

## **An Investigation into the Pinnacle of Environment and Measures to protect it with Special Reference to Renewable Energy as a Benison for Our Planet**

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### **Abstract**

Man does harm to the climate, water, ground, the different components of the world, and to nature itself, all round. There is just so much man-made waste and environmental destruction that the uncertainty waiting is sufficiently anxious to wake us up. A few developments are taking place from a climatologically standpoint of the overall scenario. Our national and regional climates are both highly polluted. In the densely developed elevations of the northern latitudes, the defensive ozone layer is fading twice as quickly as scientists assumed several years earlier. The accumulation of greenhouse emissions would contribute in the immediate term to major shifts in climate conditions due to global warming. The consequences of environmental degradation are on not only humans, but also on other living creatures as well as the natural world. The issue of environmental contamination and waste disposal will be discussed in this article. All that surrounds us is linked to the environment knowingly or unknowingly. The author of this paper is expressing in what condition our environment is now. What measures can be taken to preserve our environment? Furthermore, he discusses how renewable energy is a boon for our planet that may be proven to be a boon if individuals use it effectively.



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### **Introduction**

Individuals are specifically bound to the ecosystem. However, there seems to be no discrimination that the world is influenced by human behavior. Indeed, climate warming has a substantial impact on biodiversity. There has also been a persistent increase in global warming over the past

140 years, and now has a direct influence on a vast range of factors connected with the atmosphere. As a result of the start of industrialization, CO<sub>2</sub> and methane are being injected into the atmosphere at an alarming rate undefined.<sup>1</sup> All around the atmosphere, contaminants and methane raise their heads. Fossil fuel burning and erosion that produce

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greenhouse gases are on the rise. This would be known as the principle of the greenhouse effect. Greenhouse gases operate around the planet like a shield, covering the atmosphere with electricity. This is the explanation behind the warming of the planet. As such, over the last century, the surface temperature of our planet has increased by means of 1.5' f as well as is expected to boost an additional 3 to 15.5' f in the next century. This rise in the temperature of the earth would lead to the loss of ice, rising sea levels as well as some other global issues. The concentration of greenhouse gas emissions will impact the climate of the earth and will have negative consequences on personal wellbeing, security, education and biodiversity. Our water supply, drainage, environment, seasons, power, transport system, and so on are warped and polluted. It should be remembered, though, that such environmental changes are inevitable; CO<sub>2</sub> will stay in the atmosphere for about a century. Even as the warming of the earth continues, and the warmer it becomes, the greater the probability of more disruptive changes to the world's environment and structure. Even if the effect of climate change is impossible to foresee or estimate, what is obvious is that the environment one is familiar with is no longer a credible reference in hoping to achieve. It is critical to begin making choices that reduce Greenhouse gas emissions in terms of the negative consequences of such actions that root global heating as well as global warming, and the only way to do so is to teach themselves with new people through our learning systems as well as additional forms of community explanation.<sup>2</sup>

Natural resource supply is diminishing. Because of the extreme living conditions in industrial economies, as well as the high energy demand for product manufacturing, 1.4 earths of natural resources are used globally each year. Globally, there will be a change in the way natural resources are used. There must still be a compromise between the market for power and the supply. The greater the market, the more power plants are needed to generate electricity. The prices are entirely determined by the kind of power plants used. Light energy, heat energy, and mechanical energy are both types of energy. The key ingredient of the energy used for power that is released is CO<sub>2</sub>, which pollutes the air.<sup>1</sup> Other alternate forms of electricity, such as green energy sources for power production, have been considered

in this regard. Renewable technology significantly cuts greenhouse emissions. Natural resources are critical in the development of green energy. Sunlight, breeze, rain, and waves are examples of natural resources. Renewable power sources include wind, solar, and hydroelectric power. Using the sun or wind to produce power is a more environmentally friendly choice. India's solar energy is the world's fourth most appealing energy source. In terms of advantages, green energies can never be depleted, and upkeep is minimal. It has ecological as well as health advantages, and it reduces dependence on international capital, resulting in lower international debt incurrence. As a result, we might argue that green energy is a boon to mankind.

### **Environment at Its Pinnacle**

The environment is shifting continuously. The truth is not to be denied. However, as our universe evolves, the series emphasizes the importance of remaining aware of the issues that affect it. Citizens should be mindful of the kind of ecological threats our earth is facing, including a immense explosion of natural harms, warming and cooling duration, a variety of kinds of climate patterns, and much more. Climate change has been an unquestionable reality of our present living standards; our world is warming up and we are surely an element of the difficulty. This is not the only ecological problem that we should be thinking about, nevertheless. Inhabitants all over the earth experience a means of fresh moreover daunting ecological challenges daily. Some of them are tiny and impact just a few other ecosystems, while others are transforming the nature of what we've by now become acquainted with dramatically. There are some considerable causes of environmental damage:

