

Life isn't fair. What's worse is that we as a species have made it less fair than it should be. The tale of modernity: 20% of the world's population is obese while 10% starves to death, poor countries have their workforce and land exploited by multinational corporations, and the Earth... She awaits the next mass extinction that will reset the system to begin anew.

Light will not be found in the promises of clean technology. The humble engineer should be reminded that it was technology, the fires of industry that allowed us to ravish the planet at ever growing rates. What the engineer should remember is that not only thermodynamic systems are closed. Should the engineers look at the Earth as a closed system, they will find that for every action has a consequence. Even the best of intentions could backfire, creating a new problem that was not there in the first place. This is called the *rebound effect*. An example of this is the growing popularity of permanent magnet wind turbines. They provide clean energy but carry the socio-economic and ecological stigma of relaying on hard to extract rare-earth metals. My role as an engineer is to see the big picture, my actions are not without consequence.

It's the tale of Humanity vs. Nature. It's hard to quantize the benefits of nature. It's been a constant struggle humanity finding ways to win against nature. From a distance it seems like nature is out to harm us, we had to fight our way to the top of the food chain, we had to create shelter to keep us safe at night. Nature is imprinted in our mind as something to fend off from our cities! But think about all the services nature gives us and for free! How much would it cost to heat up the earth without the Sun? How much would it cost to turn the soil if all the worms disappear? City planners should find ways to reincorporate nature into our cities. We have to realize that the benefits of nature CAN be quantized. The energy market faces new challenges as zero marginal cost power becomes more prominent. Engineers with the help of economists have the opportunity to forge a new economic system. A system for sustainable economic growth. Such a system will allow developing nations to fuel the industries of tomorrow using not fossil fuels, but clean energy. These nations can then play catch-up with richer countries while keeping their carbon footprint low.

These ideas focus around my role as an engineer, but I'm still a part of a greater whole: society. Social change begins with the individual. I should think of about sustainability every day! I am lucky enough to have my basic needs met: food, clean water, and shelter (at least for now). I am free to make choices towards a better life. Every day I am bombarded by advertisements trying to sell me happiness. It comes in many shapes and sizes, sometimes it is a new phone that promises 10% higher speeds, an exclusive watch that will show the world just how successful I've been. You hear it all the time: you deserve it, you work so hard, you're worth it. It is no wonder we extract more resources than the earth can sustain? How can we seriously talk about overconsumption when cellphones are so cheap people can afford to change them once a year? In order for real change to happen, society has to come to an agreement that a culture of waste is in bad taste. Only then will we start living by our planetary means. We need to shift away from the woes of consumerism.