

# THE FUTURE OF GREEN IT

WHITEPAPER



# Abstract

Green IT is a recent innovation aimed at improving designs, hardware and operating computer systems to be energy efficient. Green computing has moved from just a research topic to the actual deployment of energy saving techniques for computers and IT infrastructure. It has become imperative for companies to adopt eco-friendly energy optimization for their data centers and It infrastructure. The emphasis of this study is to understand what is Green IT, how can business incorporate these strategies into their product lifecycle in all the sectors to achieve green computing, equipment recycling via virtualization, power management and green manufacturing ultimately reducing their carbon footprints in order to protect the environment.

## What is Green IT?

The process of manufacturing using and disposing of PC hazardous material, servers, & other hardware in an eco-friendly way is called Green IT. A computer or IT infrastructure which complies with Green IT tries to bring down the environmental impact of the entire process such as designing, manufacture use and disposal to minimum. A green computer is created to perform without exploiting the environment. Computers consume a lot of natural resources such as raw materials required to manufacture them, power to run them and also hazardous side waste products. A green initiative is considered to reduce the counter effects in every aspect of a computer's life from design to disposal. Green IT basically refers to the study and practice of using computers and IT infrastructures in a more efficient and eco-friendly way.

## Why should businesses care?

All the businesses are nowadays largely dependent on technology. Since the work is completely done on the PCs, notebooks, smartphones, and it is connected to servers which are running 24/7. Since the technology is ever changing and fast, there is constant need to upgrade old devices or replace them with new ones.[3] This process causes most of the businesses ultimately waste valuable resources. Since it also helps businesses to save on these resources, it only makes sense to green your IT environment and culture. To promote green computing and help environment, companies can get products with eco-label. Certificates can be given to IT products based on factors including design for recycling, recycling system, noise energy consumption etc. [3]

Cost savings are a major reason why Green IT is gaining momentum. The motivation for companies to go green is the reduced expenses on equipment, energy, paper, and ink.[3] The environmental regulations created to address the climate change are causing businesses to adopt green friendly means. For the businesses to be a part of Green IT revolution as well as to grow revenue, it is necessary for them to adopt green technology by means of supplying and servicing energy efficient equipment.[3] Customers also like to be associated with companies which take charge of green initiative and show they are responsive to combat climate change and global warming. [3]

## Key takeaways

What is Green IT?

Why should businesses care?

How could businesses apply Green IT?

Future trends on green computing

Challenges

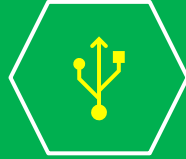
Conclusion



# How could businesses apply Green IT?

## Reduce environmental waste and buy energy efficient hardware

The first step would be evaluating the electronic waste and how eco-friendly we can dispose them off.[4] A typical computer consists of a kilogram of lead and several dangerous chemicals. Trading with hardware vendors meeting the EPA's energy star guidelines with low power consumption. There are systems which have good EPEAT ratings which are set by IEEE to measure "environmental performance."



## Virtualization technology

Reducing the number of physical servers and hence the power consumption by using virtualization technology of running multiple virtual machines over a single server. The power savings can be increased threefold and decrease energy costs as much as 80 percent.



## Green IT purchasing and power management technology

Evaluating company needs before purchasing new equipment should be done carefully and investments should be driven towards green IT products. While ordering monitors select LCD monitors which use less energy.[5] Encourage use of laptops over heavy desktop models. The advanced operating systems running on ACPI-enabled systems have power saving features which can be used to configure hardware to power down during inactivity. Optimization of computers' energy consumption can be done by gaining flexibility and control via third party power management products.



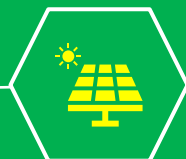
## Green Intentions by the organizations

The organizations can start by communicating intentions to adopt an eco-friendly IT infra within the organization. Everyone needs to be involved so that the motivation for the energy efficient work environment is created by a collaboration between various departments.



## Optimize data center design

The data centers consume enormous energy. Using energy-efficient power supplies, low-powered blade servers can save energy. Using alternative energy technologies like photovoltaics, evaporative cooling optimizes data center energy consumption. Catalytic converters on backup generators minimize the footprint of the buildings themselves.



