A New Trend in Green Technology

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ABSTRACT: *Technology is the adaptation of science to meet human needs. The current technological progress is speeding up to the point that it can do permanent harm to our planet. People understand that any technology has advantages and drawbacks, but they tend to overlook the negatives, which are causing significant disruption to human life and animal ecosystems. As a result, green technology seeks to preserve the environment by using natural energy that never run out. It is also used to reduce the impact of air pollutant emissions on the atmosphere by replacing waste materials with renewed products, resulting in an improvement in greenery and the ability to go green are only a few of the divisions. They all have no negative consequences, so future generations will learn from them. We are solely responsible for saving this planet from extinction because we pollute it. This paper reflects value, need, besides benefits of green technology.*

KEYWORDS: *Green Building, Green Chemistry, Green Energy, Green Technology, Pollution, Renewable.*

INTRODUCTION

Preservation besides use of the planet's natural resources. It's also useful for reducing. Clean technology is another name for it. The central idea here is sustainable growth. This technology is a technologies and techniques for producing electricity from renewable resources. Photovoltaic, wind turbines, hydroelectricity generators, and other energy-generating technologies are examples. Green technology works to mitigate toxins in the environment by preventing it or altering the factors that cause it. This will contribute to environmental economic and biological equilibrium. It aims to reduce greenhouse gas emissions and ozone layer loss, which raises critical components of research and development. For a stable, secure, and balanced world, systems that contribute to sustainable practices are critical. Denmark's government has made the decision to turn to 100% clean electricity by 2050 [1].

More than $100 billion was spent in new renewable energy capacity, industrial plants, and research and development in 2007, setting a new global record. However, because of the rapid pace of transition in recent years, expectations of renewable energy lag behind practice. This article captures the fact and gives an analysis of renewable energy's global standing in 2007. The study discusses economy, investment, industry, and policy patterns, as well as rural (off-grid) renewable energy. The article is not intended to offer commentary, address current problems, or predict the future about green energy. Many of the developments show that renewable energy is becoming more relevant than traditional energy [2]. The increase of data center energy use in the United States and around the world from 2005 to 2010 is examined in this report. It creates a coherent time series of data center energy usage using data and methodology identical to previous assessments. The following are the study' main findings:

- Because of virtualization and other causes, growth in the installed base of servers in data centers had already started to decline by early 2007.
- When opposed to the installed base prediction released in 2007, the 2008 financial crisis, the resulting economic recession, and further advances in virtualization resulted in a substantial decline in real server installed base by 2010.
- From 2005 to 2010, increase in energy used per server likely accounted for a greater share of demand growth than it did from 2000 to 2005.
- Assuming that the midpoint between the Upper and Lower bound cases correctly represents reality, data center energy use rose by about 56 percent worldwide from 2005 to 2010, rather than doubling (as it did from 2000 to 2005), and by about 36 percent in the United States.
- In 2010, global data center energy use was estimated to be between 1.1 percent and 1.5 percent of overall electricity use. In the United States, the figure was between 1.7 and 2.2 percent. The amount of electricity used in data centers in the United States in 2010 was slightly smaller than the 2007 study to Congress on data centers estimated. This finding represented lower electricity growth rates in this study relative to

earlier projections (see Figure 1), which were mostly motivated by a lower server installed base than previously expected rather than the performance gains predicted in the report to Congress.

