

DEAN'S BEANS ORGANIC COFFEE

2006 Carbon Dioxide Emissions Report

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2006 CO₂ Emissions Report

I. INTRO - In 2005, Dean's Beans launched its first ever Carbon Dioxide Emissions Audit. As newcomers to this sort of data collection and calculation, we sought guidance from a well-documented and useful manual published by the World Resources Institute – *Working 9-5 on Climate Change: An Office Guide*. With its assistance we established the tools necessary for calculating the bulk of our emissions, while recognizing the need to create an off-sets program that merged with our People-Centered Development work. Through increased efficiency, a shift to renewable energies, and the implementation of a reforestation project in Peru, we began pursuing the goal of becoming a carbon-neutral business. We also committed to performing an annual CO₂ audit, making way for this and future reports.

SCOPE - The scope of the 2006 report reflects that of 2005, with similar reporting boundaries, which include our use of energy and electricity in-house, our commuting time, travel, as well as both the shipment of our coffee through UPS to our customers 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 significant sources of CO₂ 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. Considering these varied, and seemingly endless, sources of emissions challenges a business to reflect on the ripples of influence it has up and down a given supply-chain.

According to the GRI, Scope 1 and Scope 2 emissions must be reported, while scope 3 emissions do not need to be tallied and reported. Dean's Beans has been particularly pro-active in pursuing Scope 3 data collection, calculating emissions produced from the delivery of our coffee through UPS, employee commutes, as well as emissions generated from the delivery of green beans to our Orange facility. However, the willingness to include these calculations does make 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. We do believe though 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 2006 emissions sources are located in Table I.

2006 TRENDS - In 2006, Dean's Beans roasted 335,720 pounds of coffee, an increase of 9.8% over 2005 roasting data; the business itself grew by approximately 20%. Despite a close to 10% growth in coffee production, CO₂ emissions decreased by roughly 15%, to 111.56 metric tons from 131.4 metric tons in 2005. While some specific activities saw an increase in emissions output over the course of 2006 (see Table II) it was the significant decrease in propane use that accounted for the bulk of the CO₂ emissions reduction. We discontinued the use of our after-burner mid-year. In 2005, this device accounted for roughly 50% of *total* emissions; its removal eased our emissions burden.

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. Instead, we rely on a transition to renewable energies for those activities we can control (electricity use, van deliveries). However, because of our willingness to include Scope 3 emissions, it has been obvious that we need to counteract the emissions we have no *direct* control over with an off-sets program. Currently, our off-sets project – a reforestation initiative - is based in the Pangoa Cooperative in Peru. Launched in June of 2006, it dovetails with our previous work with the Ashaninkas indigenous community. Working under the premise that the 500 trees that have been planted reach full maturity, the reforestation project will provide us with an annual CO₂ reduction of 11.2 metric tons. Part of this reduction will be isolated for our NoCO₂ coffee, and the remaining off-sets will be ear-marked for the company's Carbon Neutral initiative. Regular contact with the Cooperative will ensure that the project is properly tracked for our own off-sets reporting requirements. Our hope is that this reforestation initiative can be replicated in other coffee communities - regenerating lands and providing communities with alternate sources of income (fruits, nuts, etc) while facilitating our work to become CO₂ neutral. Refer to section IV to learn more about this exciting work.

II. DATA

TABLE 1: Breakdown of 2006 CO2 Emissions

EMISSIONS SOURCE	METRIC TONS OF CO2	EMISSIONS TYPE
<i>Flights (including car transportation to airport)</i>	5.57	Indirect (scope 3)
<i>Car trips (vehicles not owned by the company)</i>	.66	Indirect (scope 3)
<i>Van deliveries</i>	2.48	Direct (scope 1)
<i>Propane</i>	44.43	Direct (scope 1)
<i>Commute</i>	14.66	Indirect (scope 3)
<i>Electricity</i>	13.39	Indirect (scope 2)
<i>UPS</i>	22.3	Indirect (scope 3)
<i>Green Bean Freight (train and tractor-trailer truck)</i>	8.07	Indirect (scope 3)

