

ECOLOGICAL MANAGEMENT AS PART OF SUSTAINABLE DEVELOPMENT IN RENEWABLE ENERGY SOURCES

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SUMMARY

Renewable energy is energy produced from the Earth's natural resources, those that can be replenished faster than they are used up. Switching to these renewable energy sources is key to combating climate change. One of the most significant challenges of our time is the environmental crisis, mainly caused by the excessive use of fossil fuels. Burning coal, oil and natural gas releases greenhouse gases like carbon dioxide into the atmosphere, trapping heat and causing global temperatures to rise.

KEY WORDS: renewable energy sources, environment, green technologies

EKOLOŠKI MENADŽMENT KAO DIO ODRŽIVOG RAZVOJA OBNOVLJIVIH IZVORA ENERGIJE

SAŽETAK

Obnovljiva energija je energija proizvedena iz prirodnih resursa Zemlje, onih koji se mogu obnoviti brže nego što se potroše. Prelazak na te obnovljive izvore energije ključan je za borbu protiv klimatskih promjena. Jedan od najznačajnijih izazova našeg vremena je ekološka kriza, uglavnom uzrokovana pretjeranom upotrebom fosilnih goriva. Izgaranjem ugljena, nafte i prirodnog plina oslobađaju se staklenički plinovi poput ugljen dioksida u atmosferu, zadržavajući toplinu i uzrokujući porast globalne temperature.

KLJUČNE RIJEČI: obnovljivi izvori energije, okoliš, zelene tehnologije

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INTRODUCTION

Renewable energy is energy produced from the Earth's natural resources, those that can be replenished faster than they are used up. Common examples include solar power, hydropower, and wind power. Switching to these renewable energy sources is key to combating climate change. Human beings, being the most cognitively advanced, have ingeniously utilized all natural resources in various ways to meet the demands of their ever-increasing population. In this process, we inadvertently reduce the basic niche of other forms. Currently, the global ecological footprint is 1.75, which means that the world's population needs 1.75 Earths to sustain itself. Anthropogenic activities have put enormous pressure on natural resources and exacerbated environmental problems such as biodiversity loss, habitat degradation and climate change. These challenges revolve around the production and use of energy on a global scale. Harnessing renewable resources to produce green energy provides answers to create innovative solutions to these key environmental challenges. The future of energy is in the application of renewable sources, primarily wind, sunlight, water and geothermal energy. A combined global effort in the intelligent use of these natural resources can help keep planet Earth green. They can effectively close the gap by reducing energy deficits and meeting growing demands. Energy is at the heart of the climate challenge – and the key to the solution. A large part of the gases with the greenhouse effect that cover the Earth and retain the sun's heat is created through energy production, by burning fossil fuels for the production of electricity and heat. Fossil fuels, such as coal, oil and gas, are by far the largest contributors to global climate change, accounting for over 75 percent of global greenhouse gas emissions and nearly 90 percent of all carbon dioxide emissions. The science is clear: to avoid the worst impacts of climate change, emissions must be cut by nearly half by 2030 and reach net zero by 2050. To achieve this, we need to end our reliance on fossil fuels and invest in alternative energy sources that are clean, accessible, affordable, sustainable and reliable. Renewable energy sources – available in abundance all around us, provided by the sun, wind, water, waste and heat from the Earth – are replenished by nature and emit little or no greenhouse gases or pollutants into the air. Fossil fuels still account for more than 80 percent of global energy production, but cleaner energy sources are gaining ground. About 29 percent of electricity currently comes from renewable sources. The transition to renewable energy creates economic opportunities on multiple fronts. The renewable energy sector has grown rapidly, creating numerous jobs in manufacturing, installation, maintenance and research and development. According to Stanganelli (2008) the transition to renewable energy can reduce energy costs for consumers in the long term, as well as stimulate innovation and entrepreneurship in emerging markets such as electric vehicles, energy storage and grid modernization. The need for renewable energy is not a matter of choice; it is a global imperative. As the effects of climate change become more apparent and the harmful effects of fossil fuel consumption continue to grow, we must accelerate the transition to clean, sustainable energy sources. By reducing our impact on the environment, mitigating climate change, improving air quality, increasing energy security and creating economic opportunity, renewable energy offers a path to a more sustainable and prosperous future. It is time to embrace renewable energy as the mainstay of our efforts to protect the planet and ensure a better quality of life for current and future generations.