- Despite the fact that Google is a high-profile user of database servers, the company's data center activities accounted for less than 1% of all energy used by data centers worldwide. In summary, the exponential increase in data center electricity usage that occurred from 2000 to 2005 decreased considerably from 2005 to 2010, with overall data center electricity use accounting for around 1.3 percent of global electricity use and 2% of United States electricity use in 2010 [3].
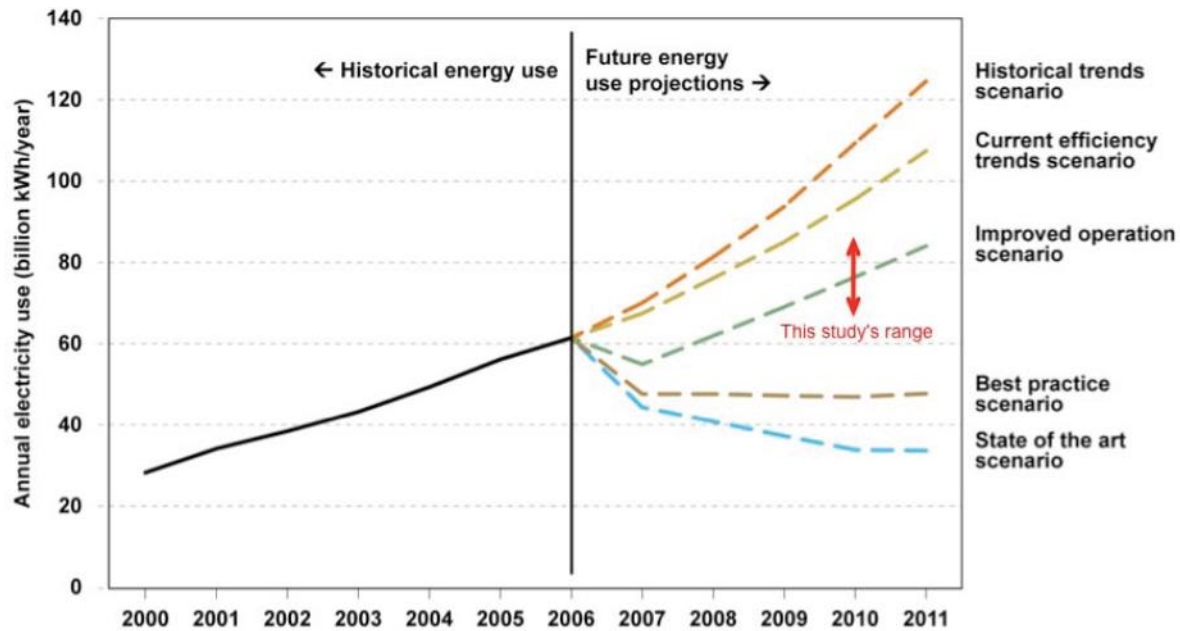

Figure 1: The Spectrum Measured In This Analysis and the Predicted US Energy Usage for Data Centers from the EPA Report to Congress (EPA 2007) [3]

Intel Corporation set a target for itself in 2007 to reduce its global warming greenhouse gas footprint by 20% by 2012. The Intel Information Technology organization is recognized as a major contributor to the company's sustainability agenda by transforming its IT activities and total Intel operations through the use of sustainable IT. Intel has achieved the sustainability benefits so far by improving four main capabilities, according to this report. These technologies were integrated into the Sustainable Information Communication Technology (ICT) Capability Maturity Framework, a model established by an industry group in which the authors played a key role. The article concludes with lessons learnt from Intel's insights that business and IT executives in other companies should apply (see Figure 2) [4].
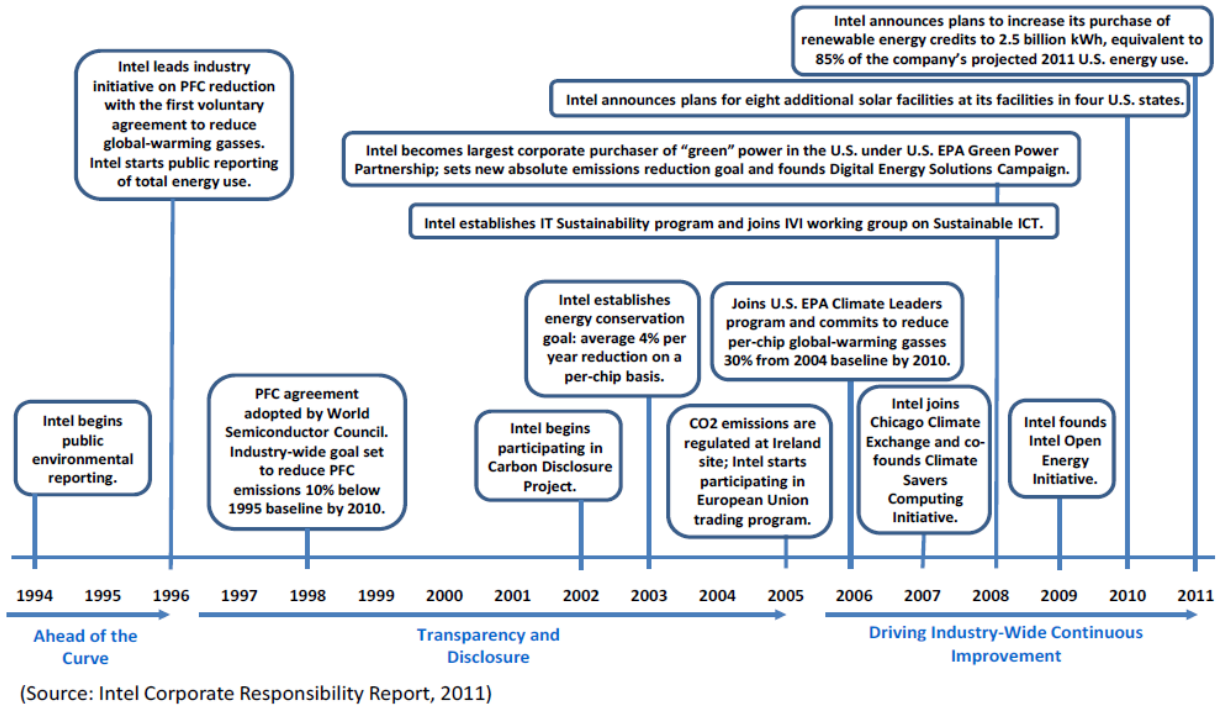
Figure 2: Climate Awareness Timeline for Green Energy from Intel. Intel Has Achieved The Sustainability Benefits So Far By Improving Four Main Capabilities, According To This Report [4].