TOTAL: 112.53 metric tons

CHART I: 2006 CO2 Sources

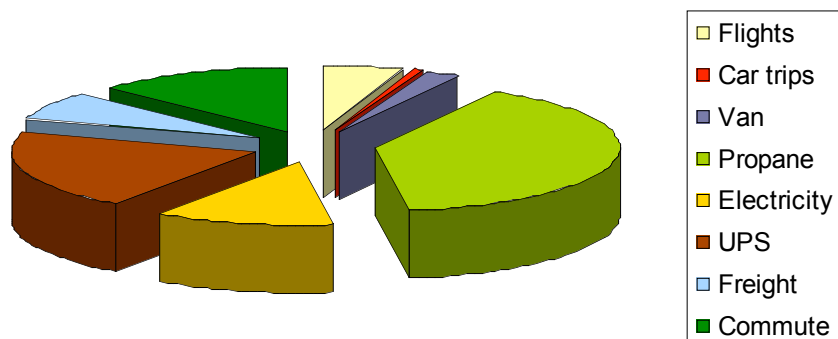
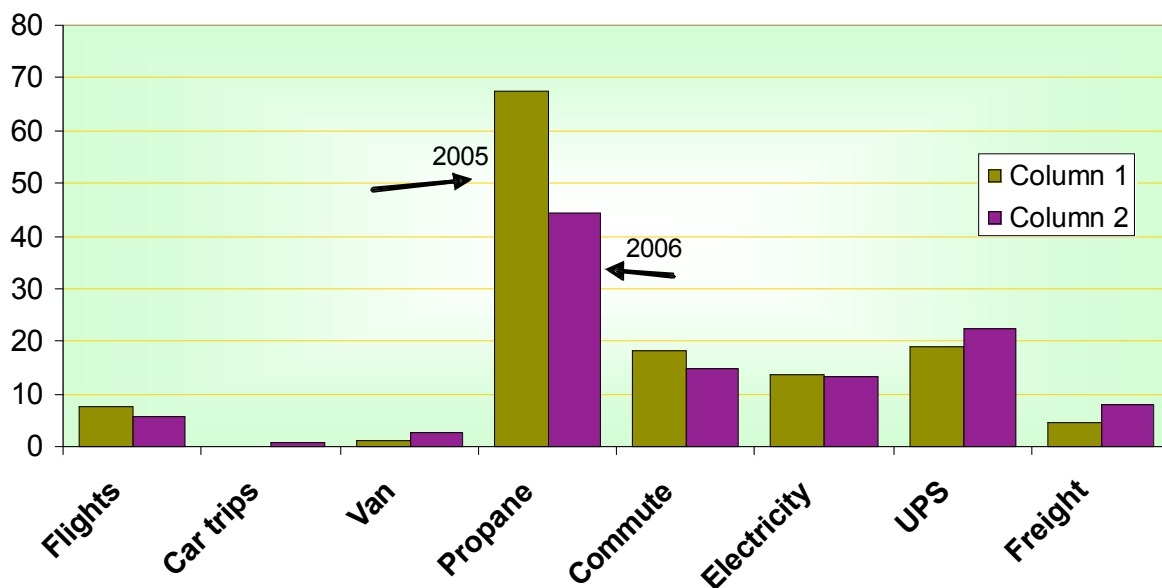


TABLE II : Comparison of 2005 / 2006 CO2 Emissions Data

EMISSIONS SOURCE	METRIC TONS OF CO2 2005	METRIC TONS OF CO2 2006	% CHANGE
<i>Flights (including car transportation to airport)</i>	7.58	5.57	- 26.5
<i>Car trips</i>	n/a	.66	n/a
<i>Van deliveries</i>	1	2.48	+ 148%
<i>Propane</i>	67.3	44.4	- 34%
<i>Commute</i>	18.32	14.66	19.9%
<i>Electricity</i>	13.76	13.39	- 2.7%
<i>UPS</i>	18.9	22.3	+ 18%
<i>Green Bean Freight (train and tractor-trailer truck)</i>	4.58	8.07	+ 76%
TOTAL	131.44	111.56	-15.1% !!

