

An Overview of Green Technology and its Various Applications

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ABSTRACT: The use of science for practical purposes is referred to as "technology." From energy-generation strategies to non-toxic cleaning products, the area of "green technology" includes a rapidly expanding community of methods and materials. This paper also focuses on the same topic green technology and its various applications but in little details or more diagrammatic way like overview of green technology which consist of meaning of green technology and their few types Ocean Energy, Solar Energy and Wind Energy etc.. This paper also gives full details of applications of green technology (such as Sewerage Treatments, Captures and Storages Technology, Renewable Energies, Solids Waste Treatments and Managements and Water Treatments) and various advantages and disadvantages from green technology. Using eco-friendly technologies Companies and utility providers are taking the requisite steps and putting in much initiative to address social demands with long-term solutions that can be used today and in the future without causing environmental damage or depletion.

KEYWORDS: Carbon, Energy, Green Technology, Solar Energy, Sustainable.

INTRODUCTION

Green technology is a concept that defines a category of technology that is deemed environmentally friendly due to its manufacturing process or supply chain. Green technologies, also known as sustainable technologies, recognizes both the long and short term environmental effect of a product. Green technologies may have fancy name, but it literally means "clean technology". Green innovations were historically known as sustainable technologies. Green innovations, from the standpoint of information technology, are environmentally sustainable goods that minimize the production of greenhouse gas. They have historically been regarded as a more expensive option to the less expensive, unsustainable technologies that has been in use throughout. Green technologies allow sustainability by creating nature friendly or ecofriendly technologies that not only fulfill human desires but also reduce wastage generation and help life nowadays and in the future. Green technology such as wind energy ocean energy, solar energy, (Figure 1) are examples of green technologies that aim to protect the atmosphere and preserve natural resources.

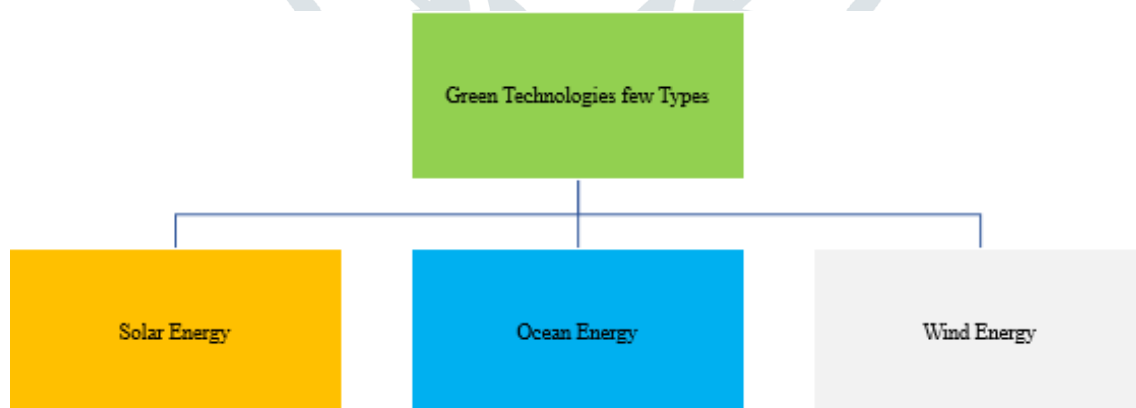


Figure 1: Few Types or Examples of Green Technology (Ocean Energy, Solar Energy and Wind Energy).

1. Types of Green Technology:

1.1. Solar Energy:

Solar energy is radiant light and heat from the sun that is harnessed using a range of ever-evolving technologies such as solar heating, photovoltaics, solar thermal energy, solar architecture, molten salt power plants and photosynthesis[1]. Solar energy is rapidly gaining traction as a viable alternative energy source. At any given time, nearly 90 petawatts of electricity are available, which is six thousand times power used by all of

human society. The planet receives as much solar radiation in 14.5 second as mankind uses in one day. Solar energy can be used in a variety of ways. Solar electricity, for example, can be used to distill water by evaporation.

Upon applying translucent plastic on a wet patch of ground in a way that stops air from escaping, the evaporate water condenses on the surface of the material and becomes a jelly. After that, the water should be collected in a cup or another bottle. The water provided is completely safe to drink. The material's surface. After that, the water should be collected in another bottle or cup. The water provided is completely safe to drink.