### **Wastage of Food**

A quarter of the food fit for human utilization, about 1.4 billion tons is discarded or wasted. It would be sufficient to serve three billion people. Wasted food and waste sources for 4.5 gigatons of energy consumption yearly; provided it was a nation, wastage of food would seem to be the 3rd largest emitter of greenhouse gases, after China and the US. Wastage and depletion happen at various phases in emerging and industrialized countries; in developing nations, 40 percent of waste happens at the post-harvest as well as manufacturing stage, whereas in developed nations, 40 percent of waste

arises at the retail and customer stages. At the retail stage, a staggering amount of food is discarded for various aesthetic reasons; in fact, in the United States, over half of all products discarded are performed simply because they are considered to be very unattractive to be sold to customers--this corresponds to approximately 65 million tons of vegetables and fruits. This adds to food shortages, another of the major ecological issues mostly on board.

#### **Air Pollution**

A study by the World Health Organization reveals that an approximate 4.3 to 8 million people suffer per year from environmental contamination on the planet and that nine in ten people inhale air that includes elevated contaminant levels. In Africa, 258 000 people perished from outside air contamination in the year 2017, up from 164500 in the year 1990, according to UNICEF. These were primarily attributed to agricultural sources and passenger cars, and also pollution from fuel burning and bad pollution levels due to dust storms. In Europe, according to a new survey conducted by the EU Environmental Agency, air pollution caused 400000 yearly deaths in the EU in 2012. In the aftermath of the COVID-19 pandemic,<sup>3</sup> focus has been given to the function of environmental impacts in the transportation of viral components. Initial research has established a strong link between COVID-19-related mortality and air quality, as well as a possible connection with air pollutants helping to transmit the virus. This may have led to a high casualty count in China, where pollution levels are chronically low, but further conclusive research needs to be done until such an inference can be reached.

#### **Pollution by Plastic**

In 1950, the planet generated upwards of 2 million tonnes of plastic waste a year. In 2015, such total consumption amounted to 420 million tonnes. Evidence, a scientific paper, has estimated that at least nearly 12 million tons of plastic are entering the seas per year, damaging wildlife ecosystems and the species that reside in them. Analysis has shown that, if no intervention is in use, it would rise to 30 million metric tons/year by 2040. If micro plastics are used, the total volume of ocean pollution could exceed 600 million tons by the year 2040. Disturbingly, Nat Geo has noticed that 92% of all plastics that have ever been produced are not reused; reflecting not just

one of the greatest environmental concerns of our lives, but yet another significant consumer loss. In view of the reality that plastic requires 400 centuries to break down, it would be several decades before it fails to exist.

#### **Fossil Fuels cause Global Warming**

Climate shifts such as global warming are indeed a product of human activity such as greenhouse gas pollution. Global warming contributes to increasing ocean and planet temperature trends that trigger polar caps to melt, sea levels to increase, and even unnatural weather trends such as flash flooding, heavy snow or soil erosion.

#### **Effect of Agriculture on Environment**

Researchers have found that international food supply contributes to nearly one-third of all living organisms' greenhouse emissions, 30 percent of which originate from animals and fisheries. Agriculture processing produces greenhouse emissions, like nitrous oxide, through application of fertilizers. 60 percent of the earth's farm land is devoted to livestock ranching, while it accounts for just 24 percent of international meat intake. Agriculture not only occupies a huge amount of stock, it also absorbs a significant amount of groundwater, also one of the main environmental issues on this chart. Although agricultural land fields and grasslands occupy 1/3<sup>rd</sup> of the globe's surface, they devour three-quarters of the globe's scarce drinking water supplies.<sup>4</sup> Scientists as well as activists have constantly cautioned that one needs to reconsider our existing food supply; transitioning to an extra green system will significantly minimize the carbon emissions of traditional agriculture.

#### **Deforestation**

Woodlands the size of twenty football fields are disappearing by the minute. By 2030, the world will have just ten percent of its forest areas; if erosion is not reversed, it will all be lost in less than a century. Agricultural production is the primary reason for deforestation, and there is another significant ecological disaster on this note. Land is reclaimed for raising livestock or for planting other crops that are marketed, like sugar cane as well as palm oil. In addition to sequestering carbon, woods help avoid soil degradation as its tree roots attach to the ground and reduce it from being drained off, and often avoid mudslides. The three nations with the upper ranks

of destruction of forests are Brazil, the Democratic Republic of Congo and Indonesia, but Indonesia is fighting this problem, with the cheapest levels at the turn of the last 100 years.

