

Prompt 2

Our human society has a huge ecological footprint on our earth. Mostly, this is because of our habits that we have acquired over the years fueled by technological advances and human greed.

One component of human's play towards a large ecological footprint is the fast depletion of fossil fuels. When we burn fossil fuels, we release sequestered (i.e. stored) carbon. We burn fossil fuels in order to create energy for our society, such as a coal powered power plant. Also, we deplete fossil fuels with more vehicles on the road as these require gasoline to run the engines. When we release these carbon dioxide emissions by burning fossil fuels, we are contributing to global warming.

After watching the documentary *An Inconvenient Truth*, we saw evidence behind human based climate change. We saw evidence of a rise in Carbon Dioxide Concentrations in the atmosphere at an exponential rate after the industrial revolution, and this was an unprecedented rise from before. This shows that humans play a huge role in the increased CO₂ concentration in the atmosphere. The reason that CO₂ concentrations are of such a concern to us is shown in the Vostock Ice Core Samples, which show a positive correlation between CO₂ concentration and temperature level. This shows that global warming is in fact a real phenomenon, and our human interactions to the earth are playing a role in an expedited time frame.

We as a nation are presented with these facts and yet we still continue to drive SUVs with low gas mileage and drive around without purpose. If we change our habits, it would do better, but we are still dependant on fossil fuels. A solution for phasing out our dependence on fossil fuels is to consider renewable methods such as solar, wind, and geothermal as well as biofuel and John's famous "vegetable oil based" fuel to power our cars.

Another component of our societies ecological footprint is deforestation. Since we are greedy, we go into open space and clear cut in order to force nature out of the land and claim it for humans. When we do this, we are removing a precious carbon dioxide sink, our wonderful trees. Trees not only take in carbon from the atmosphere, but they release oxygen in a process called Photosynthesis. Deforestation also removes animal's habitats, affecting biodiversity as the loss of habitats can lead to extinction of animals.

In the late 1990s in San Diego County, the North County Future Urbanizing Area was converted into the residential neighborhoods known today as Carmel Valley, Torrey

Highlands, and some parts of Rancho Santa Fe. This area was previously dense open space with abundant habitats, but the greed of housing developers sought to capitalize on this prime real estate nestled in San Diego. Luckily, the developers (for the most part) used selective cutting instead of clear cutting and preserved “vernal pools” for sensitive animals such as the California Least Tern. These vernal pools are lush ecosystems that are almost identical to the way the land was before the developments. If more developers were to do this when they developed land, we would be able to preserve biodiversity and work in tandem with nature enabling human and nature to live side by side.

Lastly, another component on our ecological footprint is our use of water. Water is a very precious resource, as only 1% of it is readily available fresh water. We are constantly using this fresh water unnecessarily, limiting the supplies of potable water. A huge chunk of this water is also used in agriculture. The method of irrigation that is popular today involves rotating around the center of the circular while squirting water out. This is highly ineffective, as the majority of the water is lost through evaporation during the journey from the spigot to the plant. A more sustainable way of irrigation is drip irrigation as the journey the water takes is short and most of the water makes it to the plant.

One of the most recent ways I am trying to conserve water is when I’m travelling. As a hotel guest, it is easy to take advantage of the housekeeping service and use more towels and sheets than one would normally do at home. This is mainly because the “cost” of changing towels and linens are included in the rate. However, our earth pays when millions of once-used and unused towels are washed, wasting both fresh water and detergent. One must look at the big picture when making decisions, this is something that I am trying to be more conscious of after completing this environmental science course. As Bill Marriot Jr., CEO of Marriott puts it, “We must respect the earth... ..after all, we are all guests on this planet.”

Prompt 4

We are a wasteful society. We bring a lot of consumer goods into this world, and what we bring in we eventually must dispose of. There are proper disposal methods for many of our products, yet most of the time we don't follow them accurately. Unfortunately, a lot of our waste that isn't designed to end up in a landfill does. This can have hazardous effects, such as when batteries are disposed in a landfill and leak acid.