1.2. Wind Energy:

Wind energy describes the process by which wind is used to generate electricity. The kinetic energy in wind is transformed into mechanical power by wind turbines [2]. Wind energy is a viable alternative energy option, but the unpredictability of the wind raises questions. Unsteady winds don't give wind turbines the best aerodynamic efficiency, and sudden, uneven gusts will reduce blade productivity. As of December 31, 2014, the Ministry of Energy, through the National Institute of Wind Energy in Chennai (formerly the Center's for Winds Energy Technology (C-WET)), and State Nodal Agencies had installed and monitored 794 dedicated Wind Monitoring Stations (WMS) ranging in height from 20 meter - 120 meter across the country as part of the Nationals Wind Resources Assessment program. Initially, the wind tracking was limited to places that were considered to be windy. To complete the Indian Wind resource mapping, it is now expanded to new/unexplored areas that have not been explored in previous ventures. Hundreds privates wind monitor stations can also be found throughout the region. Based on the data obtained from these 700+ WMS, it has been calculated that 238 stations have an economically preferable wind power capacity of greater than 200 Watt per meter square.

1.3. Ocean Energy:

Ocean energy is sources of power[3] and the prospect of internationally dominant, large scale ocean energy plants is merely that an enticing prospect. Current marine energy systems, like other modern technologies, have drawbacks. Their constructions and maintenances may be prohibitively costly at the moment, and not all areas are appropriate for their successful implementation. However, these challenges would almost definitely be overcome in the near future, and ocean energy conversion will quickly generate as much.

2. Applications of Green Technology:

There are various applications used in green technologies some are given below:

2.1. Sewage Treatment:

The method of separating solids nutrients and, organics, from household and company effluents is known as wastewater treatment. Sewage therapy has been understood since the early ages. Green innovations have been incorporated into this sector of contemporary culture to assist in the removal of biological, chemical, and human toxins from effluents to make ecofriendly. Wastewater disposal is important because it provides for the treatment of industrial waste water until it is pumped back into the atmosphere.

It is assumed that the wastewater contains toxic chemicals that would not only degrade the environment but also have negative health effects for humans. Figure 2 illustrates a detailed modeling of the treatment plant. Screening, primary care, secondary treatment, and final treatment are the four phases of wastewater treatment the following considerations are taken into account when planning a wastewater treatment facility:

1. Natural and biodegradable material should be removed.
2. Remove the solid component
3. Eradicating pathogenic bacteria.

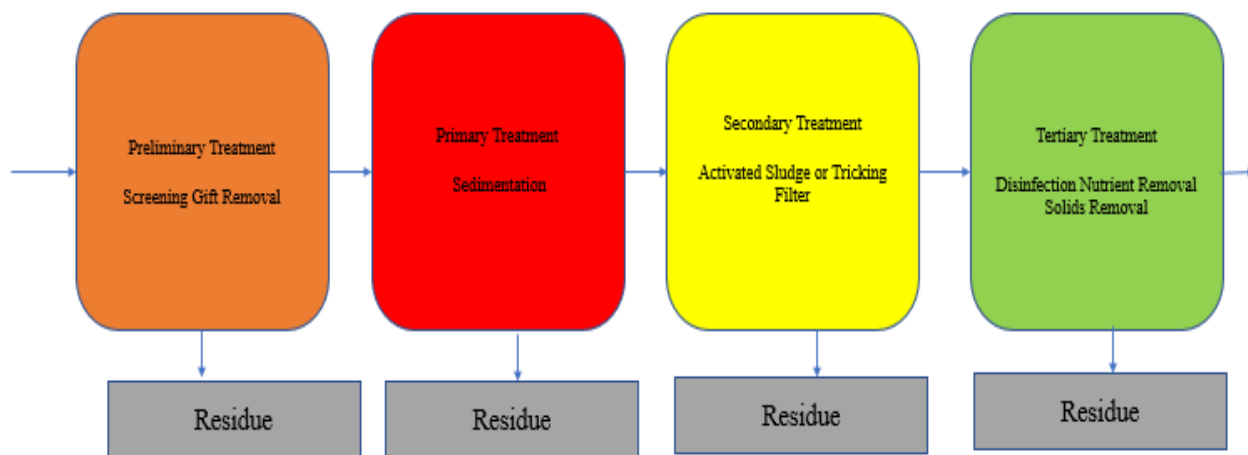


Figure 2: Four Phases of Wastewater Treatment Screening (Primary Care, Secondary Treatment, and Final Treatment).