LITERATURE SURVEY

B. Châte explained the study summaries framework related to solar and wind green energy applications, with a focus on developing countries. A summary of some of the major projects conducted by a range of United Nations agencies and bodies is given, including: and the Secretariat's Department of International Economic and Social Affairs; the Department of Technical Cooperation for Development and its Centre for Natural Resources, Energy, and Transport; federal commissions; financial institutions (United Nations Development Program and UNEP), the United Nations Industrial Development Organization (UNIDO), the United Nations Institute for Training and Research (UNITAR), and the United Nations University (UNO); specialist organizations such as World Health Organization (WHO); and the Committee on the Peaceful Uses of Outer Space (COPUOS). The upcoming, which was recently accepted by the United Nations General Assembly, is discussed in detail [5].

A. Jain et al. presented the use of fossil green energy sources produces a great deal of carbon, which contributes to the issue of global warming. Most Asian countries are plagued with noise, which has resulted in a slew of health issues. Renewable electricity sources are critical in addressing these issues. With the aid of natural language processing methods, sentiment analysis is used to evaluate user opinions for decision making. Opinions are a user's shared sentiments or feelings about a topic. Author used Twitter data to do a comparative sentiment survey on different green energy sources to learn more about people's feelings about them. In this article, author looked at five different energy sources: solar, bioenergy, wind power, hydropower, and geothermal energy. Data was gathered from Twitter, with approximately 20,000 tweets per energy source totaling approximately 100,000 tweets that were considered for study. For each green energy source, eight sentiments are measured. People's opinions on renewable energy sources, mostly solar and wind energy, have been found to generate the most tweets, and people are more optimistic about renewable energy sources for environmental reasons.

S. Kapila et al. explained a process model was built in this study to calculate the net green energy ratios and life cycle greenhouse gas emissions of three energy storage systems: adiabatic and conventional compressed air energy storage, and pumped hydroelectric energy storage, with capacities of 118, 81, and 60 MW, respectively. The net energy ratios is determined by dividing net energy outputs by total net energy inputs. The greenhouse gas emissions associated with the energy storage systems' design, usage, and decommissioning life cycle stages is assessed. The adiabatic and natural compressed air energy storage, as

well as pumped hydroelectric energy storage, have net energy ratios of 0.702, 0.542, and 0.778, respectively. 231.2, 368.2, and 211.1 g CO_2 eq. /kWh are the corresponding life cycle greenhouse gas emissions of g CO_2 eq. /kWh. In all energy storage systems, the operating stage has a significant impact on pollution. It was also discovered that energy demand in the form of electricity is the primary catalyst, with limited contributions from material usage. It was also carried out a sensitivity and ambiguity study. The findings aid in determining the net energy ratios and emission footprints of different energy storage technologies so that an informed decision can be made.

