

# **DEAN'S BEANS ORGANIC COFFEE**

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## **2009 Carbon Dioxide Emissions Report**

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# 2009 CO<sub>2</sub> Emissions Report

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**I. INTRO** – Welcome to Dean’s Beans fifth annual CO<sub>2</sub> Emissions Report. In this report we calculate and interpret our CO<sub>2</sub> emissions data from 2009 as compared to previous years. This data is invaluable in evaluating our environmental impact, and helps us reach our goal of becoming a carbon neutral business.

**SCOPE** - The scope of the 2009 report reflects that of 05, 06, 07, and 08 with similar reporting boundaries, which include our use of energy and electricity in-house, employee commutes, travel, product shipments through UPS, and the delivery of green beans to our MA roastery. Relying on the Global Reporting Initiative’s (GRI) documentation on Greenhouse Gas Reporting, we have divided emissions into Scope 1, Scope 2 and Scope 3 categories. Scope 1 refers to those emissions we have direct control over – such as the propane used to power the roasters, or the company owned van; these are referred to as “direct emissions”. Scope 2 refers to those sources of CO<sub>2</sub> created by the purchase of electricity, steam or heat. Scope 3 emissions include all other emissions generated by a company’s activities, but not owned or controlled by the company. From commuter travel to the decomposition of solid waste in land-fills, Scope 3 emissions are far-reaching. By considering these varied, and seemingly endless, sources of emissions, we are challenged to reflect on the company’s overall environmental impact.

According to the GRI, Scope 1 and Scope 2 emissions must be reported, while scope 3 emissions do not need to be calculated. Dean’s Beans has been pro-active in collecting Scope 3 data, calculating emissions produced from the delivery of our coffee through UPS, the delivery of green beans to our roastery, and employee commutes. Our willingness to include these calculations makes it difficult to control the absolute reduction of emissions, as we can’t control, say, UPS’s operations or the efficiency of our employees’ vehicles. However, we believe that greater gains will be realized for us as a business, and for those stakeholders we engage with, if we make a legitimate (and ambitious!) attempt to tackle Scope 3 emissions. A breakdown of all 2009 emissions sources are located in Table I.

**2009 TRENDS** - In 2009, Dean’s Beans roasted 379,500 pounds of coffee, an increase of .62% over 2008 roasting data, and 24.2% over 2005 roasting data; the business itself grew by approximately 16% from 2008. Despite a .62% growth in coffee production from 2008, 2009 CO<sub>2</sub> emissions increased by roughly 33.2% from 2008 (134.59 in 2009 from 101.06 metric tons, in 2008, and 27.6% increase from 2007,(134.59 in 2009 from 105.47 metric tons in 2007) . The overall increase in CO<sub>2</sub> emissions can be mainly attributed to increases in propane use, staff commutes, and travel. However, increased production has inevitably led to increases in CO<sub>2</sub> emissions in certain categories (Table II).

**OFF-SETS** – We do not buy renewable energy off-sets (“green-tags”) for our emissions, or, as some companies have started doing, purchase electricity off-sets for non-electricity produced emissions. We think such measures are lazy and confusing to consumers. Instead, we are focused on reducing our energy load, transitioning to renewable energies for those activities we can influence (electricity use, propane, van deliveries), and off-setting those emissions that we have no control over (green bean shipments, UPS deliveries). In 2006, we began the Pangoa Cooperative Reforestation Off-set Initiative in Peru. Working with local coffee farmers, we designed, funded and implemented a program that resulted in the planting of 500 trees in 2006. Working under the premise that the 500 trees that have been planted reach full maturity, the reforestation project will provide us with an annual CO<sub>2</sub> reduction of 11.2 metric tons. Part of this reduction will be isolated for our NoCO<sub>2</sub> coffee, and the remaining off-sets will be ear-marked for the company’s Carbon Neutral Initiative. More importantly, we are proud that our leadership and funding has not only paid for the planting of 500 trees, but has allowed the farmers to leverage additional, outside funding. The result: Pangoan farmers have planted 80,000 trees since the program’s inauguration. 80,000 trees reaching full maturity will result in an annual CO<sub>2</sub> reduction of 1792 metric tons. This is over 17x our company’s total annual CO<sub>2</sub> emissions! We will be replicating this reforestation initiative in additional coffee communities in 2010, with the goal of having the program up and running in all coffee communities we work within the next five years. Refer to section IV to learn more about this exciting work.

