Googleplex:
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While Google continues to appear in the news headlines on a daily basis for transforming the way that information is gathered and shared, the management team continues to thrive for and push their founding philosophies. One of the main tenants of Google's mission is that they aim to make money without doing evil, and this is especially apparent in the effort and detail that was put into developing the corporate headquarters; Googleplex. The "googleplex" is a 500,000 square foot campus in Mountain View, CA that was built in 2003 and is now home to what has become the fastest growing company ever. The building was originally built for SGI (Silicon Graphic, Inc.), but has been occupied by Google since 2005. A team comprised of Clive Wilkinson Architects (Los Angeles-based) and The Environmentals Group (Chicago-based) won the competition to develop the Google campus by creating a diversified environment that integrated highly focused workspace with learning, meeting, recreational and food facilities into the existing courtyards and building. The design was based on four main criteria that matched the needs of the Google corporate culture: Flexibility and Adaptability, Concentration and Collaboration, Work/Life Balance, and Leveraged Learning. The layout itself was rather simple and utilized a network of working "neighborhoods" that were all located along a "main street" circulation plan. This enables resource sharing and ample opportunity for both formal and informal meetings.

From the beginning, a sustainable energy-conserving environment was a high priority in the development plans. Most of the building materials used were either cradle-to-cradle products or contained a high recycled content. In addition, over the past few years Google has begun a number of initiatives and programs to support their clean energy future outlook. The remainder of this paper will focus upon these initiatives and what the impact has been on both the Google community and overall sustainability of the region. The majority of these initiatives have been employee driven, with the impetus coming from a desire to calculate the environmental footprint of all of Google's operations. Initially, Google performed an extensive energy audit to pinpoint where the majority of their energy was being consumed and how to optimally reduce their usage. Google Vice President of Operations Urs Hoelzle, who led the initial analysis, says that

the “company calculated its carbon footprint by looking at emissions from its purchased electricity, employee commuting, business travel, construction, and server manufacturing”. Once the analysis was complete, Google also reached out to the Environmental Resources Trust organization (an environmental non-profit) to independently confirm their findings. The three primary areas that they identified to explore solutions for were renewable energy, energy-efficiency and conservation, and transportation.

The effort that Google has taken to incorporate renewable energy into their overall energy source portfolio has been one area that has been receiving a lot of press lately. During the summer of 2007, Google partnered with solar energy services provider, Energy Innovations, to install a 1.6 megawatt (MW) solar system on the Googleplex that utilizes ground mounting, roof mounting, and solar car port technology. The system is large enough to provide up to 30% of Google’s electrical load in Mountain View, which can be equated to a reduction of 4.2 million car miles of carbon dioxide a year. While the exact costs have not been disclosed, Google estimates that they are saving $393,000 annually in electricity costs and the investment will have an approximate payback period of 7.5 years. In addition, recognizing that the infrastructure required for running extensive data centers throughout the world consumes a lot of electricity (mostly generated from fossil fuel-based resources), Google has also set a goal of installing 50 megawatts (MW) of renewable energy at their various data center locations. While this may appear to be a lofty goal, Google calculated this figure by conducting a theoretical cost of carbon analysis, a notion that most companies have yet to embrace.

In addition to using recycled building materials and conducting cradle-to-cradle life cycle analysis on the products used to retrofit the Googleplex, Google has also instituted a number of energy efficiency and conservation measures to reduce their overall impact. For one, at the Googleplex and in the computer industry as a whole, Google is encouraging and incentivizing computer manufacturers to push aggressive efficiency standards. The program is termed the Climate Savers Computing Initiative and aims to reduce energy usage on PCs by four times the current amount. Google has also begun to retrofit the building with more efficient HVAC systems and high-efficiency