2.2. Captures and Storages Technology:

The aim of carbon captures and storages (CCS) is to reduce GHG emissions. CCS is a technology that absorbs carbon-dioxide from the atmosphere and retains it on viable surfaces. It follows a three-step protocol, as seen in Figure 3. Capturing carbon dioxide from power stations, exporting carbon dioxide by tubing, and storing carbon dioxide are all part of the operation. Carbon dioxide is stored in oil and gas recovery sites or unmineable coal sites using CCS technologies.

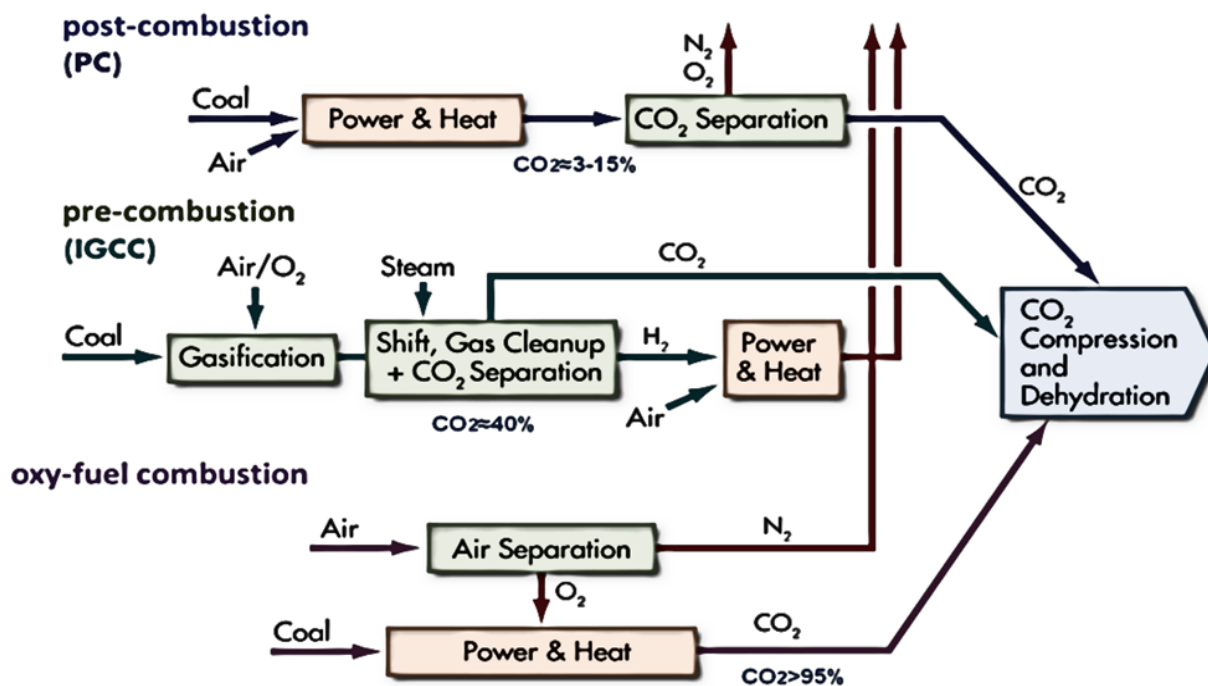


Figure 3: This shows the Carbon Dioxide Capture Technologies in Power Stations, Exporting Carbon Dioxide by Tubing, and Storing Carbon Dioxide are all Part of the Operation [4].

2.3. Renewable Energy:

Energy has been a key component of every country's economic and social growth. Rapid power use has become a global threat, necessitating the development of renewable and energy-efficient technology. For decades, fossil fuels have been used as a source of electricity. Fossil fuel is described as a material that is derived from the sun, converted into chemical energy, and deposited in animals and plants that have been dead's for decades. Plants emit greenhouse gases (GHGs) as they are worked on to generate electricity. GHGs have detrimental

implications for the climate and future generations. As seen in Table 1 below, fossil fuels are the primary source of electricity production according to a research study conducted in Malaysia in 2002.

Table 1: Emission Factors of Fossil Fuels for Electricity Generation.

