

Investigates of CO2 Emission from ICT Devices in Linton University

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Abstract: Many natural and human factors have caused the in-balance of the energy retained within the atmosphere due to increased amount of GHGs. Factors such as burning of fossil fuels for energy and transportation, production companies of ICT devices, food processing plants, oil companies, generating plants and a host of others have added to the amount of GHGs. This research investigates into Linton University's role on the use of ICT devices and rate of CO2 emission from use of electricity. Use of electricity by ICT devices is also a source of CO2 emission but can however be reduced by these same ICT devices based on recent technology.

Keywords: ICT device, CO2 emission, green-house gasses

1. INTRODUCTION

The dynamic nature of technology today has affected the lives of so many individuals. So many people like to keep up to date with the rapid growing technology, this becomes necessary as a result of either succeeding in business, school, need for social infrastructures, personal hobbies, peer influence etc. On the average, most individuals are found to have a minimum of three electronic gadgets, most of which emits carbon dioxides. CO2 does not only contribute to the greenhouse effect, but also causes illusion in humans and constant headaches.

In addition, scientists have shown that there is a considerable amount of CO2 released from electrical gadgets while in use, which also contributes to the increase in the amount of GHG emitted into the environment. However, Linton University College uses electricity in almost every aspect of its amenities. Considering the vast number of people residing in the community, one can assume that the amount of electricity consumed will be very high, which is also directly proportional to the amount of carbon dioxide emission. Thus, it is imperative to know the amount of CO2 emission by the Linton Community, so as to see the need to reduce or control the rate of emission with a view to sustaining the environment we live in.

According to a blog dated July, 2012 titled "The Green Mechanics", Malaysia's average household electricity consumption annually is 3,012 kWh or 251 Kwh per month, which is translated to the release of 171.68 kg of CO2 per household in a month due to energy consumption. Thus, to estimate the amount of CO2 actually emitted in Legenda College is almost impossible as efforts to

know the monthly consumption rate of the college proves abortive. This is due to the fact that such information is not readily available.

In a similar vein, the use of electricity around the community is unregulated properly. Even though there have series of campaigns through flyers and banners around the college regarding conservation of water and electricity, it has still been observed that certain apartments live most of their electrical appliance turned on even while they away in their classes. This point out the fact that there is no proper awareness on the effects of prolonged use of electricity especially in relation to CO2 emission to the residents of the community.

The purpose of this research is to investigate the level of CO2 emission among ICT devices and its effect on global sustainability in Linton University College. Carbon dioxide or Carbon four Oxide also known as CO₂, used to be an essential element among the Green House Gases (GHG) which helped in stabilizing the earth's temperature. The temperature, which depends on the balances between energy entering and leaving the earth's system, is warm when energy by the sun is absorbed by the system and cooled, when energy is reflected back into space.

2. RELATED LITERATURE

The Irony of Energy Efficient PCs. Ana-Maria Tolbaru (2012), a German Scientist, in a recent study, said: "Upgrading old laptops is more energy-efficient than purchasing newer, 'greener' models".

In other words, the production of newer efficient laptops with the aim of replacing old ones, which are less energy efficient, causes more harm to the environment. "The german Oko-Institute study showed that the manufacturing part of information and communication technology (ICT) devices, such as notebooks or portable computers, counts for a very large part of the carbon footprint of the product, because the process is highly energy-intensive" (Tolbaru, 2012). The study also reveals that about 56% of total GHGs are emitted from the production of a notebook, which has a considerable higher impact than the use of that notebook.

If the lifetime of a notebook is assumed to be 5 years, 214 kilograms of carbon dioxide equivalents arise from its production and 138 kilograms or 36% from use of the notebook. Supposing a new notebook is 10% more energy-efficient than old one, the emissions arising from production, distribution and disposal would only pay back after 41years of use, the report said. However, if the energy efficiency improvement of the new notebook in the use phase is 70%, the amortization period could shorten to about 13 years (Tolbaru, 2012).

ICT Constitutes 2% of Global CO₂ Emission. According to a research by Booz Company in 2010, Danny Karam explains that: “it is clear that ICT usage by companies contributes significantly to the carbon footprint, which makes up about 2% of global CO₂ emission, about same level with the entire airline industry”. The research shows that “companies face pressures from enforced legislation and regulations, increasing energy costs, and customers’ demands for more sustainable products. IT departments in some companies respond by practically reducing the number of PCs in the organization, which however, is not enough to create a sustainable environmentally conscious program”, commented by Ramez T. Shehadi.