CHART II: Comparison of 2005 / 2006 Data

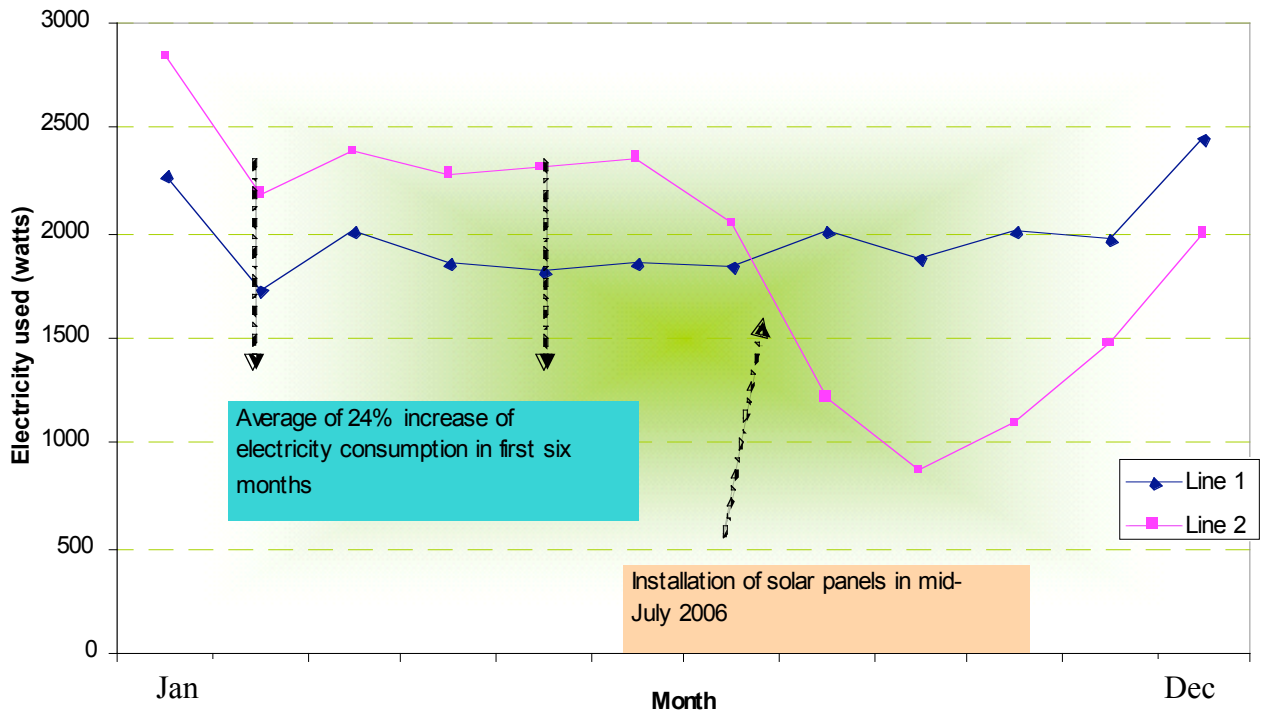


III. Break Down of Emission Sources

ELECTRICITY USE - Dean's Beans made a powerful decision in 2005 to install a solar panel system. The system, provided by Pioneer Valley Photovoltaics, went live in late July of 2006. Although electricity use was significantly decreased in the summer months, and moderately so in November and December, the electricity use for 2006 still rivaled that of 2005 (a decrease in 2006 of 640 watts). Although we may have expected a greater decrease due to the installation of the panels, this is also a reflection of increased energy consumption due to a rise in production. As we move into 2007, we hope to reap greater benefits from the solar panel system over the course of the year, while also looking closely at ways in which we can increase our own energy efficiency as production continues to rise.

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: Electricity Use 2005 / 2006



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, then shipped to us either by a combination of rail and freight, or simply by freight. In 2005, one of our green bean receiving ports in New Orleans was destroyed. While our green beans from Royal Coffee are still delivered to a Los Angeles port, Cooperative Coffees had to change its delivery locations. In 2006, this meant that coffee was brought to us from Toronto and New Jersey, and in neither case by less energy intensive train transit, our preferred method of transportation. The number of deliveries in 2006 also increased, from 7 to 12, and this, combined with a shift in the mode of transit, increased the emissions by 76% over 2005 trends.

