office - Other professional	MROW	gas
Facility 3	Houston	8	Office - Other professional	ERCT	electric
Facility 4			(select from list)	(select from list)	(select from list)
Facility 5			(select from list)	(select from list)	(select from list)
Total		106			

1 - Please enter number of full-time-equivalent employees averaged over the year
 2 - This is used primarily to estimate savings potential; if you have mixed sources of heat select the source that provides the majority of the heat

Fleet info (company-owned vehicles)

	Average efficiency (miles per gallon)
Gasoline	56
Diesel	
Biodiesel (B100)	

(Please revise figures at left if known. Doing so will increase the accuracy of your footprint but is not absolutely necessary. If you don't have any fleet vehicles of the fuel type listed then please leave the efficiency number as-is.)

Additional Info

Describe any special conditions or notes about how you completed this carbon inventory *(for your own, future reference)*

Carbon Footprint Calculator

Transportation Worksheet



The interface below allows you to enter data about your company and employee's transportation patterns. These data will be used to estimate CO₂ emissions from these activities, which are presented on the *Results* worksheet.

Data Gathering: For information on Business Travel, work with your office manager, fleet manager, facilities manager, accounting, or travel departments to gather travel records (gallons and/or miles), reimbursement forms, and company credit card receipts. If these are unavailable, conduct an internal survey of employees.

For information on Employee Commuting, a survey of employees will be necessary. The Chamber of Commerce is providing a pre-made SurveyMonkey online employee commute survey that may be useful. See the *SurveyMonkey* worksheet (or tab) in this tool for more information.

TRANSPORTATION DATA

	Business Travel per Year		AND	Employee Commuting per Year	
	Value	Units		Value	Units
Cars & Trucks (Company-owned fleet)					
Gasoline (enter miles travelled or gallons used)	42,510	miles			(select from list)
Diesel (enter miles travelled or gallons used)		(select from list)			(select from list)
Biodiesel (B100)*		(select from list)			(select from list)
Cars & Trucks (Employee-owned or rental)					
Gasoline (enter miles travelled or gallons used)	19,073	miles		225,455	miles
Diesel (enter miles travelled or gallons used)		(select from list)			(select from list)
Biodiesel (B100)*		(select from list)			(select from list)
Train					
Regional (e.g., Amtrak)		miles			miles
Subway (in other cities)		miles			miles
Bus					
Kansas City Area Transportation Authority		miles		7,064	miles
Unified Gov't of Wyandotte County		miles			miles
Johnson County Transit operated by Laidlaw		miles		348	miles
Other		miles			miles
Air Travel					
Enter total miles travelled in each flight category					
Short trips (<300 miles per flight leg, e.g. Omaha, St. Louis)	14,291	miles			
Medium (300-1000 miles per flight leg, e.g. Chicago, Denver)	422,075	miles			
Long (>1000 miles per flight leg, e.g. West or East Coast)	108,911	miles			

Tip:
If you are using the pre-n online Survey Monkey co survey, see the two *SurveyMonkey* and *SurveyMonkey Process* worksheets and do not er below. Results will auton be calculated based on y survey data and present *Results* worksheet with r detailed results on the *SurveyMonkey Process* worksheet.

Please note that flights are divided into "short, medium, and long" based upon the distance of each leg of the flight. These are important to break out because shorter flights have different per-mile emissions factors than longer flights.

* **Note regarding biodiesel:** The only option currently presented for biodiesel fuel is B100 (100% biodiesel). If you use another blend, you may record a proportional share of the fuel in the B100 and Diesel categories. For example, if you use 100 gallons of B20, you could record 20 gallons in B100 and 80 gallons in diesel. Although this oversimplifies the actual emissions of the blend, it is offered here as an alternative to listing several possible biodiesel blends. Note that the emissions for B100 biodiesel are assumed to be zero, based on a simplified life cycle analysis and following the lead of the Seattle Climate Partnership. However, there is much debate about how to assess the true life-cycle emissions from biodiesel use.

Carbon Footprint Calculator

Energy Worksheet



Please enter data below using only one of the three methods for each facility (leave data cells blank for the methods you aren't using). You may, however, use a different method for each facility. Note that Method 1 is the most preferred method and Method 3 is the least preferred. All data should cover a one year period.

