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# Save Environment by Replace Plastic, The Case of Pepsi-Cola

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## ABSTRACT

Pepsi-Cola is one of the largest multinational food and beverage brand in the world. In 1902 Pepsi-Cola Company was founded in the United State. It has continuously developed during the past 118 years. Our Report is about replacing Plastic bottle to Reusable Plastic to develop and change the company product to be better.
The issue of environmental pollution especially plastic pollution is becoming serious; it is damaging the ecological environment. This had triggered the attention of organization on the environment and some of them take their responsibility to work hard on sustainability a strong environmental profile.

Keywords: Plastic, Reusable Plastic, Pepsi-Cola, Environmentally friendly, Pollution, Sustainability.

## INTRODUCTION

In the recent years with the developments of technology, people awareness in many issues increased. Nowadays customers might stop buying a product they like because of certain believes. This is not meaning they are wrong; we mean as businesses that we need to understand customer's behaviours, needs and culture. As people wants and behaviours change, for sure companies need the change not just for the customer but for it to survive. Most of the companies that refuse the change, they are not existing now. Pepsi-Cola company the famous successful brand name. The company was founded in 1898 in New Bern. Their main product 'Pepsi-cola' sales are estimated 100 billion cans per year. The company owned other famous brand name like Quaker Oats, Tropicana, Mountain Dew, Miranda and more. As a company that sells that huge amount of canes and other products with other brand names, it has a huge responsibility toward customers and environment.
In our project we are looking for the best substitute for the Plastic which is actually harming the environment through two ways. Firstly, while producing processes. Secondly, finished cans because it is hard to disposal. As a team we found that the Reusable plastic is the best choice and we will support our idea through our study and information's that we gathered. Plastic issue seriously exists; Pepsi-cola Company has a huge amount of plastic trash according to the facts and the number of cans that is produced. Plastic is not disappearing at all, unless human involves and act, so imagine from the first (can) that have been ever made in 1898 might be exist until now. If we collect even less than the half of the amount produced and eliminate producing more, we are helping in saving the environment.
The process of making a plastic requires using of petroleum. Using petroleum in plastic industry will cause gases that pollute the atmosphere so we are suggesting replacing the

petroleum with another input which is the waste plastic. Using a waste plastic as alternative of petroleum will benefit in two different sides, one of them is that it will decrease the amount of plastic trash in the environment and the second one is that it will decreases the pollution. For the company Pepsi-Cola will gain a good reputation, attract customers and reducing the cost. If the company implement the idea it might be not the first mover so it can learn from the first mover or a company's specialize in produce the reusable plastic. Pepsi-Cola can collaborate with experienced company in such field, so if possible, Pepsi-Cola will not need to change its factory processes as a result will reduce cost.

In the next chapters we will present more information about Pepsi-cola Company, more facts and details of the pollution caused by plastic industry, the reusable plastic advantages and disadvantages and description of the idea which is replacing traditional plastic with reusable plastic.

**Pepsi Cola Company**

Pepsi cola company an American famous brand name. It employed approximately more than 290,000 employees. It is a multinational company that locate on 200 countries. The company have five different categories are; Frito lay, Pepsi cola, Tropicana, Quaker and Gatorade. PepsiCo mission is "Create more smiles with every sip and every bite". And their vision is "Be the global leader in convenient foods and beverage by winning with purpose". The company care about their customers and used to have a clear code of conduct that make employees understand what they need to do like ensure ethics, show respect and perform work responsibility. PepsiCo is attracting mostly the young generation by different marketing ways.

Company small SWOT analysis, the company strength is meaning that the company has internal features that help it to compete and be competitive advantages for it such as Its big expanding, Brand name and innovative product line. The company weaknesses which mean disadvantages that affect how the company compete, like its huge competition with Coca Cola. The Opportunities for the company, means that the company has a choice that can benefit it to be stronger. Such as; expand to more developing countries. T represents the threats. Which are the factors that might affect the company performance negatively. For example; Damage to reputations that cause losing big number of customers. With no customers no company exist.