RENEWABLE ENERGY SOURCES AS GREEN ENERGY IN THE WORLD

One of the most significant challenges of our time is the environmental crisis, mainly caused by the excessive use of fossil fuels. Burning coal, oil and natural gas releases greenhouse gases like carbon dioxide into the atmosphere, trapping heat and causing global temperatures to rise. This phenomenon, known as global warming, leads to catastrophic consequences, such as increasingly frequent and severe weather conditions, rising sea levels, and the disappearance of plant and animal species. Renewable energy offers a solution to this crisis by generating electricity without emitting these harmful gases. Renewable energy sources such as solar, wind, hydro and geothermal are inherently clean and produce little or no greenhouse gas emissions. By switching energy production to these sources, we can significantly reduce our contribution to climate change. Solar panels convert sunlight into electricity, wind turbines use the power of the wind, and hydroelectric plants use flowing water to produce energy, all without releasing carbon dioxide into the atmosphere. By embracing renewable energy, we can take a giant step towards mitigating climate change and ensuring a healthier planet for future generations. In addition to their role in the fight against climate change, renewable energy sources also address the pressing problem of air pollution. Burning fossil fuels not only releases carbon dioxide, but also emits pollutants such as sulfur dioxide, nitrogen oxides and particulate matter. These pollutants have dire consequences for air quality, leading to respiratory disease, heart disease and premature death. Renewable energy technologies do not produce such harmful emissions, leading to cleaner air and improved public health. In addition to environmental benefits, renewable energy sources increase energy security. Traditional energy sources, such as oil and natural gas, are limited resources that are subject to price and geopolitical conflicts. Reliance on these sources poses a risk to our energy supply and national security. Conversely, renewable energy can be harnessed locally, reducing our dependence on global energy markets and the potential for supply disruptions. It also helps diversify the energy mix, making our energy system more resilient. According to R.J. Klein and others (2005) about 80 percent of the global population lives in countries that are net importers of fossil fuels - that's about 6 billion people who depend on fossil fuels from other countries, which makes them vulnerable to geopolitical shocks and crises. In contrast, renewable energy sources are available in all countries, and their potential has yet to be fully exploited. The International Renewable Energy Agency (IRENA) estimates that 90 percent of the world's electricity can and should come from renewable energy sources by 2050. Renewable energy sources offer a way out of import dependence, enabling countries to diversify their economies and protect them from unpredictable changes in fossil fuel prices, while fostering inclusive economic growth, new jobs and poverty reduction. Renewable energy is actually the cheapest power option in most parts of the world today. The prices of renewable energy technologies are falling rapidly. According to E.L. Tompkins and others (2008) the cost of electricity from solar energy fell by 85 percent between 2010 and 2020. Also, Moser stated (2005) that the cost of onshore and offshore wind energy fell by 56 percent and 48 percent, respectively. Falling prices make renewable energy more attractive everywhere – including low- and middle-income countries, where most of the additional demand for new electricity will come. With costs falling, there is a real opportunity for much of the new power to come from low-carbon sources in the coming years. Cheap renewable electricity could provide

65 percent of the world's total electricity supply by 2030. It could decarbonize 90 percent of the energy sector by 2050, which would significantly reduce carbon emissions and help mitigate climate change. While solar and wind costs are expected to remain higher in 2022 and 2023 than pre-pandemic levels due to generally higher commodity and transportation prices, their competitiveness is actually improving due to much sharper increases in gas and coal prices, the International Agency says for Energy (IEA). According to the World Health Organization (WHO), about 99 percent of the world's people breathe air that exceeds air quality limits and endangers their health, and more than 13 million deaths worldwide each year are caused by avoidable environmental causes, including air pollution. Unhealthy levels of fine particles and nitrogen dioxide come mainly from burning fossil fuels. In 2018, fossil fuel air pollution caused \$2.9 trillion in health and economic costs, about \$8 billion per day. Switching to clean energy sources, such as wind and solar, thus helps to address not only climate change but also air and health pollution. Every dollar invested in renewable energy creates three times as many jobs as in the fossil fuel industry. The IEA estimates that the transition to net zero emissions will lead to an overall increase in jobs in the energy sector: while around 5 million jobs in fossil fuel production could be lost by 2030, an estimated 14 million new jobs would be created in clean energy, resulting in a net gain of 9 million jobs. In addition, energy-related industries would require an additional 16 million workers, for example to take on new roles in the production of electric vehicles and hyper-efficient devices or in innovative technologies such as hydrogen. This means that a total of more than 30 million jobs could be created in clean energy, efficiency and low-emission technologies by 2030. Ensuring a just transition, putting people's needs and rights at the heart of the energy transition, will be of the utmost importance to ensure that no one is left behind. About \$7 trillion was spent subsidizing the fossil fuel industry in 2022, including explicit subsidies, tax breaks, and health and environmental harms that are not factored into the price of fossil fuels. By comparison, around \$4.5 trillion a year needs to be invested in renewables by 2030 – including technology and infrastructure investments – to enable us to achieve net zero emissions by 2050. The upfront costs can be daunting for many countries with limited resources, and many will need financial and technical support to make the transition. But investments in renewable energy sources will pay off. Reducing pollution and climate impacts alone could save the world up to \$4.2 trillion annually by 2030. Moreover, efficient, reliable renewable technologies can create a system less prone to market shocks and improve resilience and energy security by diversifying supply options.