### **Loss of Biodiversity**

For the last fifty years, there has been a recent increase in human usage, population, world commerce and urbanization, culminating in mankind consuming more of the planet's energy than it will possibly replenish. According to a new WWF study, the absolute numbers of mammals, fish, insects, reptiles, and amphibians decreased by 69% between 1970 and 2016. This study relates the decline in biodiversity to a number of causes, but primarily to land-use transition, in particular the transfer of wetlands, such as trees, grasslands and mangroves, to farming production. Some animals like sharks, pangolins and seahorses are greatly impacted by the international deal in animals as well as, as a result, pangolins are scarce. More generally, a new study has revealed the 6th mass loss of biodiversity on the planet is increasing. About 550 types of ground animals are on the endangered list and are expected to be endangered in twenty years; a similar amount has been lost throughout the previous century. Researchers believe that even devoid of the disregard for human beings, this pace of depletion might have occurred for decades.

### **Poor Governance**

Global warming is a product of several business disruptions, as per economists including Nicholas Stern. Experts and campaigners have been urging policymakers to reduce the expense of greenhouse gas pollution activities for years, the omission of which is the greatest market failure, like carbon tariffs which will promote innovation in low-carbon technologies. Government agencies must not only dramatically increase support for renewable technologies in order to reduce the total amount of low-carbon energy sources in order to cut pollution efficiently and easily enough, but they must also implement a number of additional measures in order to address all of the supplementary sector shortcomings. Actually, a nationwide carbon tax is in effect in multiple countries worldwide, like the EU, Canada, Singapore, Japan, Ukraine and Argentina. Nevertheless, new fiscal frameworks are not sufficiently matched with the emissions profile of sources of energy, as per the 2019 OECD

Tax Energy Consumption Survey. The OECD, for instance, argues that carbon prices on carbon emissions are not stringent yet, even though they have proven to be efficient for the energy market.

### **Melting of Glaciers**

The topic of reducing glaciers is a controversial one. While NASA surveys have indicated that there is a rise in the amount of ice in the Antarctic, this rise is just one quarter of what has been reduced in the Arctic. There is ample proof that ocean levels are increasing, and a contributory factor is the melting of the Arctic glaciers. The loss of the glaciers over a period could contribute to severe floods, clean water pollution and substantial ecological changes.

### **Measures to Protect Environment**

#### **Keep the Greenhouse or Greenery Protected from Pesticides**

Cut back on pesticides and herbicides for your own use. Such pesticides are the probable rivals of any greenhouse insects; they destroy bees, moths and other pollinators, like ladybirds, beetles and spiders. Over the past forty years, over three-quarters of UK butterflies have died, and research shows how, in fact, pesticides are among the reasons for such reductions.<sup>5</sup>

#### **Don't Purchase Plastics that are Single-Use**

Every time out and about, drop a container or reusable container into your pocket. Develop a routine and absolutely reduce the regular purchase of bottles, preventing bottles from winding up in the ground and seas. If only 50 individuals brought a flask rather than purchasing a bottle, over 2,700 plastic bottles a year would be prevented from reaching our atmosphere entirely. A major improvement may be created from minor improvements.

#### **Regionally and Organically Shop**

Buying new organic produce is a perfect way to help small producers, decrease your environmental impact and help biodiversity with your food decisions if you have the ability.

#### **Monitor the Animals Next to You**

Vital evidence that helps conservation groups preserve the ecosystem is generated by monitoring the biodiversity where you live. The data was used by the government to expose environmental protection at global, UK and European levels. Butterfly

Conservation's control and tracing systems help guide our preservation resources to where they are most important.

### **Recycle and Reuse**

It has the best advantages for the world to reduce the volume of things you ingest. In the first instance, it is preferable to disregard waste and, as a result, take your transactions more seriously. Re-using materials, as well as saving money, avoids the environmental capital and energy required to produce new systems.

### **Scaling Down your Carbon Emissions**

It does make a difference, perhaps the slightest attempt to reduce carbon emissions. Why don't you leave the vehicle in lieu of cycling or commuting on quick walks? Should you share a car with a partner and get to your workplace or even use the transport system?

### **Stop Fertilizer Dependent on Peat**

A stable peat land plain can contain large quantities of groundwater that can decrease the probability of floods. In fighting global warming, bogs are indeed very useful as they store up large quantities of biomass.<sup>6</sup> They will potentially hold much more carbon than plants. Butterfly Conservation's Bog Team 'mission is to work hard to preserve this priceless ecosystem, but then you can still create a change by removing peat-based manure.

### **Pollinating Plants-Friendly Plants**

Garden Ringlet Butterfly helps bees, moths and other pollinators by introducing a jar of nectar trees to your doorway, patio or back yard this season without breaking the bank. Pollinators are a project for everyone; you don't need a greenhouse or green fingers to grow plants that will help our endangered butterflies and bees.

### **Sign up for an Agency for Animals or the Climate**

At Waster Moss Butterfly Restoration, citizens constructing ditch-blocking reservoirs depend on the assistance of hundreds of volunteers who devote an approximate 176,000 days in total each year, equivalent to 850 full-time workers. We cannot do our job without them. There are numerous resources available to anyone who wants to get involved, regardless of age or background, whether

it's working on wildlife projects or capturing the butterflies and moths that you might see.