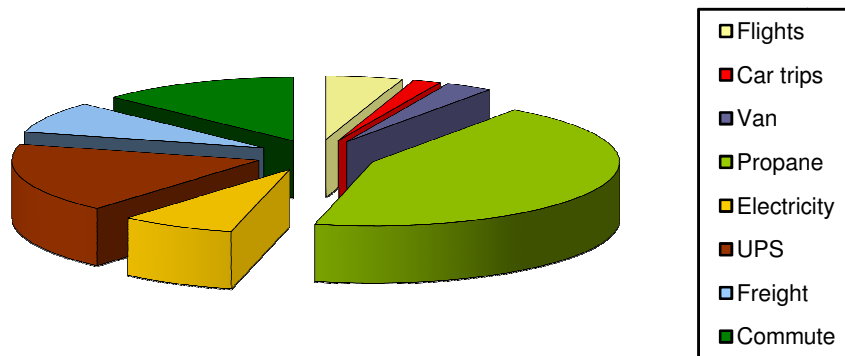
## II. DATA

**TABLE 1: Breakdown of 2009 CO2 Emissions**

<b>EMISSIONS SOURCE</b>	<b>METRIC TONS OF CO2</b>	<b>EMISSIONS TYPE</b>
<i>Flights (including car transportation to airport)</i>	<b>6.65</b>	<b>Indirect (scope 3)</b>
<i>Car trips (vehicles not owned by the company)</i>	<b>2.38</b>	<b>Indirect (scope 3)</b>
<i>Van deliveries</i>	<b>4.1</b>	<b>Direct (scope 1)</b>
<i>Propane</i>	<b>59.24</b>	<b>Direct (scope 1)</b>
<i>Commute</i>	<b>17.45</b>	<b>Indirect (scope 3)</b>
<i>Electricity</i>	<b>10.2</b>	<b>Indirect (scope 2)</b>
<i>UPS</i>	<b>23.8</b>	<b>Indirect (scope 3)</b>
<i>Green Bean Freight (train and tractor-trailer truck)</i>	<b>10.77</b>	<b>Indirect (scope 3)</b>