POTENTIAL SAVINGS USING RENEWABLE ENERGY SOURCES

According to the G.C. Gallopín (2006) leading publication on analysis and projections, we are in the midst of the first global energy crisis. 90% of the increased global pressure on electricity prices is due to high gas, oil and coal prices. The global energy shock makes us realize that this weak energy system, which relies heavily on non-renewable resources, is unsustainable. According to the IEA, this energy crisis has stimulated the deployment and use of solar photovoltaic cells and wind power in 2022, which will continue to grow over the next few years. These renewable energy sources are key to reducing pollution, producing clean energy and solving energy security issues. Moreover, the generated energy will be cheaper and more accessible. Exploiting the enormous potential of solar energy, wind

energy and hydropower can accelerate the energy economy. A shift has been seen in clean energy investment over fossil fuels, according to an IEA report, with clean energy projected to nearly double in 2023. According to another IEA report, the energy crisis caused by the Russia-Ukraine war has already led to a 40% increase in renewable energy capacity % in Europe by 2024. Globally, around 100 million households will rely on rooftop solar PV by 2030. Hydropower has been used on a small scale since time immemorial in flour mills. Fast water, ocean waves and tides can be used to create energy from water. Hydropower contributed one-sixth of the world's electricity in 2020. Although hydropower is the largest renewable source of energy production, it decreased by 0.4% in 2021 due to intermittent droughts in hydropower-rich countries such as Brazil, the United States, Turkey, China, India and Canada, according to the IEA. Wind can be harnessed by using turbines in wind-mills to produce energy. It is the second largest renewable energy source. Wind electricity generation grew by a record 273 TWh in 2021 (up 17%), according to the IEA, making the growth rate 55% higher compared to 2020. The largest contributor to wind generation growth in 2021 was China (70%), the United States (14%) and Brazil (7%). Geothermal power plants release the heat generated within the Earth's core to produce energy. This energy can be used for the production of electricity or for direct use through heat pumps. According to the IEA's 2021 Annual Report, electricity generation has been overtaken by the direct use of geothermal energy globally. With over 25% of the world's total capacity online, the US remains at the top of the world in installed geothermal capacity. Supporting green energy policies across nations is an incentive to gain energy independence and strengthen the economy.

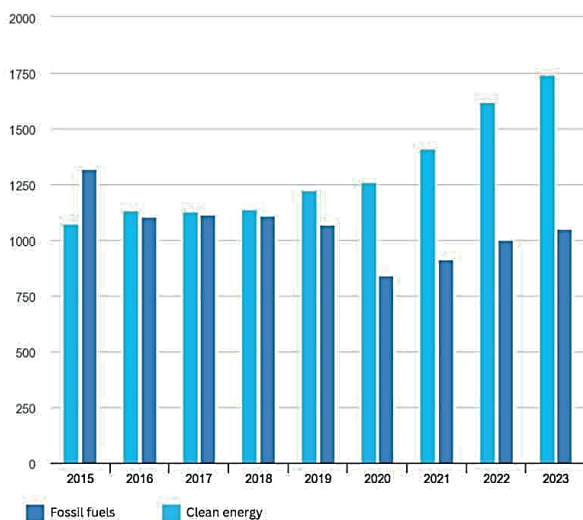


Figure 1. Global energy investments in clean energy and fossil fuels (2015-2023)

The economic aid plan for growth is promising. Individual countries are estimated to invest about US\$108 billion in clean energy and US\$470 billion in energy-related stimulus packages. The IEA also predicts that deployment of solar PV and wind energy will increase

significantly this year due to increasing policy momentum, fossil fuel prices and energy security concerns. Growth is expected to match the combined electricity generation of China and the United States, with total global renewable electricity capacity up to 4,500 GW. Renewable energy sources are ubiquitous. They can be easily exploited by using appropriate technology. It is imperative to deploy renewable energy sources and improve green energy generation capacity to tackle climate change and meet net zero emissions. Green energy is not only environmentally friendly, but also affordable and creates employment.

