PRACTICAL 2

Introduction:-

Green computing is the environmentally responsible and eco friendly use of computer and their resources **Green computing**, **green ICT** as per International Federation of Global & Green ICT "IFGICT", **green IT**, or **ICT sustainability**, is the study and practice of [environmentally sustainable](https://en.wikipedia.org/wiki/Environmentally_sustainable) computing or IT.

The goals of green computing are similar to [green chemistry](https://en.wikipedia.org/wiki/Green_chemistry): reduce the use of hazardous materials, maximize [energy efficiency](https://en.wikipedia.org/wiki/Efficient_energy_use) during the product's lifetime, the [recyclability](https://en.wikipedia.org/wiki/Recycling) or [biodegradability](https://en.wikipedia.org/wiki/Biodegradation) of defunct products and factory waste. Green computing is important for all classes of systems, ranging from handheld systems[[1]](https://en.wikipedia.org/wiki/Green_computing" \l "cite_note-1) to large-scale data centers.[[2]](https://en.wikipedia.org/wiki/Green_computing#cite_note-ReferenceGCS9-2)

Many corporate IT departments have green computing initiatives to reduce the environmental effect of their IT operations.[[3]](https://en.wikipedia.org/wiki/Green_computing#cite_note-3)

In 1992, the [U.S. Environmental Protection Agency](https://en.wikipedia.org/wiki/United_States_Environmental_Protection_Agency) launched [Energy Star](https://en.wikipedia.org/wiki/Energy_Star), a voluntary labeling program that is designed to promote and recognize the [energy efficiency](https://en.wikipedia.org/wiki/Efficient_energy_use) in monitors, climate control equipment, and other technologies. This resulted in the widespread adoption of [sleep mode](https://en.wikipedia.org/wiki/Sleep_mode) among consumer electronics. Concurrently, the Swedish organization TCO Development launched the [TCO Certification](https://en.wikipedia.org/w/index.php?title=TCO_Certification&action=edit&redlink=1) program to promote low magnetic and electrical emissions from [CRT](https://en.wikipedia.org/wiki/Cathode_ray_tube)-based [computer displays](https://en.wikipedia.org/wiki/Computer_display); this program was later expanded to include criteria on energy consumption, [ergonomics](https://en.wikipedia.org/wiki/Ergonomics), and the use of hazardous materials in construction.[[4]](https://en.wikipedia.org/wiki/Green_computing#cite_note-4)

Many [governmental](https://en.wikipedia.org/wiki/Governmental) age cies have continued to implement standards and regulations that encourage green computing. The [Energy Star](https://en.wikipedia.org/wiki/Energy_Star) program was revised in October 2006 to include stricter efficiency requirements for computer equipment, along with a tiered ranking system for approved products.[[6]](https://en.wikipedia.org/wiki/Green_computing#cite_note-6)[[7]](https://en.wikipedia.org/wiki/Green_computing#cite_note-7)

By 2008, 26 US states established statewide recycling programs for obsolete computers and consumer electronics equipment.[[8]](https://en.wikipedia.org/wiki/Green_computing#cite_note-8) The statutes either impose an "advance recovery fee" for each unit sold at retail or require the manufacturers to reclaim the equipment at disposal.

In 2010, the [American Recovery and Reinvestment Act](https://en.wikipedia.org/wiki/American_Recovery_and_Reinvestment_Act) (ARRA) was signed into legislation by President Obama. The bill allocated over $90 billion to be invested in green initiatives (renewable energy, smart grids, energy efficiency, etc.) In January 2010, the U.S. Energy Department granted $47 million of the ARRA money towards projects that aim to improve the energy efficiency of data centers. The projects provided research to optimize data center hardware and software, improve power supply chain, and [data center cooling technologies](https://en.wikipedia.org/wiki/Computer_cooling).[[9]](https://en.wikipedia.org/wiki/Green_computing#cite_note-9)