An increase in deliveries, and emissions, can be attributed to Cooperative Coffees no longer being able to consolidate coffee at the LA port. There is no indication that these delivery practices might be changed to increase efficiency, or to integrate more environmentally friendly train transport. As a small company, we have little 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.

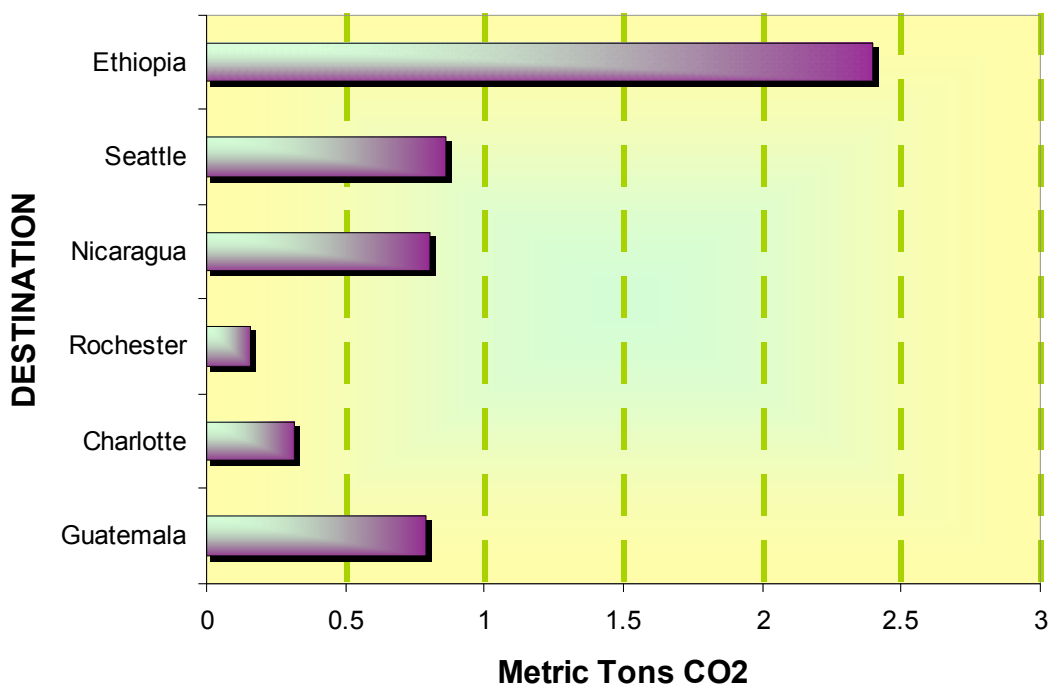
Data was collected by reviewing shipments received in the Green Bean Receiving Log. The length of the trip was estimated by using Yahoo Maps, though more or less direct routes may be used by truck-drivers and trains. Emission factors for trains were found in WRI literature. Emission factors for freight 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 - 2006 was a hard year for us when it came to securing a reliable bio-diesel source. The company we had originally sourced from went out of business, and finding a similar service – one that would bring us upwards of 275 gallons of biodiesel in one delivery – was not as easy as expected. The supply that this company had delivered to us ran out in the spring. We found one distributor, who we could go to weekly, but this was out of our way and cumbersome, though it got us through the warm summer months, and ensured us a 100% biodiesel mix. Luckily, the biodiesel trend picked up in the region, and a service station by our Greenfield deliveries opened up in the fall, where we now fill our tanks with a 20% biodiesel mix, tiding us through the cold winter months when a 100% mix would freeze. In 2007 we intend to find a distributor who can deliver us enough bio-diesel to get us through the warm months, cutting down on the need to secure a supply on a weekly basis. Given that our emissions from van deliveries rose by 148% this seems to be a reasonable, and necessary, objective.