Fuel	Emissions Factor (kg per kWh)			
	Carbon-Dioxide	Sulphur-Dioxide	Nitrogen-Oxide	Carbon-Monoxide
Petroleum	0.8600	0.0165	0.0026	0.0003
Gas	0.5400	0.0006	0.0010	0.0006
Coal	1.1900	0.020	0.0053	0.0003

The Figure 4 shows the emission factors of fossil fuel for electricity generation which shows the high value of emission factor is by carbon-dioxide from petroleum, gas and coal and the maximum value emission factor fuel is by petroleum whose value is 0.8600 kg per kWh. The least emission factor is 0.0003 which is from petroleum and coal.

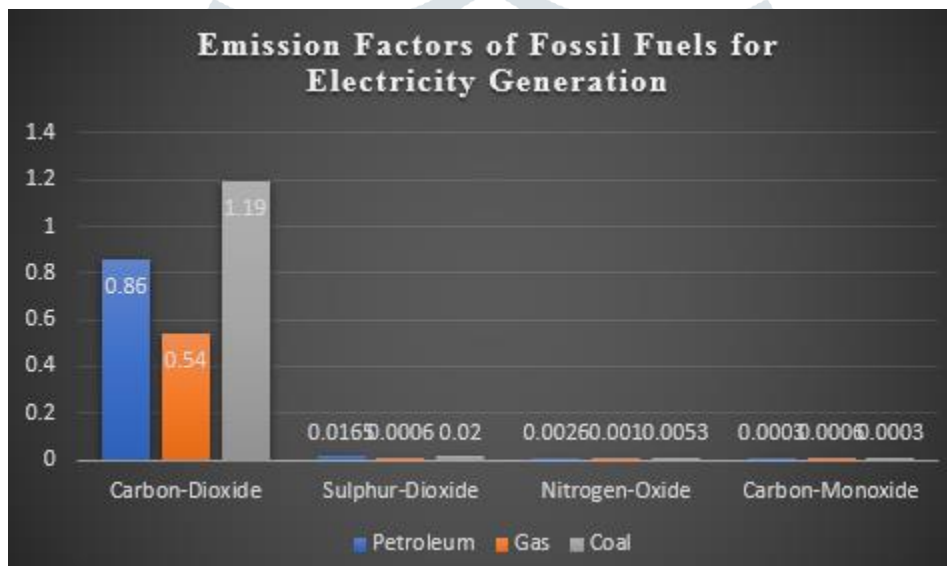


Figure 4: Graphical Representation of Emission Factors of Fossil Fuels for Electricity Generation

Renewable energy sources (biomass, hydro, geothermal and solar) are critical to long-term economic and environmental viability. This green developments have the potential to produce vast amounts of electricity while emitting less greenhouse gases. By 2050, the International Energy Agency estimates that renewable energy will account for more than half of all electricity produced. However, in order to achieve long-term renewable energy sustainability, a long-term grid is needed.

2.4. Solids Waste Treatments and Managements:

Solid waste management is one of the main facets of recycling that has gained recent attention. Government sponsored solids waste management's initiatives have culminated in the development of creative waste reduction methods. According to Australia's Product Stewardship Bill 2011, every company has a duty to retain responsibility and keep the world clear of hazardous waste. These rules and codes were critical to the long-term economic and social stability of the country. Landfill waste disposal is incompatible with long-term sustainability.

Reuse, Reduce, Recover, Recycle, Landfill and Incinerate, and are six phases in the recommendations for a sustainable growth, as seen in Figure 5 below. Disposing of waste in landfills contradicts the ideals and necessitates the production of new goods. As a result, there will be a rise in demand for food, electricity, and other services. Furthermore, when waste breaks down in these landfills, GHG emissions such as carbon-dioxide as well as methane rise. Waste management technology varies between developing as well as developed countries, urban rural and areas, and suburban and industrial zones.