**TOTAL: 125.92 metric tons**

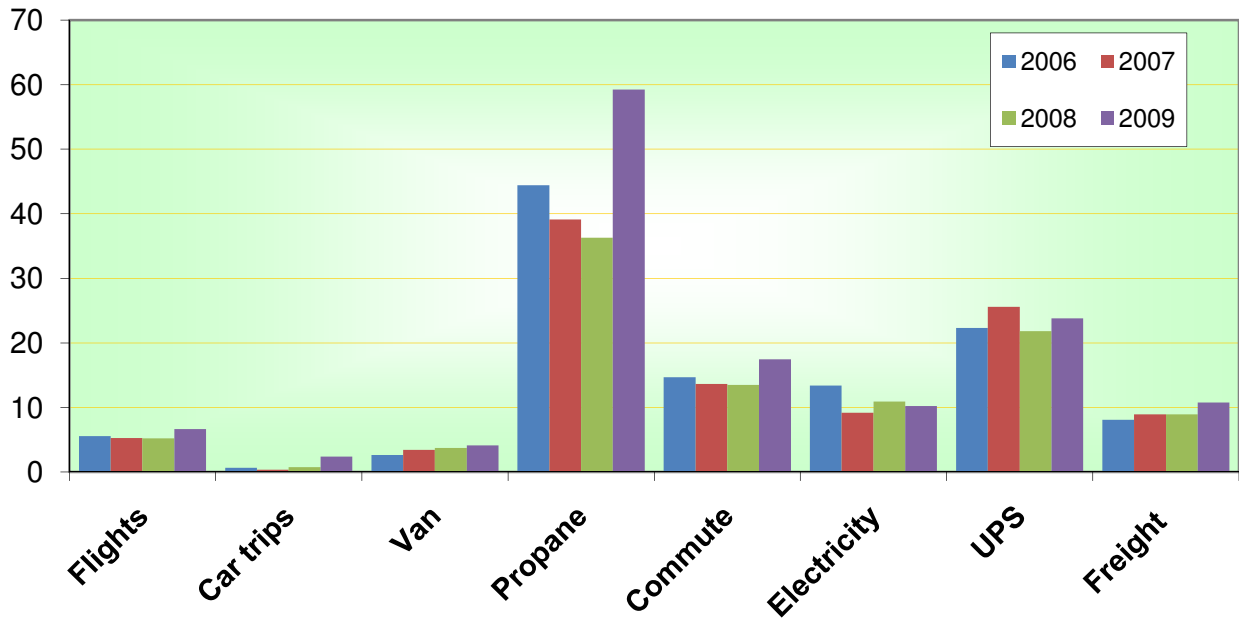
**CHART I: 2009 CO2 Sources**



**TABLE II : Comparison of 2005 / 2006 / 2007 /2008 CO2 Emissions Data**

EMISSIONS SOURCE	METRIC TONS OF CO2 2005	METRIC TONS OF CO2 2006	METRIC TONS OF CO2 2007	METRIC TONS OF CO2 2008	METRIC TONS OF CO2 2009	% CHANGE 08-09	% CHANGE 05-09
<i>Flights (including car transportation to airport)</i>	7.58	5.57	4.3	5.22	6.65	+ 27.39	- 12.27
<i>Car trips</i>	n/a	.66	.351	.73	2.38	+226	0
<i>Van deliveries</i>	1	2.48	3.4	3.7	4.1	+ 10.81	+ 309.9
<i>Propane</i>	67.3	44.43	39.1	36.3	59.24	+ 63.20	- 11.98
<i>Commute</i>	18.32	14.66	13.65	13.49	17.45	+ 29.35	- 4.75
<i>Electricity</i>	13.76	13.39	9.19	10.9	10.2	- 6.42	- 88.88
<i>UPS</i>	18.9	22.3	25.6	21.8	23.8	+ 9.17	+ 25.93
<i>Green Bean Freight (train and tractor-trailer truck)</i>	4.58	8.07	8.92	8.92	10.77	+ 20.74	+ 138.15
<b>TOTAL</b>	<b>131.44</b>	<b>111.56</b>	<b>104.51</b>	<b>101.06</b>	<b>134.59</b>		

**CHART II: Comparison of 2006 / 2007 / 2008 / 2009 Data**



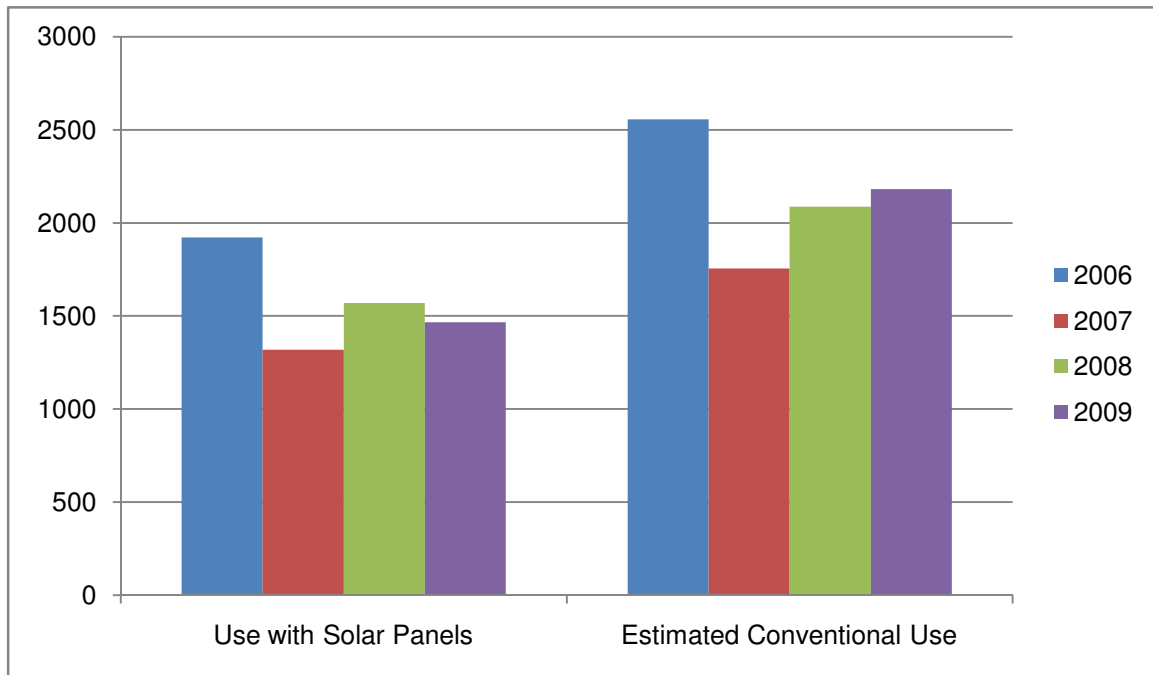
### III. Break Down of Emission Sources

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**ELECTRICITY USE** - Deans Beans installed a 10KW solar panel system on the roof of the roastery which went live in July, 2006. As a result, we have seen a dramatic decrease in the company's use of conventional, on-the-grid electricity usage, despite dramatic increases in production. From 2005-2009, conventional, on-the-grid electricity consumption decreased by 794 watts, decreasing CO<sub>2</sub> emissions by 25.9%, despite a .62% increase in production during that time. Although our electricity consumption increased from 2005-2009 due to rising production consumption of conventional electricity decreased as the consumption of solar electricity increased. From Chart III you can see our average monthly consumption with the use of solar panels and the estimated conventional electricity consumption if we had we not installed solar panels.