To analysing PepsiCo in the market, first the Bargaining power of suppliers. As the Company locates in different areas and it is very large expanding, it has many supplier's relationship and they also care about the quality. A company like PepsiCo very big and have a long age on the market it is stronger than suppliers. The company can choose whatever suitable for its benefits so the bargaining power of suppliers on PepsiCo Company is weak. Second, the bargaining power of buyers is medium because although the brand is strong but without the loyal customers, Pepsi cola could loss customers. The Product is available in many stores and even in machines in stations so it is close form customers hands. Third, Substitutes, Pepsi cola substitutes are existing for examples coffee, tea, juice and much different type of soft drinks, so the Bargaining power of the substitutes is not weak. Fourthly, the competitors, PepsiCo Company have competitors in the market but the strong famous competitor for is Coca Cola Company. It is similar and close to Pepsi cola product but the loyal Pepsi cola customers make the company compete with it, so the threat of the competitors is strong. Lastly in order to analyze Porter five is the threat of the new entries. With new development and technology copying the process of the company will not be impossible as well as producing similar

product. But it required huge capital and strong expertise with many things to do, to be a competitor for PepsiCo Company.

## RESULTS AND DISCUSSIONS

### Plastic issue

Plastic depreciation amount is very large. According to studies around 260 million tons of plastic per year, approximately from world oil production equal 8%. Plastic is inexpensive, Lightweight, strong and durable. Plastic contain different components some of them are Phthalates, Bisphenol (BPA) and Polybrominated biphenyl (PBDE), those components are harmful chemicals for human's health also it contains other petroleum-based material. In the process of producing plastic those components are be like viscous state that can be moulded, cast and spun. The 8% of Petroleum amount goes directly to plastic manufacturing and that amount from the whole world petroleum so the percentage considered big.

They might transfer to human body directly from plastic or indirectly, evidence related to that based on experiments on animals and the effects of those chemicals on human's health. Plastic waste is not just on our areas it expands to the oceans. More than 5 trillion plastic pieces are floating on the sea. Plastic harm reaches the marine life. It is killing animals from small fish to whiles. Not just that it is start affecting our health from eating seafood. Plastic face many issues that crush it to small pieces like waves and storms. Those small pieces look like a food for fish and some plastic bags that sink on the sea look like jellyfish, so the seals are going to eat it. Plastic is not just floating in the surface of the sea but it also sinks on it. The amount under the sea is hard to be determined.

Pepsi Cola Company owns another brand name. Just Pepsi cola sales around 100 billion cans per year. So, you can imagine the amount of plastic waste from its all brand name. Pepsi cola considers to be one of the most three companies that have plastic trash. Pepsi cola factory play a role in Pepsi cola company pollution practices. Using petroleum in the process to produce plastic is causing a harm toxic flying on the air. According to the National Oceanic and Atmospheric Administration, it is difficult to determine the real volume, location and size of the plastic. Plastic bags and bottles are the most spread plastic trash from plastic garbage around the world.

Recycling is useful process that decrease plastic amount exist, increase people awareness toward waste separation, save energy and reduced needs for a virgin material. In the U.S only 8% of plastic waste is recovered while the remains go to the landfills. The process might not be that easy because some of plastic types can't be mixed together also plastic should be clean with no drinks or oil.

People awareness toward plastic issue is increasing, as a business's we know that customers have different belief that affects their behaviours to buy. There are groups of people do care about environment, animals and human's health. Plastics do not disposals easily and the chemicals inside it can convert to be toxic that affect our future by damaging the environment. Finding solutions for decreasing the amount of plastic on our earth is best for us and for our future generations. "Sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs." (Brundtland Commission, 1987)

### Reusable Plastic

Plastic bottles are convenient for everyday use and can even make some taste better, so it is a popular way to consume beverages. However, the environment will be harmful when the process of manufacturing and transporting millions of bottles. Keep going use of plastic bottles can seriously damage the earth. Most people just appreciate the

convenience plastic bottles water offer. Having a small bottle that can be thrown away is easier, rather than having to bring a larger reusable bottle home at the end of the day. Also, plastic bottles water comes in big "value packs" in most stores, which is beneficial for large group events and big families. Plastic bottles are made of polyethylene terephthalate (PET) plastics that don't biodegrade, but they are completely recyclable. PETs break down into smaller fragments over time. These fragments absorb all the toxins that pollute waterways, contaminate soil, and sicken animals (which are then consumed). The plastic trash also contents organic pollutants such as BPA. They take centuries to decompose while sitting in landfills, amounting to billions of environmentally poisonous time bombs.