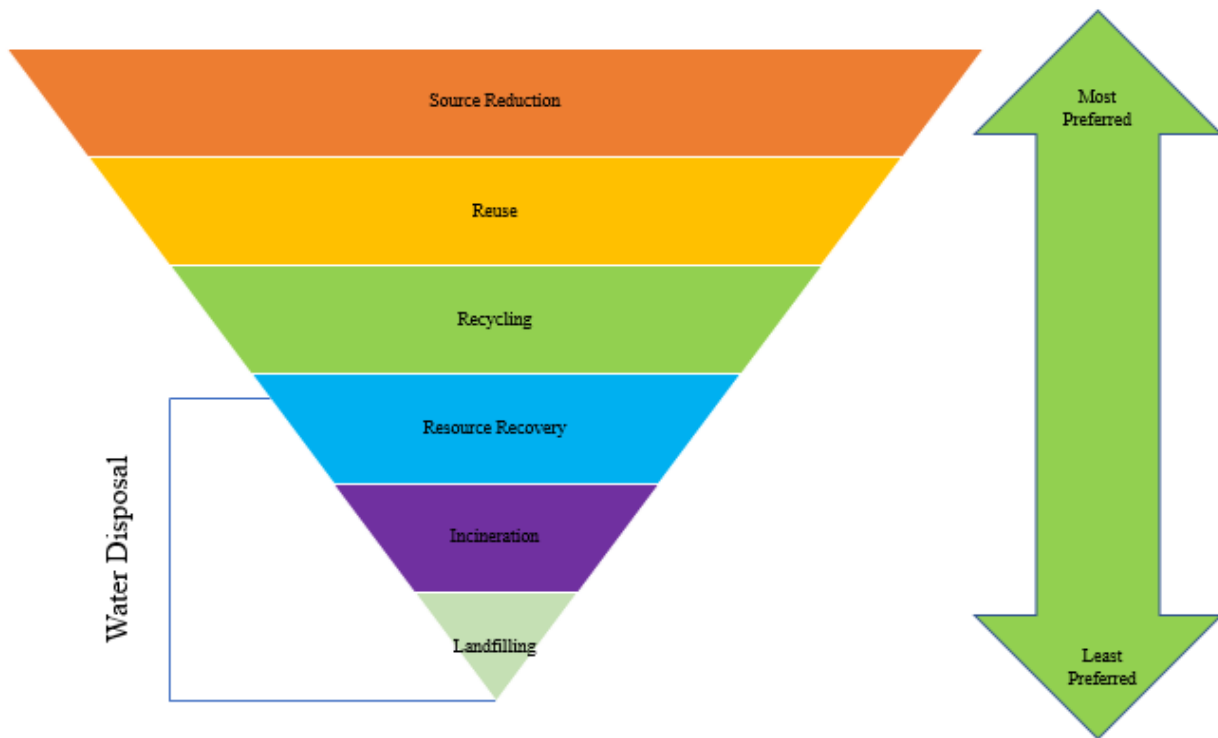


Figure 5: Solid Water Management Hierarchy (Source Reduction, Reuse, Recycling, Resource Recovery, Incineration and Landfilling)

2.5. Water Treatments:

Water is a critical part of life. Several parts of the planet are plagued by water pollution and shortages. The process of eliminating unwanted toxins from water is known as water treatment. Biological, physical, and even chemical contaminants are examples of undesirable compounds, rendering them viable for use of other applications. Many developed countries prefer water treatment as a means of mitigating water tension. Depending on the application, such as industrial or human interaction, this approach can be based on various viewpoints.

2.6. Stages of water treatment:

Flocculation and Coagulation, disinfection, filtration, and sedimentation, are the most common types of water treatment today (Figure 1). In most situations, flocculation and coagulation are the first step in water treatments. During this point, a positive-charged chemical is applied to the water, while the dirt absorbs the negative charge. This procedure separates foreign protein from water, resulting in large particles like Flocculation and after that, the large particles are separated in method of sedimentation which is the process of leaving sediment and tiny particles that survived the filtration stage are captured by the filters. Most water treatments plants also use sophisticated filtering devices such as Nano filters and membrane filters, which are green innovations that are being applied in the water treatment process. These filters arrest all the tiniest particles and disinfect is the final move.

Bacteria, viruses, protozoa, and Parasites are all removed during this process. Chlorine and chlorimide are the two widely employed disinfectants in modern's treatment plant, however, this procedure is hazardous. Water that is safe to drink is necessary for survival and chemical experiments are used to assess the quality of drinking water because it cannot be assessed only by physical inspection.

3. Benefits of Green Technology:

The various advantages of green technology are given below[4]:

- No hazardous substances are released into the atmosphere.
- It has the potential to offer economic opportunities to many regions.

- It needs less upkeep, meaning you won't have to spend too much money to keep it running.
- We will never run out of green energy.
- Reduced CO2 emissions will help to mitigate the impacts of global warming.

4. Drawbacks of Green Technology:

The various disadvantages of green technology are given below[4]:

- Exorbitant deployment costs.
- A lack of knowledge.
- There are no known alternatives in terms of chemical or raw material inputs.
- There is no alternate process technology that has been found.
- Uncertainty about the effect on results
- A scarcity of human capital and expertise.