*Data was collected by using National Grid invoices. Calculations were made using WRI formulas, and Massachusetts electricity production emissions factors supplied by the EPA.*

**CHART III: Average Monthly Electricity Use 2006 / 2007 / 2008 / 2009**



**GREEN BEAN DELIVERIES** – Dean’s Beans purchases coffee through Royal Coffee, and our green bean buying cooperative, Cooperative Coffees. Green beans are delivered to US ports, stored in warehouses, and then shipped to us either by a combination of rail and freight, or just freight. Green beans from Royal Coffee are delivered to a Los Angeles port, and green beans from Cooperative Coffees are delivered to a port in New Jersey. Reflecting an increase in production, the number of deliveries in 2009 stayed the same as the previous year. The increase in shipments from seven in 2005 to eighteen in 2009 has resulted in a 94.8% increase in CO2 emissions.

As a small company, we have no control over a) where green beans are brought to port and b) how they are ultimately delivered to us. Our only real option is to try purchasing more coffee with each shipment, decreasing our need for multiple deliveries. Unfortunately, this is also dependent on warehouse space and harvest cycles.

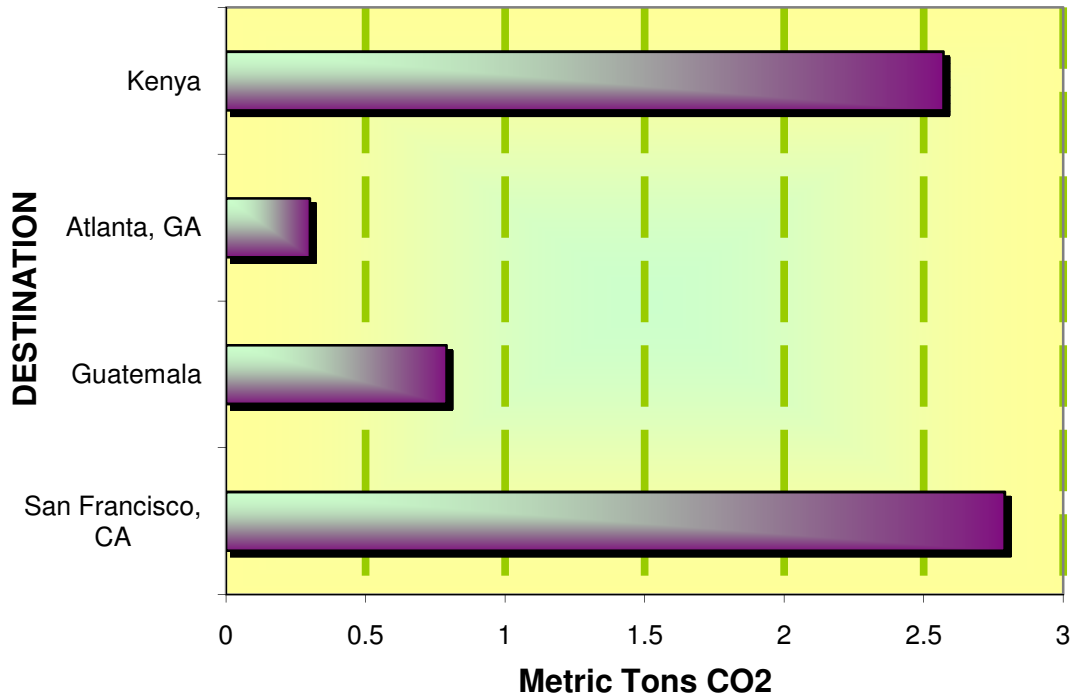
*Data was collected by reviewing shipments received in the Green Bean Receiving Log. The length of the trip was estimated by using Yahoo Maps, though more or less direct routes may be used by truck-drivers and trains. Emission factors for trains were found in WRI literature. Emission factors for freight were based on an average supplied by the National Commission on Energy Policy and the EPA. Train deliveries were calculated to Springfield, MA, and then freight was calculated from this destination. All deliveries were considered one-way trips.*

**BIO-DIESEL TRENDS** – The company has been unable to secure a reliable source of 100% biodiesel, and instead uses a 20% biodiesel mix for our delivery van during six months of the year. As the number of deliveries and delivery route changed only slightly from 2008-2009, reflecting a slight increase in CO<sub>2</sub> emissions over the past year. The dramatic increase in CO<sub>2</sub> emissions from 2006- 2009 can be attributed to the unavoidable move from 100% to 20% biodiesel.