Data gathering: For buildings and facilities you own, contact your facilities manager or accounting department. For facilities you lease, contact your building manager or landlord. This may take a few calls and it will be important to know the square footage of your office space. For

ENERGY USE DATA

More accurate Less accurate

Tip: Be sure to enter data in the units specified. Also, don't forget to specify your facility location and heat source on the *Company_Info* tab.

	More accurate	OR			OR			Less accurate
	Method 1: Energy Purchased Directly <small>Use if you know energy use (from bills or building)</small>	Method 2: Building Averages <small>Use if you can acquire energy use data for the entire building (e.g., from building management) but not for your company's space</small>			Method 3: Simple Estimation <small>Use if you cannot acquire any energy data particular to your business or building</small>			
	Energy purchased directly	Total facility energy use	Company area (square feet)	Total building area (square feet)	Estimated energy use by company	Similar facility energy use (per square foot)	Company area (square feet)	Estimated energy use by company
Kansas City								
Natural Gas (therms)					-			-
Electricity (kWh)	471,737				-			-
Steam (thousand lbs)	1,429				-			-
Des Moines								
Natural Gas (therms)	2,407				-			-
Electricity (kWh)	7,505				-			-
Steam (thousand lbs)					-			-
Houston								
Natural Gas (therms)					-			-
Electricity (kWh)	70,014				-			-
Steam (thousand lbs)					-			-
Facility 4								
Natural Gas (therms)					-			-
Electricity (kWh)					-			-
Steam (thousand lbs)					-			-
Facility 5								
Natural Gas (therms)					-			-
Electricity (kWh)					-			-
Steam (thousand lbs)					-			-

You can unhide rows if you have more than five facilities.

Carbon Footprint Calculator

Materials Worksheet



Please enter data below using only one of the three methods for each facility. Leave data cells as-is (blank) for the methods you aren't using. However, for the method you selected, be sure to enter in the information on each type of paper used. If there is a paper type at a facility that you didn't use, **be sure to enter a zero**; otherwise, the tool will use industry averages for that paper type). Note that Method 1 is the most preferred method and Method 3 is the least preferred. All data should cover a one year period.

Data gathering: Your office manager or accounting dept. should have purchase records with this information. If you need more information regarding recycled content, your supplier (e.g., Corp. Express, Staples, New Leaf Paper) should be able to provide this information to you in its quarterly summary.

MATERIAL PURCHASING DATA

		More accurate		Less accurate					
		Method 1: Actual Material Purchases Use if you know the quantity of paper purchased		OR	Method 2: Estimates Based on Cost Use if you know the cost (but not quantity) of paper purchased		OR	Method 3: Estimates Based on Industry Averages Use if you don't know the quantity or cost of paper purchased	
		Quantity	Units	Average Recycled Content	Cost	Average Cost per Ream	Sheets (estimated)	Sheets (estimated) (Assumes all employees are office employees)	
Kansas City									
	Paper, virgin		reams	0%		\$ 3.00	-	810,000	
	Paper, 30% recycled		reams	30%		\$ 3.00	-	81,000	
	Paper, 100% recycled		reams	100%		\$ 4.00	-	9,000	
	Paper, other		(select from list)	50%		\$ 3.00	-	-	
Des Moines									
	Paper, virgin		(select from list)	0%		\$ 3.00	-	72,000	
	Paper, 30% recycled		(select from list)	30%		\$ 3.00	-	7,200	
	Paper, 100% recycled		(select from list)	100%		\$ 4.00	-	800	
	Paper, other		(select from list)	(enter)		\$ 3.00	-	-	
Houston									
	Paper, virgin		(select from list)	0%		\$ 3.00	-	72,000	
	Paper, 30% recycled		(select from list)	30%		\$ 3.00	-	7,200	
	Paper, 100% recycled		(select from list)	100%		\$ 4.00	-	800	
	Paper, other		(select from list)	(enter)		\$ 3.00	-	-	
Facility 4									
	Paper, virgin		(select from list)	0%		\$ 3.00	-	-	
	Paper, 30% recycled		(select from list)	30%		\$ 3.00	-	-	
	Paper, 100% recycled		(select from list)	100%		\$ 4.00	-	-	
	Paper, other		(select from list)	(enter)		\$ 3.00	-	-	
Facility 5									
	Paper, virgin		(select from list)	0%		\$ 3.00	-	-	
	Paper, 30% recycled		(select from list)	30%		\$ 3.00	-	-	
	Paper, 100% recycled		(select from list)	100%		\$ 4.00	-	-	
	Paper, other		(select from list)	(enter)		\$ 3.00	-	-	

You can unhide rows if you have more than five facilities.

