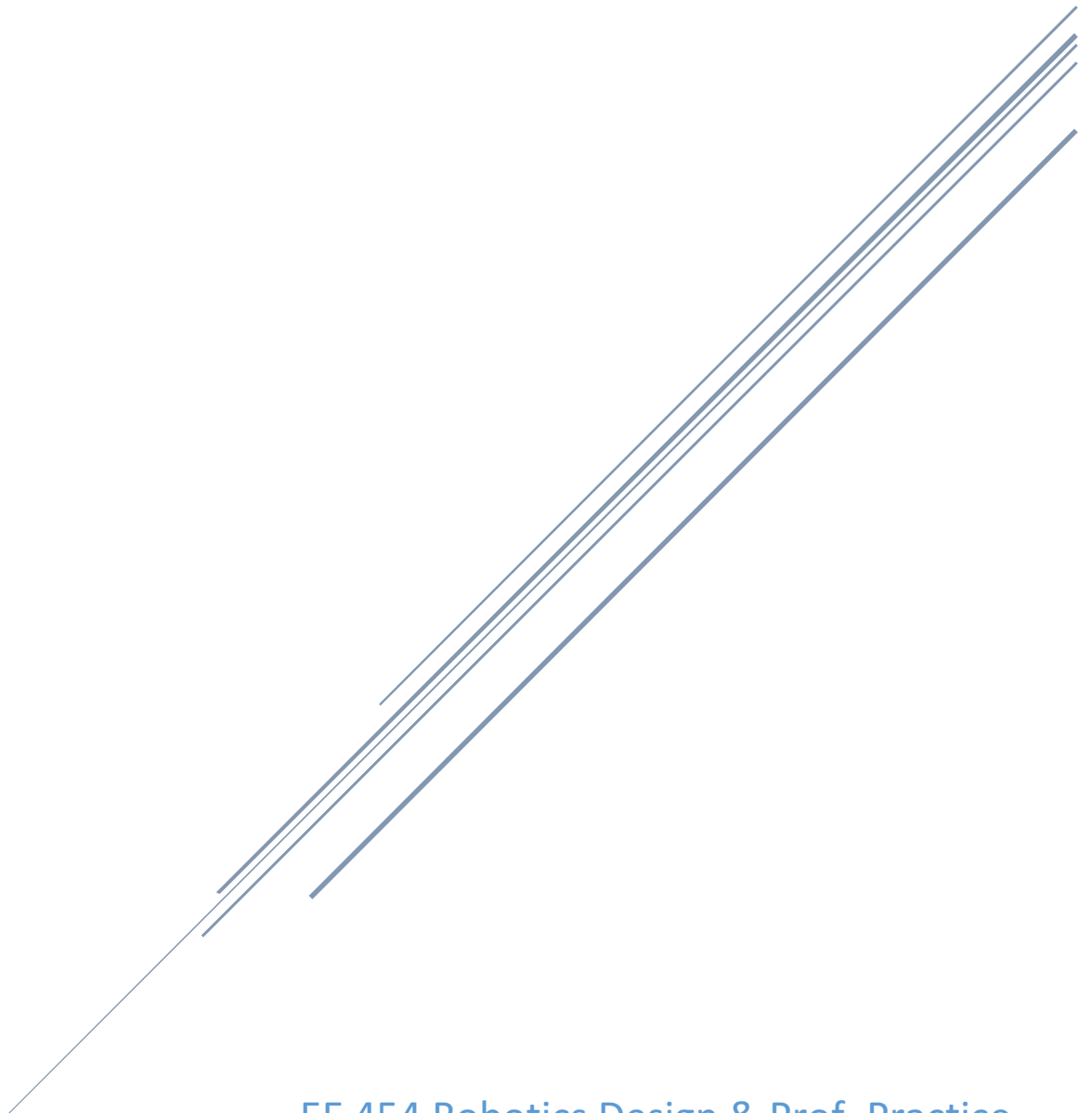


SUSTAINABLE BUSINESS PRACTICES THROUGH THE EYES OF APPLE INC.