With the current number of PCs projected to double by 2014, and mobile voice and data traffic forecasted to rise, total ICT emissions are estimated for a 50 per cent increase by 2020. In view of this, many companies have a clouded view as to how IT can help reduce their carbon emissions. As a result, a carbon footprint reduction programme focused mainly on minimizing energy usage and non-recyclable waste in corporate IT departments known as “Greening IT” was established (Karam, 2010). Shehadi (2010) added that “creating a successful green IT strategy is extremely challenging, but the effort is well worth it, particularly when the green IT programme delivers cost savings and new potential revenue streams. Thus Booz & Company has developed a four-phased framework to keep the green IT programme on course and also enable overcome obstacles to its implementation”. These phases include: Diagnostic base lining, opportunity assessment, target state definition/blueprint, and green IT road map and business case.

3. CRITIQUE AND ANALYSIS OF DATA

In general, there are three basic types of data gathering that can be employed during any research work. This includes the use of questionnaire to a targeted audience, interviewing relevant bodies or individuals in the field of research and or observation by the researcher to obtain facts and figures of the research in question. However, the researcher employed the use of observation and investigation techniques for the purpose of obtaining data for this research, which will be analyzed below.

As mentioned earlier, the dynamism in technology has found almost everyone wanting. Common among students and staff of Linton College, most people have an average of 3 ICT devices. Even though some of these devices are modern and said to be energy efficient, they still consume a certain amount of energy which cannot be neglected at the long run. However, the amount of energy involved in the production of these devices is considered to be greater than that of the non-energy efficient devices. Therefore our demand for a better ICT is indirectly adding to the greenhouse gas effect.

The following policies and operational plan is developed so Linton University community will be able to sustain and maintain CO2 free environment:

- Use only devices with energy saving logo such as Energy Star, TCO label and ESR labels in school laboratories.
- Introduce virtual classes to the school curriculum to reduce excess use of electrical energy in laboratories.
- Create public awareness on CO2 emissions and encourage the use of energy efficient devices in school laboratories and staff offices.
- Only thin-client technology should be used to network computers in the laboratories and staff office.
- Invoke the use of multifunctional devices in offices such as the 3-in-one printers, as opposed to several separate devices.

4. RESULT AND DISCUSSION

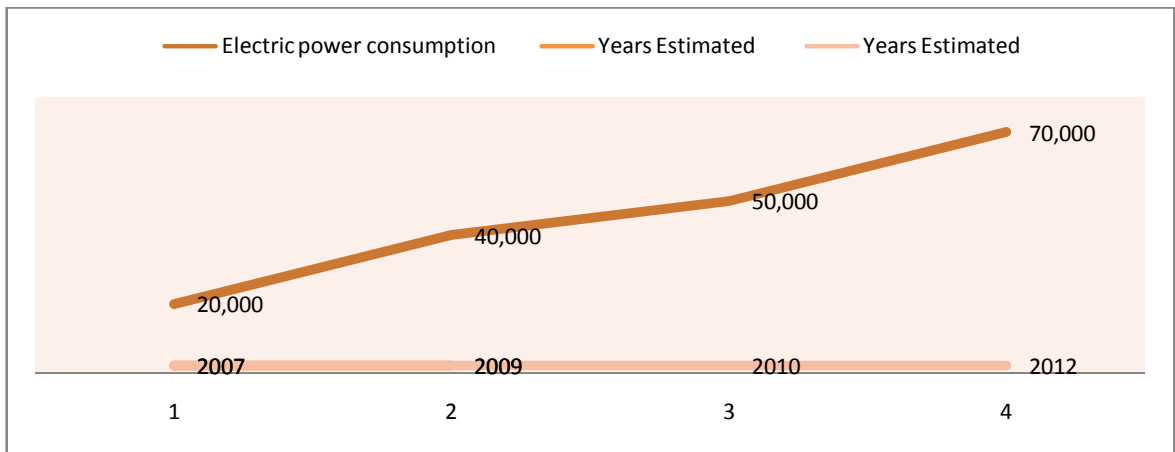


Figure 1. An estimated forecast on electricity consumption in Linton University College

From Figure 1, it clear realize that the rate of electricity consumption in Linton College per annum has increased drastically over the last 5 years. In other words CO2 emission has increased in an alarming rate over the past years.

