



Analysis of the Tech Giant's Green Path Taking Apple Company as an Example

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Abstract. In the 21st century, environmental issues have become a pressing concern. The pressure of climate, waste, and resource wastage has led many commercial companies, huge ones, to look after the environment and their business operations. However, the high cost of doing so has deterred some companies from operating in a more environmentally friendly way. This article introduces and analyzes the measures and concepts of Apple, one of the large commercial companies, in the field of environmental protection and sustainable development by citing representative relevant data. Environmental protection areas involved include carbon emissions, e-waste, and resource conservation. In addition, combined with data analysis and pointed out the hidden dangers of environmental protection in Apple's products. This article aims to analyze Apple's environmental affairs to appeal to other companies to increase the priority of related environmental affairs.

Keywords: Apple Inc · sustainable development · e-waste · CO₂ emission · mobile electronics

1 Introduction

Nowadays, business is not just business in a way. While most companies focus on business development, they are also required to take part in social responsibility, especially large-scale companies. Environmental protection is an integral part of social responsibilities. It is clear that the larger the company, the more significant the environmental impact due to the scale of production and the high demand from consumers. This, in turn, leads to greater consumption of natural resources. As the world's most valuable company, Apple's market capitalization reached \$2.9 trillion in 2022 [1]. The environmental concerns of this leading company in the business world have been particularly prominent and noticeable in recent years. This paper will analyze the concepts and measures of the world-famous company Apple in environmental protection and sustainable development, as well as its existing problems.

2 Priority of Environmental Protection

2.1 The Environment We Live In

Of the 16 sustainability goals set out by the United Nations in 2012 to be achieved by 2030, five are related to the environment: water, climate change, marine resources,

terrestrial ecosystems, and sustainable modern energy [2]. This shows that the importance of environmental protection has become a pressing concern worldwide. A range of activities that began with the industrial revolution and continue to this day have had a significant impact on climate and the environment. For example, manufacturing activities in factories owned by a large number of commercial companies have emitted large amounts of carbon dioxide into the atmosphere, gradually contributing to the current serious global warming problem.

2.2 The Impact of the Electronic Age

With the boom in the electronics industry in the 21st century, the planet is increasingly overwhelmed by the vast amount of electronic waste generated. Around 50 million metric tons of e-waste is generated each year globally, less than 20% of this is recycled, and it has become the fastest-growing waste stream [3]. People point fingers at the major electronics companies that make electronics for such hazards. Due to their vast production scale and demand, large electronics companies often find it challenging to consider environmental issues. In Greenpeace America's green electronics rating, many well-known large electronics companies are not doing well. Samsung received a D-, Huawei and Amazon were classified as a D, and Dell and HP were slightly better performers and classified as a C+. It is worth noting that Apple, the highest-value company, has a decent B- in this rating.

3 Apple's Way of Going Green

3.1 Electronics Recycling

China produces more than 10 million discarded mobile phones every year, yet the recycling rate in the whole country is less than 1% [4]. As a result, almost all discarded mobile phones eventually become electronic waste and affect the ecological environment. However, this negativity may be mitigated by the idea of one of Apple's sales initiatives, Apple's trade-in plan.

In the distant 2005, when customers bought new iPods, they could return their used iPods to Apple for a minimum 10% discount [5]. At that time, when the development of intelligent devices was immature, and the threat of e-waste was not serious, Apple had already taken relevant recycling measures. The trade-in plan launched by Apple in recent years can be carried out in nearly 100 countries and regions where products are sold. The details of this scheme are that customers can offset a portion of the price of a new product with an older model, up to half the price, when they purchase it. The program covers a range of Apple's mainstream computers, tablets, phones, and other products. When Apple receives an old machine from a customer, Daisy, an intelligent dismantling robot developed by Apple, will dismantle the device into its parts. The collected materials will eventually be returned to the raw material market for later reuse in manufacturing new generations of products. Not only products from Apple but also products from other famous electronics companies such as Huawei, Google, and Samsung are accepted in the trade-in program. In 2021, this program, together with other recycling partners,

will convert over 38,000 tonnes of e-waste worldwide into recycling [6]. This is an awe-inspiring achievement.

Not only in terms of the environment but also terms of marketing, this program has helped the company. The field of smart devices has become more sophisticated in recent years. People almost have a smartphone in their hands, and those who work almost have a computer in their hands. This has led to the market becoming increasingly saturated and people becoming reluctant to buy the new generation of devices [7]. The trade-in program helps Apple persuade consumers to update their devices in part by offsetting some of the costs. Under the premise of achieving recycled materials, product sales can also be stimulated, and customers can enjoy specific discounts. This is a viable plan for all parties.