Climate change is one of the most pressing challenges facing humanity today. The burning of fossil fuels for energy production is considered a major contributor to global warming and its associated effects. To mitigate the effects of climate change, there is an urgent need to switch to renewable energy sources. This integrated approach aims to study different aspects of renewable energy and their role in the fight against climate change. The main driver of climate change is increased greenhouse gas emissions caused by human activities. Burning fossil fuels such as coal, oil and natural gas to produce energy is the largest contributor to greenhouse gas emissions. These gases trap heat in the Earth's atmosphere, triggering a phenomenon called the greenhouse effect. Other human activities that contribute to greenhouse gas emissions include desertification, industrial production and agricultural practices. Climate change has esoteric effects on every aspect of the planet. Rising global temperatures are causing polar ice caps and glaciers to melt, leading to rising sea levels. This poses a serious threat to coastal and low-lying residents and increases the risk of flooding and destruction. Changing rainfall patterns are causing droughts, heat waves and severe weather such as hurricanes and cyclones to become more frequent and severe. Climate change is having a profound impact on ecosystems and biodiversity around the world. One of the most significant impacts of climate change on ecosystems is the change in the distribution and abundance of species. As temperatures rise, many species shift their ranges poleward or to higher altitudes in search of cooler temperatures. This can lead to the loss of biodiversity in areas that are left behind, as well as the creation of new ecosystems in areas that are being colonized. Changing the timing of seasonal events is another effect of climate change on ecosystems. Many species rely on certain seasonal cues to determine the timing of their life cycles and migrations, such as the time of flowering or the appearance of insects. These signals, however, lose accuracy as the temperature rises, causing changes in the timing of seasonal events. Positive environmental impacts are one of the main advantages of renewable energy. Unlike fossil fuels, renewable energy sources emit almost no greenhouse gases while in use. By reducing the amount of carbon dioxide and other pollutants emitted into the atmosphere, this helps mitigate climate change. Furthermore, renewable energy sources minimize adverse effects on ecosystems and public health by not increasing air or water pollution. Countries benefit from better energy security and independence thanks to renewable energy sources. Renewable energy can be produced domestically, unlike fossil fuels, which are often imported from other regions or nations. This limits reliance on imported energy sources and reduces vulnerability to price or supply changes. For example, countries with abundant wind resources can use wind energy to generate electricity instead of importing coal or natural gas to do so. Countries can improve their energy security and reduce their vulnerability to the geopolitical risks of fossil fuel imports by diversifying their energy mix with renewable energy sources. The use of renewable energy sources has significant benefits for public health. Air pollution from conven-

tional energy sources such as coal and oil is linked to respiratory problems, cardiovascular disorders and early mortality. Emissions of hazardous pollutants including sulfur dioxide, nitrogen oxides and particulate matter can be significantly reduced by switching to renewable energy sources. For example, switching from coal-fired power plants to solar or wind power plants can improve air quality in a local area and reduce the incidence of respiratory diseases. Along with improving public health, this also reduces the cost of treating pollution-related illnesses. Global climate change is not a future problem. Changes to Earth's climate driven by increased human emissions of heat-trapping greenhouse gases are already having widespread effects on the environment: glaciers and ice sheets are shrinking, river and lake ice is breaking up earlier, plant and animal geographic ranges are shifting, and plants and trees are blooming sooner. Effects that scientists had long predicted would result from global climate change are now occurring, such as sea ice loss, accelerated sea level rise, and longer, more intense heat waves. Scientists have high confidence that global temperatures will continue to rise for many decades, mainly due to greenhouse gases produced by human activities. The severity of effects caused by climate change will depend on the path of future human activities. More greenhouse gas emissions will lead to more climate extremes and widespread damaging effects across our planet. However, those future effects depend on the total amount of carbon dioxide we emit. So, if we can reduce emissions, we may avoid some of the worst effects. Burning fossil fuels, cutting down forests and farming livestock are increasingly influencing the climate and the earth's temperature. This adds enormous amounts of greenhouse gases to those naturally occurring in the atmosphere, increasing the greenhouse effect and global warming. 2011-2020 was the warmest decade recorded, with global average temperature reaching 1.1°C above pre-industrial levels in 2019. Human-induced global warming is presently increasing at a rate of 0.2°C per decade. An increase of 2°C compared to the temperature in pre-industrial times is associated with serious negative impacts on the natural environment and human health and wellbeing, including a much higher risk that dangerous and possibly catastrophic changes in the global environment will occur. For this reason, the international community has recognised the need to keep warming well below 2°C and pursue efforts to limit it to 1.5°C. The main driver of climate change is the greenhouse effect. Some gases in the Earth's atmosphere act a bit like the glass in a greenhouse, trapping the sun's heat and stopping it from leaking back into space and causing global warming. Climate change affects all regions around the world. Polar ice shields are melting and the sea is rising. In some regions, extreme weather events and rainfall are becoming more common while others are experiencing more extreme heat waves and droughts. We need climate action now, or these impacts will only intensify. When greenhouse gases such as carbon dioxide build in the atmosphere, they act like a blanket around the earth. When sunlight (mostly short-wave radiation) hits this blanket, it passes straight through and continues until it reaches the surface of the planet. The earth then absorbs this sunlight and emits a different type of light, longer-wave infrared radiation, back out to space. As it leaves the atmosphere, the infrared radiation also hits the greenhouse gas blanket. Most of it goes straight through, but some of it is absorbed and goes back down to earth. This traps the infrared radiation and causes the surface to heat – a process we call the 'greenhouse effect'. It is crucial to understand that the greenhouse effect is critical to life on earth. Without a blanket of greenhouse gases trapping in heat, the temperature would be bitterly cold, and humans would be unable to