### **Offer others Motivation**

Participate at a social venue-Provided you are 5 or 105, volunteering to rescue butterflies; moths and other animals can be enjoyable. Express your love of nature to everyone around you, and encourage your family and friends to participate in outdoor activities. The most significant approach to helping preserve it could be to inspire people to see the importance and uniqueness of nature and its biodiversity.

### **Renewable Energy as a Benison for Our Planet**

Nowadays, we primarily use fossil fuels to heat and power our homes, as well as to power our automobiles. Although we have a limited supply of the earth's resources, it is simple to use coal, oil, and natural gas to meet our power needs. One is using them even quicker than they are being built. They would run out finally. And the US will remove all of its nuclear power by 2020 due to various security problems and waste management questions. In the meantime, over the next 20 years, the energy requirements of the country are projected to rise by 33 percent. It will further fill the void with green energy. And if we had an infinite supply of fossil oil, it would be safer for the world to utilize clean energy. We also label clean or green renewable energy sources as they emit little any other contaminants. Renewable energy utilizes sources of energy such as solar, wind, water, the heat of the planet, and plants, which are continually replenished by it. Renewable energy innovations transform such fuels, most commonly electricity, and moreover heat, chemicals, or mechanical strength, into functional energy sources.<sup>7</sup>

### **Wind Energy**

One of the quickest technologies for green energy is wind power. Globally, demand is already on a rapid increase, in particular since prices are dropping. As per the recent numbers from IRENA, international deployed near shore and offshore wind power ability has grown by a factor of nearly 75 in the previous 2 centuries, rising from 7.6 gig watts in the year 1997 to some 565 GW by the year 2018. Wind power generation increased from 2009 to 2013, and wind power contributed to 16percent of the electricity produced by renewable in 2016. Numerous parts

of the planet have strong winds,<sup>9</sup> but often distant ones are the best places to produce wind energy. Wind energy offshore provides enormous promise. Over a century earlier, windmills first appeared. In the year 1830, after the development of the electric motor, engineers began seeking to manipulate wind energy to create electricity.



**Fig.1: Wind Energy**



**Fig.2: Solar Energy**

Wind energy arrived in the UK and the US in the year 1887 and 1888, respectively. However, current wind energy is consideration to have initiated in Denmark, where lateral wind turbines were mounted in 1891 and a 22.9-metre wind turbine began repair in the year 1897 and the kinetic energy generated by the wind in motion is utilized by the wind to produce energy. Using wind farms or wind turbines that are transformed into electricity. Wind first reaches the blades of the machine, rooting them to revolve as well as bend the turbine that is linked to them. This transforms kinetic energy into turning motion by spinning the shaft linked to the creator and producing electricity by way of electromagnetism.<sup>9</sup> The sum of wind power that can be generated relies on the height of the turbine and the extent of its wings. Output is relative to the ratios of the turbine and the cube of flow pace. In principle, as gust speed

increases, the competence for wind energy rises by a multiplier of eight. Wind turbine capability has grown over time. Standard turbines had a nominal power of 0.06 megawatts as well as a 16 meter rotor diameter in the year 1985. There are turbine strengths of around 2 MW offshore wind and 3-5 MW offshore in modern latest wind energy ventures.

### **Solar Energy**

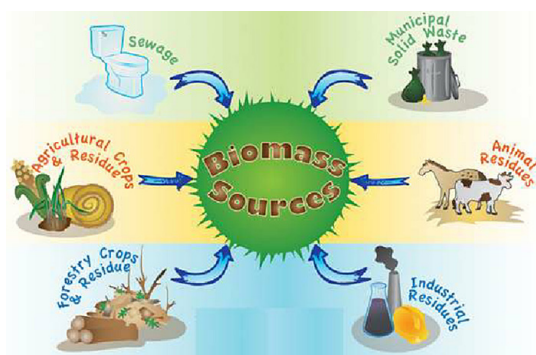
Solar energy is power which is turned into thermal or electrical power by light. The nicest and most plentiful green energy option possible is solar energy, and the U.S. has among the world's wealthiest solar energy. Such power can be used by solar energy for a number of applications, like generating power, arranging illumination or pleasant inside weather, and heating water for domestic, business or manufacturing applications.

Photovoltaic, solar heating & cooling, and focusing solar electricity are three key methods to tap solar energy. Photovoltaic cells use an electrical mechanism to generate energy directly from sunlight, which can be used to control everything from small electronics like calculators and street symbols to dwellings and large commercial corporations. Throughout the category of SHC devices, solar heating & cooling and concentrated solar power technologies both use the heat produced by the sun to provide room or water heating or, in the case of CSP power plants, to operate conventional electric power turbines.<sup>10</sup> Solar power is indeed a very scalable renewable energy: it can be installed as a distribution system or as a concentrated solar power plant on a utility scale (similar to traditional power plants). Using leading edge solar + storage systems, each of these approaches may also preserve the energy they generate for delivery after the sun sets. In the United States, solar operates within a diverse and interconnected electricity infrastructure, operating along with other innovations such as wind energy to move the United States to a renewable energy economy. Each of these applications relies on constructive municipal, federal and state policy<sup>11</sup> systems to maintain equal access for households and companies to renewable energy technology such as solar.