RESOURCES AND RENEWABLE ENERGY

Renewable fuels, such as wind, solar, and tidal energy, are outlets that can never deplete the earth. Despite the fact that we use them often, it is ample and infinite in nature. These can be had for a low price or for free. It aids in the reduction of air emissions and the improvement of the health of all living things on the planet. Energy cannot be produced or lost, according to the law of conservation of energy, but it can be transformed from one form to another. As a result, energy generation for necessary purposes is also possible. Let's take a closer look at each renewable resource [6].

1. *Energy from the Sun:*

The bright and massive radiant energy emitted by the Sun, which is thousands of miles away from the earth. Excess green energy is stored in solar cells. Energy is collected during the day for the manufacture, and home appliances such as solar cookers, solar water heaters, solar calculators, and solar panels are also commonly used. Solar cookers rely on the sun for heating, drying, and pasteurization. Concentrated solar panel systems direct a wide field of sunlight through a narrow beam using lenses or mirrors. Using the photoelectric effect, photovoltaic converts light into electric current. Solar power is another name for solar energy. According to the United Nations Development Program's World Energy Assessment of 2000, solar energy has an annual capacity of 1,575-49,837 exa joules (EJ). This is many times more than the overall global energy demand in 2012, which was projected to be 559.8 EJ. At the upper layer of the atmosphere, the Earth absorbs 174 peta watts (PW) of solar radiation. The remainder with nearly 30% reflecting back to space. The sun's rays are reflected keeping the earth's surface at a constant 14°C. Green plants turn solar energy into chemically stored energy, which is used to make fruit, wood, and biomass, which can be used to make fossil fuels. Solar power, according to the International Energy Agency, will generate the majority of the world's electricity while reducing greenhouse gas emissions [7].

2. *Biofuel and Biogas:*

Biofuel is formed by the decomposition of organic waste matter in a non-oxygen environment. Agricultural waste, sewage, and food waste are examples of organic waste. There is no net CO_2 generated as a result of this (carbon dioxide). If CO_2 emissions are not taken into account in the coming decades, the earth's atmosphere will change irreversibly, resulting in disasters. Biogas were used for cooking in over 44 million households as of 2011. In place of petrol or gasoline, environmentally friendly biofuels such as CNG (compressed natural gas) are used in automobiles. Ethanol is the most widely used biofuel on the planet. Obtained from rice, sugar cane, molasses, and some other sugar or starch produces alcohol fuels. Thermal conversion, chemical conversion, and biochemical conversion are three processes for converting biomass to useful energy-containing substances. This biomass conversion will produce solid, liquid, or gaseous fuel. Biofuels produced from food crops cultivated on friendly land are known as "first-generation" or traditional biofuels. Biofuels of the second generation are oils made from a variety of biomasses. Biomass is a broad word that refers to any supply that is quickly renewed as part of the carbon cycle. Algae culture and algae fuel are the first examples of third are the fourth generation biofuels including vegetable oils and animal fats can be used to make green diesel.

3. *Power of the Winds:*

The control of generators for energy generation. Wind energy is abundant, sustainable, and clean, emitting no greenhouse gases, consuming little electricity, and requiring little soil. Wind turbines are machines that transform the kinetic energy of the wind into electricity. Denmark produces as of 2015. A wind farm is a set of wind turbines with land in between them that can be used for farming or other purposes. There are over

200,000 wind turbines in use worldwide, with a gross capacity of 432 Giga Watt, as of 2015. There are no fuel prices for wind power.

4. *Wave/Tidal Energy:*

Wind flowing along the sea's surface causes waves to form. Transforms the intermittent up-and-down movement of ocean waves into electricity by putting equipment on the ocean's surface that collects the mechanical energy generated by the wave movement and converts it to electricity. A wave energy converter (WEC) is a system that uses wave control. Coastal wave energy is estimated to have a global resource of more than 2 Tera Watt. It is emission-free because, as opposed to other renewable technologies, wave energy produces little or no pollution. The tides are dissipated along the shoreline, preventing coastal erosion. Migrating fish and marine species had no problems with it present at Deep Ocean locations is about three to eight times that of shoreline locations.