by TJ Thomas



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In order for a business in the modern age to survive and thrive, a company's business practices must be flexible and able to adapt to important changes. One of these changes which has been vital and is becoming one of the most important focuses, is the idea of being sustainable and to implement sustainable business practices. These practices not only help the world, but can help the company in the long term. In order for a business practice to be sustainable, it must be economically viable, environmentally stable, and finally, socially responsible (Center for Sustainable Business Practices). To be able to cover how sustainable business practices and their impact on long and short term business strategies, it is most beneficial to describe how an actual company is going about doing so. Through a specific and detailed view, one will be able to see all of the different aspects and get a sense of how a company can successfully or not so successfully implement sustainable business practices.

A good example of a large company trying to incorporate short term and long term sustainable business strategies is Apple Incorporated. To discuss some of the company's background, Apple Inc. is a highly profitable and successful business that continues to thrive in the business world today. Apple produces a wide range of electronic devices including cellular phones, computers, tablets, music devices, and most recently watches. Apple has been putting forth various efforts to constantly improve life technologically while also thinking environmentally by becoming "green" and sustainable. For such a large company with a high demand for the next best device, it can be difficult as a big business to limit its impact on the environment.

Apple consists of the company having more than four hundred retail stores globally. There are multiple data processing centers located throughout the United

States including California, Nevada, North Carolina, and Oregon. The biggest Apple campus is the processing center located in Cupertino, California which employs over 15,000 people. There are more than 80,000 employees worldwide that work at Apple, however, from transportation all the way to engineering Apple has created about 598,500 jobs across the United States as of 2012 (Apple Inc., 2014).

There are many different definitions of sustainability that exist today. Apple's interpretation and definition of sustainability consists of a three-tiered approach including clean energy, green materials, and the conservation of resources. The clean energy portion of the definition consists of the need to reduce the impact on climate change by using renewable energy sources and driving energy efficiency in products. The green materials portion of the definition includes pioneering the use of greener materials in their products and processes. Finally, the conservation of resources portion of the definition of sustainability deals with the necessity of using the least amount of precious resources so the world as a whole can thrive off of the positive impact.

All aspects of Apple's definition of sustainability is the basis for what changes have and are being made at Apple Inc. across the globe to becoming sustainable. Apple's vice president of environmental initiatives, Lisa Jackson, states about Apple's sustainability; "But we know we have a long way to go, and a lot of work ahead of us. And we are committed to increasing openness in our sustainability work and welcome you to join us on our journey." Knowing that there is always room for improvement, Apple has a key understanding of what being sustainable really means in that aspect (Apple Inc., 2014). Constantly improving the company is a good example of a long-term sustainable business strategy.

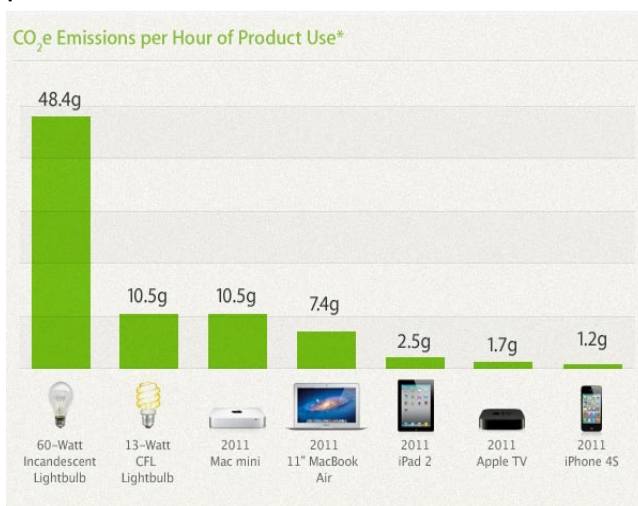
Apple Incorporated products are widely used every day and are vastly present in human life. The demand for Apple products is large and with a majority of the world using these products, there must be a large industry involved. This huge industry of Apple Incorporated uses heavy machinery and demands large amounts of space for factories in order to produce these products. These factories in large quantities can be potentially harmful to the environment. Apple Inc. was chosen as an example in order to understand and be aware of what this major company is doing to the environment since it is such a big business and they have a large impact on long and short term sustainable business practices. Big businesses like Apple must be making improvements to alleviate harmful effects on the Earth and that is why it is important to investigate, research, and inform about what Apple is or is not doing correctly for the environment of the planet (Apple Inc., 2014). By learning about their sustainable business practices of a company, other companies can utilize their ideas to study and build off their successes in terms of impact of sustainable business strategies.