### **Bioenergy**

Bioenergy corresponds to gas and electricity, identified as biomass, that is produced from organic

compounds. From trees and wood to farm and animal waste and also sewage, there may be everything. The word bioenergy often includes fuels made from biological materials for transportation. Because in this article, we're only concentrating on how electricity and carbon neutral gas are produced.<sup>12</sup> It is indeed alluded to as 'feedstock' while biomass is being used as a source of energy. Feedstocks may be cultivated primarily for their total energy, and they can be composed of surplus materials from sectors such as livestock, food manufacturing or wood products. In boilers or furnaces, dry, flammable feedstocks like woody biomass are burned. This boiling water in turn releases steam, which powers the production of electricity by a turbine.



**Fig. 3: Bioenergy**

Wet feedstock is placed in enclosed tanks where they degrade and emit methane gas, such as wasted food, for example. To produce energy, the gas may be caught and burned. Or it may be pumped and used for cooking and heating into the national gas grid. Bioenergy is a type of energy and is very versatile. To satisfy demand, it can be switched up and down easily, making it a perfect backup for green energies such as wind and solar, which are weather-dependent. Biomass combustion releases carbon dioxide. Although, since it emits the same volume of carbon that was consumed by the organic material used to generate it when it was rising, it does not disturb the ambient carbon balance. Burning fossil fuels, in contrast, emits carbon dioxide, which has been stored up for millennia,<sup>13</sup> from a period before the climate of the planet was very unique. In our existing environment, this introduces more carbon emissions, breaking the carbon balance. If waste feedstock or power crops are used, it may rely on the total environment and sustainable advantages of bioenergy.

## Hydro

Hydropower generation is likely the most widely used type of renewable energy, particularly in subtropical climate zones. Hydro energy is probably the most efficient, theoretically usable, as well as environmentally sustainable renewable energy option, and can be described to be a foundation of renewable energy derived from flowing water. Hydropower power is the incorporation of hydro energy into energy by running water.<sup>14</sup> When water is used as the initial source of electricity, it is referred to as hydroelectric power or hydropower.



**Fig. 4: Hydro Power**

Some hydroelectric power plants are located on rivers, streams, and canals, but water storage behind dams is important for daily, continuous, efficient, and renewable electricity production. To support agriculture, households, in addition to manufacturing needs as well as energy production, dams hoard water to liberate later. The reservoir behaves more similar to an array, holding water to be unrestricted to produce power as desirable. With minimal operational and construction costs and virtually no fuel costs, hydro energy is a capital intensive electricity foundation. A main approach to reducing the extent of potential climate change is raising the usage of sustainable energy options, like hydropower.<sup>15</sup> Environmental concerns linked to hydropower production systems, for example dams, rivers and pumped storage facilities, have a marginal influence on air emissions and surrounding areas; though, this does not denote that they are environmentally sustainable. Major attempts have been made to mitigate environmental issues linked to hydropower activities, such as ensuring healthy passage of fish and improving the quality of water during the last 10 years. Additional research, in addition to growth actions, would continue to

improve the operational competence and ecological performance of hydropower installations, water supply control, turbine reaction, and dam protection.

### Geothermal

Geothermal power corresponds to the generation of energy utilizing the planet's crust's excess temperature. Such heat arises from the minerals' nuclear degradation and steady heat depletion from the initial formation of the planet. Geothermal power extraction includes digging wells at an average depth of 3-10 km into the Earth's crust. In a number of procedures, the heat is collected but is drawn from the atmosphere utilizing water and steam in most situations. To heat residences and structures, hot water from the soil may be collected. This is accomplished either by passing the hot water directly into structures and through filtering it into a heat exchanger that moves the heat to the house. Geothermal energy may also be utilized in a geothermal energy plant to generate energy. Electricity is generated when thermal energy produces water, which transforms turbines into generators. Mostly in areas with unique geological requirements, will geothermal technology be utilized.<sup>16</sup> For this reason, the most volcanically and tectonically vigorous areas of the earth are the main regions of geothermal production. In Iceland, Indonesia, New Zealand, Hawaii, California, and Ecuador, for instance, heat and energy plants may be located. It can contribute significantly to the energy and heating sectors in these areas, such as over % of heat pumps and % of Iceland's energy from geothermal sources.



**Fig. 5: Geothermal Plant**

As innovation reduces expenses and helps to transport on the assure of a renewable electricity system, green power is rising. Without compromising efficiency, American wind as well as solar power is

shattering milestones and being incorporated into the regional electricity system.

