

1. After reading everyone's interventions, I noticed some themes. The people you live with can either be super encouraging of your attempt to increase awareness of waste, or they can be against the idea. I also noticed that a large amount of our waste is related to food packaging. This makes sense since food is a daily necessity, but other countries definitely package their food less intensely as America. Luckily, a lot of the students in the class seem to be aware of this and want to change. We shall see if anyone (including myself) actually holds themselves to changing their ways.
2. **Turning in midterm corrections later**
3. Unlike what Mike screamed, we will most likely never come to a time where every last drop of oil is gone from the Earth. However, there may come a time when it is no longer "worth it" to extract oil from the Earth. We have already used up about half of our *accessible* oil. And if nothing were to change, then we would run out of *accessible* oil. However, we live in a world highly reliant on oil, so things will change. As accessible oil becomes scarce, the supply decreases. Therefore, the cost of oil increases. When this occurs, the demand decreases. With this increase in cost, there are more funds to go into creating new technology in order to extract the formerly un-extractable oil. This new technology allows us to increase our supply, meeting the demands. However, there are costs to reaching this new oil. As we become more desperate, we are willing to use less high quality oil. Therefore, we extract the lower quality oil, and crack it to make it higher quality. This process alone requires a lot of energy, and since you must always have waste, the energy density of the fuel source decreases. Finding newer sources of oil also requires digging in new places or digging deeper in existing locations. Both hurt the environment by destroying ecosystems, contaminating water sources, or increasing seismic activity. Using lower quality fuel also releases a lot more emissions and particulate matter into the air. For people working in those facilities, their health will decrease. When new drilling areas or plants are built, then the people living near them will also be harmed health-wise. Unfortunately, these sorts of activities hurt the poor the most, since the rich have the power to prevent oil from being drilled/burned anywhere near them. Countries are already tense towards each other in regards to oil, and this increased race to find more oil will only raise those tensions. There may come a point in which we are using more energy to extract and process the oil than it produces for us. There may also come a time when the price of oil is so high that consumers will not be willing to pay for it. But until we reach these intense points, we will continue our search for oil.
4. **Oil Production and Consumption Graph**
 - a. In 1955, US oil production started dropping below US oil consumption. This led to the US having to increase their reliance on other countries to provide oil imports. Since oil is such a crucial part of our economy and lives in this country, the US had no choice but to become more and more reliant on imports. The price of oil increased in the US, but not to the extent in which consumers were no longer able to afford it. Some presidents have tried to make OPEC provide more oil, but OPEC essentially ignores them. Instances like this show the weakness of the US, hurting their secure presence in the world. Self-sufficiency is a sign of a strong country, and the US was becoming less and less self-sufficient.
 - b. Recently there has been an increase in oil production and a decrease in oil consumption. The decrease in oil consumption starting around 2004 was due to the large increase in pricing of oil. Improved technology plays a small role as well. With increased mileage of cars for example, our need for fuel has declined slightly. *why production increase*
 - c. In recent years this trend has changed. Oil production has increased but consumption has also increased. Oil prices have dropped tremendously, allowing consumers to increase their consumption for little money.
 - d. Under the Trump administration, I expect the trend mentioned in c to continue. Trump is a large supporter of fossil fuels, so he will continue to subsidize and support the mining of more oil. With decreased legislation on the matter, companies and individuals will also be able to use more oil without any repercussions.
5. "The decision maker must bare the full cost"

- a. If the decision maker is bearing the full cost, in order for the petroleum market to be working, the price of oil must reflect all of the costs that come with mining/processing/transporting oil. External costs need to be taken into consideration. The price of oil needs to increase dramatically for consumers to understand the real cost of everything, especially environmental costs. Awareness is crucial. ✓
- b. Some external costs of the petroleum market include: increased emissions and particulate matter as we continue to increase our burning of lower quality fuel, increased land degradation as we mine deeper and in new areas, increase seismic activity in areas with deep drilling, decreased ecosystem services in these areas, opportunity costs lost as we build new plants or create new drilling sites ✓
- c. Fossil fuels are one of the most subsidized products in the US. Currently, oil is subsidized almost \$5 billion per year through taxes. ✓
- d. By not accounting for external costs and subsidizing oil, we are keeping the price artificially cheap, making consumers happy but unaware of the consequences of their extreme usage. With cheaper prices comes increased consumption, hurting our already dwindling supplies. ✓
- e. If we increased the price of oil, our use would decrease. Since we are at a point in which renewable technology is a viable option, this could force us to make that transition we have been trying to make for so long. We already have the current technology and capacity to run our country on renewables, so if we slowly increased the price of oil and slowly introduced more renewables into the system, there is a chance it could work. Slow is probably necessary in order to avoid complete chaos. However, the reality is that this is a very politically controversial topic, and with current legislation, there will really be nothing done to help fix the current market. In fact, consumers will most likely become even less aware of the consequences. ✓

6. Ozone hole versus global warming

- A
- a. The main gases associated with global warming are carbon dioxide, methane, nitrous oxide, and ozone. CFC's are the main gas associated with depletion of the ozone layer. It is good to note that ozone is necessary in the upper layers of the atmosphere to block UV rays, but is dangerous in the lower layers of the atmosphere. CFCs do contribute to climate change, but are not considered among the main contributors. The same goes the other way. Some of the chemicals mainly associated with climate change do play some small role in ozone depletion. ✓
 - b. CFC's do not have any large effects on the surface of the earth, but when they reach the upper atmosphere, they react very readily with ozone. The chlorine in CFC's steals one of the oxygen atoms in ozone, producing oxygen and another compound. By depleting the ozone layer, UV rays hit the surface of the earth more. When the gases associated with climate change increase in concentration in the air, and the world becomes warmer, environments change. Plants are no longer able to grow in some areas, and some animals can no longer survive in those locations. Essentially, global warming is altering the typical types of ecosystems found in a region. ✓
 - c. Biologically, because of the depletion of the ozone, since more UV hits the surface, there are more cases of skin cancer in humans. Ingestion or inhalation of CFCs can also hurt the lungs, CNS, liver, and kidney. In some cases it can result in death. Large concentrations of gases associated with climate change can be harmful to human organs. ✓
 - d. To fix the ozone depletion situation, CFC's have been banned (Montreal Protocol). However, there are still some areas where CFCs are used. Alternatives have been found, but the main challenge is avoiding the release of chlorine into the atmosphere. Global warming seems to be a harder fix. We need to work very hard to decrease our CO2 emissions, which seem to just be increasing. Unlike the ozone depletion, there is not large consensus on the existence of global warming. Trump doesn't believe climate change is real, and thus is not willing to put in the effort to reduce our impact. Both situations have a way to go before they can be completely fixed, and I can't imagine them being resolved anytime soon with the current global mindset. Overall, the remedy is to stop releasing harmful toxins into the environment, but this is much easier said than done in our society. ✓