LITERATURE REVIEW

The several researcher and there researches on green technology and there related things are given below: Global warming, Climate change, oil shortages, and additional environmental issues have prompted the advent of green technology, according to Zaffar A. Shaikh. Researchers studies that in current year, climatic change, global-warming, energies depletion as well as other environment related concern have led for emergences in green technology. It would also have a huge potential effect on sustainability. Human creativity and invention was marked by technological advances in contemporary society. However, such developments have wreaked havoc on the world on a global and local scale. Green innovations have brilliant future in fulfilling the demands of long-term economic viability. However, environmental and social sustainability considerations must be mutually strengthened. Before implementing a technology, it is important to consider both its economic and environmental implications. When economic as well as sustainable developments are prioritized, it should be a win scenario. Their paper addresses green technology and the obstacles that come with creating and applying them, as well as the developments that contribute for sustainability. Their paper further addresses governmental strategies as well as financial issues[5].

N. Attia al. analyze existing environment's sustainability strategies and the role of green technology in sustainable growth, as well as evaluate various green technologies from the perspective of adaptability and deployment problems for urban life in a sustainable climate. Human Society creates and uses a range of technology to sustain day-to-day operations. Technology acceptance is minimal, and it has negative implications for the world and human society. As a result, emerging developments that are more eco and environmentally friendly will be used to support day to day practices in today's lifestyle. New innovations, on the other hand, are more effective and environmentally sustainable as a result of expanded understanding and recent advancements in energy conservation science. These are referred to as "green" or "clean" technologies. recycling, Energy performance, health risks, safety renewable energies, and several other topics are tackled by green technologies[6].

Minjian Guo looks at the features of a sustainable development evaluation methodology that is being developed in the sense of green technology. Methodology in questions based on indicator from the Sustainable Development Goals (SDG) Index, particularly in it ecological dimension. An Average Sustainable Developments Index (ASDI) and a Normalize Sustainable Developments Index are based on these metrics (NSDI). The technique developed as a result was extended to twenty countries from the SDGI ranking. The intense operation of the brown factories in the, Kazakhstan, the Russia Korea United States, and United Arab Emirates and, according to the study, culminated in substantial carbon dioxide emissions. Russia, Switzerland, and Kazakhstan won high points for long-term water and sanitation maintenance. Russia was the only developing country with an ASDI greater than SDGI, with no significant difference between the ASDI and NSDI indexes, suggesting a positive trend in greentech growth. The explanation for the growing disparity between SDGI energy and NSDI was that countries at the top of the socioeconomic rankings used more and wealth had a significantly larger environmental footprint than those that consumed less.

Using comparative studies on conventional technological and green technology innovation, as well as a difference study of environmental systems improvement, Xian Zhiyong attempts to develop a basic structure for environmental systems improvement from the perspective of the green technology innovation paradigm, specifically including the Improvements to the framework of environmental rules and legislation, as well as the system of environmental accountings. System of professional requirements for the atmosphere and system of economic benefits for the environment [7].

After study and reads the researcher researches on topic green technology they have little missing of some point which is compensate by this paper. This paper gives meaning of green technology and their few types in detail manner .This paper also gives full details of applications of green technology and various advantages and disadvantages from green technology.

DISCUSSION

There are lots of researcher who studies and analyzed about the green technology and its various applications. This paper also focuses on the same topic green technology and its various applications but in little details or more diagrammatic way like overview of green technology which consist of meaning of green technology and their few types (Ocean Energy, Solar Energy and Wind Energy etc.).This paper also gives full details of applications of green technology (such as Sewerage Treatments, Captures and Storages Technology, Renewable Energies, Solids Waste Treatments and Managements and Water Treatments) and various advantages (such as no hazardous substances are released into the atmosphere, the potential to offer economic opportunities to many regions etc.) and disadvantages (Exorbitant deployment costs, lack of knowledge etc.) from green technology.

CONCLUSION

This paper focuses on the subject of green technology, and includes the definition of green technology as well as the various forms of green technology (such as wind energy, ocean energy, solar energy, etc.). This paper further addresses the various uses of green technology (such as sewage control, carbon capture and recycling, clean energies, solid waste treatment and management, and water treatment, among others), as well as the benefits and drawbacks of green technology. Using eco-friendly technologies Companies and utility providers are taking the requisite steps and putting in much initiative to address social demands with long-term solutions that can be used today and in the future without causing environmental damage or depletion.

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