A good alternative reduce pollution towards our earth is to use reusable plastic bottle. Reusable plastic water bottle is a bottle that less need manufactures new bottle from virgin petroleum resin and less trash that end up in landfills, stream and parks. This is because the plastic is manufactured from crude oil and the used containers take up a large amount of space in our landfills. When these bottles are appropriately reused or recycled, they cannot be used to create new water bottles.

There are many advantages of reusable plastic water bottles. First of all, reusable plastic bottles can reduce waste. Landfill space is limited and make it nearly impossible for anything, including plastic, to biodegrade. Reusing and recycling plastic water bottles helps to conserve space that can be used for other waste. It can also help reduce the number of plastic water bottles that end up as litter in roadways and water sources. Besides, it can reduce greenhouse gas emissions. The plastic manufacturing process will result in the creation of greenhouse gases, including carbon dioxide, which is thought to contribute significantly to the global warming effect. Since the process for reusing plastic water bottles requires less energy and fossil fuels, it also results in fewer greenhouse gas emissions.

On the other hand, there are some disadvantages about reusable plastic bottle. Reused plastic bottles can leach toxic chemicals. Repeated reuse of plastic bottles which get dinged up through normal wear and tear while being washed will increase the chance that chemicals will leak out of the tiny cracks and crevices that develop in the containers over time. Reusing bottles without cleaning them encourages the growth of potentially harmful bacteria. This will bring a variety of health problems.

**Plastic based plant or Bio plastic another alternative for replacing the tradition plastic.**

Bio plastic is a biodegradable material that comes from renewable sources and can be used to reduce the problem of plastic waste which is suffocating the planet and polluting the environment. The third most commonly used petroleum derivative in the world is plastic. There are about 200 million tons of plastic will be consumed on the planet each year. This waste is the cause of the death of marine species and fowl that ingest them and pose a serious environmental problem, such as garbage patches.

The use of bio plastics is being promoted as an alternative that consisting in obtaining natural polymers from agricultural, cellulose or potato and corn starch waste. These are 100% degradable, equally resistant and versatile and it already used in agriculture, textile industry, medicine and, over all in the container and packaging market. Few commercial applications exist for bio plastics. In principle they could replace many applications for petroleum-derived plastics, however the cost and performance will be remained problematic. As a matter of fact, if supported by specific regulations that limiting the usage of conventional plastics, their usage is financially favourable.

Bio plastics are mostly made of carbohydrate-rich plants such as corn, sugar cane or sugar beet so it called food crops or first-generation feedstock. First generation feedstock is currently the most efficient for the production of bio plastics. This is because it requires the least amount of land to grow and produces the highest yields.
The bio plastics industry is also researching the use of non-food crops which are second and third generation feedstock, such as cellulose, with a view to its further use for the production of bio plastics materials. Innovative technologies are focussing on non-edible by-products of the production of food crops, which generates large amounts of cellulosic by-products such as straw that can be used to produce biopolymers. Compare to the traditional plastics that we throw away every day, it will create a result which is believed to be eco-friendly.
A bio plastic brings a lot of advantage to our earth as they do not release other dangerous items upon decomposition. Plastics make our lives easier in many ways, but they can also contain potentially dangerous products that could harm our health at the same time. Bisphenol a (BPA) is a key ingredient in resin and plastic manufacturing.
Bio plastics eliminate these substances from being needed. Secondly, bio plastics consume less energy during the manufacturing cycle. That means we are burning fewer fossil fuels, consuming less of them during the manufacturing process, and releasing fewer contaminants when the plastics reach their end-of-life stage. Because of this energy savings, the long-term cost of using biodegradables could be substantially less than traditional plastics – especially if the clean-up costs from plastic pollution are added to that calculation. Bio plastics also reduce the amount of waste we produce. There are approximately 13% of our current waste stream will be make up by plastics. The remainder goes into landfills and other waste disposal programs, where it could take up space for more than a century.
There are also disadvantages of bio plastics. Bio plastics come at a higher capital cost. At our current technology levels, it costs up to 50% more to manufacture bio plastics than it does to follow the traditional production cycle. These prices are coming down as our technologies improve and source material access becomes cheaper to produce. That means it may not be an affordable solution for everyone right now, but it could be in the future. Next, bio plastics do not guarantee a net savings. Many of the advantages of bio plastics rely on a net savings being created by a reducing of energy, water, or greenhouse gas emissions. Because there is no general oversight on the manufacturing cycle from crop growth to final distribution, there isn't reliable data available to suggest that biodegradables are useful beyond the ability to offer more profits to some companies or create compost fodder. Since many of the reports cited in research involves industry-produced data, we must have access to more independent studies to understand if the advantages and disadvantages of biodegradable plastics are moving in the right direction.