More than twenty years ago, Apple Incorporated started working on ways to minimize the environmental impacts the company and their products have on the planet. However, it was not until 2008 when Apple started to record the reduction of the power and energy consumption. The data from the energy and power consumption started the factual information to be recorded in other areas that were monitored in order to reduce resources and improve the environment regarding their movement towards sustainability. Reporting carbon emissions for Apple is constantly being reported and the data is included in its annual sustainability report (Apple Inc., 2014). When a company such as Apple monitors their energy and power, it is a good short-term

sustainable business strategy. Along with this idea, when this monitoring turns into tracing progress annually, it turns into an example of a long-term sustainable business strategy.

Metric systems such as Carbon footprint data started to be recorded in 2009 and ever since has been compared to the previous year's numbers in order to see if there was any year to year improvement (Apple Inc., 2014). The need for measuring the positive and negative impacts Apple Inc. has on the atmosphere is crucial. Metric systems are used in order to quantify the benefits of incorporating sustainability as well as indicate sustainability efforts of "health, stability, and long-term prospects of a company (Hilbert, 2013)." The factual data obtained through metrics is used to track the progress sustainability has on the company and its future. New goals are set after each reporting period to ensure the ongoing process of sustainability is being reached (Center for Sustainability at Aquinas College).

Carbon footprint analysis is monitored yearly for their total emissions but their product emissions are monitored with an hourly rate at Apple Inc. The figure to the left



is an emission diagram displaying a few of Apple's products created in 2011 which were compared to everyday products used in an average person's home in terms of carbon dioxide emissions. Each of Apple's products emits a significantly smaller amount of

greenhouse gases. The comparison was made using a common item to demonstrate

the significant difference in emissions between Apple's electronics and the household lightbulb. Apple takes into account the effect the product has on the environment during production and after production. The future of each product is considered through its whole life span demonstrating a key long-term sustainable practice at the company. They also track their product emissions in units of grams of carbon dioxide equivalents per hour of product use which displays the other side of the spectrum, the way the company utilizes short-term business strategies.

Many things are being done at Apple that are helping them become sustainable and being "green." Reducing, removing, and recycling are three important processes taking place at Apple Inc. Apple has reduced their total power usage by 57 percent since 2008 by using renewable energy such as solar, wind, geothermal, and micro-hydro energy that is used to completely power every Apple data center. This conversion into renewable energy at the data processing centers increased facilities' use of renewable energy by 60 percent from 2010 to 2014. They removed harmful toxins from being used at their facilities or in their products such as PVC, phthalates, and brominated flame retardants. Another such harmful toxin removed from their facilities was mercury. The removal of mercury from iPods and all other products at Apple was a small but tough change in the industry. Mercury was replaced by LED background illumination in its products. Apple also recycled over 421 million pounds of electronic waste and takes back any unwanted Apple products from people and recycles them properly free of charge (Apple Inc., 2014). All of the changes made at Apple represent their short-term goals which eventually turn into long-term business strategies through continuous change.

