Technology and Society

Effects of Technology on the Natural World

There's a town in China where the air is not safe to breath and the water cannot be consumed. The town is called Guiyu, and it is the dumping ground for e-waste in China and possibly the world. The blood of its inhabitants is laced with lead. The poison coming out of the homes is coming from America. The television program 60 Minutes did an investigation in this town. What they revealed was absolutely horrifying. It proved that old saying, "The road to hell is paved with good intentions," is true. Recycling companies in America were sending material such a cathode ray tubes to Hong Kong, where it was shipped to a small town to be disassembled and recycled. Workers toiled in an unsafe environment to remove some of the valuable materials by burning the plastics that it was incased in. Some of the toxic wastes that these computers contained were lead, cadmium, chromium, and polyvinyl chlorides. The effects of this living in this toxic environment range from brain damage, to kidney decease and cancer.

Streams are pitch black with industrial waste and a pungent smell hangs in the air. Some streams have acid baths in them and this is where children play. The ash burned e-waste blackens a nearby riverbed. The waste is strong enough to disintegrate a penny in only a few hours. Most of the people there have never used a computer but they spend their days processing high tech equipment from all over the world. They make only a few dollars a day but claim life is better than in the remote farming villages they come from. But most of the children tested for lead in

their blood and that could affect their I.Q. and the development of their nervous system.

More than 80% of all e-waste that is sent out by American companies ends up in places like China, India and Nigeria. The lax environmental concerns in these countries make it easier to place toxic components in those areas where it's dumped into fields and processed with crude equipment. The runoff from the burning plastics flows into the water supply and it literally make people sick. Exportation of e-waste from developed nations has been going unchecked for over a decade.

It's ironic that recycling is the green thing to do, but in this process it is providing a heightened health t risk to the poor people. Recycling is a business and there are people out to make money is first, and changing the environment for the better is a distant second. People are changing their computers and iPhones at an alarming rate, so it seems the flood of e-waste coming into small towns such as Guiyu will not stop soon. According to the EPA 3.412 million tons of e-waste was generated in 2012 and only 1 million tons or 29% was recycled. The recycling industry is already inundated with the 29% of the e-waste, it's ironic that if the recycling percentage goes up, there's a possibility that the additional e-waste will create other towns like Guiyu.

The Great Pacific Garbage Patch, or simply the Trash Vortex, as it is sometimes called is a collection of debris floating in the North Pacific Ocean. It's made mostly of plastic and other slow to degrade products. It's mixed with natural plankton, dead fish and mammals and the unfortunate birds that get tangled in this Texas sized soupy mess as it slowly swirls in perpetuity. Charles Moore, an american

oceanographer, believes that about 100 million tons of flotsam is contained in this heap. Another oceanographer and leading authority on flotsam compared it to a living organism, "It moves around like a big animal without a leash. The garbage patch barfs, and you get a beach covered with this confetti of plastic.

Green Computing – As noted, society's expanding use of computers has been cause for concern. The amount of power used to support the computer infrastructure and the heat generated is a great concern. Add to that, the problem of disposables such as paper and CDs posses yet another challenge. Much of this material ends up in landfills. Hazardous material generated by the production of computers is also being improperly disposed of. There's much attention being focused on energy usage and companies are starting to take measures to decrease their carbon footprint.

Green computing concerns itself with using computers in an environmentally friendly way. It seeks to reduce the amount of natural resources used in the production, use, and recycling of computers and related equipment. The U.S. Department of Environmental Protection Agency (EPA) introduced the **ENERGY STAR** program in 1992. It's a voluntary program that designates the product uses between 30% and 65% less energy, depending on use. Energy STAR labels appear on most electronics, major appliances and heating/cooling equipment.

Energy Consumption and Conservation – The increase in computers has put a strain on energy resources. Power consumption from servers has generated heat and in return the cost of cooling has increased. The industry has responded by using server virtualization, which helps reduce the cost of the enormous amounts of

energy used by servers. Powering down computers when not in use, desktop virtualization and cloud computing also have tremendous benefits. According to the EPA, a 10% decrease in energy consumption in a typical data center would save enough energy to power up 1 million homes per year.

Hardware manufacturers are working to develop more energy efficient products such as computers, servers, microprocessors, power supplies and other components. Some components are engineered to work on low power mode or simply turn off when not in use. Sometimes is does not take a whole lot of ingenuity to come up with a great idea for saving energy. A flat panel LED display saved 12% in energy consumption compared to and LCD display.

Alternate Power – Solar power is one of the mainstays of electronic equipment such as mobile phone, and portable computers. Solar power uses the sun's rays to convert sunlight into usable energy and then stores that energy in batteries. An improvement in solar technology has caused this alternate energy source to be adopted in more applications than ever before. Solar panels are being installed on computer laptops, cell phones, on cars and watches. Just think of anyplace that does not have reliable electrical power, those are the places and situations which the idea of solar power can thrive. Places and situations where solar power can be used are, hiking/camping, power outages, and emergency/disaster events. Solar panels provide Google with 30% of its energy needs at their Mountain View, California headquarters. Companies are also making computers greener. The hardware and packaging material are more recyclable; Dell

bans the use of chemicals such as cadmium and mercury. Some cell phones are also green, being made out of recycled plastics.

Wind Power – Many experts believe that wind power has the best chance of being fully adopted out of all of the alternative energy we have available. It may be in the best position to replace fossil fuel. The European Union has committed to use 20% of its electricity supply from renewable energy and much of that 20% will come from wind power. In America, that same goal is in site for the year 2030. President Obama stated in his 2011 State of the Union address that 80% of *all* energy should come from clean energy by 2035.

However, there are still many problems to overcome to insure goals are met. The wind is variable. According to data from the Met Office (Britain's national weather service) some of the past few months have been the least windy. And even if a record year of wind is recorded, the nature of wind, like the weather itself, can be widely unpredictable and therefore less dependable. Wind has to blow in specific areas at specific time and strength to be dependable and that is not a garmented to provide consistency. The physical and natural environment determines wind power, unlike coal plants or nuclear reactors.

The climate is projected to undergo significant change due to climate change. This is a direct problem for the reliance of wind power. When considering wind power, climate change has to be factored into the decision. Climate change could possibly could impact the entire wind energy industry.

Other problems persist. Even though most people support the use of renewable energy, residents living next to wind farms frequently oppose these

facilities. It may simply be a matter of scale; they are huge and take up many acres and could also be considered unsightly to some. Some expert's think that this opposition is based on inaccurate information proposed by opponents of wind farms. Wind farms in Australia have faced opposition by people who do not want their view obstructed by the giant wind turbines and they are considered an eyesore. The orange-bellied parrot, one of only 200 remaining on earth is held up as an example what is bad about wind farms. Studies have also shown that wind turbines kill a huge number of bats. At Altamont Pass Wind Resource Center in west-central California, where there are 5,400 wind turbines, a number of birds, including bald eagles, raptors, red-tailed hawks, and American kestrels, among others are killed by colliding with wind turbines every year.

The term "*Wind Turbine Syndrome"* was hypothesized in a self published book by Nina Pierpont. According to the book, symptoms such as headaches and dizziness resulted from turbines generating low frequency sounds. There is no solid proof that this disease is real but there is a heightened sense of dread, fear and annoyance from the people living near these wind farms. More research is needed for this relatively new technology. Of course, wind turbines are not the only technology that threatens our environment; dams built to control floods and provide electricity are have also left a negative effect on our natural world.