Other Materials

If you would like to include upstream, manufacturing emissions associated with other materials and know their quantities and emissions factors, enter them below.

Item	Quantity	Units	Emission Factor	Units	Mg CO ₂
1 (enter item name)	0	pounds	0	kgCO ₂ /lb	0
2 (enter item name)	0	pounds	0	kgCO ₂ /lb	0
3 (enter item name)	0	pounds	0	kgCO ₂ /lb	0
4 (enter item name)	0	pounds	0	kgCO ₂ /lb	0
5 (enter item name)	0	pounds	0	kgCO ₂ /lb	0

For reference, following are some upstream, manufacturing emission factors for common materials/products.
 --Computers: 28 kgCO₂/lb
 --Books: 1.1 kgCO₂/lb
 --Fibreboard: 0.2 kgCO₂/lb (e.g., some furniture)
 --Carpet: 2.0 kgCO₂/lb

Carbon Footprint Calculator

Waste Worksheet



Please enter data below using only one of the three methods for each facility. Note that Method 1 is the most preferred method and Method 3 is the least preferred. All data should cover a one year period.

Data gathering: Your accountant or office manager may have waste disposal bills. Facilities managers may all track waste disposal and recycling. If your firm has used the services of the Resource Venture, then use the same information.

WASTE DISPOSAL AND RECYCLING DATA

	More accurate				Less accurate
	Method 1: Actual Data from Waste Bills Use if your bills show tons or volume of service		Method 2: Estimates using Waste Bills Use if your bills show dollars only		Method 3: Estimates using industry averages (Used automatically if you don't use Method 1 or 2)
	Quantity	Units	Annual Cost	Tons (estimated)	Tons (estimated)
Kansas City					
Waste disposed	<input type="text"/>	(select from list)	<input type="text"/>	-	84
Recycling	<input type="text"/>	(select from list)	<input type="text"/>	-	21
Food/yard waste composting	<input type="text"/>	(select from list)	<input type="text"/>	-	-
Des Moines					
Waste disposed	<input type="text"/>	(select from list)	<input type="text"/>	-	7
Recycling	<input type="text"/>	(select from list)	<input type="text"/>	-	2
Food/yard waste composting	<input type="text"/>	(select from list)	<input type="text"/>	-	-
Houston					
Waste disposed	<input type="text"/>	(select from list)	<input type="text"/>	-	7
Recycling	<input type="text"/>	(select from list)	<input type="text"/>	-	2
Food/yard waste composting	<input type="text"/>	(select from list)	<input type="text"/>	-	-
Facility 4					
Waste disposed	<input type="text"/>	(select from list)	<input type="text"/>	-	-
Recycling	<input type="text"/>	(select from list)	<input type="text"/>	-	-
Food/yard waste composting	<input type="text"/>	(select from list)	<input type="text"/>	-	-
Facility 5					
Waste disposed	<input type="text"/>	(select from list)	<input type="text"/>	-	-
Recycling	<input type="text"/>	(select from list)	<input type="text"/>	-	-
Food/yard waste composting	<input type="text"/>	(select from list)	<input type="text"/>	-	-

You can unhide rows if you have more than five facilities.

Carbon Footprint Calculator



Results

This worksheet summarizes results of the carbon footprint assessment based on inputs entered on the *Company Info*, *Transportation*, *Energy*, *Materials*, and *Waste* worksheets. Emission estimates from current practices are directly below, followed by options to test the impacts of possible CO₂-reduction scenarios. (further below). All results are reported as metric tons of CO₂. These figures should be interpreted as CO₂ "equivalents", because although most of these emissions are actual CO₂, some of the emissions are from methane (from waste disposed in landfills).

