

GLOBAL CLIMATE CHANGE AND REMEDY: GREEN COMPUTING

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Abstract: Time ago the climate was human-friendly because the human was environment-friendly, while both relationships decaying in the current scenario. There are enormous reasons behind, but in preference of modernization, we are more going towards the digital world, more technologies. Technology is a solution but it causes the problem also and one of the reasons for global climate change. Green computing and cloud computing can be two possible solutions.

Keywords: Green Computing, NComputing, Cloud Computing, IaaS

Introduction: It is the era of high technology, from weak to morning till sleep in a night, from age 4 to age 80 almost globe highly depend and highly habitual of technology. So the existence of high tech devices is high and at the same time, a lot required. Manufacturing of such devices causes a lot of carbon and cause of climate change that will discuss in section I in this paper. Further, the solution is Green computing discussed in section II, Green computing can be achieved by nanotechnology discussed in section III devices by saving energy one other solution of Green computing is cloud computing through IaaS model discussed in section IV, it can also achieve by NComputing discussed in section V.

A number of mobile users globally from 2013 till 2019 is 5.07 billion. Predictably a number of mobile phone users will cross five billion by 2019. In 2016, an estimated 62.9 % of the population globally owned a mobile phone. It is growing rapidly, will be around up to 67 % by 2019.

Around 2014, 38% of all users. Around 2018, this number is expected to arrive at over 50%. A number of Smartphone users may grow by one billion globally within five years, in other words, Smartphone users in the world may reach up to 2.7 billion by 2019. Samsung and Apple are leading Smartphone vendors, with about 18 % of the market divide each.[1]



Fig 1. Number of mobile phone users globally from 2013 to 2019 (in billions)[1]

Manufacturing of high tech devices causes a lot of CO₂ which cause increase the Earth temperature by about 6 degrees +/- 2 degrees, Increase in sea level and of melting of ice caps making coastal plains not fit to live in, Agricultural productivity also affected due to global climate change, ozone layer depletion, weather change rapidly systems could occur due to warmer climate causes more floods and stronger storms and extremes of weather, increase of diseases due to increasing temperatures which would have otherwise been contained due to cold weather, A major change to ecosystem could occur with most organisms moving towards the North and South pole.

II. Green Computing[2][3]

Green computing meaning maximum reusability of computing resources and reduce energy consumption to reduce CO₂ emission. Green computing practices came into being in 1992, by the Environmental Protection Agency (EPA) in the Energy Star program. Today almost all streams machines which consume a lot power. Green computing to reduce the use of hazardous materials and maximize energy efficiency it also promotes the recyclability or biodegradability of defunct products and factory waste.

Data centers usually need high energy, by using the concept of Green Computing Data centers can significantly save their

energy and space efficiency through technique such as storage consolidation and virtualization. Which results in saving energy. The U.S. federal government has already set a minimum 10% reduction energy target for data center usage by 2011? With aid of a self-styled ultra efficient evaporative cooling technology, Google Inc. is able to minimize energy use to 50% of that of the industry.

To create energy efficient scenario using Green Computing [2].

- Energy-demanding manufacturing of computer parts can be minimized by making the development process more efficient by replacing petroleum- filled plastic by bio-plastics plant-based polymers need less oil and energy to produce than customary plastics with a challenge to keep these bioplastic computers cool so that electronics won't melt them.
- Around 10% of energy can be saved by replacing hard drives with solid-state, or flash, memory, which has less watt-using moving parts.
- A recommendation is also to employ a low power desktop or a laptop computer (40-90 watts) then a higher power desktop (e.g. 300 watts).
- Computer power supplies are about 70-75% efficient; to produce 75W of DC production they require 100 W of AC input and melt the remaining 25 W in heat.
- For desktops, get a low power central processing unit (CPU). This reduces power consumption and cooling necessities.
- Buy hardware from manufacturers that have a hardware recycling scheme, and recycle your old computer equipment rather than sending it to landfill.
- Enable hibernation with the power management settings. It saves more energy than standby.
- Use PC or laptop for a long time up to 4-5 years. This reduces resource and energy consumption associated with the manufacture and distribution of PCs by 40%, compared to replace PCs every 3 years which is current corporate observe.
- Avoid an unnecessary operating system version upgrade which requires a hardware upgrade.
- Use Linux, requires fewer resources than many other operating systems on an older computer as an extra or a file server.
- Server Virtualization is also causing save energy