We have direct impact on where our waste ends up when we make the decision where we put our refuse. Some materials, such as aluminum and paper, can be recycled to be used again. Recycling is better than just throwing out the materials, be it storage in a landfill or disposal through an incinerator, the latter releasing harmful chemicals into the atmosphere while producing a very tiny amount of energy in the process. However, the energy of recycling materials is greater. For example, recycling aluminum products use only 5% of the energy needed to make a new one. However, when we are lazy and throw out our aluminum cans in the trash can or improperly sort our recyclables, this energy is "wasted" as it instead just ends up in a landfill. Some materials, such as plastic bottles, can only be downcycled, but it is still better than just throwing the material away.

We also have an indirect impact to the waste disposal practices. For example, a simple choice of choosing which airline to fly can cut down on plastic and aluminum waste. For example, Southwest Airlines instituted a recycling program a couple of years back in which they sort the aluminum cans and plastic cups for recycling by their ground service crew. They provide soda and even water in a chilled aluminum can in order to reduce the number of plastic cups needed on the flight. It is disheartening how some airlines aren't taking these measures solely because they benefit better by squeezing three drinks out of one can, and the cost of plastic cups are cheaper. It is the society that we live in, the "greed" that we have that continues to make this the case time after time.

One of the ways we as a consumer can mitigate our waste impact is by make conscious choices regarding the items we buy and the services we use. As we continue to live in a society where corporations care more about the almighty dollar instead of the planet, we must make our own informed decisions on what to do with our used stuff and think for ourselves on whether or not it is time to replace our items instead of reusing them.

Prompt 5

America is a country driven by consumerism. We see it every day when we open our newspaper, turn on our TVs, and look at bus station ads. We are constantly being told “our current way of life sucks” by marketing agencies. What we don’t see, however, is most of the cycles of the life product of a consumer item. After watching *The Story of Stuff*, it is apparent that there is more behind the scenes than what we see during the duration we own the item. The effect of this is felt all over the world due to **globalization** of the economy.

Annie Leonard from *The Story of Stuff* explains that there are five stages of the **materials economy**: extraction, production, distribution, consumption, and disposal. The flaws of this linear system lie in the globalization of world societies. This materials economy affects all three spheres of sustainability: environment, society, and economy.

In the **extraction** phase, manufacturers go to the far corners of the world to **exploit the resources** of different countries. We have depleted 80% of the world’s original forests. The indigenous people in developing countries lose their own resources because they are not affiliated with the big corporation going into their country. Since the corporation has money, they prevail.

The next step is the **production** phase, in which **synthetic chemicals** are placed in the stuff to make it cheaper for the companies to produce. Also, in order to keep costs and prices low, they **exploit their workers** paying them below minimum wage in order for them to produce our beloved stuff. We don’t think about who made our laptops when we are surfing the net, if they were treated equitably or not, and what conditions the factory was in. The factories get their workers because their lifestyles are left in shambles after the extraction of the resources on their land render it unlivable for them.

Once the products are made, they are **sold to the consumer**. Most companies keep the prices low so they can compete with other similar products. They **externalize the cost** of the products. This means that the direct dollar amount you are paying for the item is not the actual cost of the item. Our environment and societies that we are exploiting pay for this. Since globalization brings everything from all corners of the globe together for the products, companies are able to keep prices low by allowing the societies around the world to “pay” for the products. This whole notion of externalized cost is one of the appealing reasons consumerism works in a first world country.

The **golden arrow of consumption** drives the American society. We purchase all of these items only for them to be retired in 6 months, only 1% of all purchased items are still in operation 6 months after their date of purchase. This is a depressing statistic,

we are doing all the extraction and production leaving environments and societies around the world trashed only to retire the item in such a short time. This is due to **planned** and **perceived obsolescence**. The reason that these have become the norm is due to the thought of a need to constantly buy stuff in order to stabilize the economy, with increasing consumption top priority after World War 2. Planned obsolescence is the intentional design to have the products have a shorter life so that they are replaced sooner. We keep spending money to buy updated technology such as a new cellphone or computer just to keep up with technologies. Perceived obsolescence is like trends, if we don't continue buying the latest and greatest, we are not "cool". This perceived obsolescence affects us through the media, making sure we constantly buy new things to stay "cool".

