Extracting Gold in an

Efficient and Cheap Manner

## Report 1

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Technology is something humanity cannot exist without. It is a large part of many people’s lives. The media and society promote the idea where newer is always better, and we give in to this, and dispose of our old electronics and buy new replacements. Every year, the world generates and disposes almost 20 to 50 million metric tonnes of e-waste. This is equivalent to about 10 million cars, or about 153 CN Towers. The disposal of electronic devices is termed as ‘e-waste’. E-waste has become the largest growing factor of solid waste in the world. The average person living in Europe disposes about 20 kg of e-waste in a year, and in the United States it is about 7 kilograms of e-waste in a year. The amount of e-waste disposed per year is projected to increase. Recycling e-waste has been a major issue in recent years. One might think that because the amount of e-waste produced is increasing then the governments of the world would also use their power and financial support to aid the growth of collection and recycling of these harmful products.

As a result of the poor efforts from the political ranks, it is up to small business and not-for-profit organizations to devise a solution on how to go about this e-waste crisis. Stephen Foley is an entrepreneur, who has created a sustainable and inexpensive method with the help of his team to remove the gold from the electronic devices. Getting gold out of e-waste is one of the most tedious tasks of the process. The only methods that have been found are astronomically expensive and inefficient when compared to the method found by Stephen and team. Gold is one of the least reactive elements on Earth, which makes it very difficult to dissolve. That is why, it also lasts the longest and artifacts that are over 3000 years old still have gold on them. He and his team wanted to invest their time in harvesting gold.

There are only two methods in obtaining gold, the first being actually mining the ore from the earth, and the second, harvesting it from jewelry or electronic waste. The industry standards for removing gold is to either burn the electronic waste, known as pyro-metallurgy, or leaching chemicals such as cyanide, known as hydro-metallurgy. These two methods of gold removal are expensive and are harmful to the environment.

Pyro-metallurgy is a method mostly used in third-world country’s as it is fairly cheap. However, this burning process releases so many toxins that it can be fatal to the human body. Guiyu is a city in China. This city receives about 100,000 tonnes of electronic waste everyday. They use methods similar to pyro-metallurgy to extract the gold. Along with the burning of gold, the other parts of the electronic device are also burned. One major part of most electronic devices is plastic. When the plastic is burned it releases dioxins into the air, which is fatal to the human body. Due to these unregulated extraction, Guiyu has the highest levels of dioxins in the world. Furthermore, through all this release of dioxins, most of the residents living in Guiyu have some sort of mental disease, or have experienced neurological damage.

Hydro-metallurgy is a method that uses a strong concentration of acids to dissolve the gold. These chemical consist of cyanide or aqua regia, which is a mixture of concentrated nitric acid and hydrochloric acid. This process is very expensive, and poses many hazards towards the workers. In addition, the waste created cannot be reused or recycled.

Foley’s team uses one of the most common chemicals in the world, acetic acid, also known as vinegar. This solvent is almost as clean and green as water; therefore, it creates no waste. The cost to extract one kilogram of gold is $1520 using cyanide, and creates 5000 litres of waste. Foley’s method makes the cost to extract one kilogram of gold $66 and creates 100 litres of waste that can be reused again. This is an exceptional improvement from the industry standard.

Foley and his team initially planed to sell the gold that he obtains from electronic waste, and along the way they invented the best way to extract gold from electronic waste. His next goal is to move into the big leagues – in other words, use his gold extracting method on a larger scale. He says that with this method, they have opened up whole new frontier in the gold industry. They are now looking for industry partners to help them get their business flourishing.

# Bibliography

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