Awareness is eminent at Apple when concerning carbon emissions and actively trying to decrease these emissions. There was a three percent decrease of carbon emissions from 2012 to 2013. Carbon emission tracing is a good sustainable business strategy. One of the data processing centers Apple has that is located in Maiden, North Carolina earned the LEED Platinum Certification from the US Green Building Council. LEED stands for Leadership in Energy and Environmental Design which is a rating system based on the construction, design, maintenance, and operation of green buildings, homes, and neighborhoods (U.S. Green Building Council). About 60 to 100 percent of the renewable energy the data processing center utilizes is generated onsite. The data center in Maiden, North Carolina is the largest onsite solar array in the United States with a Bio-Gas fuel cell that has a renewable energy saving of about 82 million Kilowatt hours per year (Apple Inc., 2014).

Sustainability reporting can reveal both negative and positive impacts the business has on the environment. Not only does Apple measure the greenhouse gases of the facilities, but they measure the impact of their supply chain. The EPA states that:

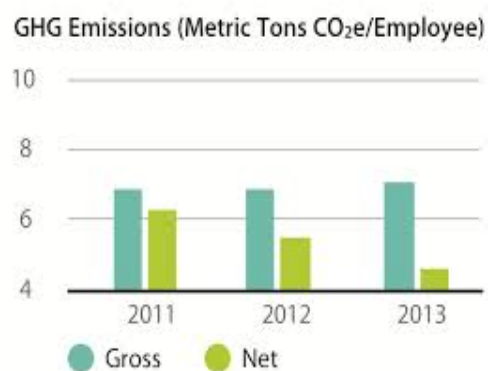
“Applying a life cycle perspective can help identify opportunities and lead to sustainable solutions that help improve environmental performance, societal image, and economic benefits. Businesses do not always consider their supply chains or the ‘use’ and ‘end-of-life’ processes associated with their products (Environmental Protection Agency, 2014).”

As previously mentioned, the carbon footprint is viewed as a life-cycle analysis and accounts for the entire life of the products made by Apple. This is very different from other companies as stated by the EPA in that they track their emissions throughout

their supply chain as a long-term strategy. The largest contributors for the 2013 carbon footprint were from manufacturing with 23.6 million metric tons and product usage with 7.5 million metric tons. Other factors within the carbon footprint analysis include facilities, transportation, and recycling (Apple Inc., 2014).

Apple thinks about the effects and changes they can make in the environment which influence other business practices, short and long term. The company utilizes chilled water storage systems which cool thousands of servers with water chilled by the night air and during cool-weather hours, avoiding the use of electric coolers 75 percent of the time. Most technological devices give off emissions or utilize power or other resources to fuel themselves. Also, Apple makes continuous efforts in reducing a product's power consumption and resource utilization for the long term of the product. For example, the newer Mac computers use 72 percent less energy by grouping certain operations together to reduce its CPU capacity (Apple Inc., 2014).

Apple compares their emissions data to their past years to track their progress. Their data includes the natural gas and electricity that is consumed at Apple facilities worldwide as well as the emissions from employee commute, fleet vehicles, and all business travel. The renewable energy that Apple has been integrating into their

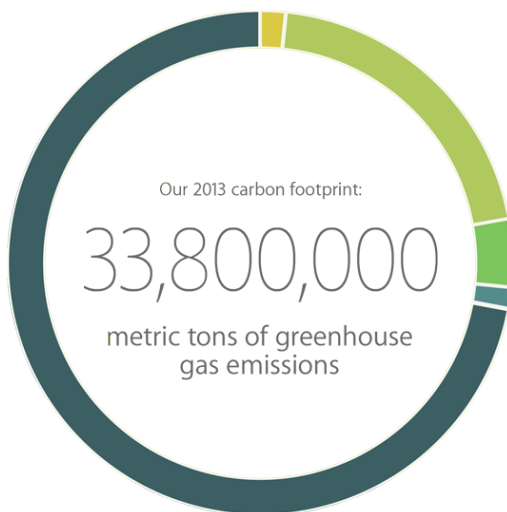


business has reduced their net emissions greatly.