Which implies that even in the energy markets, renewables are steadily displacing filthy fossil fuels, as long as the benefit of inferior carbon emissions in addition to other kinds of contamination. While not all resources of power promoted as green are ecologically sustainable, in considering the results on ecology, global warming and other topics,<sup>17</sup> biomass and large hydroelectric projects are making tough choices. Here's what you should be acquainted with regarding the numerous forms of forms of renewable energy and how you should use these evolving technologies at dwelling

### New Trends in Renewable Energy

#### Developed Practices and Strategies for Wind Turbines

New technical advances in the process as well as preservation of wind turbines are being used. Drones, including High Definition cameras and thermal cameras, are now addressing a range of challenges encountered for years by wind machinery operators. Drones include high resolution photographs and video recordings from each air wind turbine to monitor for harm and thermal imaging in order to spot internal irregularities.<sup>18</sup>

#### Mono Perc Modules are Becoming more Common

In the 1980s, solar cells were developed by Passive Emitters Rear Contact, but were manufactured recently on a wide scale for industrial usage. Such devices will only become common as conventional solar modules in 2019. PERC modules are a performance improvement from standard mono crystalline modules.

#### The Law Would Encourage Solar Energy on the Terrace

A few authorities at city and region level have lobbied for laws that permit some top room as well as portions of a structure to be utilized in solar power energy plants.

#### Latest Solutions for Photovoltaic Cell

A variety of solar photovoltaic technologies are now being introduced, like solar paths, solar space and hybrid power stations.<sup>19</sup> Solar roads are compact



structures that have solar panels specifically built for walking and moving. Space-based solar power is when spacecraft absorb and turn the rays of the sun in the Earth's orbit. Solar photovoltaic is successfully paired with other innovations in hybrid power stations to improve economic performance and higher power production.

#### **Data and Technology Utilization**

New technology, like Artificial Intelligence and Machine Learning and block chain, are being implemented by power firms in particular. Artificial Intelligence and Machine Learning play a significant role in strengthening demand projections, non-dispatch able power production forecasts, such as wind, solar and wholesale<sup>20</sup> price expectations. Block chain is used by businesses to build and manage energy sharing networks from message passing.

#### **Solar Floating Installation and Maintenance**

The industrial size of floating photovoltaic solar installations increased in 2016, and more than 2GW is reportedly being built between 2016 and 2019. Floating solar is about 25 percent more costly than ground-mounted solar panels.

#### **Hydrogen will Promote Expanded Renewable Energy Participation**

Hydrogen is among the prevailing options for renewable-energy storage and appears preferred as the cheapest option in days, weeks and months for storing large amounts of electricity. Hydrogen fuel can be retained for lengthy stretches of time and can only be stored in volumes restricted by storage facilities.

#### **Capacity of Battery**

The increasing portion of renewable power resources mandated the usage of battery energy storage systems technologies. Irregular renewable technologies like wind and solar energy with broad peaks and troughs involve power storage to deliver consistent production and lower predictive margins for medium and large power stations.

#### **Increasing Size and Coastal Deployment Technologies**

Offshore wind energy is facing a process of transition. In order to tap greater wind rates, engineers build even bigger turbines in shallow waters.<sup>21</sup> Turbines are able to withstand stronger winds, are unregulated

by water heights, and provide a support system which can manage the sacred grail sought by the growing scale of the wind turbine.

#### **Extended Rotor Blades of Wind Turbine**

The larger a rotor blade is the more and more wind the device will transform to power. Large blades are manufactured using sophisticated structural models through the use of advanced composites.

#### **Predictive Maintenance Is Involved**

In recent times, predictive maintenance systems have been a standard procedure in the wind O & M market. Predictive repair systems allow manufacturers of O & M to prepare for component ordering and arranging work and renovation depending on the appraisal of the situation.<sup>22</sup> It therefore removes the requirement for a skilled crew member to visit the plant daily. The method consists of statistical templates for visual analysis, harm assessment, a plan of action and an estimation of the running period of the machinery.

#### **Integration of the Market for Wind Farm Production**

Since 2017, the wind energy business has been consolidated, particularly among the original equipment manufacturers. An important indication of this was the integration of Siemens and Gamesa into a new business – Siemens Gamesa. European producers have been spreading to regions historically controlled by regional companies. Joint ventures with local players were created, where required, whether for enforcement or for competition in that specific sector.

#### **Larger Wind Farms have Been Built and Identified**

Higher wind farm structures and longer wings improve turbine power and electricity. Expenses are often lowered on a per megawatt basis. With rising technical abilities, greater turbines are developed and more manufacturers like to build these warehouse windmills. The offshore wind has been rising, especially.<sup>23</sup> GE newly developed a 107m blade and 220m rotor for the world's largest wind turbine blade – the Halidade-X 12MW offshore turbine.

