Source Evaluation #2

**Research Question:** How does cryptocurrency affect our global climate?

**Frame/focus:** Energy consumption and/or tradeoffs.

**Citation:**

Egiyi, Modesta Amaka, and Grace Nyereugwu Ofoegbu. "Cryptocurrency and climate change: An overview." *International Journal of Mechanical Engineering and Technology*, 20 July 2020, http://eprints.gouni.edu.ng/2575/.

**Information on the Author:**

Grace Nyereugwu Ofoegbu is a senior lecturer in the department of accountancy in the University of Nigeria, Enugu Campus. Her topics of study include financial reporting, taxation, management accounting, and auditing. She holds two master's degrees in accountancy, one from the University of Nigeria Nsukka and the other from the Enugu State University of Science and Technology.

Dr. Modesta Egiyi is a senior lecturer of accounting in Godfrey Okoye University of Enugu, Nigeria. Her expertise is in management accounting, budgeting, and costing. She has previously led studies on accounting information on stock exchanges, and taxation regarding economic growth.

**Summary of Paper:**

The purpose of this paper is to explore whether bitcoin mining has an impact on the global environment. The authors accomplish their explanation by dividing their paper into four distinct sections, each with its own header. The authors first explain how Bitcoin mining is known to take up a lot of resources and electricity, creating high electricity usage trends in certain countries. The authors then go into detail what exactly climate change is and focus on the idea of greenhouse gases. They explain that greenhouse gas is a factor in climate change and is most comprised of carbon dioxide. The third section connects how Bitcoin and cryptocurrency mining relates to greenhouse gases, as well as what exactly Bitcoin mining is. They include information on who is mining under what circumstances, as well as comparisons of equivalent energy usages. The last section is their conclusion, but also offers some solutions and recommendations to policy makers and cryptocurrency developers. They give warnings that bitcoin will be the greatest factor to global warming and how this will affect the public.

**Key Terms and Concepts:**

Bitcoin mining: Bitcoin mining, or any cryptocurrency mining, is when new units of bitcoin or said cryptocurrency are made. Highly efficient hardware and software is tasked with complex mathematical problems called hashes, and solving these problems rewards the miners with the cryptocurrency.

Greenhouse gases: Greenhouse gases are any type of gas that adds to the greenhouse effect. Specifically, it is a gas that absorbs infrared radiation, which includes carbon dioxide. Greenhouse gases trap heat in the atmosphere and actively warm up the planet.

Energy conservation: Energy conservation is the active prevention of wasting energy for futile or idle use cases. The authors discuss whether Bitcoin is such a case, and therefore should be a source of energy to abolish.

**Quotes, Paraphrases, and Analyses**

In one of the early sections of the paper, the authors explain just how bad Bitcoin mining is becoming. "[Bitcoin] is fast becoming a real-world environmental disaster. This assertion was based on the cost of the bitcoin mining process which consumed well over $150,000 worth of electricity in a day" (Egiyi and Ofoegbu 16). Recently, bitcoin is rapidly increasing the amount of greenhouse gases in our atmosphere. This is due to its electricity usage, which is run by plants that burn fossil fuels. The largest issue here is that bitcoin is indirectly being mined through burning fossil fuels. If Bitcoin was moved over to a power grid relying on renewable energy sources, e.g. geothermal, solar, hydroelectric, tidal, etc. there would no longer be an influx of greenhouse gas.

The authors also introduce solutions to the number of emissions that mining generates. "In order to effectively control the hazards of global warming and climate change, the emission of greenhouse gases into the atmosphere should be drastically reduced. This can be achieved by improving energy conservation and production as well as enhancing efficient utilization of non-fossil fuels." (Egiyi and Ofoegbu 16). The authors begin to move away from the software side of mining, which is the efficiency of calculation and breaking bitcoin hashes, and instead turn to specific energy sources. The authors claim that improving the efficiency of power usage, not the hardware, will yield significance for our climate. There is both a hardware/software and energy output side to this issue, but I believe that hardware is what links both. If the hardware was made to be more power efficient, this would lower the amount of carbon emissions generated. However, development in efficient power is parallel with efficient hardware processing, and so both development paths can be run simultaneously.

Lastly, the authors give a warning of sorts to the public and lawmakers of the effects of mining and what they can do to help.

Public, in general, should be responsible about their decisions on energy conservation methods. This will ensure a healthy atmosphere and stable climate for our future generations. Governments should devise and pass policies which encourage the energy companies and people, in general, to use renewable energy instead of conventional energy" (Egiyi and Ofoegbu 23).

Everyone should be made aware of the complications and effects of bitcoin mining. If humanity wants a cleaner and greener future, then they should begin taking steps to solve the bitcoin energy crisis. In addition, lawmakers should pass legislation to advocate renewable energy sources instead of burning limited and harmful fossil fuels. The authors give good reasons and warnings of the usage bitcoin mining, and this connects to earlier in their passage about how development should be made on the efficiency of power generation and usage of said mining computers.

**Synthesis**

Both this text and Stoll et al.'s *The Carbon Footprint of Bitcoin* touch upon points of Bitcoin mining and it's carbon emissions. One large connection is that both sources give forms of advice or solutions to the issue. Both sources urge legislation be made to regulate the amount of non-renewable energy that Bitcoin mining is allowed to use, though this source takes it one step further by connecting the public's health and concerns to the issue.

**Overall Evaluation of Source**

Overall, this is a strong source for my research project. The ideas and topics introduced in this paper can be applied to my question in many ways, including how mining works, how it uses energy, how much energy it uses, and solutions to use less non-renewable energy. The frame of the authors is change; they want the public and lawmakers to make a difference instead of letting Bitcoin's energy usage fly under the radar. However, there are some limitations to the source. One is that it does not fully explain how much energy Bitcoin has been using. There are figures and comparisons given, but this is not enough to make a sound explanation. Another limitation is that there is a focus on changing the energy sources or efficiency, rather than anything on the software, hardware, or economical side of cryptocurrency. The source is recent, published in 2020, and like the previous source I expect that the values of carbon emissions today are much higher than what the authors of this paper could have anticipated due to the pandemic. This paper includes a total of twenty-eight sources, including some technology journalism, other research papers and reports, and feature magazine articles. Some notable sources include the *Wall Street Journal* and *Bloomberg Opinion*, as it provides an economical lens. There is also information from government reports regarding greenhouse gas emissions, as the United States Environmental Protection Agency is a source. One question that I have after reviewing this paper is if there is already any legislation regarding Bitcoin in any country, and how it has fared; Bitcoin is a decentralized currency which makes it difficult to track and crate laws on.