Not only does Apple Inc. compare their greenhouse gas emission data yearly, but they compare both their default and net emissions. They measure their emissions in carbon dioxide equivalents per employee. As seen on the figure to the left, the net

emissions of Apple have gone down since 2011, but their gross emissions went up nine percent in 2013. This increase was due to a miscalculation of the emissions the year before. Apple had not accounted for all of their emissions in 2012 so they recalculated it and it was found that the carbon emissions for gross decreased 3 percent each year. Apple states that when "...assessments reveal a material, process, or system that's making a significant negative impact on our carbon footprint, we reexamine how we design that product, process, or facility (Apple Inc., 2014)." This concept of monitoring data demonstrates how Apple and other companies can encompass both long and short-term business practices.

Many different ideas concerning sustainable practices within Apple Incorporated are important in order for the company to keep goals of staying environmentally friendly. These ideas and methods practiced at Apple to continue sustainable practices are guidelines and goals that other companies should follow. Apple stated that "climate change is a real problem, so we're taking real action." Being aware of the potential dangers of the world and working to eliminate or alleviate them can be admired. The



desire to alleviate environmental impact is an immediate, short-term strategy at Apple. The ongoing cycle to create awareness of harmful environmental impacts is a long-term sustainable business practice.

In the figure to the left is a "life cycle analysis" of Apple's 2013 carbon footprint. What is different about this idea is that Apple accounts for the carbon

emission usage throughout the entire life span of the products created at Apple Inc. In 2013, Apple measured its greenhouse gas emissions to be almost 40 million metric tons. This is a fairly large amount of carbon emissions. What this figure to the left demonstrates is the amount of emissions given off in each field of production. The dark green color which makes up a majority of the circle is the manufacturing part of the business which has given off about 23.6 million metric tons of greenhouse gas emissions. The light green color which is the second largest amount of the circle is the product usage portion of the business which had an estimated 7.5 million metric tons of emissions. The four smaller colors of the circle account for the transportation, recycling, and facility use emissions. What the company states here is an important detail of what sustainability is; a continual cycle of improvement which is what Apple is currently doing and striving for (Apple Inc., 2014).

Apple Inc. has been monitoring various aspects of their business relating to “being green” and have incorporated many different methods of measuring their impacts on the environment. One such metric system adopted by Apple is the carbon footprint life cycle analysis method. “Environmental footprint analysis is an accounting tool that measures human demand on ecosystem services required to support a certain level and type of consumption by an individual, product, or population (Hilbert, 2013).” There are a number of footprints that exist which measure a specific parameter related to the environment. These footprints consist of ecological, carbon, nitrogen, material, and water. To complete an environmental footprint analysis, the data collected from the different footprints is combined and analyzed (Center for Sustainability at Aquinas

College). To monitor different aspects of footprints, it demonstrates a way the company is striving to be sustainable.

Apple is not the only business that creates various technological devices, therefore, competition exists for Apple. Samsung is one of Apple's biggest competitors in the market today. According to Samsung's 2013 Sustainability Report, Samsung focused upon their business goals and how to be more frugal. Apple's 2013 Sustainability Report had many different tactics as to how to reduce impact on the environment where Samsung had tactics to reduce energy in order to save money. Samsung is considering their impact on the environment but compared to Apple, they did not display any definitions of what they believe sustainability is nor did they provide as many original strategies like Apple did. However, Samsung did have a strategic process that consisted of first identify the major environmental issues, secondly perform a risk analysis, thirdly analysis of internal competence, then materiality tests, and then finally a strategy development. This idea and process is beneficial for sustainability in that it considers the environmental impact of its products for the long-term. Samsung may be a tough competitor, but in respect to a sustainable future Apple has more tactics available and seem to have a larger push for sustainability (Samsung, 2013). Samsung lacks in long-term business strategies unlike Apple.