survive. However, by adding extra greenhouse gases into the atmosphere, humans have created an enhanced greenhouse effect. The greenhouse gas blanket is now thicker and is absorbing more infrared radiation than before. In other words, the greenhouse effect is stronger and, instead of keeping the earth at a stable temperature, it is causing the planet to heat up. To feed our livestock and ourselves, people have chopped down large areas of the forest and used the land to grow crops. Forests are very good at removing carbon dioxide from the atmosphere, and so cutting down trees allows carbon dioxide to build up in the atmosphere even more. Land can also be used to rear livestock, such as cattle for meat and milk. These animals produce additional gases, like methane. They also eat crops that might otherwise have been needed by humans, meaning that even more land is required. As well as fossil fuels, deforestation and land use, aeroplanes and the production of cement also contribute to emissions of carbon dioxide. Greenhouse gases can live in our atmosphere for tens or hundreds of years. The gases that are already in our atmosphere are effectively locked in and will contribute to increasing temperatures. Even if we stop all emissions today, we cannot avoid some level of warming. The amount of warming we will see, beyond what we have already caused, depends on the changes we make. If we want to avoid significant increases in the average surface temperature, we must cut greenhouse gas emissions and switch to renewable energy sources. We must also use land more sustainably and may need to use techniques to remove carbon dioxide from the air. Burning of fossil fuels is one of the biggest culprits for climate change. Coal and gas generally burned in power plants to make electric energy. As of 2021, coal and gas make for 45% of production of electric energy in Europe. In the US the situation is much worse, where over 81% of energy production comes from fossil fuels. Another big consumer of fossil fuels is transportation, where oil products are used as automobile or jet fuel for either passengers or cargo. About a third of the oil in the world's CO₂ emissions are caused by burning of oil products. Land use is another culprit that contributes to release of CO₂ in the atmosphere. Forests are large stockpiles of organic carbon, both in the mass of the wood from the trees, but also in the soil, where their roots create a microbiome together with bacteria and fungi. When the forest is cut, the roots decay together with the biome underneath, releasing the stored carbon. Another part of land use is agriculture. The intensive farming methods currently used and supported will till the soil and turn it over, which exposes the soil microbiome. This leads to its death and decay, reducing the amount of organic matter in the ground and its subsequent release into the atmosphere as carbon dioxide. There is a balance between the planet's carbon and temperature. Artificially tipping that balance has largely unknown consequences, but some of them can be predicted already. These are the so called "tipping points". There are many reserves of greenhouse gasses on earth, for instance frozen in the polar caps or trapped under permafrost. As temperatures increase and this ice melts, the gasses will get released, amplifying the negative effects in a feedback loop. This is why it's important to stop the warming of the planet because it is not clear when these tipping points will be reached, and when they are reached, there is no way of reversing them. Some of the consequences of increasing the temperature of the planet are unstable weather: frequent and intense drought, storms and hurricanes, heat waves, extreme cold. It takes a long time for ecosystems to adapt to changing climate, and the rate at which it's happening leads to extinctions and destruction of natural habitat. Another large consequence is melting of glaciers, which leads to an increase in sea level causing displacement of people. Unstable