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) during the cold winter months of early 2006, 100% diesel was used b) the 100% biofuel mix we had in-house ran out in late spring it was replaced by a local 100% biofuel mix for the summer months c) a 20% biofuel mix, purchased on the weekly van run, was used starting in October of 2006. It was assumed that the van has a gas mileage of 24 miles / gallon, and that it travels 182 miles per week, for 52 weeks a year. This did not take into account the times when a van had to be rented because our van was being repaired.

TRAVEL - Our emissions from travel to the coffeelands was reduced by 22.7%. We took one less trip to coffee communities in 2006, and the ones we did visit were closer to home. A trip to Papua New Guinea, for example, in 2005, created a significant amount of emissions, while trips closer afield – Nicaragua, and Guatemala – in 2006 ensured a decreased dependence on jet fuel. We expect that travel to the coffeelands will average 3-4 trips per year, and that this source of emissions, over any given two year time period, will remain fairly constant, if they do not decrease relative to fuel efficiency gains in the airline industry.

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.

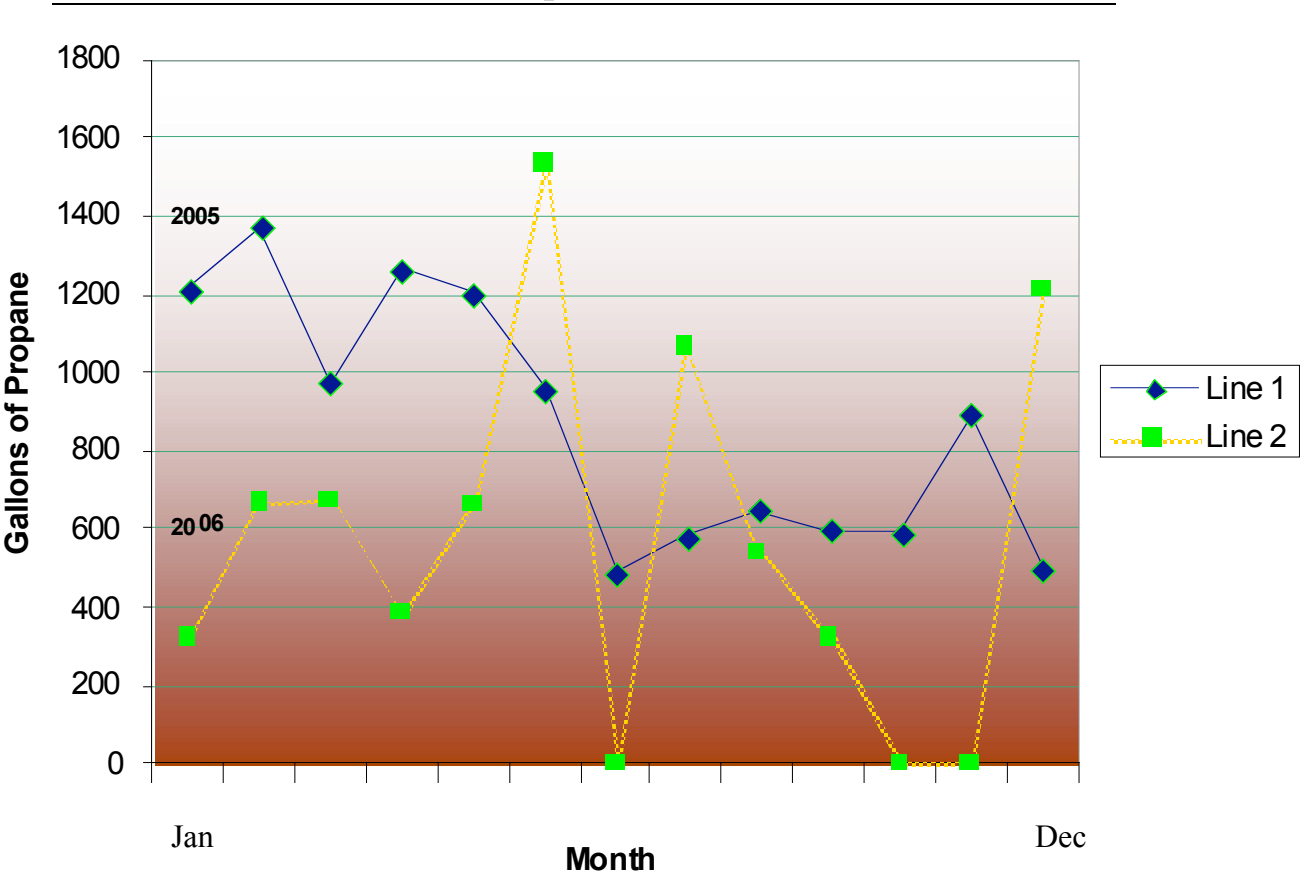
CAR TRAVEL - In 2005, we did not track the number of car trips taken to various regional locations, be it for coffee tastings, presentations, equipment repair or general business. The available 2006 data is not entirely accurate, as no formal tracking system was established to record such trips; the Comprehensive Sustainability Officer noted those trips that she could recall. A more formal tracking system is currently being designed so that this data is as accurate as possible in 2007.