* [Climate Savers Computing Initiative](https://en.wikipedia.org/wiki/Climate_Savers_Computing_Initiative) (CSCI) is an effort to reduce the electric power consumption of PCs in active and inactive states.[[10]](https://en.wikipedia.org/wiki/Green_computing#cite_note-CSCI_pressrel_launch-10) The CSCI provides a catalog of green products from its member organizations, and information for reducing PC power consumption. It was started on 2007-06-12. The name stems from the [World Wildlife Fund](https://en.wikipedia.org/wiki/World_Wildlife_Fund)'s Climate Savers program, which was launched in 1999.[[11]](https://en.wikipedia.org/wiki/Green_computing#cite_note-11) The WWF is also a member of the Computing Initiative.[[10]](https://en.wikipedia.org/wiki/Green_computing#cite_note-CSCI_pressrel_launch-10)
* The [Green Electronics Council](https://en.wikipedia.org/wiki/Green_Electronics_Council) offers the [Electronic Product Environmental Assessment Tool](https://en.wikipedia.org/wiki/Electronic_Product_Environmental_Assessment_Tool) (EPEAT) to assist in the purchase of "greener" computing systems. The Council evaluates computing equipment on 51 criteria - 23 required and 28 optional - that measure a product's efficiency and sustainability attributes. Products are rated Gold, Silver, or Bronze, depending on how many optional criteria they meet. On 2007-01-24, President [George W. Bush](https://en.wikipedia.org/wiki/George_W._Bush) issued Executive Order 13423, which requires all United States Federal agencies to use EPEAT when purchasing computer systems.[[12]](https://en.wikipedia.org/wiki/Green_computing#cite_note-12)[[13]](https://en.wikipedia.org/wiki/Green_computing#cite_note-13)
* [The Green Grid](https://en.wikipedia.org/wiki/The_Green_Grid) is a global consortium dedicated to advancing energy efficiency in data centers and business computing ecosystems. It was founded in February 2007 by several key companies in the industry – [AMD](https://en.wikipedia.org/wiki/AMD), [APC](https://en.wikipedia.org/wiki/American_Power_Conversion), [Dell](https://en.wikipedia.org/wiki/Dell), [HP](https://en.wikipedia.org/wiki/Hewlett-Packard), [IBM](https://en.wikipedia.org/wiki/IBM), [Intel](https://en.wikipedia.org/wiki/Intel), [Microsoft](https://en.wikipedia.org/wiki/Microsoft), [Rackable Systems](https://en.wikipedia.org/wiki/Rackable_Systems" \o "Rackable Systems), [SprayCool](https://en.wikipedia.org/w/index.php?title=SprayCool&action=edit&redlink=1" \o "SprayCool (page does not exist)) (purchased in 2010 by [Parker](http://www.parker.com/portal/site/Market-Tech/menuitem.e9f921bc8ae21676de92b210237ad1ca/?vgnextoid=e7bfa7bee4a70310VgnVCM10000048021dacRCRD&vgnextfmt=default)), [Sun Microsystems](https://en.wikipedia.org/wiki/Sun_Microsystems) and [VMware](https://en.wikipedia.org/wiki/VMware). The Green Grid has since grown to hundreds of members, including end-users and government organizations, all focused on improving [data center infrastructure efficiency](https://en.wikipedia.org/wiki/Data_center_infrastructure_efficiency) (DCIE).
* The [Green500](https://en.wikipedia.org/wiki/Green500) list rates supercomputers by energy efficiency ([megaflops](https://en.wikipedia.org/wiki/Megaflops)/[watt](https://en.wikipedia.org/wiki/Watt)), encouraging a focus on efficiency rather than absolute performance.
* [Green Comm Challenge](https://en.wikipedia.org/wiki/Green_Comm_Challenge) is an organization that promotes the development of energy conservation technology and practices in the field of Information and Communications Technology (ICT).
* The [Transaction Processing Performance Council](https://en.wikipedia.org/wiki/Transaction_Processing_Performance_Council) (TPC) Energy specification augments existing TPC benchmarks by allowing optional publications of energy metrics alongside performance results.[[14]](https://en.wikipedia.org/wiki/Green_computing#cite_note-14)
* [SPECpower](https://en.wikipedia.org/wiki/SPECpower) is the first industry standard benchmark that measures power consumption in relation to performance for server-class computers. Other benchmarks which measure energy efficiency include [SPECweb](https://en.wikipedia.org/w/index.php?title=SPECweb&action=edit&redlink=1" \o "SPECweb (page does not exist)), [SPECvirt](https://en.wikipedia.org/wiki/SPECvirt" \o "SPECvirt),[[15]](https://en.wikipedia.org/wiki/Green_computing#cite_note-15) and [VMmark](https://en.wikipedia.org/wiki/VMmark" \o "VMmark).[[16]](https://en.wikipedia.org/wiki/Green_computing#cite_note-16)