

An Emerging Crisis: Climate Change and Global Warming

Logeshwar Saravanan

Department of Mechanical Engineering

Dr. Joel. K. Berry

MECH 322

October 17, 2022

An Emerging Crisis: Climate Change and Global Warming

The term "climate change" refers to a broad spectrum of modifications to the Earth's climatic system. It is mostly brought about by human activity, such as land use changes, deforestation, and the burning of fossil fuels. One of the most obvious and concerning effects of climate change is the planet's warming, sometimes known as global warming. Rising sea levels, more frequent and severe weather events, water scarcity, and food insecurity are just a few of the far-reaching and potentially disastrous repercussions of climate change. According to the scientific community, the world needs to take immediate action to cut greenhouse gas emissions and get ready for the effects of climate change.

The Need to Act Now on Climate Change

The effects of climate change on the earth are already profound, and they will probably get worse in the years to come. Even if urgent and major effort is made to cut greenhouse gas emissions, the Earth's temperature is expected to climb by another 0.5°C to 1.5°C by 2040 from pre-industrial levels (IPCC, 2018). Because of the melting of glaciers and ice sheets brought on by global warming, sea levels are rising, endangering low-lying communities and displacing millions of people. Also, it is resulting in more frequent and severe weather occurrences, such as heat waves, droughts, floods, and storms, which have a substantial negative effect on society and the economy.

It is impossible to exaggerate how urgent it is to confront climate change. Mitigating the effects of climate change will become more challenging and expensive the longer we wait to act. The effects of climate change will worsen as long as we continue to produce greenhouse gases, making it more difficult to adapt to and recover from extreme weather events and causing irreparable harm to ecosystems and species.

Reducing greenhouse gas emissions is one of the most important parts of combating climate change. Moving away from fossil fuels and toward renewable energy sources, such wind, solar, and geothermal energy, is necessary to achieve this. It also involves the development and deployment of technology that can capture and store carbon dioxide emissions, such as carbon capture and storage technologies.

It's critical to plan for and adapt to the effects of climate change that are already being felt and will continue to be seen in the future, in addition to lowering greenhouse gas emissions. This involves establishing drought-resistant agricultural methods, building resilient infrastructure that can withstand extreme weather events, and improving water management systems to ensure that water is used effectively and sustainably. Due to the seriousness of the issue, all facets of society must work together to

combat climate change. Governments must play a key role in establishing aggressive goals for cutting greenhouse gas emissions, enacting laws and regulations that encourage the use of low-carbon practices and technology, and funding R&D to aid in the transition to a low-carbon economy.

Also, the business sector must lessen its carbon footprint and create creative climate change solutions. By making wise decisions about the goods they purchase and the lifestyle choices they adopt, consumers may play a part. Individual initiative is also crucial. By making simple adjustments to their everyday routines, such as taking public transit, consuming less energy, and wasting less food, everyone can help the fight against climate change. Despite their seeming insignificance, individual actions can have a major impact on lowering greenhouse gas emissions and decreasing the effects of climate change when paired with collective action.

Engineers' Social Responsibilities in Combating Climate Change

When it comes to combating climate change and global warming, engineers are essential. They are skilled and knowledgeable enough to create and put into practice solutions that cut greenhouse gas emissions and lessen the effects of climate change. They also design and construct the infrastructure and technologies that support modern society. Moreover, engineers can aid communities in preparing for and readjusting to the effects of climate change.

Engineers must take into account the wider social and environmental effects of their work in order to fulfill their societal obligation to combat climate change. This requires them to consider how their projects might affect communities and the environment, and to seek to reduce any bad effects while maximizing any beneficial effects. Also, engineers must make sure that all communities may access and benefit from their solutions.

Technological Developments Needed to Address Climate Change

It will take a variety of technology to combat climate change and global warming. One of the main technologies is Renewable energy technologies, which are crucial for lowering greenhouse gas emissions and implementing a low-carbon economy, including solar, wind, and geothermal energy. These technologies are being implemented globally at an accelerated rate and are becoming more and more cost-competitive with fossil fuels. Batteries and pumped hydro storage are examples of energy storage technologies. These technologies are essential for enabling the mainstream adoption of renewable energy technologies. These innovations can ensure that renewable energy is available when it is required while balancing the supply and demand of electricity.

Technologies for capturing and storing carbon dioxide emissions are crucial for lowering industrial sector greenhouse gas emissions because they can store carbon dioxide emissions from power plants and other sources underground. Although these technologies are still in the early stages of research, they have the potential to help the economy decarbonize significantly. Sustainable transportation systems: Electric cars, high-speed rail, and cycling infrastructure are just a few examples of sustainable transportation systems that are essential for cutting down on greenhouse gas emissions from the transportation industry. Also, these technologies can aid in lowering air pollution and enhancing public health.

Systems for managing waste and water that are sustainable can help protect public health, lessen greenhouse gas emissions from the waste sector, and lessen water scarcity. These technologies include waste-to-energy, composting, and water reuse and recycling. Infrastructure that is climate-resilient: Communities must be protected from the effects of climate change using infrastructure that is climate-resilient, such as sea walls, green roofs, and other protective measures. These technologies can also aid in lowering the expenses and harm caused by climatically related calamities.

Conclusion:

Global warming and climate change are important issues that call for action at all societal levels. The technology and infrastructure required to combat climate change and lessen its effects must be developed and deployed, and engineers have a critical role to play in this process. Engineers have a social duty to guarantee that their work has a positive influence on society and the environment and that all groups may access and benefit from their solutions. To combat climate change, a variety of technologies will be required, including those for renewable energy.

References

- The Engineers Role in Climate Change Mitigation*. (n.d.). Retrieved March 20, 2023, from https://www.researchgate.net/publication/276206146_The_Engineers_Role_in_Climate_Change_Mitigation
- Fork, D., & Koningstein, R. (2023, March 15). *Engineers: You can disrupt climate change*. IEEE Spectrum. Retrieved March 19, 2023, from <https://spectrum.ieee.org/engineers-you-can-disrupt-climate-change>
- Routledge: Taylor and Francis Group. (n.d.). *Combating Climate Change: The Role of Science and Engineering*. Combating climate change: The role of science and engineering. Retrieved March 19, 2023, from <https://www.routledge.com/blog/article/combating-climate-change-the-role-of-science-and-engineering>
- SITNFlash. (2016, October 28). *Engineering the Earth to fight climate change*. Science in the News. Retrieved March 19, 2023, from <https://sitn.hms.harvard.edu/flash/2016/engineering-earth-fight-climate-change/>
- Tackling climate change - the role of the engineer: SGR: Responsible science*. Scientists for Global Responsibility. (n.d.). Retrieved March 19, 2023, from <https://www.sgr.org.uk/resources/tackling-climate-change-role-engineer>