ISSN 2279-0489

AN INTERNATIONAL MULTIDISCIPLINARY HALF YEARLY RESEARCH JOURNAL

GENIUS

Volume -VI Issue - I Part - II August-2017 to January-2018

Peer Reviewed and Referred UGC Listed Journal

(Journal No. 47100)

ज्ञान-विज्ञान विमुक्तये

IMPACT FACTOR / INDEXING
2016 - 4.248
www.sjifactor.com

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❖ PUBLISHED BY ❖

Ajanta Prakashan
Aurangabad. (M.S.)

VOLUME - VI - ISSUE - I - AUGUST 2017 to JANUARY - 2018
GENIUS - ISSN - 2279-0489 - IMPACT FACTOR - 4.248 (www.sjifactor.com) PART - II

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An Empirical Study on Green Enery - and its Emergent need in the Reducing Environmental Risks in the Modern Computing ERA

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Abstract

Atmospherein world is polluted due to chemical emissions as so green energy is a basic need in the world. various factors such us factories, de-forestration and Enormous use of electronic devices is increasing day by day subsequently, the corbon emission are immensely increased by electronic devices its hardware, software and storage. In this paper I am going to discuss on Most studies and regulatory controls focus on hardware-related measurement, analysis, and control for energy consumption.

Section-I of this paper will be on about introduction of green energy and its promising need in case of environmental threats due to corbon emission,

Section – II will specify the different areas to have green energy for the well being of people.

Section – III will be on a case study on the implementation of by software development organization to provide green energy to reduce environmental defects.

I) Green energy comes from natural sources such as sunlight, wind, rain, tides, plants, algae and geothermal heat. These energy resources are renewable, meaning they're naturally replenished. In contrast Green energy, utilizes energy sources that are readily available all over the world, including in rural and remote areas that don't otherwise have access to electricity. Advances in renewable energy technologies have lowered the cost of solar panels, wind turbines and other sources of green energy, placing the ability to produce electricity in the hands of the Green energy can replace fossil fuels in all major areas of use including electricity, water and space heating and fuel for motor vehiclesFossil fuels — coal, oil and natural gas — currently provide more than 85 percent of all the energy consumed in the U.S., nearly two-thirds of its electricity, and virtually all of its transportation fuels. Moreover, it is likely that the nation's reliance on fossil fuels to power an expanding economy will actually increase over at least the next two decades even with aggressive development and deployment of new renewable and nuclear technologies.

Renewable energy sources also have a much smaller impact on the environment than fossil fuels, which produce pollutants such as greenhouse gases as a by-product, contributing to climate change. Gaining access to fossil fuels typically requires either mining or drilling deep into the earth, often in ecologically sensitive locations.Green energy, however, utilizes energy sources that are readily available all over the world, including in rural and remote areas that don't otherwise have access to electricity. Advances in renewable energy technologies have lowered the cost of solar panels, wind turbines and other sources of green energy, placing the ability to produce electricity in the hands of the Green energy can replace fossil fuels in all major areas of use including electricity, water and space heating and fuel for motor vehicles.

The different categories of green energy are **a)** Solar power- produced using photovoltaic cells, which capture sunlight and turn it into electricity. most prevalent type of renewable energy b)Hydropower - Hydropower depends on high precipitation levels to produce significant amounts of energy. c) generated by the Earth's water cycle, including evaporation, rainfall, tides and the force of water running through a dam. e) Wind Power - Air flow on the earth's surface can be used to push turbines, with stronger winds producing more energy a network of land-based, 2.5-megawatt wind turbines in rural areas f) Geothermal Energy - Just under the earth's crust are massive amounts of thermal energy, which originates from both the original formation of the planet and the radioactive decay of minerals. e) Biomass - Recently-living natural materials like wood waste, sawdust and combustible agricultural wastes can be converted into energy with far fewer greenhouse gas emissions than petroleum-based fuel sources. That's because these materials, known as biomass, contain stored energy from the sun.

II) Energy efficient techniques can be applied to various aspects in the nature in various type of resources and application we are using the real world. Enormous use of electronic devices is increased day by day so corbon emission are tremendously increase as increase in electronic devices its hardware, software and storage .Most studies and regulatory controls focus on hardware-related measurement, analysis. and control for energy consumption. However, all forms of hardware systems are controlled by software components. Although software systems don't consume energy directly, they affect hardware utilization, leading to indirect energy consumption. Therefore, it's important to engineer software so that its energy consumption is optimized. The software number of publications, empirical studies, and conferences on the topic demonstrate few techniques used are:

Energy efficient Green Transport: Green transportation program includes biodiesel shuttles and the largest corporate electric vehicle charging infrastructure in theUnited States. These investments support our commitment to reduce singleoccupancy

GBus program: Google's GBuses shuttle more than 9,000 riders in the Bay Area each way their shuttles run on 5% biodiesel and use filtrationsystems that eliminate harmful emissions like nitrogen oxide.

