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• Climate Change •



# The Role of Renewable Energy in Combating Climate Change

(All images from Canva)

Climate change presents a global crisis that demands immediate and sustained action. One of the most effective strategies to combat this serious risk is to reduce our reliance on fossil fuels and transition to clean renewable energy sources. In this article, we will explore the array of renewable energy technologies available today, delve into the associated challenges and benefits, and examine the steps taken by governments and businesses worldwide to scale up their utilisation.



Diverse renewable energy technologies are in use across the globe today. Among the most prominent is solar power, which harnesses energy from the sun to generate electricity. Photovoltaic (PV) panels, a common technology in this field, convert sunlight into electricity through the photovoltaic effect. Solar power boasts numerous benefits, including its abundance, scalability, and environmental friendliness. It has even reached the consumer level, with solar power products readily available for charging electronics, making it the most accessible form of renewable energy.

Another widely embraced renewable energy source is hydropower, which generates electricity by harnessing the energy of flowing water, often through dams and hydroelectric power plants.



Hydropower stands out as a reliable energy source capable of storing excess power for future use. Beyond electricity generation, hydropower dams offer dependable freshwater supplies for drinking, irrigation, and industrial needs, particularly in regions vulnerable to droughts. Malaysia, for instance, hosts several prominent hydropower dams and hydroelectric projects that play a vital role in both energy generation and water management. The Bakun dam in Sarawak, the Temenggor dam in Perak, and the Sungai Selangor dam, which supplies water to the Klang Valley, are well-known examples.

Wind energy captures the kinetic energy of the wind to drive turbines and generate electricity. Wind farms can be found both onshore and offshore and are recognised for their maturity and cost-competitiveness. Leading nations, such as China, the United States, and select European countries, have well-established wind energy industries. Additionally, there are two other prominent renewable energy sources i.e., biomass and geothermal energy. Biomass energy derives from organic materials like wood, agricultural residues, and waste, which can be burned directly for heat or converted into biogas, biofuels, or electricity. Biomass energy is the fourth-largest primary energy source in the world, accounting for about 14% of global energy consumption. In 2020, global biomass consumption reached 146 billion metric tons, up from 139 billion metric tons in 2019.



On the other hand, geothermal energy taps into the Earth's natural heat from the core, harnessed through geothermal power plants and heat pumps for building heating and cooling. Geothermal resources are distributed unevenly across the world, with countries like Iceland, the Philippines, and New Zealand relying heavily on geothermal energy due to their abundant resources, while others like the United States possess significant untapped potential.

The International Energy Agency ('IEA') projects state that biomass consumption and geothermal energy consumption will grow by 25% by 2030.

The adoption of renewable energy sources offers a multitude of interconnected benefits. Firstly, wind, solar, hydro, and geothermal power represent crucial allies in the battle against climate change and the quest for cleaner air. Their minimal greenhouse gas emissions during electricity generation significantly reduce our carbon footprint, ensuring a more sustainable future. For example, a 2021 study by the International Energy Agency found that renewable energy helped to avoid 2.3 billion tonnes of carbon dioxide emissions in 2020.



Moreover, renewable energy enhances energy security by tapping into domestic resources, reducing dependence on imported fossil fuels. This not only fortifies nations against supply disruptions and price volatility but also bolsters their energy independence. Furthermore, the growth in renewable energy technologies has catalysed substantial job creation across various sectors. From manufacturing and installation to maintenance and research and development, the renewable energy sector has become a significant source of employment, benefitting urban and rural areas alike. For example in 2021, the Malaysian Renewable Energy Development Authority (Seda Malaysia) reported that the renewable energy sector has employed over 20,000 people, and this number is growing every year.

Additionally, the transition to renewable energy fosters broader economic growth. Investments in renewable technologies attract private capital, stimulate innovation, and give rise to entirely new markets and industries. For example, the proliferation of electric vehicle manufacturing and energy storage solutions is intricately linked to the rise of renewable energy .