It can observed with keen interest, the attitude of both students and employees of Linton University College towards the utilization of ICT devices and energy consumption of electrical appliances within the college.

Series of activities carried out by individuals within the Linton Community raises alarm as to the non-compliance with the move to reduce the emission of CO₂. Such activities as to the level of use of electricity through ICT devices are increasing almost on a daily basis. Drawn from observation, each individual has an average of 3 to 4 ICT devices that solely depend on electrical energy. Devices ranging from desktop PCs, laptops, smart phones, printers, photocopiers, televisions, air-conditioners, tablets etc. all rely on the electrical energy. Similarly, people rely on these devices to meet their academic, social and economic needs. Ironically, these devices are meant to ease the lives of its users but indirectly causing environmental health hazards to these same individuals.

Energy conservation is very important in environmental sustainability, particularly in terms of electricity use. However, this practice is to a large extent neglected around Linton College. In the laboratories for example, it has been observed that students are found with the negligence of leaving the computer systems on after use. In most cases these PCs remain on all through the weekend. This act of negligence is also found even among some staff offices. Studies have shown that there is vast amount of CO₂ emission from use of these ICT appliances while using electricity. About 0.684 kg of CO₂ is released from every 1KWh of electricity consumed (Blog: De Engineer, 2012). Therefore, calculating the total amount of CO₂ released from excess electricity usage plus that which is released from ICT gadgets, amounts to a great volume of CO₂ released, thereby harming the environment we live in.

Base on a survey conducted by the National Energy Foundation (NEF), about 18% of office workers never switch off their computers at the end of work or weekends, and a further 13% leave their PCs on in some nights weekly thereby producing about 700,000 tons of CO₂ (Postnote, 2008).

Similarly, the act of prolonged use of electricity is more pronounced in student apartments. Most students are fund of leaving their air conditioners, TV sets, PCs etc. on, almost on a 24 hours bases, consuming vast amount of electricity contributing to the already “CO₂ pregnant atmosphere” in which we live in. Thus, it is evident that, as surprising it may sound, Linton Community is unconsciously an agent of greenhouse gas emission.

An estimated electricity consumption by the college can be illustrated in the graph provided below: Even though CO₂ is an important element to the immediate human environment, its large volume in the atmosphere really calls for concern. Therefore, the following are some recommended solutions to reduce the rate of CO₂ emission from use of ICT devices in Linton University College.

- Encouraging or enforcing ground rules with regards to prolonged use of electricity in the students’ apartment.

- Use of energy efficient ICT devices in students' labs and staff offices will reduce the amount of CO2 emission.
- Introduction of virtual meetings and class lectures could reduce the use of electricity.
- Introduction of a network technology known as "thin-client" could also reduce excess electricity consumption, which also signifies reduced CO2 emission for electricity use,
- Students and staffs should be encouraged to switch off electrical appliances when not in use so as to conserve energy.
- Support upgrading of ICT devices to meet modern standard as opposed to buying newer 'greener' devices.
- Use of virtual databases such as cloud computing as opposed to large data centers should be encouraged
- Encourage the use of laptops as opposed to desktop PCs where the former only consumes one third of the energy consumed by the latter.
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5. CONCLUSION

Carbon dioxide (CO₂), a natural gas and an important element of the greenhouse gases, has profound importance in stabilizing the earth's temperature. Both natural and human activities today release a considerable amount of CO₂ into the earth's atmosphere. Today large amount of CO₂ present in the atmosphere has caused the effect on greenhouse gases. However, based on the research carried out, Linton University Community poses a great threat to the environment due to incessant release of CO₂ resulting from lack of conservation of electricity and large presence of ICT devices. Policies to check-mate these acts were silent as they are not being enforced properly by the authorities of the college. Furthermore, this situation is said to be peculiar to most organizations and households inclusive, pointing to the fact that CO₂ emission from ICT devices globally is not well checked, thereby raising a situation in terms of global sustainability which is very alarming.

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