OBJECTIVES OF GREEN TECHNOLOGY

Any mission to accomplish in order to meet the current generation's needs. However, researchers must not only understand the benefits of sophistication; researchers must also consider the pitfalls. Green energy technology's key goals are to meet needs without depleting resources or harming the environment. It entails the use of environmentally sustainable materials. If researchers want to produce every time, researchers will be wasting a lot of resources. Then there's the idea of repurposing the recycled materials. In more depth, researchers refer to it as the 3R principle, which entails

- Reduce
- Reuse
- Recycle.

'Reducing' means decreasing wastage or eliminating surplus demand. Researchers can achieve healthy living for the current and future generations by being waste conscious. For e.g., rather than using paper for anything, researchers might use an online document. Another method for eliminating waste is to reuse materials in the recycling process.

The term "recycle" refers to the method of taking old materials, processing them, and repurposing them as new. Pollution levels can be regulated in this way. Glass, paper, and metal are also readily recyclable materials. Per year, the average American citizen generates 730kg of waste for the United States alone. Aluminum coke tins, for example, can take up to 50 years to decay into the soil. As a result, they must rather than discarded.

Recycling these tins saves enough electricity to power a three-hour television show. Recycling a pound of steel saves enough electricity to power a 60-watt light bulb for a day. Instead of chopping down trees for new papers, each newspaper can be recycled for reuse.

DISCUSSION

1. *Green Technology Branches:*

Green Technology is divided into five categories:

- Electricity
- Information Technology
- Nanotechnology
- Buildings
- Chemistry

1.1.*Electricity:*

It is generated using renewable green energy sources such as solar, wind, and biomass. As we all know, traditional power supply, which is dependent on the combustion of the burning of coal, emits CO_2 into the atmosphere, which is responsible for the majority of emissions. It includes toxins that damage the environment, and this is thought to be the primary cause of global conflict. According to the International

Energy Agency (IEA), a worldwide transition to energy-efficient lighting solutions will save almost one-tenth of the world's power bill. Eco-friendly bulbs provide a viable solution with the potential to save both electricity and resources. Motion sensors will help keep lights switched off while they're not in use, dimmers will provide the perfect amount of illumination, and timers will switch stuff they're required. A green car is a road vehicle that has less negative environmental effects. Vehicle emissions add to the levels of greenhouse gases that cause climate change. CO_2 emissions from road cars account for over 85% of the greenhouse gas emissions from transportation. The transportation industry produces the most greenhouse gases.

1.2.Green IT:

Green computing, also known as green ICT, is the research and application of environmentally friendly computing or information technology, according to the International Federation of Global and Green ICT (IFGICT). The Information System's carbon emissions would be reduced as a result of this. Green networking and information management designs use materials that harmful impact of human interaction on the environment. Green computational mechanisms are used by many corporate IT departments to reduce the environmental impact of their IT activities. People, networks, and hardware are all essential components of modern IT systems, so a green computing mechanism must address all of them. The United States Department of Energy has identified five key areas where energy efficient data Centre architecture best practices should be focused:

- IT systems
- Environmental conditions
- Air management
- Cooling systems
- Electrical systems

Term "green IT" first appeared US Environmental Protection Agency introduced Energy Star, a programmed that lets businesses save money and mitigate greenhouse gas emissions by recognizing energy-efficient goods. Green computing has a number of advantages, including decreased environmental effects (lower GHG emissions, less e-waste, and less virgin materials used for modern device manufacturing), lower energy prices, and longer-lasting computing systems, as well as reduced health risks for machine staff.

1.3.Green Nanotechnology:

Green nanotechnology creates nanomaterials and devices that are safe for the atmosphere and humans. Produce micro and nano goods with non-toxic materials at low temperatures and with renewable inputs. Green nanotechnology aims to produce nanomaterials and devices that are not harmful to the atmosphere or human health, as well as products that solve environmental issues. Nano-machines modelled after *Ideonella sakaiensis*, a bacteria bioengineered to eat plastics, are one green nanotechnology breakthrough currently in progress. Degrade plastics hundreds of times faster than bioengineered microbes. Light Emitting Diode displays are another clear example.