SUMMARY OF CURRENT ANNUAL PRACTICES

Overall emissions: 773 metric tons of CO₂ (Mg CO₂) annually, 7.3 metric tons of CO₂ per employee

COMPANY EMISSIONS FOOTPRINT

Transportation	Miles		CO ₂ (Metric Tons)
	Traveled (Business Travel)	Traveled (Commuting)	
Car & Truck	61,583	225,455	90.56
Airplane	545,276	-	103.23
Train	-	-	-
Bus	-	7,412	3.11
Subtotal	606,859	232,867	196.90

Energy Use	Quantity	Units	CO ₂ (Metric Tons)
Natural gas	2,407	therms	12.77
Electricity	549,256	kWh	428.68
Steam	1,429	thousand lbs	160.09
Subtotal			601.54

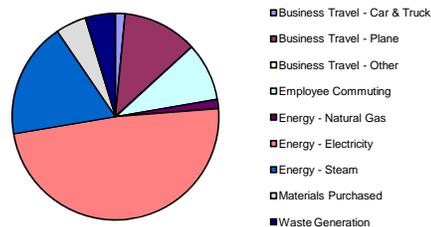
Materials Purchased	Quantity	Units	CO ₂ (Metric Tons)
Paper	1,060,000	sheets	5.38
Other	-	pounds	-
Subtotal			5.38

Waste Generation	Quantity	Units	CO ₂ (Metric Tons)
Disposed	99	tons	41.54
Recycled	25	tons	(71.95)
Composted	-	tons	-
Subtotal	124	tons	(30.41)

EMISSIONS REDUCTION POTENTIAL*

Footprint and Reduction Potential	Footprint (Metric Tons CO ₂)	Reduction Potential* (Metric Tons CO ₂)	Relative Reduction Potential (% of total)
Business Travel - Car & Truck	13.3	13.3	2%
Business Travel - Plane	103.2	103.2	12%
Business Travel - Other	0.0	0.0	0%
Employee Commuting	80.4	80.4	9%
Energy - Natural Gas	12.8	12.8	1%
Energy - Electricity	428.7	428.7	49%
Energy - Steam	160.1	160.1	18%
Materials Purchased	5.4	42.4	5%
Waste Generation	-30.4	41.5	5%
Total	773.4	882.4	100%

Relative Reduction Potential



Carbon Footprint Calculator



Results

***Emission reduction potential** is the amount of greenhouse gas emissions that can be reduced through actions taken by your organization. Note that the reduction potential for electricity, materials, and waste may be different than your footprint in these categories.

For example, for materials, the reduction potential lies primarily in the ability to sequester carbon in forests by using fewer trees for paper. The emission reductions associated with reducing virgin paper use or switching to a higher recycled content paper are substantial.

For waste, the reduction potential is primarily in recycling, and is also due in large part to the benefits of forest carbon sequestration. By supplying recycled paper to markets, businesses can help avoid the use of trees for paper, thereby sequestering carbon. However, because the fraction of each business' waste that is recyclable paper (or other recyclables) is unknown, the 'reduction potential' for waste is set simply as the emissions from disposal.

ACTION PLANNING

The interface below allows you to test the overall impact of potential CO₂-reduction strategies. Please change the numbers in the outlined cells to reflect the scenario you wish to test.

**Estimated Annual
CO₂ Reduction
(metric tons)**

Sector and Action

Transportation

Commuting		employees transition from	Car	to	Bus	#VALUE!
Business travel	Reduce number of airplane trips or miles by:	0 %				0.00
Business fleet	Increase average fleet efficiency from:	56 mpg	to	30 mpg		-3.12

Energy Use

Fluorescent bulbs	Use compact fluorescents (CFLs) to replace:	0	75-watt incandescent bulbs	0.00
Thermostat setting	Reduce office thermostat setting by:	0	degree(s) (winter only)	0.00

Materials Purchased

Office paper	Switch to:	30% recycled	paper from	virgin	for	0	boxes (10 reams)	0.00
Double-sided printing/copying	Use duplex printing to reduce office paper use by:	0 %						0.00

Waste Generation

Increase recycling	Of the company's waste, divert an additional	0 %	to recycling	0.00
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Reductions, total of above: #VALUE! metric tons CO₂

Current total emissions: 773.4 metric tons CO₂

Hypothetical total emissions with above reductions : #VALUE! metric tons CO₂

Percentage reduction from current total: #VALUE!

The chart below displays your current carbon footprint alongside your carbon footprint assuming the actions above have been taken. The exception is for electricity, for which the chart depicts *reduction potential*, as discussed above, for both the current and future scenarios.

Current and Possible Future Emissions
(Assuming actions detailed above)