**Replace Tradition Plastic with Reusable Plastic**

In 1967, PepsiCo started to use aluminium beverage cans and therefore the growth of demand for aluminium cans increased dramatically. However, the production of aluminium cans is very high energy-intensive. The production of one tonnes of aluminium cans will take an average of 14000 kWh of electricity and it will cause a high carbon footprint. According to the 2016 study of EPA, there are 11.09 tonnes of carbon dioxide gas emissions per ton of cans while there are only 2.2 tonnes of greenhouse gases per tons of plastic bottles will be emitted. As we know about the fact of production of plastic is at around 250-300°C while aluminium smelting requires over 1000°C in term of

temperature. The increase in emission of carbon dioxide will bring a lot of effects to our environment.

Therefore, we suggest that PepsiCo to use reusable plastic to replace tradition cans to reduce the impact of tradition cans to environment, the plastic that we suggest to use is RePET plastic. RePET plastic is made up from recycled PET bottles, It is 100% recycled and sustainable, no petrochemical as raw material are required. It can save our natural resources and reduces the impact of pollution to environment. It can save around 90% of energy to produce it compare to the energy required to produce aluminium cans. At the same time, it will be able to save 2 tons of crude oil.

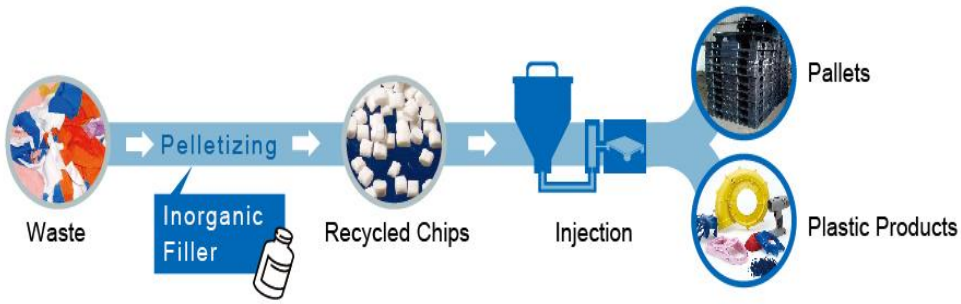


Diagram 1.0 The flow of production of RePET plastic by LIBOLON

In partnership with LIBOLON, it can achieve the second goal of PepsiCo which is strive to use 25 percent recycled content in their plastic packaging by collaborating with their suppliers, helping to increase consumer education, fostering cross-industry and public-private partnerships, and advocating for improved recycling infrastructure and regulatory reform, all of which are required to realize our ambition. The production of RePET plastic uses high-temperature heating and injection moulding to recycle scraps from LIBOLON's factories to produce eco-friendly resin. Besides, PepsiCo can help to increase consumer education by encourage citizen to participate empty bottle recycling campaign. It also can increase the awareness of recycled to citizens. Citizen can bring these empty bottles to any convenience stores and the retailers will collect these empty bottles back to factories. These collected plastic bottles will be recycled and reproduce a new RePET plastic. By using the RePET plastic, PepsiCo is able to achieve their goals and also reduce the pollution.

**To applied the idea.**

Pepsi Co. is one of the world's biggest producers of plastic trash as mentioned before. The most common types of plastic that produced by Pepsi Co are polystyrene which is mostly used in packaging, and PET which is used in bottles and containers. The plastic contains harmful chemical which will bring effects to environment. According to recent research, production of plastic has grown from 50 million metric tons to over 300 million metric tons per year in the last 70 years. This plastic pollution has effected over 267 species of marine life worldwide as a result of ingestion, starvation, suffocation, infection, drowning, and entanglement. Therefore, Pepsi Co has the responsibility to take action in reducing the plastic pollution.