III. Nanotechnology [4]

Nowadays neon technology is widely used in mobile phones, to save energy nanotechnology equipped devices to have good battery power. Thin, efficient and high-performance devices are being introduced very often into the electronics market. These devices have been more reliable in processing data.

Applying nanotechnology to electronics helps in reducing the size of chips and helps to increase memory. Presently, researchers and scientists are functioning vigorously in developing organic computers, which is supposed to store and process data just like the human brain without the involvement of another electrical device.

The main goal of nanotechnology is, therefore, to fabricate or manufacture devices on a much smaller scale with high performance and efficiency in the analyzing and processing of data that less energy consumption devices reduce CO₂ emission and help to control global climate change

IV. Cloud Computing [5]

Cloud computing combines several computing concepts and technologies of Internet creating a platform for more responsive and cost-effective business applications and IT infrastructure. Cloud services are usually divided into the three main types, Software-as-a-Service (SaaS), Platform-as-a-Service (PaaS) and Infrastructure-as-a-Service (IaaS). All cloud IaaS model based on Virtualization of resources and help for Green computing, an example of IaaS is Amazon EC2 and Windows Azure which is very popular.

Amazon Elastic Compute Cloud forms a central part of Amazon.com's cloud-computing platform, Amazon Web Services, by such users can use rent virtual computers on which he/she can run their own computer applications[6].

Microsoft Azure is a cloud computing service created by Microsoft. Use of such service is for building, testing, deploying, and managing applications and services from side to side a global network of Microsoft-managed data centers[7].

Example of PaaS model is Google App Engine, it is a web framework and cloud computing platform for developing and hosting web applications in Google-managed data centers. Applications are sandboxed which run across multiple servers [8].

Example of SaaS like FaceBook or youtube. All cloud models are energy saving models virtualization concept and help in Green Computing and in controlling Global Climate change.

V. NComputing

NComputing virtualization company for desktop it manufactures hardware and software and creates virtual desktops which allow multiple users to simultaneously share a single operating system and instance. By Such scenario requirement of the actual system is reduced and also save energy and CO₂ emission, it is an also way to implement green computing

If NComputing systems were used at a ratio of 6 NComputing devices to each PC:

- Energy saving around 143 billion kilowatt-hours per year
- CO₂ emissions decrease around 114 million metric tons. Similar to planting 550 million trees.
- E-waste also reduced up to 7.9 million metric tons

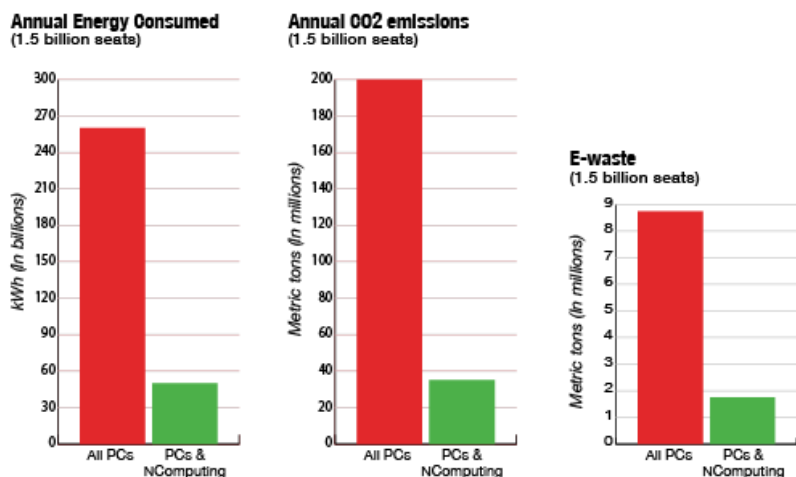


Fig2. The benefits of green computing. number of PCs approaches 2 Billion by 2015, the possible savings related to power use, CO₂ emissions and e-waste are indisputable.