3.2 Carbon Emission Reduction

Apart from e-waste caused by the electronics industry, greenhouse gas emissions are another major problem affecting the global environment. From around the 16th century onwards, atmospheric greenhouse gases and global temperatures rose sharply compared to the previous period, an effect of the industrial revolution. In order to achieve industrialization and overall development, humanity began to use large amounts of fossil fuels, which are the primary source of greenhouse gases [8]. The main use of fossil fuel combustion is to generate electricity from fuel, and approximately 40% of CO₂ emissions are generated in this way [9]. While the percentage share of fossil fuels in global electricity generation has been steadily declining in recent years with the rapid expansion and deployment of renewable energy, the total actual global consumption of fossil fuels for electricity generation and other needs has continued to increase; this phenomenon that is expected to continue until the middle of this century [10]. Astonishingly, as of January 2018, all of Apple's facilities around the world and the facilities they choose to partner with our 100% covered by renewable energy, rather than consumed as a non-renewable resource and fossil fuels that produce greenhouse gases, which reduces emissions by about one million tons.

For the fiscal year 2021, Apple has reduced carbon emissions by more than 23 million tons across all scopes. While total revenue rose 33%, emissions grew by less than 5%. Since FY2015, the total carbon footprint has shrunk by as much as 40%. Their goal is to reduce their carbon footprint by 75% by 2030 compared to the 2015 financial year and achieve their carbon neutrality target.

3.3 Material Savings

In the iPhone 12 series launched in 2020, when everyone was attracted by the new features and appearance of the new generation of smartphones, Apple has made a big difference in the packaging of the iPhone series that has lasted for more than ten years. Change. The iPhone series no longer comes with charging plugs and wired headphones. In addition, the material consumption of the packaging shell has also been reduced to a certain extent. Overall package weight has dropped by almost 50% compared to previous years. The implementation of this initiative has been very controversial among consumers. Some consumers see that the new generation of smartphones no longer comes with a charger as

a ploy by Apple to force consumers to spend about \$20 extra on a separate charging plug. The explanation given by Apple is that most consumers have extra charging plugs when they have purchased previous mobile phones, and the measure that no charging plugs are included can achieve the purpose of saving resources. However, many consumers remain unconvinced by this explanation, believing that Apple is only saving money under the guise of saving resources, which, after all, could save Apple over US\$264 million per year.

There is no denying that this does save Apple some costs. However, if we compare the cost savings of this measure with the resources it saves, we will see that it does contribute to resource savings. In 2018, the recycling rate for containers and packaging across the United States was only 53.9%, burning approximately 7.4 million tons; in addition, landfills received a total of 30.5 million tons of packaging products consisting of cardboard, plastic, wood, and other materials [11]. The materials used for the outer packaging of products are already putting much pressure on the relevant authorities dealing with waste. Apple's "revolution" in product packaging has reduced the amount of plastic in product packaging by 75% compared to before, making plastic only 4% of the entire product packaging, and replaced by more renewable resources. It could eliminate plastic from its packaging by 2025.

In addition to the change in the material on the outer packaging, the removal of the charging plug also contributes. Since the iPhone no longer came with this accessory, it is estimated that 550,000 tonnes less copper, tin, and zinc have been mined. On the other hand, removing the charging plug makes the boxes lighter and smaller, allowing each loaded version to carry up to 70% more iPhones, significantly increasing transport efficiency and avoiding over 2 million tons of carbon emissions [12]. Although this measure by Apple leaves it with much money, its savings and conservation of resources are genuine.

4 Problems that Remain

4.1 The Quality Control Problem

While Apple's contribution to the environment is highly praised, it is not 'perfect'. The quality of the iPhone charging cable has also been criticized for its frequent replacement cost to users and its environmental impact through unnecessary waste. According to statistics, the charging cable of each iPhone cracks and affects usage as soon as every six weeks on average [13]. Apple has also rejected the EU's proposal to introduce a universal charging cable for smartphones, instead continuing to use its proprietary charging cable for Apple phones. The continued existence of exclusive iPhone charging cables signals that Apple will continue to generate additional e-waste due to its lower-quality products.

4.2 Product Maintenance Problems

In recent years, the new generation of Apple products has been found to have almost one common feature - they are all tough to repair [14]. Whenever a customer's product breaks down or needs to be repaired because it has been in use for too long, the high level

of difficulty in repairing it often requires the customer to pay a significant repair bill. As a result, many consumers will be discouraged, and the device will become part of the electronic waste stream. Apple also discourages users from getting unofficial repairs from third-party repair parties. For example, suppose the iPhone's system senses that the phone's battery is unofficial. In that case, it could limit some of the phone's original functions, such as battery health analysis and user verification. In the short term, this may improve profits, but it could jeopardize Apple's environmental reputation and customer loyalty in the long term.

5 Conclusion

When the global economy has been hit hard by the epidemic, companies are racking their brains and doing whatever they can to recover their economies. Unfortunately, social responsibility can often be overlooked at such times. Apple is setting the industry benchmark in terms of its environmental and sustainability efforts, which are not perfect but are still at the forefront of the industry. It is not just a matter of one or two policies. Whether it is recycling equipment, carbon neutrality, or materials conservation, it demonstrates its commitment to integrating environmental concepts into its corporate culture. As Apple CEO Tim Cook said, 'The time for talk has passed, and the time for action is now. We are thrilled to continue doing things that make the world better than we found it'.

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