

Why Green Technology is Needed?

Mrs. Tejashri Prashant Jadhav

Hirwal Education Trust's College of Computer Science and Information Technology, Mahad-Raigad, India
tejashrichavan578@gmail.com

Abstract: *Green technology, commonly referred to as clean technology, is crucial for resolving today's environmental issues. It comprises integrating technology into production processes that are focused on sustainable energy. "Green technology" refers to the use of science and technology to the creation of ecologically friendly products and services. This category of green technology encompasses several breakthroughs in sustainable development, waste management, and environmentally friendly generation of renewable energy sources. Both carbon emissions and the effects of climate change are mitigated. It also lessens our influence on the environment, improving the health and sustainability of the planet.*

Keywords: carbon footprint, green products, sustainable energy, and clean technologies

I. INTRODUCTION

The origins of the term "green IT" may be traced back to 1992, when the U.S. Environmental Protection Agency (EPA) launched the Energy Star voluntary labeling scheme, which identifies items with improved energy efficiency. Companies and individuals can save costs and their carbon footprint by using IT solutions that bear the Energy Star certification. As a result, guidelines, a product registry, and Environmental Assessment Tools were provided by the EPA to aid in the development of the Electronic Product.

Importance of green IT

Green IT is important for several reasons, including the following three:

Climate change. Enterprise IT emits a lot of greenhouse gases and contributes to climate change. Businesses must track and reduce their emissions as well as various types of toxic electronic waste that pollute the environment. Green IT approaches can be a useful part of broader climate strategies in companies.

Compliance. Businesses are increasingly under pressure from governments and the public to reduce their environmental impact. Green IT makes more efficient use of resources, reducing waste and emissions and improving recycling rates. This helps businesses comply with government regulations.

Competitive advantage. Green IT can be a component of environmental, social and governance initiatives in companies, and many now use ESG reporting to disclose green IT practices. Positive ESG performance is attractive to customers, prospective employees and investors. IT organizations often include ESG practices as purchasing criteria when choosing information and communication technology.

Benefits of green IT

Green IT offers the following social, environmental and business benefits:

Reduced emissions. Decreasing carbon emissions helps improve the environment. To limit global warming, worldwide emissions must be reduced by 7.6% every year to 2030, according to the United Nations.

Less waste. Reusing and refurbishing IT equipment is a more environmentally friendly -- and potentially cheaper -- option for product acquisition. It's also part of the circular economy, which eliminates waste and improves supply chain resiliency. Circular economy models can also involve servitization, where companies sell products as a service and manage the maintenance and end-of-life processes for customers.

Extended maintenance periods. Reusable, green IT products allow for longer maintenance cycles and less frequent device replacement.

Cost savings. Using more energy-efficient technology to reduce energy consumption helps a business reduce its energy bill and carbon footprint.

Raised awareness. By using green IT methods and reporting on their use, businesses set an example in their industries and foster collaboration with other companies on climate initiatives.

Improved corporate culture. Green IT demonstrates to employees that they work for an ethical company, which can improve employee morale and retention. Increasing sustainability through the use of green technology also presents opportunities for more efficient ways of working.

More sustainable product design. Having green IT goals encourages vendors to design environmentally friendly technologies and approaches.

Improved reputation. Green technology use creates a good public image, improving a company's brand perception.

Increased customer satisfaction and loyalty. Many customers want to do business with socially responsible companies that make sustainability a key part of their strategies.

Green IT offers the following social, environmental and business benefits:

Reduced emissions. Decreasing carbon emissions helps improve the environment. To limit global warming, worldwide emissions must be reduced by 7.6% every year to 2030, according to the United Nations.

Less waste. Reusing and refurbishing IT equipment is a more environmentally friendly -- and potentially cheaper -- option for product acquisition. It's also part of the circular economy, which eliminates waste and improves supply chain resiliency. Circular economy models can also involve servitization, where companies sell products as a service and manage the maintenance and end-of-life processes for customers.

Extended maintenance periods. Reusable, green IT products allow for longer maintenance cycles and less frequent device replacement.

Cost savings. Using more energy-efficient technology to reduce energy consumption helps a business reduce its energy bill and carbon footprint.

Raised awareness. By using green IT methods and reporting on their use, businesses set an example in their industries and foster collaboration with other companies on climate initiatives.

Improved corporate culture. Green IT demonstrates to employees that they work for an ethical company, which can improve employee morale and retention. Increasing sustainability through the use of green technology also presents opportunities for more efficient ways of working.