Once we are done with our items, they go to the **disposal** phase as our houses reach their capacity and can't hold our stuff. Our garbage, if not recycled, ends up in the landfill or an **incinerator**. The incinerator release **dioxin**, the most toxic man made toxin known, into the atmosphere. When this happens, we pollute the environment even more than we do during the extraction stage.

This is a vicious cycle that continues to go around as we are still consuming more after we dispose of our goods. We are treating this linear system like a cycle, when in fact, it currently isn't. If we did make it into a cycle by removing the disposal phase, we would turn our production into a **closed loop system**. This will lead to increased sustainability in all three spheres: environmental, economical, and society.

Prompt 7

There are many different methods of energy generation currently in use across the globe in order to meet our energy demand. According to Nate Lewis' presentation, *Powering the Planet*, our country used only 3 terawatts of energy in 2006, while our world as a whole used 13 terawatts of energy. In 50 years, we are projected to use 28 terawatts of energy worldwide. As carbon dioxide emissions rise and our fossil fuel supply depleted, our society needs to evaluate renewable resources for powering our planet in the future.

Currently, we rely the most on nonrenewable energy generation, such as oil and coal. When we burn these fossil fuels, we release carbon into the atmosphere at a faster rate than we can sequester the carbon again. These greenhouse gas emissions loiter in the atmosphere trapping in heat through a process known as global warming. The limited supply of fossil fuels and the problems we face with greenhouse gas emissions are the main reason why we need to use more renewable methods of energy generations.

One of the renewable methods we can use is wind power. Wind power works due to the uneven heating of the earth's surface, providing high amounts of wind at certain spots on our earth. Windmills harness to power of wind and turn a turbine to generate electricity. Although having pros such as having an ability to create clean air energy (no emissions) there are cons as it does not provide as much electricity as other methods and the windmills make a low frequency "woosh" when in operation. Windmills are a great addition to powering low scale communities, but cannot be deployed for large scale energy generation.

Another renewable method is solar power. We receive about 10 terawatts of power from the sun every hour, and this energy is not being harnessed. Solar power attempts to harness this power. There are two types of solar power, active solar and passive solar. Active solar utilizes moving parts, and it's goal is to get the energy converted to electricity. One of the ways this is accomplished is by using photovoltaic cells. When photons from the sun hit the photovoltaic cell, the energy is converted to usable electricity. Passive solar energy has no moving parts. An example of passive solar energy is solar heating, in which the sun powers the heating for a facility. Solar energy is just like wind energy in that is clean air, however, one of the largest cons is that it is hard to store energy for later. This is one of the main reasons halting large scale deployment of solar energy.

Lastly, another renewable method is hydroelectric energy. This method creates energy using the kinetic energy powered by the gravitational flow of water

downstream. To capitalize off this energy, hydroelectric turbines are placed in dams and turn with the flow of water. This is a very cheap renewable energy source, and produces a lot of energy for the investment. However, we have maxed out our locations for hydroelectric sites, so future site selection is complicated. Also, fish and other aquatic wildlife can be killed if it enters the turbine facility. Lastly, another con of hydroelectric energy is that it displaces people when the land is redeveloped in order to accommodate a substantial reservoir.

While there are many renewable alternatives out there, it is important to consider all of them, as not just one of them alone will provide the answer. For example, in order to power our country using solely solar power, a solar panel the size of a Midwest state would need to be constructed. We need the perfect fusion of renewables in the future in order to meet our energy demands, as relying on one is not feasible.

Though not a renewable resource, it is important to also consider **nuclear energy** for our planet's futures. Each reactor produces approximately 1 gigawatt of power, and for the footprint the facility takes up is very good compared to solar and wind energies. Also, nuclear breeding procedures can be taken in order to prolong our supply of nuclear fuel by turning used uranium into plutonium. Such procedure is already being done in France. This could help with the largest con of nuclear energy, the storage of radioactive waste.