weather also makes certain areas unsuitable for living because of intense droughts or frequent flooding, which also causes displacement, particularly in developing countries. Climate refugees might be becoming more and more common in the modern world. Right now humanity is on a course towards a doomsday scenario. It's becoming apparent that if we want our future planet to be as habitable as it is today, drastic changes need to be undertaken right now to reduce, and ultimately halt our emissions of CO₂ in the near future. This would require us to completely change the way we produce energy, and shift the focus away from fossil fuels. This is difficult because the current growth-oriented capitalistic model of society is very dependent on fossil fuel as a resource for quick and easy growth. Therefore, the most fundamental approach we can take is that of resisting the consumerist approach towards life we've been brought up in. Finally, it's important to educate future generations in order to build a conscious and sustainable society of the future. The way children are taught in schools influences their outlook on the environment, and their role and connection with it. It is very important to be taught from a young age to appreciate the nature and the benefits we get from the connection with nature. It is also important to teach critical thinking, as well as how to be an active citizen who understands their role in the society, but also the structure of society and power. Climate change is commonly defined by atmospheric scientists as a significant and long-lasting change of weather patterns over periods of decades to millions of years. There is much debate in some political circles and business organizations that these changes are primarily caused by biotic sources, variations in solar radiation, volcanic eruptions, and ocean circulation. Some observers have opined that climate changes have occurred in the past and is not associated with man's combustion of fossil fuels. Scientific consensus, however, is "that climate is changing and that these changes are in large part caused by human activities". While much remains to be explained, the overwhelming evidence suggests that hypotheses and scientific models of climate change have stood firm in light of challenging scientific debate over the past few decades. The release of carbon dioxide in the atmosphere since the beginning of the Industrial Era has resulted in a rapid increase in global temperatures, a reduction of ice in the polar caps, a rise in sea levels, and more dynamic weather extremes. Climate change is expected to impact the hardest—changes in precipitation levels, rising sea levels, temperatures that impact crop production, and weather-related events.

CONCLUSION

The pursuit of renewable energy solutions is driving innovation and technological progress. Research and development of clean energy technologies have led to breakthroughs in energy storage, grid management and energy efficient devices. These innovations not only benefit the environment, but also boost economic growth and competitiveness. Although renewable energy holds great promise in the fight against climate change, it is not without its challenges. One of the main obstacles is the sporadic nature of some renewable sources, such as wind and solar. Energy storage solutions such as batteries and grid upgrades are key to ensuring a reliable and consistent energy supply. Also, the transition from fossil fuels to renewable sources requires significant investments in infrastructure and a commitment to moving away from energy sources that use carbon intensively. Renewable energy is not just an option; it is necessary in our fight against climate change. Its ability to reduce green-

house gas emissions, improve energy efficiency and stimulate economic growth makes it a vital component of any climate action plan. The urgency of the climate crisis requires us to accelerate the transition to renewable energy sources and reduce reliance on fossil fuels. In this way, we can protect our planet, ensure a sustainable future for generations to come, and ultimately turn the tide of climate change. It is critical to continue investing in research and development to develop solutions to climate change. This entails creating breakthrough technology, expanding the efficiency of renewable energy sources, improving carbon capture and storage techniques, and identifying environmentally friendly substitutes for high-emitting businesses. We need to reduce our reliance on fossil fuels and switch to renewable energy sources including solar, wind, hydroelectric and geothermal energy as one of the most important measures to mitigate climate change. Compared to fossil fuels, these sources are much more abundant, cleaner and emit much less greenhouse gases. Governments can encourage the use of renewable energy through programs such as feed-in tariffs, tax credits and subsidies. In addition, it is crucial to invest in research and development to increase the efficiency and cost of renewable technology. Consequently, the transition to renewable energy sources is essential to reduce climate change and ensure a sustainable future. However, there are a number of obstacles preventing this change. These issues fall into three main categories: those that are economic, technological, and political. Because they rely on resources that are constantly renewed, renewable energy sources are sustainable. Renewable energy can be used continuously without losing the source, unlike fossil fuels which are limited and depleting. Future generations can be sure that energy will be available for a long time. Moreover, compared to traditional power plants, renewable energy solutions often use less water during operation. This is crucial in areas of water scarcity or drought. For example, unlike thermal power plants that use a lot of water for cooling, solar photovoltaic systems do not need water to produce electricity.

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