More sustainable product design. Having green IT goals encourages vendors to design environmentally friendly technologies and approaches.

Improved reputation. Green technology use creates a good public image, improving a company's brand perception.

Increased customer satisfaction and loyalty. Many customers want to do business with socially responsible companies that make sustainability a key part of their strategies.

Green IT techniques reuse and refurbish old equipment as well as reduce electronic waste.

Challenges of Green IT

There are many potential barriers to implementing green IT successfully, including the following:

Cost. The initial cost of implementing new green technologies and programs can be expensive. Revamping old legacy IT systems can also be costly.

Cultural pushback. Implementing green IT can require new ways of working, which might meet internal resistance and create issues with customers and suppliers.

Prioritization. It can be difficult to decide where to start on implementing green IT. At every level, IT uses energy, so it can be hard to pick which systems to address first.

Conflicting initiatives. In some cases, technology that purportedly reduces emissions can also have a negative environmental impact. Virtualization and artificial intelligence (AI) are examples of technology that can both help and hurt sustainability goals. For instance, AI can provide detailed insight into energy use and other sustainability factors, but AI technology also consumes a lot of energy.

Emerging fields. Some areas of green tech are relatively new and have few best practices. Development of green software is one of these emerging fields.

Ways to Develop Green Environment

To start implementing green IT or sustainable computing, below are a few ways to start;

Copyright to IJARSCT

www.ijarsct.co.in

Green Energy Production

The main function of green energy is to produce electricity and fuel through the use of renewable, naturally occurring energy sources. Green technologies are being invented and refined on a consistent basis to make better use of recurring resources and harness their power in hopes of replacing fossil fuels and destructive production manners entirely.

Current widespread methods of green energy production include the following:

Solar

Solar panels, combined into a tower, placed in a field or affixed to a roof, are used to convert sunlight into electrical energy through photovoltaic components or mirrors that concentrate solar radiation.

Biogas

Produced during the breakdown of organic matter when oxygen is absent, biogas is primarily composed of methane and carbon dioxide. Biogas can be compressed once carbon dioxide is removed and used to power motor vehicles. Technology is developing to further harness these gasses to reduce fossil fuel use on a larger scale.

Geothermal

Geothermal energy is produced by harnessing the Earth's heat just feet below the surface. Temperatures increase by approximately 1°F every 70 feet, so heat pumps and geothermal systems can be used to harness this energy for powering and cooling indoor spaces and water.

Biomass

Biomass can be chemically converted into liquid fuel or oil, creating products typically made from petroleum that generate electricity or facilitate transportation.

Nuclear Power

Nuclear power is a zero-emission clean energy source that produces power through fission, splitting uranium atoms for energy. Heat released by fission creates steam that spins a turbine and generates electricity. Nuclear energy production successfully eliminates the harmful byproducts emitted by fossil fuels, possesses a minimal footprint and produces little waste.

Low-Impact Hydroelectric

Utilizing dams, mills, stream-reach applications and other technologies, low-impact hydroelectric systems extract energy from moving water. Though the energy produced is clean, existing hydroelectric systems can be damaging to local ecosystems, so new infrastructure is needed to reduce the impact of harnessing this energy.

Recycling and Upcycling

Another massive component of conservation and sustainability is recycling, and by extension, upcycling. These industries are also ideal candidates for being optimized and streamlined by technology companies such as TerraCycle, Routeware, Avangard Innovative and RoadRunner Recycling.

Recycling

Recycling is the result of cradle-to-cradle design and is defined as reusing any item after fulfilling its initial purpose. It can be as simple as reusing a jar as storage or taking aluminum cans to a local recycling facility.

Upcycling

Upcycling is a form of recycling that refers to reusing an item for a purpose other than its original purpose, including combining or transforming items to form something entirely new. A good example of upcycling is cutting a glass bottle in half and painting it to create a decorative vase.

Composting

Composting has been used for centuries as a way to turn organic waste of all kinds into nutrient-rich natural fertilizer for the earth. During the composting process, bacteria work to break down and decompose waste into simpler compounds that are filled with microorganisms and nutrients, enriching soil and facilitating healthy plant growth. Composting can be done in large and small quantities, whether on a farm or at home.

Electric Vehicles

The introduction of hybrid vehicles, and recently, fully electric vehicles, at a large scale reduces the heavy burden of fossil fuel pollution produced by gas vehicles every day. It's projected that 45 percent of new car sales will be electric by 2035, according to industry analysis IHS Market.