Commuter e-Bike and GBike programs: mostly 10% of Google employees biketo work. We help facilitate this by providing an electric pedal-assist bike, lock, andhelmet to any Googler at our headquarters who wants to make biking his or her primary means of commuting. We also have hybrid bikes available for visitingemployees and interns, and 1,500 community bikes stationed around our Bay Areacampus for employees to travel between buildings.

Electric vehicle charging stations: To encourage Googlers to use electric vehicles (fig1.1), to date we've installed more than 1,600 charging ports globally at our offices and data centers, and we provide charging at no cost to our employees.

Fig 1.1: Vehicle charge station goal is to provide charging for up to 10% of the parking spaces at our Bay Area headquarters.

Efficient transportation with google Maps

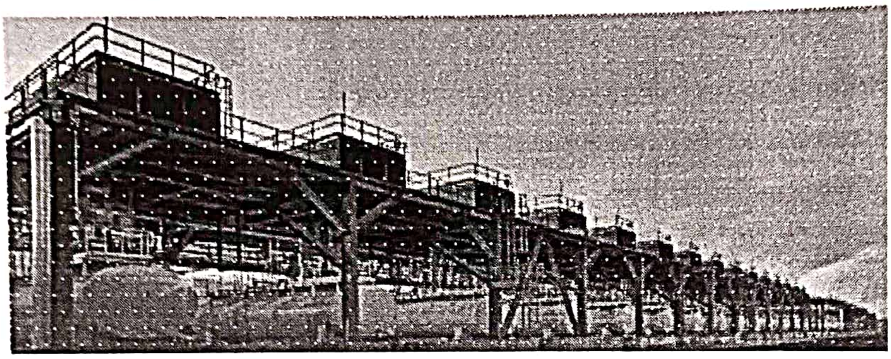
Travelers or commuters wanting to reduce their personal carbon footprint (not tomention their waistline) can use Google Maps (**fig1.2**) to get where they're going by walking,biking, or using public transportation. According to the U.S. Department of Transportation, taking the bus reduces aperson's GHG emissions by 33% per mile compared with driving alone in a car. Subways and other heavy rail trips are even more efficient, reducing GHG emissionsby 76% per passenger mile.

(fig. 1.2: google Map in mobile devices)

And travelers can avoid vehicular emissions altogetherby choosing the bike or walking icon in Maps and getting customized turn-by-turndirections incorporating bike and pedestrian routes. Maps offers transit info for more than 6,000 public transit agencies and 3 milliontransit stations in 20,000 .cities and towns in 64 countries—which adds up to morethan 1 billion kilometers' .

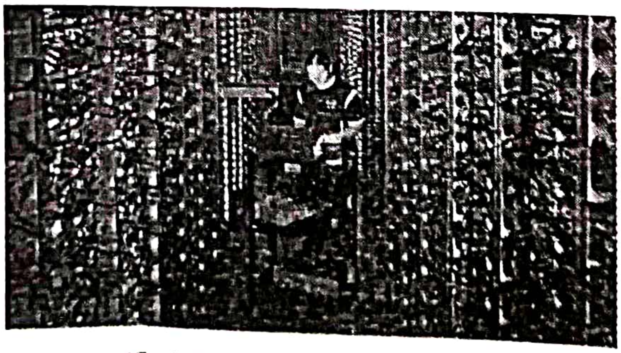
Free Cooling: The electricity that powers our servers ultimately turns into heat. The industry norm for data centers is to use air conditioning to cool things down, which requires 30% to 70% overhead energy use. While we still keep mechanical chillers on hand at most of our sites for when the temperature or humidity gets too high, we use these only when necessary.

For the most part, we're able to rely on "free cooling"—utilizing local conditions by cooling with water or air rather than mechanical chillers. Fig 1.3 Most of our facilities, for instance, use highly energy-efficient evaporative cooling, which brings cold water in to cool the servers and then releases it through cooling towers as water vapor.