*According to the EPA, a 20% bio-diesel mix is 15% cleaner burning than regular diesel, and a 100% biofuel mix is 75% cleaner burning. The following were assumed for the calculations: a) the van has a gas mileage of 24 miles / gallon, and b) that it travels 182 miles per week, for 52 weeks a year.*

**Air TRAVEL** - Our emissions from air travel to the coffeelands increased by 27.39% from 2008-2009 as Owner Dean Cycon took more trips to the Coffeelands. There has been a 12.27% reduction in CO2 emissions from air travel from 2005-2009.

**CHART IV: CO2 Generated by Plane Travel**

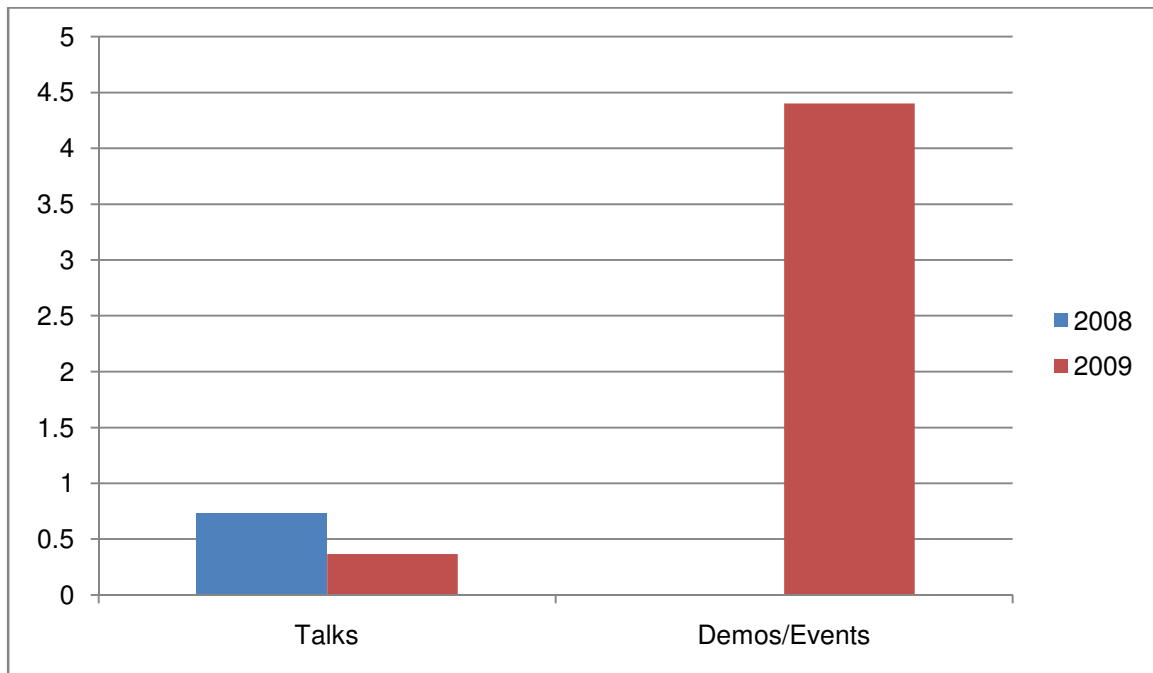


*Using WRI data, flights were split into 3 categories – long, medium and short – depending on their length, which determines the emissions factor. To this was included the emissions generated by a round-trip car trip to the airport. However, because of a lack of information, car-trips were not included at the point of destination, nor was car travel in the coffeelands included.*

**CAR TRAVEL** – We have a better system to track car trips taken to various regional locations, be it for coffee tastings, presentations, equipment repair or general business. 2005-2009 data is estimated.

*Car trips were calculated using the gas mileage of the car in use. It was assumed that the trip was round-trip. Yahoo maps was employed to determine the length of the excursion.*