Renewable technologies often incorporate energy-efficient practices, further amplifying their impact. Solar panels, for instance, convert sunlight into electricity with minimal energy losses. Combining renewable sources with energy-efficient strategies across various sectors yields substantial energy savings and cost reductions. In sum, embracing renewable energy represents a holistic and sustainable approach to meet escalating energy demands while mitigating the adverse effects of fossil fuel consumption.

However, embracing renewable energy sources comes with unique challenges that must be addressed to realise their full potential. Firstly, the issue of intermittency and energy storage arises. Solar and wind power generation depend on weather conditions, making them less consistent than fossil fuel-based sources. To ensure a reliable energy supply, effective energy storage solutions like batteries are essential to capture excess energy during periods of high generation for use during low-generation periods.



Secondly, the substantial initial costs of implementing renewable energy systems can be a deterrent. Although long-term benefits, including reduced energy bills and incentives like tax credits, can outweigh these upfront expenses, the high initial investment can be a barrier for some. Additionally, to fully harness the benefits of renewable energy, significant upgrades to our energy infrastructure and grid integration are necessary. This entails substantial planning and investment to ensure the smooth integration of intermittent renewable sources into the existing energy grid.

Another challenge pertains to land use and environmental concerns associated with certain renewable sources are hydropower and biomass energy. They can have significant environmental and social impacts if not implemented and managed carefully. Sustainable practices and meticulous planning are essential to mitigate these negative effects, ensuring that renewable energy development aligns with environmental goals and community well-being.



In Malaysia, government and business initiatives are playing a pivotal role in advancing renewable energy adoption and sustainability. The Malaysian government has implemented several policies and incentives to promote the use of renewable energy, including the feed-in tariff (“FiT”) system, which guarantees fixed prices for electricity generated from renewable sources like solar and biomass. This initiative encourages individuals, businesses, and industries to invest in renewable energy projects. A 2021 study by the Malaysian Green Technology Corporation found that renewable energy could contribute up to RM100 billion to the Malaysian economy by 2030.

In the business sector, Malaysian companies are increasingly recognising the benefits of renewable energy. Several corporations, including those in the palm oil industry, have adopted sustainable practices and invested in renewable energy technologies to reduce their carbon footprint. For instance, some palm oil companies have integrated biogas capture systems into their operations to convert waste into renewable energy. Tenaga Nasional Berhad (“TNB”), is diversifying its energy generation portfolio to include renewable energy sources. They have invested in solar power projects and are working on increasing the share of renewable energy in Malaysia's electricity generation mix. Malaysian Green Technology Corporation study found that rooftop solar panels could help to reduce Malaysia's carbon dioxide emissions by up to 10



million tonnes per year. These initiatives not only contribute to environmental sustainability but also enhance the companies' reputations and competitiveness in international markets.



Furthermore, research and innovation efforts are on the rise in Malaysia to improve renewable energy technologies. Universities and research institutions collaborate with government agencies and private companies to develop more efficient and cost-effective renewable energy solutions. This collaborative approach is essential for advancing the renewable energy sector in the country, ensuring a sustainable and clean energy future for Malaysia. Additionally, Malaysia has set renewable energy targets as part of its commitment to reduce carbon emissions, further incentivising the transition to cleaner energy sources. The Ministry of Natural Resources, Environment and Climate Change (NRECC) set a target to reach 31% of renewable energy share in the national installed capacity mix by 2025. This target supports Malaysia's global climate commitment to reduce its economy-wide carbon intensity of 45% in 2030.

The role of renewable energy in combating climate change cannot be overstated. The transition to renewable energy sources is urgent. Climate change is already having a devastating impact on people and communities around the world, and the costs of inaction are only going to grow

higher in the future. By transitioning away from fossil fuels and embracing clean energy sources, we can significantly reduce greenhouse gas emissions, create jobs, and stimulate economic growth. We have the technology and the resources we need to transition to a clean energy future. What we need now is the political will to make it happen. Governments and businesses play a crucial role in driving this transition through policies, commitments, and investments in research and innovation. As we continue to scale up the use of renewable energy technologies, we move closer to a sustainable and resilient future for our planet.