Pepsi Co. had set several goals to make up our 2025 packaging sustainability agenda:

1. Strive to design 100 percent of their packaging to be recyclable, compostable or biodegradable.
2. Strivee to use 25 percent recycled content in their plastic packaging by collaborating with their suppliers, helping to increase consumer education, fostering cross-industry and public-private partnerships, and advocating for improved recycling infrastructure and regulatory reform, all of which are required to realize our ambitionn.
3. Strive to reduce 35 percent of virgin plastic content across their beverage portfolio by 2025, driven by increased use of recycled content and alternative packaging.
4. In partnership with the PepsiCo Foundation, work to increase recycling rates.

To achieve the first goal of agenda which is design 100 percent of packaging to recycle, compassable or biodegradable, our suggestion is using composable and biodegradable plastic bag that called “Xylobag” to replace traditional plastic which is bioplastic that made from a material called lignin. The reason that we choose lignin because it contains in all plant life and is a largely discarded waste product from the befouls and papermaking industries. Cycle Wood Association is located in Texas, United Stated that produce biodegradable plastic bag which is biodegradeble within 150 days. The products of Cycle Wood Association can decompose naturally without bring effect to marine life and animals. By using the technology “Xylomer™”, these products breaks down into humus in approximately 180 days once they have reached the natural environment, improving soil structure and leaving a cleaner environment.As we know, ttraditional plastic is made with fossil fuels and chemical fillers that can be harmful to the environment when released the plastic is melted down. However, biodegradable plastic made from natural sources that do not pose the same risk to the environment. This is a good opportunity for Pepsi Co to achieve their goal in 2025. As we know, current plastic content burning of fossil fuels that are high cost and non-renewable components while biodegradable plastic is a favorable substitute which free from petroleum-based and give a good impact to the health of planet.

Future opportunities will come from a continued capacity for growth and consumer demand for environmentally-friendly products as well as efforts to reduce pollution and reliance on petroleum-based products. Therefore, Pepsi Co can partner or buy patents with Cycle Wood Association as a packaging supplier that use the raw materials which is the best substitute to plastic grocery and packaging. By partnership with Cycle Wood Association, Pepsi Co company can achieve their goal of 100 percent of their packaging to be compostable and biodegradable in 2025.

However, the cost of producing Xylobag is expensive than the cost of producing traditional plastic. For the production of traditional plastic, it may cost 1.2 cents per unit while producing Xylobag are expected roughly 1.5 cents per unit. It may higher the cost of packaging of Pepsi Co Company but the costs of some next-generation bioplastic are now even those derived from oil. It can even meet today’s oil price of around $55 per barrel due to the rising price of petroleum oil which is the raw material of producing traditional plastic. By forecasting the rising petroleum oil price, the cost of production of Xylobag is lower than traditional plastic bag because the process uses lignin which is the waste of the paper mill industry. No additional trees are cut down to produce the Xylobag which is lignin-based plastics. Besides, Pepsi Co can also save the cost of recycling traditional plastic. The total energy savings to the mill amounts to $0.04 per pound of

lignin burned. This is essentially the cheapest way to dispose of the lignin compare to other materials.

## CONCLUSIONS

### Recommendations

Pepsi Cola Company is Unsuccessful Company but replacing plastic might be not easy for it but it is not impossible, they need Experience Company to learn from or to collaborate with them. In order to reduce time and effort for finding labors and collecting plastic waste it is better to just work with another company that ready to produce that kind of product with the ability of know how. Research and Development will always enhance and improve company productivity. If scientist fined in future solution that is more affordable and less cost, the opportunity should always be known for Pepsi Cola Company.

### Conclusions

Our research talked about saving environment by replacing plastic to another kind that will reduce pollution toward the earth. The reusable plastic is the best substitute from our point of view as mentioned in research because it well decreases amount of plastic waste and eliminate reducing more of plastic that contains petroleum components and harm the environment. Pepsi Cola Company was the target company due to its action in wasting plastic. Plastic pollution is expanding and people awareness is increasing. We had presented all data about the issue and about the idea. In conclusion, Pepsi Cola Company is successful but to be always success you always need develop and change, whither on employment, processes strategy, goods or services.

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