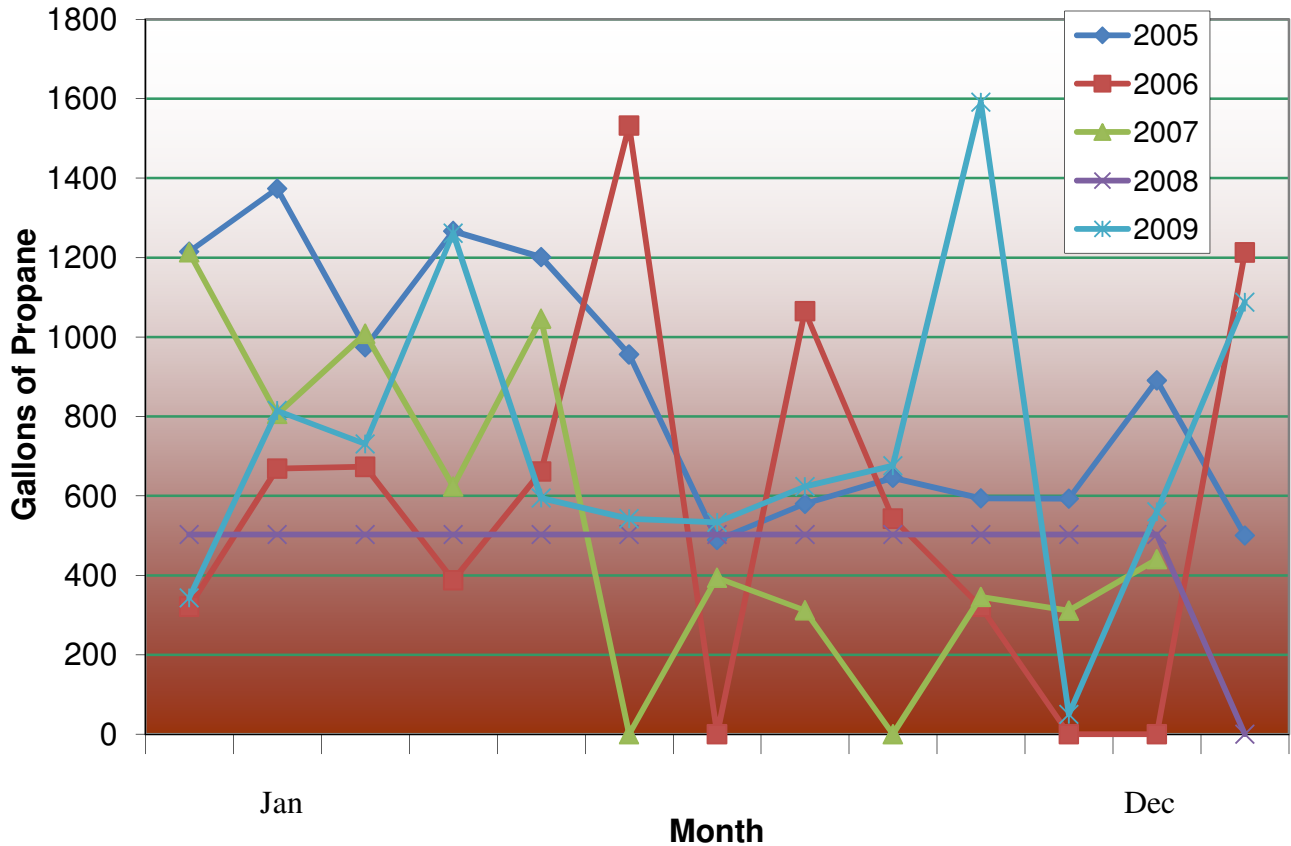
**CHART V: CO2 Generated by Car Travel 2008 / 2009**



**PROPANE** In 2009, the most significant increase has been in CO<sub>2</sub> emissions from our propane use. In 2005, it was decided that the amount of energy used by the roasters' afterburner was disproportionately high compared to the benefits it offered. No where else in the business was as much energy being used. The solution to this problem had been to install a wet scrubber electrostatic precipitator (WSEP) that uses the energy equivalent of a 60 watt bulb. In 2009 due to unforeseen issues within town bi-laws we had to install a new afterburner one aspect of the increase in propane use. In May 2010, after having many issues with gas leaking we determined that a connection (for natural gas) was improperly used for our propane based roaster resulting it 20,000 BTU's per hour being sourced and leaking into our beanery. We find this recent information to be the main reason for the propane increase.

*Data was collected from monthly propane bills and information provided by WRI was used to calculate the quantity of CO<sub>2</sub> generated*

**CHART VI: Propane Use 2005 / 2006 / 2007 / 2008 / 2009**



**UPS** – 2009 saw a slight increase in the amount of CO<sub>2</sub> produced from UPS shipments. Shipments were up 9.9% from 2008 to 2009, overall by 26.48% from 2005 to 2009. (21,266 shipments in 2009, versus, 19,345 shipments in 2008, versus, 22,757 shipments in 2007, versus 20,111 shipments in 2006, versus 16,813 shipments in 2005). We are in communication with UPS’s environmental director, and are one of only a handful of companies in the world using UPS’s CO<sub>2</sub> calculation tool. By engaging in dialogue with and expecting more from UPS and other transportation services, we are pushing for industry change. As more and more companies start calculating their carbon footprint and asking the right questions, we believe shipping companies and other vendors will follow suit.

*This calculation was made using an excel tool created by UPS. The data used was number of packages shipped. It should be noted that a small percentage of packages were shipped through the US Postal Service. A lack of quality information about the Postal Service’s shipping practices, including delivery routes and the gas mileage of its fleet, makes calculating any associated CO<sub>2</sub> emissions particularly difficult. Engaging with USPS should be a priority in 2010.*

**EMPLOYEE COMMUTE** – CO<sub>2</sub> emissions generated by employees commuting to Dean’s Beans increased by 29.35% from 2008 to 2009 but has decreased by 4.75% from 2005 to 2009. We employed more people in the 2009, some live closer to work than they did in 2005, and two employees started carpooling in 2007.