Lithium-ion Batteries

Lithium batteries have become standard in the majority of portable electronic devices to hit the market. These batteries are rechargeable and able to be reused multiple times, unlike alkaline batteries. The downside, however, is that lithium batteries can present fire risks and contain heavy metals that do not break down. Alkaline batteries do not possess these metals but must be replaced more often, creating excess inorganic waste.

Cloud Storage

Computers, hard drives and home or office servers can consume massive amounts of electricity and require non-renewable resources, but thanks to advancements in technology, computing has become more efficient. One of the most impactful innovations was the creation of cloud storage, which enables users to store nearly unlimited amounts of data on superpowered third-party servers built to ensure security and fast access from anywhere. This eliminates the need for having massive amounts of power or storage on hand and consolidates these power-drawing computing networks to a limited number of distributed locations.

Smart Power Bars

Computers and other home appliances can still draw massive amounts of power, even when not in use. Smart power bars combat this by featuring specially designed outlets that restrict the power being used unless the outlet registers an “on” signal from the appliance.

Programmable Thermostats

These thermostats can be controlled by smartphones to change the temperature of a home at any time. Reducing heat or shutting off air conditioning reduces the use of fossil fuels and electricity, leading to lower monthly costs and better preservation of crucial resources.

Encourage Sleep Mode

Office workers underestimate using sleep mode on device energy consumption. While it’s true it doesn’t reduce energy consumption considerably right away, the energy it saves gradually accumulates. After a year, the amount of energy saved can be considerable. Especially across large offices or businesses with lots of work stations.

A standard computer consumes an average of 200 watts of energy. This is reduced to 8 watts with sleep mode activated, when not being used. So sleep mode cuts computer energy consumption by 96%. A challenge to implementing this practice is getting employees involved at scale. For this reason, it’s best to introduce this practice during onboarding to make it standard practice.

Use Power Strips

To reduce energy consumption further, investing in power strips can provide great ROI. Across a workplace, even when in sleep mode, devices still consume energy. Experts call this vampire load. One way to reduce or eliminate vampire loads is to turn off devices. That may prove difficult, given the amount of computers or devices in a typical office. With a power strip, quickly turn off multiple electronics at once when not in use.

Research has found that power strips can cut down on electricity usage by up to a considerable 48%. The only issue with using power strips is that they can become a mass of messy cables, if not handled professionally. To avoid this, you can seek assistance from experts. If you’re situated in somewhere like the U.K, local companies can look into IT support in London by Computers In The City as an option for professional cable management and IT setups.

Go Paperless

one of the best ways to improve the sustainability of a workplace is by going paperless. Use technology to reduce the use of paper for things such as documents, fax and more. To go paperless, here are a few pointers:

Store files and documents in the cloud. You’ll have digital copies of your paper documents which will enable you to save your files in cloud storage

Use digital notepads for notetaking

Cease printing presentations

Copyright to IJARSCT

www.ijarsct.co.in

Use instant messaging or email instead of traditional mail
Use electronic signatures for transactions.

Invest in Energy Efficient Equipment

most individuals and business owners go for products that boast high durability, features and affordability. Whilst reasonable, energy efficiency is important for a sustainable environment and can also save costs. Check Energy Star ratings to see how devices or equipment compare on energy consumption.

II. CONCLUSION

This research paper concludes about what is meant by green technology and why there is a necessity of green technology in today's era. Also, it gives us an idea regarding various benefits of a green sustainable environment, its different challenges. In the above research paper, we get an idea regarding how to develop a green environment.

REFERENCES

- [1]. https://www.researchgate.net/publication/360522738_Green_IoT_Sustainability_Environment_and_Technologies
- [2]. <https://www.mdpi.com/2073-8994/15/3/757>
- [3]. https://www.researchgate.net/publication/360522738_Green_IoT_Sustainability_Environment_and_Technologies
- [4]. <https://www.netguru.com/blog/what-is-greentech#:~:text=Green%20tech%20is%20the%20use,towards%20a%20more%20sustainable%20future.>
- [5]. https://www.investopedia.com/terms/g/green_tech.asp
- [6]. <https://blogs.nvidia.com/blog/2022/10/12/what-is-green-computing/#:~:text=Green%20computing%2C%20or%20sustainable%20computing,software%20are%20designed%20and%20used.>
- [7]. <https://www.techtarget.com/searchdatacenter/definition/green-computing>
- [8]. https://en.wikipedia.org/wiki/Green_computing