Apple Inc. has been monitoring every aspect of their business that pertains to carbon emissions. One such part of their business that is being monitored is their employee transportation. These emissions are measured in equivalents of carbon dioxide per employee and are reviewed frequently. In 2010, they started measuring the emissions of employee travel and their values have gone down since then. Although

there was no change in the emissions between 2012 and 2013, Apple has implemented programs to alleviate their emissions. A transit subsidy is given to each employee, bicycles are used, and carpooling is encouraged. 2100 of their Apple employees use biodiesel-powered coach buses daily to commute to work. In doing so, 6377 metric tons of greenhouse gas emissions have been avoided. 300 electric vehicle charging ports are used on Apple facilities that cut down emissions by 161,000 kilograms (Apple Inc., 2014). Apple chose to implement environmentally friendly transportation systems for their employees which aids in admirable long and short term business strategies related to their employees and not just their products.

“It takes an enormous amount of energy to design, assemble, and ship hundreds of millions of products all over the world (Apple Inc., 2015).” It is challenging to incorporate sustainability into all of their products and to meticulously account for every aspect of their very large business that relates to greenhouse gas emissions. This is why sustainability reporting can reveal negative features in a business and this is true for Apple Inc. Apple recently revealed their carbon emissions for 2014 of 34.2 million metric tons. This is an increase of 400,000 metric tons of greenhouse gas emissions. Although Apple’s products today now generate 61 percent less greenhouse gases than their products from 2008, the emission rate still went up. This increase was due to the volume of products sold by Apple last year resulting in a 5 percent increase of the total manufacturing emissions (NBC News, 2015). The manufacturing emissions went from 23.6 million metric tons in 2013 to 24.8 million metric tons in 2014. Apple’s response to this increase is to take action with short-term sustainable goals in mind. Apple is reducing the carbon intensity that is related to the making and using of their products.

They also are continuing to reduce their Scope 1 and Scope 2 emissions which has decreased 48 percent between 2011 and 2014 (Apple Increased Carbon Footprint in 2014, 2015).

Apple Incorporated is a very large electronic producer and business in the world today. Their company spans a large portion of the globe, so the effect it has on the atmosphere is great. Sustainability reporting for Apple and for every company is important to be able to determine both the good and bad sustainability statistics of a business. According to Stoner and Wankel, the level of change needed in order to make the change from an unsustainable world to a sustainable one is great, but the bigger businesses have a greater effect on the environment. Changing the business world in terms of sustainability will have a great impact on the environment as a whole. Apple Incorporated is a large business and has many different successes in the sustainability movement with plans of improvement and continuation of these sustainable practices throughout the future (Stoner & Wankel, 2010, p. 3-4). Following the ideas by Stoner and Wankel, having such a big business like Apple involved in the sustainability world can greatly influence the impact of the environment in a positive way and really set the standards of both short and long-term sustainable business practices for every company.

Works Cited

1. Apple Inc. (2014, January 1). Environmental Responsibility Report 2014. Retrieved March 10, 2016.
2. Apple Increased Carbon Footprint in 2014. (2015, April 21). Retrieved March 9, 2016.
3. Center for Sustainability at Aquinas College. (n.d.). Retrieved March 9, 2016.
4. Center for Sustainable Business Practices. (n.d.). Retrieved March 9, 2016,
5. Environmental Protection Agency. (2014, August 9). Life Cycle Perspective. Retrieved March 6, 2016.
6. Hilbert, J. (2013, December 2). Measuring Sustainability - The Need for Precise Metrics. Retrieved March 8, 2016.
7. NBC News. (2015, April 20). Apple Carbon Footprint Rises Despite Green Measures. Retrieved March 6, 2016.
8. Samsung Electronics. (2013, January 1). Sustainability Report 2013 Global Harmony with people, society & environment. Retrieved March 6, 2016.
9. Stoner, J., & Wankel, C. (2010). Introduction. In *Global Sustainability as a Business Imperative* (First ed., pp. 3-4). New York: Palgrave Macmillan.
10. U.S. Green Building Council. (n.d.). LEED. Retrieved March 6, 2016.