*Emissions were calculated according to emissions factors provided by WRI, the round-trip mileage attributed to each employee’s commute, and the gas mileage of his car. If an employee took any vacation, this was deducted from the assumption that each employee works 5 days a week, 52 weeks a year. This Scope 3 emissions tally should not be considered 100% accurate, given that a) on some days employees might take different routes to work b) the speed with which one drives (highway vs back roads), and the stops involves, changes the gas mileage c) gas mileage shifts according to temperature and d) not every employee necessarily provided the most accurate data about their gas mileage.*

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**IV. CARBON DIOXIDE MITIGATION STRATEGIES** – Like many companies concerned about climate change, we know that the obvious way to combat global warming trends is to entirely halt the generation of green-house gas producing emissions. However, for any business, this is rarely easy, or practical. When access to new, carbon reducing technologies can be restricted by high costs, many businesses tend to balk at making these sorts of expensive investments. However, a portfolio of mitigation strategies can yield favorable results, and important reductions in emissions.

Dean’s Beans approach to carbon mitigation involves cutting back on Source 1 and Source 2 emissions, and doing so with the adoption of energy conservation and renewable energy solutions. It also involves looking for innovative projects with coffee communities to sequester emissions that have already been produced, and which are often attributed to “unmanageable” Source 3 emissions. Dean’s Beans asks two questions when taking a serious look at its own emissions sources: 1) how can we be more efficient in those areas where we maintain some control over our activities and 2) is it reasonable to assume that we can use new, cleaner technologies to reduce emissions?

**CARBON MITIGATION AND PEOPLE-CENTERED DEVELOPMENT** – Inspecting closely our mitigation options from 2005 to 2007 has led us to some interesting conclusions about how we can be a more efficient, climate friendly business that *still prioritizes improving the lives of coffee farmers and their communities across the globe*. What we have discovered is that while new technologies, such as the solar panels we installed, are important, we are in a unique position to implement highly efficient and effective people-centered reforestation initiatives that will lead to much larger CO<sub>2</sub> reductions for less money than it costs to transition to renewable energy technologies.

Dean’s Beans has strong ties with farmers in the global south, farmers whose connection to the land informs their desire to sustainably manage it. Our conversations with farmers about sustainability and global warming have consistently turned to the subject of tree planting and land regeneration. Planting trees has many benefits aside from their powerful carbon sequestration abilities.

Trees fix nitrogen in soil, prevent ground erosion and landslides in times of heavy rain, they attract diverse forms of wildlife, and clean the air. In addition, tree planting can create jobs for locals, and certain trees – fruit and nuts – can diversify farmers’ income, spreading their risk across a range of products.

Our first reforestation project in Peru arose organically from conversations with the Ashinankas, a group of indigenous farmers who belong to the Pangoa Cooperative. Their sacred lands have been illegally forested since the 1970’s, and they wanted help in designing and sustaining a tree-planting program. With money from Dean’s Beans (\$2,000) they began the tree-planting in early 2006, constructing a tree nursery accommodating 500 seedlings. All 500 trees have been planted and are thriving; at maturity, they will annually each sequester 50 lbs of CO<sub>2</sub>. Regular contact with the president of the Pangoa Cooperative, as well as two on-site visits in 2006 and early 2007 have assured the proper tracking of the program. As well, it bears repeating that our funding for this model program allowed the farmers to leverage more money, expand the program, and plant 80,000 trees. This program was so successful that we will be expanding it to other coffee communities in 2010.

**IN-HOUSE CARBON MITIGATION** – Our current in-house renewable energy initiative includes: an annual CO<sub>2</sub> audit, a 10 kilowatt solar panel and the use of bio-diesel for the company owned van. We are currently exploring ways to increase our energy efficiency through improved insulation, daylighting as an alternative to electric lights, and other methods of decreasing our energy load. As well, we are exploring the option to installing a ground-sourced heating system.

The decision to install solar panels on our roof was made in 2005. Although very expensive, this appeared to be one of the most responsible moves we could make as a business committed to environmental sustainability. Instead of purchasing green-tags, we were going to go the extra-mile and make upwards of 65% of our own electricity. As a small business installing a sizeable system on its own facility, we also sought to demonstrate to larger businesses that they too could step up to the plate, supporting the construction of a new energy infrastructure.