#### **Empowering Old Wind Turbines**

Wind regeneration is described as replacement of old winds farms with new windmills before the end of

the present state of the existing turbines.<sup>24</sup> The latest windmills are far more effective and strong. These use the wind in an optimum way and can produce high outputs with enhanced electricity production.

### **Future Scope and Limitations**

Renewable electricity options have many potential and benefits. They have the potential to enhance ecological sustainability when they emit little or no GHGs. They allocate resources evenly and address power protection as well as energy shortage issues since they are present almost anywhere on the planet, and they can be called a stable energy supply as opposed to fossil fuels. They often have low operating costs and economic benefits, and on a macroeconomic basis, they help to sustain jobs and stabilise oil prices. They will boost living standards in a home to meet the majority of electricity requirements without running out. Furthermore, they may have a beneficial effect on public wellbeing, as tests have demonstrated that, due to their low GHG emissions, they do not pose as many health issues as fossil fuels.<sup>25</sup> The key drawbacks of renewable energy sources are their higher upfront expense, which may be prohibitively expensive for consumers, and the expense of storing systems, which is also very large. Furthermore, renewable energy is dependent on weather conditions, and prolonged periods of inclement weather can result in energy deficiency. Furthermore, vast land areas are expected to install the requisite green energy technologies. Renewable energy options, according to Brook and Bradshaw, may supply about a percent of overall energy available in the US but more than a percent of the land will have to be utilized. Despite minor challenges, renewable energy resources are regarded as the best option for meeting the world's energy needs, replacing inefficient fossil fuel use, and meeting the seventh Sustainable Development Goal for clean and renewable energy.

### **Conclusion**

The reasons for environmental concerns are various. In view of straightforward one-on-one interactions, the multitude of factors makes it impossible to precisely demarcate the causes and effects of ecological degradation. In dynamic networks of social, technical, political and environmental variables, the causes and consequences are also intertwined. Nevertheless, demographic increase,

industrial growth correlated with the income factor, and technical transition are some of the main problems of destruction of the environment that can be easily figured out. Demography is a critical asset for growth, but as it reaches the threshold levels of support structures, it is a significant cause of environmental pollution. Ultimately, the overarching effect of negative population pressure falls on our capital and habitats. The circumstances of poverty and underdevelopment, together with this, establish a scenario where citizens are expected to live in squalor and worsen their lives further. The construction phase itself often contributes, if not properly controlled, to environmental destruction. The lavish income, synonymous with fast economic development, absorbs much more capital and puts far greater demand on natural resources. The technological shift triggers expected obsolescence, allowing more and more waste to be produced, which in turn is ecologically dangerous. Moreover, short-term interests in maximizing private benefit are hampering the process of replacing outdated technology with ecologically benign technologies. Renewable power, frequently attributed to as renewable power, derives from unknown factors or processes of continual replenishment. For starters, sunlight or wind continues to flourish and travel, while their ease of use depends on occasion and climate. While green power is still viewed as a new innovation, the strength of nature has long been sufficient to harness heating, transportation, electricity and more. Ships were powered by wind to sail the oceans and grind grains with windmills. The sun provided sunlight during the day and helped start fires to last through the night. Nonetheless, over the last 500 years or so, people have steadily shifted to cheaper, dirtier power sources such as coal as well as natural gas.

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### **Conflict of Interest**

The article asserts that he has no conflicts of interest.