## Green IT Compliance Assurance

Once the intentions are set and to put the ball in motion the organizations should form a committee exclusively to make sure they are acquiring all energy efficient IT infrastructure for the company. This team should ensure that all the green initiative criteria that is taken into consideration to protect the environment are met by these products.



## Recycle systems and supplies

To lessen the burden on already overtaxed landfills and avoid sending hazardous materials to those landfills, old systems can be reused or recycled. The high end workstations may be required by an engineer, the old computer can be adequately used by the one working on spreadsheets and less intensive tasks, hence the IT systems can be repurposed within the organization instead of steady purchase of new workstations. And the ones completely not used by companies can be donated to schools and NGOs.



## Carbon footprint generated by IT products

There should be a carbon footprint reference point. The carbon footprint brought in by IT services is crucial information that should be known and acknowledged by the company. There should be measures taken to lower the footprint by checking the power usage in the IT center and keeping it within the limits of the existing power efficiency standards and metrics for the industry.



## Business process enhancement through Green IT policies

Even if we are engaging in green IT initiatives that does not mean we cannot align it with our business goals. We have to ensure that our green IT goals also complement our business goals. Also, everyone needs to be involved in the initiative so that we introduce eco-friendly computing in all the horizontal and vertical aspects of our business.

## Monitoring and continuous optimization

The results of green initiatives, comparison of this data with the benchmarks and metrics set for the company should be continuously monitored and optimization is required to achieve green IT results and reduce the carbon footprints of the company.

# Future trends in green computing

The primary focus of Green IT is to reduce carbon footprints as well as organization's self interest in energy costs in IT infrastructure. This motivation also gives rise to the numerous innovations to align with corporate social responsibility with the focus on improved energy use in IT infra. Some of the efforts are as follows:

## Cloud computing

Cloud computing has received significant attention over the years as a means of improving the utilization of data center resources. It is energy efficient, provides potential energy savings, also does not require hardware infrastructure and is good in terms of system operation and networking aspects as well. It is a better resource utilization which is an excellent source for sustainability and green IT.

## Certifications

There are several proactive organizations evaluating green technology and providing certificates to green technology. Vendors are selected based on their product quality, how eco-friendly are they, life of the product and recycling capabilities. In future with government regulations and compliance would mandate vendors into using green technology and get certified as an eco-friendly vendor.

## Challenges

The only focus for developing Green IT was on computing efficiency and reducing costs. But with the ever-growing needs of the IT infrastructure in almost every field, there is a huge demand of growing computing needs, which also has led to ever growing energy consumption and global warming. The demand of processing power is more as compared to the drive of being environment friendly. [6] Also even if there are cost benefits in the long run, but there is a significant investment at present. For instance, the use of solar panels would give save money on the energy bills, but it would alone cost a hefty amount to install the panels. With the rapid change in technology, inventing new eco-friendly IT product requires time and cost which at the end cannot cope with the changing technologies.

## Conclusion

With the ever-growing needs of computers and IT infrastructure, there is also a depletion in resources required to power these devices. However, computing developments can also provide solutions to businesses to adopt a greener way to ensure power savings and protecting the environment.[6]The IT industry is far more prepared than any other industry to face the ever-growing rapid changes in trends, however it does not mean that it cannot incorporate the greener ways to accelerate around these changes.[6] IT industry is the crucial part of the sustainability program because of the amount of energy it consumes, number of e-waste that is generated and the number of hazardous wastes that needs to be properly disposed of or recycled. Although there are barriers that needs to be overcome, in the long run for a greener and sustainable future proactive action are required and Green It is the first step towards it.



## Data compressions

In enterprise there is always a huge amount of data which is redundant and duplicate which also gets stored in the backup system. Intelligent compression system techniques can be used to compress such data and get rid of redundant and duplicate data.

## Green IOT

IOT connects everything in the world via help of software and hardware making it a smart technology, thus also giving rise to consumption of loads of energy. Green IOT would make way for a hardware solution which consumes less energy without reduction in performance while software solutions offering efficient designs which minimizes utilization of resources. In addition, power saving virtualization should be implemented.

## References

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