**COMPARING STRATEGIES** - In retrospect, and after doing a simple cost-benefit analysis, it appeared that maybe we hadn’t made either the most cost-effective, or even, for that matter, the *most* environmentally friendly choice by going solar. It made us uncomfortable to look at the numbers, especially as we heartily support the renewable energy movement. The benefits of solar were obvious, and yet it looked like the money we had earmarked for the project could have been better used in the fight against Global Warming. Looking at the cost-benefit analysis, we realized that if we were to simply consider a net-contribution or deduction of CO<sub>2</sub>, then trees exceeded the panels by 3000%. In other words, for every 1 metric ton of carbon dioxide *not emitted* by the use of our solar panels, **3,000** metric tons of carbon dioxide would have been sequestered by

trees purchased for the same price.<sup>1</sup> Given that the expensive solar system also only supplies 65% of our electricity consumption, it would appear that, for the simple endeavor of mitigating emissions, trees stood out as a more efficient option.

If we had it to do all over again, we would probably still erect a solar panel system. Like trees, there are benefits that surpass those attributed to climate change gains – supporting national energy security, engaging in an important movement, and living more lightly on the land. However, we think we will achieve greater gains in the future by focusing on our area of expertise – People-Centered Development. Given our distinctive relationship with farmers across the world, we will most likely focus our attentions in the coming years to spreading learning about global warming in the coffeelands, and initiating long-term tree-planting projects that will continually help the Earth and her people.

**TOTAL VS RELATIVE REDUCTIONS IN CO<sub>2</sub>** - By participating in an off-sets program, we do not intend to shift attention away from our actual emissions. We continue to seek absolute reductions, decoupled from production. We don't want to mislead our customers with slick calculations that show that per pound of coffee roasted, CO<sub>2</sub> emissions have gone down by x percent. We find that lots of other companies are doing this. While their overall operations might be getting more efficient over time, their total emissions continue to rise. As we did in 2009, we intend in 2010 to find ways to reduce our *total* emissions.

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**V. CONSIDERATIONS FOR FUTURE REPORTING YEARS** - As a company that does better business by stretching itself to exceed the status quo in environmental management and social responsibility, we decided in 2005 to include certain emissions that *we did not necessarily create* (Scope 3 emissions). While many reporting companies will include emissions created on site, through electricity and energy use, or even commuter travel, fewer are willing to step back and look at the bigger picture of their activities. In 2005, this led us to reflect on the very nature of our business, and how we play a role in the world of international trade. We felt that, as a coffee company, we must be responsible for the emissions created not only from our activities in-house, but also for those created by the shipment and delivery of our over 300,000 pounds of coffee.

**SCOPE EXPANSION** - Despite the recognition we've received for including some important scope 3 emissions, *as we move into another reporting year we recognize that we can still consider an even wider range of who we are and what we do*. While in a first phase we analyzed the emissions from coffee deliveries,

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<sup>1</sup> These calculations are based on the following assumptions: our solar panels cost us \$90,000, planting a tree in the tropics costs 10 cents. A mature tree will sequester 50 lbs of CO<sub>2</sub> while 1 solar-power generated kilowatt hour in the state of MA will sequester 1.28 pounds of CO<sub>2</sub>.

we also have a variety of goods delivered, ranging from office products to coffee roasters and t-shirts, and each of these deliveries contributes to global warming. This notion deserves more research, and we intend to inspect this more closely in 2010. Our greatest barrier, as we plunge into this uncharted territory, will be to locate quality information from our various vendors, and to ensure their participation. It was really only through UPS's willingness to engage with us that we were able to successfully retrieve information that pertained to our shipping methods, and we hope to establish similar partnerships down our supply-chain.

**POTENTIAL COST SAVINGS** - Pursuing an even more in-depth analysis of our emissions sources would lend Dean's Beans the opportunity to consider improvements in, say, product delivery efficiency. This could reduce CO<sub>2</sub> emissions *and* increase our cost savings. Similar gains might be realized, for example, by tracking the CO<sub>2</sub> generated by our solid waste disposal. Recording these emissions can help pinpoint where Dean's Beans is inefficiently using resources. Generating this important information may be best integrated into the larger context of an Environmental Management System.

**REGIONAL INITIATIVE** – While the issue of Global Warming is being tackled by small and large businesses alike, it is also being addressed in regional, multi-stakeholder forums. The Eastern Climate Registry, established in 2003 and supported by 10 regional states, has been developing a regional initiative that organizations can participate in to voluntarily report their emissions. The Registry is integrating reporting organizations' audits. This is an opportunity for Dean's Beans to participate in the larger movement of Greenhouse Gas reporting, and support an important trend in the region. Specialized software has also been developed by the Registry, which includes calculation tools for all Green House Gases. Including these emissions in future audits may be another logical step in the expansion of Dean's Beans work to combat climate change.