## References

1. Dungan J. Faculty Opinions recommendation of Contributions to accelerating atmospheric CO<sub>2</sub> growth from economic activity, carbon intensity, and efficiency of natural sinks. Published online December 19, 2007:554474. doi:10.3410/f.1093824.554474
2. Owusu PA, Asumadu-Sarkodie S. A review of renewable energy sources, sustainability issues and climate change mitigation. Dubey S, ed. *Cogent Engineering*. 2016;3(1):1167990. doi:10.1080/23311916.2016.1167990
3. Parmar Adityarajsinh , Rana Ravirajsinh , Giri Parth , Prof. C.B. Mishra, "Pinnacle of solid waste management and covid-19", *International Journal of Science & Engineering Development Research (www.ijedr.org)*, ISSN:2455-2631, Vol.5, Issue 4, page no.175 - 179, April-2020, Available :http://www.ijedr.org/papers/IJEDR2004028.pdf
4. Schanes K, Dobernig K, Gözet B. Food waste matters - A systematic review of household food waste practices and their policy implications. *Journal of Cleaner Production*. 2018;182:978-991. doi:10.1016/j.jclepro.2018.02.030
5. Siksnyte-Butkiene I, Zavadskas EK, Streimikiene D. Multi-Criteria Decision-Making (MCDM) for the Assessment of Renewable Energy Technologies in a Household: A Review. *Energies*. 2020;13(5):1164. doi:10.3390/en13051164
6. Abbasi T, Premalatha M, Abbasi SA. The return to renewables: Will it help in global warming control? *Renewable and Sustainable Energy Reviews*. 2011;15(1):891-894. doi:10.1016/j.rser.2010.09.048
7. Kumar M. Social, Economic, and Environmental Impacts of Renewable Energy Resources. In: Eloghene Okedu K, Tahour A, Ghani Aissaou A, eds. *Wind Solar Hybrid Renewable Energy System*. IntechOpen; 2020. doi:10.5772/intechopen.89494
8. Lei M, Shiyan L, Chuanwen J, Hongling L, Yan Z. A review on the forecasting of wind speed and generated power. *Renewable and Sustainable Energy Reviews*. 2009;13(4):915-920. doi:10.1016/j.rser.2008.02.002
9. Manickam, S. (2018). Potential Impact of Geopathic Radiation on Environment and Health. *Current World Environment*, 13(Special issue 1), 25–30. <https://doi.org/10.12944/CWE.13.Special-Issue1.05>
10. Chandra Kulshrestha, U. (2019). Threats to Himalayan Ecosystem due to Long Range Transport of Air Pollutants and Land Use Changes. *Current World Environment*, 14(1), 01–02. <https://doi.org/10.12944/CWE.14.1.01>
11. Chang ACC, Chang H-F, Lin F-J, Lin K-H, Chen C-H. Biomass gasification for hydrogen production. *International Journal of Hydrogen Energy*. 2011;36(21):14252-14260. doi:10.1016/j.ijhydene.2011.05.105
12. Umeki K, Namioka T, Yoshikawa K. Analysis of an updraft biomass gasifier with high temperature steam using a numerical model. *Applied Energy*. 2012;90(1):38-45. doi:10.1016/j.apenergy.2010.12.058
13. Panda, L. R. L., Aggarwal, R. K., & Bhardwaj, D. R. (2018). A review on Air Pollution Tolerance Index (APTl) and Anticipated Performance Index (API). *Current World Environment*, 13(1), 55–65. <https://doi.org/10.12944/CWE.13.1.06>
14. Mondal MdAH, Denich M, Vlek PLG. The future choice of technologies and co-benefits of CO<sub>2</sub> emission reduction in Bangladesh power sector. *Energy*. 2010;35(12):4902-4909. doi:10.1016/j.energy.2010.08.037
15. Ullah MH, Hoque T, Hasib MM. Current status of renewable energy sector in Bangladesh and a proposed grid connected hybrid renewable energy system. *Int J Adv Renew Energy Res*. 2012;1:618-627.
16. Kaygusuz K. Energy for sustainable development: A case of developing countries. *Renewable and Sustainable Energy Reviews*. 2012;16(2):1116-1126. doi:10.1016/j.rser.2011.11.013
17. Sukanya, S., & Joseph, S. (2020). Water Quality Assessment using Environmetrics and Pollution Indices in a Tropical River, Kerala, SW Coast of India. *Current World*

- Environment*, 15(1), 11–23. <https://doi.org/10.12944/CWE.15.1.04>
18. Panwar NL, Kaushik SC, Kothari S. Role of renewable energy sources in environmental protection: A review. *Renewable and Sustainable Energy Reviews*. 2011;15(3):1513-1524. doi:10.1016/j.rser.2010.11.037
  19. Robertson GP, Dale VH, Doering OC, et al. AGRICULTURE: Sustainable Biofuels Redux. *Science*. 2008;322(5898):49-50. doi:10.1126/science.1161525
  20. Rogelj J, McCollum DL, Reisinger A, Meinshausen M, Riahi K. Probabilistic cost estimates for climate change mitigation. *Nature*. 2013;493(7430):79-83. doi:10.1038/nature11787
  21. Verbruggen A, Fishedick M, Moomaw W, et al. Renewable energy costs, potentials, barriers: Conceptual issues. *Energy Policy*. 2010;38(2):850-861. doi:10.1016/j.enpol.2009.10.036
  22. Esteban M, Leary D. Current developments and future prospects of offshore wind and ocean energy. *Applied Energy*. 2012;90(1):128-136. doi:10.1016/j.apenergy.2011.06.011
  23. Demirbas MF, Balat M, Balat H. Potential contribution of biomass to the sustainable energy development. *Energy Conversion and Management*. 2009;50(7):1746-1760. doi:10.1016/j.enconman.2009.03.013
  24. S. Mishra, S. K. Singal, and D. K. Khatod, "Sustainable energy development by small hydropower with CDM benefits in India," *International Journal of Ambient Energy*, vol. 32, no. 2, pp. 103–110, 2011.
  25. Kumar. J CR, Majid MA. Renewable energy for sustainable development in India: current status, future prospects, challenges, employment, and investment opportunities. *Energ Sustain Soc*. 2020;10(1):2. doi:10.1186/s13705-019-0232-1