(fig 1.3 Free cooling) renewable Energy: Utilization of use of renewable energy(fig:1.3) has been growing rapidly. A study in google says In 2015, they purchased enough renewable electricity to match 44% of their total annual electricity consumption, and in 2016, increased this percentage to more than 50%.they will will nearly double their annual purchases of renewable electricity in 2017, reaching 100% renewable energy for global operations—including both data centers and offices. Fig (1.3: Renewable Energy)

Energy Efficient computer Network: The world's most energy-efficient computing networkand to squeeze more out of every watt of power consume. Compared with fiveyears ago, it can now deliver more than 3.5 times as much computing power withthe same amount of efficient servers and efficient facilities. In addition to making our data centers (Fig 1.4) moreenergy efficient, we also buy renewable energy for our operations



(fig 1.4:energy efficient server)

of the data centers are Google servers—high-performance computersrunning 24/7. Since 2001 we've been custom designing our own servers touse as little energy as possible by minimizing power loss and removingunnecessary components.Up to a third of the energy consumed by a typical server is wasted before it getsto the computing components that actually run software products and services. Wecombat this by minimizing the number of times we convert power from one type ofelectrical current to another and using high-efficiency batteries that we keep as closeas possible to the equipment they need to power

IBM Brings Green Horizons to India with Delhi Clean Air Project

IBM announced an agreement with the Delhi Dialogue Commission to apply advanced technologies to support the Government of Delhi's clean air action plan. To improve air quality and better protect the health of Delhi's citizens. The combined forces of urbanization and industrialization are creating air quality challenges for high-growth cities around the world. Delhi, with a population of almost 18 million, is the world's fifth largest 'megacity'. Its landscape, landlocked location, weather patterns, rising energy needs, commercial activity and rapidly growing traffic all contribute to high concentrations of air pollutants in the city, including ultrafine particulate matter particles - the most harmful to human health. Building on IBM's global Green Horizons initiative, which draws on research innovations to provide air quality management systems to cities around the world, the partnership with the Delhi Dialogue Commission will provide greater insight about the complex and dynamic nature of air pollution in the city and help identify sustainable methods for improving the outlook in the short and long term. One of the focus areas of the study will be how Delhi's 7.4 million vehicles contribute to air pollution in the city which is especially important with the number of vehicles in the city growing by over 1,200 each day.

"Tackling air pollution is a major priority of the Delhi government in order to safeguard the health of our citizens and ensure an attractive environment for people and businesses alike. For us to optimize our action plan, we need accurate, real-time insight about the situation on the ground and a better understanding of how to respond in the most effective and sustainable way.

IBM Green Horizon Initiative draws on innovations from the company's global network of research labs with contributions from leading environmental experts. At the heart of the initiative are air quality management systems which draw on vast amounts of environmental Big Data generated by thousands of sensors in environmental monitoring stations, traffic systems and meteorological satellites. Cognitive technologies understand this data and use it to tune a predictive model that shows where the pollution is coming from, where it will likely go, and what will be its potential effect, allowing more informed decisions about how to improve air quality.

Machine learning technologies ensure that the Green Horizon system constantly self-configures, improving in accuracy and automatically adjusting the predictive models to different seasons and topographies.

It blends various predictive models including traffic flow, weather forecasting, air pollution and economic data to help officials explore various 'what if' scenarios and better understand the consequences of certain actions, such as optimizing or changing traffic flows, relocating industry, switching to renewables and even introducing more green areas into the city. Feeding on the experience of other cities around the world, Green Horizons' pollution forecasting and scenario modelling capabilities can also help city governments make informed decisions about the construction and location of future industry, power generation facilities and roads.

"Air pollution is a global challenge and one of the top environmental risks to human health. Our India research team is helping to create a powerful decision support system with unprecedented accuracy. This will not only advance understanding of today's issues, but provide actionable insight for addressing them while also protecting economic activity and livelihoods.

Future Enhancement: Environment pollution is a global challenge and one of the top environmental risks to human health. Every country research team is helping to develop a powerful decision support system with unprecedented accuracy. This will not only advance understanding of today's issues, but provide actionable insight for addressing them while also protecting economic activity and livelihoods. Each Government should provide fund to the eminent people to invent new application and tools to enhance the energy efficiency all over the world

References

- file:///C:/Users/15dbcom46/Desktop/G/All%20presentations_greenbankworkshop_for%20web.pdf
- https://www.forbes.com/sites/ibm/2015/04/09/carnegie-mellon-how-one-university-is-making-buildings-smarter/#72f04e3048bb
- https://www.forbes.com/sites/ibm/2015/04/22/this-earth-day-lets-start-using-analytics-to-conserve-energy/#6f6dc1a632d5
- http://www-03.ibm.com/press/us/en/pressrelease/48416.wss
- www.google.com
- google-2016-environmental report
- www.wikepedia.com
- http://www-03.ibm.com/press/us/en/pressrelease/48255.wss
- https://www.ibm.com/ibm/green/data_center.html