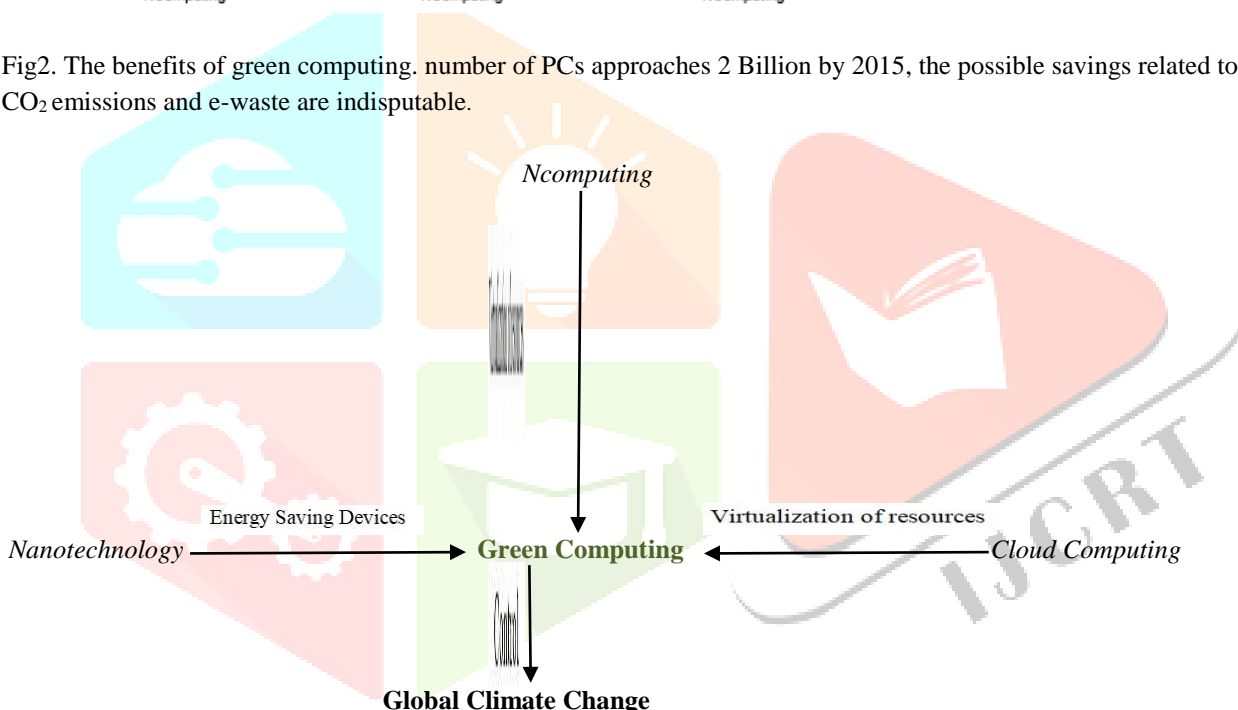


Fig 3. How Green Computing Contribute to controlling Global Climate Change.

Conclusion: Rapidly climate is changing in entire globe and affecting all lives, and also almost lives are reason of climate change, an era of modernization and high-tech devices their manufacturing emits CO₂ causes global warming, Green Computing is a way in controlling in Global Climate Change, some methods like NComputing, Cloud Computing, Nanotechnology is helping to achieve Green Computing change to stable climate conditions

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