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.

PROPANE In 2006, the most significant reduction in CO2 emissions came from our cut in propane use. In 2005, it was decided that the amount of energy used by the roasters' afterburner was disproportionably high compared to the benefits it offered. No where else in the business was as much energy being used. The proposed solution to this problem was to install an electro-static precipitator that would use the energy equivalent of a 60 watt bulb; while this was *not* implemented, we did stop using the after-burner mid-year. This accounts for the drop in emissions associated with coffee roasting. There is, however, a small group of neighbors who are opposed to the coffee smoke that wafts onto their property, and we are currently partnering with the town to find a mutually beneficial solution.

Data was collected from monthly propane bills and information provided by WRI was used to calculate the quantity of CO2 generated

CHART V: Propane Use 2005 / 2006



UPS – 2006 saw an increase in the amount of CO₂ produced from UPS shipments. This is due to an increase in company growth, with shipments up by 20% (20,111 shipments versus 16,813 shipments in 2005).

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 CO₂ emissions particularly difficult. Engaging with USPS should be a priority in 2007.

EMPLOYEE COMMUTE – CO₂ emissions generated by employees commuting to Dean's Beans dropped by 20% in 2006. The exact reason for this is not entirely clear. While more individuals were hired at the end of the year, there were far fewer employees working in the summer than there had been for some time. In addition, it could be that those people let go in early 2006 lived farther away from the Beanery, and had hence disproportionably contributed to CO₂ emissions generated by driving. In addition, a few employees car-pooled to work over a period of time.

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.

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 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 over the course of 2005 and 2006 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 discovered in 2005-2006 is that while new technologies, such as the solar panels we installed, are an important, even crucial part of the global cooling solution, we are an active Fair Trade company uniquely positioned to work hand in hand with farmers on reforestation initiatives; this is work where we play our own crucial role in abating the Global Warming phenomena. It is also work that we have ready access to, unlike many companies, putting us in a place of responsibility and opportunity.

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; we wanted to tailor an off-sets program that represented the greater sphere of work that we do abroad. Conversations with farmers have consistently turned to the subject of tree planting and land regeneration. Undeniably, 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 conversation 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 CO₂. 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.

IN-HOUSE CARBON MITIGATION - While our work with farmers represents one part of our CO₂ mitigation program, we also have evolved an in-house renewable energy initiative. This includes the use of solar panels as well as bio-diesel for the company owned van. Again, we like to take managing off-sets directly into our own hands, avoiding the oft complicated (and expensive) work with other organizations that supply off-sets in the form of trees or green-tags. We source our bio-diesel locally, and we have our own 10 KW solar system that rests hidden from view on our roof.

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 CO₂, 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.¹ 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 CO₂ - 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, CO₂ 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 2006, we intend in 2007 to find ways to reduce our *total* emissions.

¹ 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 CO₂ while 1 solar-power generated kilowatt hour in the state of MA will sequester 1.28 pounds of CO₂.

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, 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 2007. 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 CO₂ emissions *and* increase our cost savings. Similar gains might be realized, for example, by tracking the CO₂ 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 planning to integrate reporting organizations' audits by year-end 2007. 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.