1.4.Buildings:

Architecture refers to a structure as well as the incorporation of environmentally friendly and resource-efficient processes during the life cycle of a building, including construction, use, repair, restoration an extra 2% up front, but pay for themselves 10 times over the course of their lives. According to EPA surveys, indoor pollution levels can reach that are accredited are built to provide a safe, safer indoor atmosphere, which improves the occupants' health is a form of construction that emphasizes the use of less chemicals and the support of local labor and society. The following materials are used in the design of green buildings:

- Low volatile organic compounds paints
- Bamboo flooring
- Cotton bat insulation
- Ecological concrete
- Paper insulation panels
- And good ventilation

1.5.Chemistry:

It is known as sustainable chemistry, is a method of chemical science and engineering that promotes the creation of materials and methods that require less chemicals and produce less toxic substances. Chemical materials should be produced in such a way that they perform their intended purpose. Furthermore, certain plants are used in cosmetics. Dr. Syed Hussain of the Pakistani National Centre of Physics first proposed the concept of green chemistry. Discovered a nano-catalyst that can be used to transform used tea into biodiesel. If this makes it to the consumer market, it will be a fantastic way to generate renewable electricity. On the other hand, collecting the methane released by farm animals in their manure could result in the generation of technologies will minimize waste and emissions, as well as provide early warnings of global warming, which are generated during development, use, and the effects of natural disasters. This technology aids in the reduction of waste and the protection of our world from natural disasters. It can be used in a variety of areas, including cars (such as Compressed Natural Gas vehicles) and domestic biogas. It brings together scientists, architects, scholars, and technocrats from around the world to consolidate science. Green research and technology activities and applications. It is preferable to avoid pollution than to clean up after it has occurred.

2. The Benefits of Green Technology:

The below are the key benefits of renewable technologies:

- Saving of Energy
- Friendly to Environment
- Cost Effective
- Save Power
- Reuse of Natural Resources

CONCLUSION

As a consequence, producing electricity from renewable resources is easy and harmful to the environment. This environmentally friendly technology makes life easier and more dependable. Air quality, in particular, must be monitored because it is steadily worsening, resulting in an exponential rise in mortality. Delhi is the first capital, according to a WHO survey from 2014, to cross the safe pollution limits. The levels discovered in 2013 were nine times higher than the recommended levels. Due to soil particles and smoke, increased transport density has resulted in respiratory ailments and deaths. It has been stated that if particulate matter PM 2.5 levels exceed 90-120, along with PM10 levels of 250-350, serious health complications and lung infections will occur, while PM 2.5 levels in Delhi and other parts of the world have surpassed 153. As a consequence, it is important to minimise waste and protect our environment. Humans are not the only ones that are affected; animals and fish are also affected if no action is taken. Instead of escalating in toxic materials or radioactive compounds, it is important that we think for our atmosphere and promote environmentally sustainable products.

In 2007, the United States invested more than $100 billion on new clean energy capacity, industrial facilities, and research and development, setting a new global milestone. However, aspirations of renewable energy lag behind reality due to the rapid speed of change in recent years. This report summarises the facts and assesses green energy's global position in 2007. The research looks at trends in the environment, finance, manufacturing, and policy, as well as rural (off-grid) renewable energy. The aim of this article is not to provide analysis, discuss current issues, or forecast the future of green energy. Renewable energy is becoming more important than conventional energy as a result of a number of advancements. This study looks at the rise of data center energy consumption in the United States and around the world from 2005 to 2010. It creates a consistent time series of data center energy use using the same data and methods as previous studies.

Renewable energy sources such as wind, solar, and tidal energy would never deplete the earth's resources. Despite the fact that we use them often, they are abundant and limitless in nature. All are available at a reduced cost or for free. It contributes to the elimination of greenhouse gas emissions and the overall wellbeing of all living beings on the planet. According to the law of conservation of energy, energy cannot be generated or lost, but it can be converted from one form to another. As a consequence, it is also possible to generate electricity for essential purposes.

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