lighting. Compact fluorescent light bulbs (CFLs), which can be used almost anywhere traditional incandescent lighting is used, are four times as efficient as their traditional counterparts and last up to 10 times longer. Thus, reducing the amount of carbon dioxide released into the atmosphere as a result of fossil fuel-based electricity generation. The pure design of the building also is conducive for energy efficiency, as there are plenty of open spaces and opportunities for natural lighting (the majority of indoor meeting places have "tent ceilings" that soften sound and deflect light throughout the room). The last major energy efficiency activity within the Googleplex is the use of food and the cafeteria system. The majority of the food used in the cafeteria is organic and/or sourced locally, which not only limits the amount of harmful pesticides that are used but is also beneficial in terms of reducing the negative implications of transporting food from outside regions. There is actually a vegetable garden on the premises that the chefs use for ingredients, but that is also used as an educational tool on sustainable gardening. In addition, Google actively promotes the use of reusable trays and plates throughout the cafeteria and facilitates a seamless mechanism for tray collection. If an employee absolutely has to get a "to-go" box, all of the boxes and utensils are made of recycled materials.

The last major area that Google focused on to limit the footprint of their Mountain View operation is the transportation to and from campus as well as within the campus. For one, Google offers a free biodiesel fueled shuttle service throughout the Silicon Valley and Bay Area to help employees navigate what is some of the worst traffic in the nation. As of this summer, the service transported approximately 1,200 employees to and from the Googleplex each day (25% of the workforce) on the 32 shuttles that are currently in their fleet. The shuttle buses are equipped with comfortable leather seats, wireless internet access, and allow for bicycles and dog passengers. They run 132 trips every day to over 40 locations in more than a dozen cities. The system's routes cover more than 230 miles of freeway, which is more than twice the amount of the regional BART commuter train system, and travels more than 4,400 miles a day. For those employees that are unable to take the bus or feel the need for personal transportation, Google offers two additional programs to promote sustainable transportation to work. Currently, Google will give any employee who purchases a vehicle with more than 45

miles per gallon of efficiency a $5000 rebate. Also, for those employees that are able to arrive to work on a non-motorized vehicle (i.e. bicycle or walking), Google rewards such behavior with a $10-$15 per day donation to the charity of the employees choice. Google is also active in promoting and fostering technological innovation in the transportation sector. Aside from installing plug-in electric hybrid recharging stations in some of their car ports, Google has also developed a grant program to help fund the development of commercial products to facilitate the building of the infrastructure necessary for plug-in vehicles. In addition, for those employees that come to work via non-motorized means, Google has recently established a partnership with enterprise rental to make 100 plug-in hybrid electric vehicles available to employees that need to run errands throughout the day or attend local business meetings. One negative issue that is worth mentioning is whether or not all of these initiatives would be necessary had Google not set up operations in Mountain View, CA as opposed to a more central location closer to the downtown area of San Francisco where the majority of it's younger employees reside (the Googleplex is approximately 35 miles from the center of San Francisco). Lastly, the design of the campus in general fosters an active lifestyle, with biking and walking encouraged throughout the campus (free bikes are available and a number of paths have been created for moving around campus).

While not all of the initiatives and programs highlighted above are specific features of the actual design of the Googleplex, they all sum to the direction and overall stance that Google is taking on sustainable development and a clean energy future. Not all of the quantifiable benefits for the local community have been realized yet, but some of the more qualitative and long term goals are beginning to get recognized. One of Google's primary goals in combating climate change is to increase awareness of some of these issues with their products and services, and through industry stewardship. I believe that for the most part they have been successful in this regard, as we can already witness in the popular press the number of large corporations that are taking sustainable development more seriously and incorporating it into their office complex designs (see the new Comcast Center in Philadelphia and the Bank of America Tower in New York). In addition, the amount of money and dedication that Google has shown in sustainable

development is accelerating technological improvements and increasing the amount of political pressure on policy makers. By no means is the battle won and has Google exhausted all of the options available to them, but I believe that they are taking a positive approach and dedicating the appropriate amount of resources towards reducing their environmental footprint and contributing to sustainability through thoughtful system design.

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